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RETHINKING SHORT DISTANCE TRAVEL

THE EFFECT OF MOBILITY HUB DESIGN AND LOCATION ON SUSTAINABLE MOBILITY IN NIEUWEGEIN

Master Thesis by

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Under supervision
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Preface

In front of you lies the master's thesis *"Rethinking short distance travel: The effect of mobility hub design and location on car use in Nieuwegein"*. This thesis was written in fulfilment of the graduation requirements for the Master's programme in Spatial Planning at Utrecht University. Since February 2025, I have worked on this research, which explores how design and location of mobility hubs affects the use of sustainable mobility for short trips in Nieuwegein.

Throughout this process, I tried to combine academic insights with practical policy relevance, and made use of a quantitative survey. I have had previous experience with SPSS during my studies, but new challenges also appeared. These included designing a well-structured survey and applying the right statistical tests to it in order to answer the research questions. Furthermore, I have learned how spatial structures, design principles, and behavioural factors interact with each other, and how they shape mobility patterns.

This thesis has not only helped me to grow in an academic way, but also taught me the importance of staying flexible but consistent. I found great value in connecting theories with real-world policy issues, and this has strengthened my interest in working on applied mobility challenges in the future.

I would like to thank my thesis supervisor S.R. Smith for the valuable feedback and guidance throughout the process. Your sharp insights and targeted suggestions helped me improve my argumentation and structure. I also want to thank the Municipality of Nieuwegein for the opportunity to do an internship and thereby conduct this research, and for supporting the survey distribution among residents.

Bjorn Lakerveld

June 27th, 2025

Abstract

This thesis explores how the location and design of mobility hubs affect the use of sustainable mobility for short trips in Nieuwegein. Nieuwegein is a medium-sized Dutch New Town which is historically shaped by car-oriented planning. On the other hand, mobility hubs gain increasing attention in spatial planning and policy. The concept of mobility hubs can be viewed as physical nodes where sustainable transport modes such as public transport, shared mobility, walking, and cycling come together. However, empirical evidence regarding their behavioural impact on short-distance travel remains scarce. By integrating spatial characteristics, design features, and behavioural intentions, this study addresses the following research question: *How do the location and design of mobility hubs in Nieuwegein affect the use of sustainable mobility for short trips?* A structured online survey among 572 residents was conducted in collaboration with the municipality of Nieuwegein. The survey tried to measure concepts as current travel behaviour for trips under 2.5 km, familiarity with and perceptions of mobility hubs, preferences regarding hub design, and willingness to reduce car use. Results show that although walking and cycling are the most frequently used modes for short trips, the car remains dominant for purposes such as shopping or trip chaining. Furthermore, perceptions of mobility hubs show differences in both attitude and maximum travel distance to hubs. Design features that are considered most important include elements as good lighting, multimodal connectivity, and real-time travel information. On the other hand, childcare facilities and shared mopeds are less valued. Furthermore, sociodemographic factors such as age and education level influence both mobility behaviour and perceptions, but even more important, the willingness to reduce car use increases when hubs are well-designed and located within walking or cycling distance. With this, the study contributes to the literature by combining spatial and design aspects of mobility hubs within a medium-sized Dutch New Town. Overall, it can be stated that a one-size-fits-all approach is ineffective. Mobility hubs must be specifically implemented to local routines, user needs, and spatial characteristics. The insights from this research can therefore guide urban planners and policymakers in realising effective and inclusive hub strategies that support a broader shift towards sustainable urban mobility.

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1. Introduction

In recent years, the concept of mobility hubs has gained increasing importance in Dutch mobility and spatial planning. This concept can be explained as physical locations where sustainable transport modes such as public transport, shared mobility, cycling, and walking are integrated into one system (Hached & L'Hostis, 2022). Because these alternatives are offered at one place, mobility hubs are seen as essential instruments that have the potential to reduce private car use for short trips. Nevertheless, it is important aligning these hubs with supportive infrastructure, accessibility, and behavioural incentives to actually create more sustainable mobility patterns (Arnold et al., 2022; UITP, 2023). Another positive effect is that with this modal shift, emissions can also be reduced (Aydin et al., 2022; Mackett, 2001).

Although relatively new in the Netherlands, the implementation of mobility hubs is gaining traction at the local and regional levels. Municipalities such as Utrecht, Groningen, and Eindhoven have started to develop hubs in collaboration with transport providers and private stakeholders (Geurs et al., 2024; Witte et al., 2021). Policy documents also see potential in hubs, not only for improving spatial efficiency and quality, but also for changing mobility behaviour and reducing car dependency (Rongen et al., 2022; Province of North Holland, 2023). However, despite growing policy support, empirical evidence on their actual behavioural impact, especially for short-distance travel, remains limited (Van Gerrevink et al., 2021; Bösehans et al., 2021).

This is particularly relevant given that short trips, defined here as those under 2.5 kilometres, are still predominantly made by car, even in cities with high-quality active transport infrastructure (Kim & Ulfarsson, 2008; Mackett, 2003). Mode choice for short trips is often shaped by practical needs such as combining multiple activities or transporting items, but also by deeper behavioural and infrastructural barriers, including habitual car use and perceived lack of attractive alternatives (Loukopoulos & Gärling, 2005; He et al., 2020). If mobility hubs are to provide a meaningful alternative, their success depends on how well their location and design align with residents' routines, needs, and perceptions (Bell, 2019; Blad et al., 2022). Important here is that the design of a mobility hub does not only refer to the physical features such as layout and amenities but also to the way it is able to facilitate an accepted form of multimodal travel (Arias-Molinares et al., 2023; Arup & Go-Ahead, 2021).

This gap is reinforced by studies that often focus on either spatial or design aspects of mobility hubs without integrating both, despite recent authors stress the need for a holistic approach (Roukouni et al., 2023; Weustenenk & Mingardo, 2023). Furthermore, while there is increased attention to mobility hubs in academic and policy contexts, most literature focuses on either large cities or rural areas and thus lacks an understanding of mobility hubs in medium-sized cities like Nieuwegein. Finally, research on how mobility hubs influence mode choice for short trips in New Towns is limited.

Developed during the 1970s, Nieuwegein was shaped by a planning paradigm centred on car use, resulting in spatial separation of functions, extensive parking facilities, and segregated networks for cars, bicycles, and pedestrians (Bruinsma & Koomen, 2018). This urban form has made short-distance car use both convenient and culturally embedded. At the same time, the municipality sees potential in mobility hubs in reducing this car dependency across the city (Witte et al., 2021). This study therefore contributes to creating new knowledge on sustainable mobility transitions and spatial behaviour, which both are becoming increasingly interesting themes within the literature. With this, it responds to calls for more integrated research that links spatial design, user perception, and behavioural intention at the local level (Berger et al., 2014; Banister, 2008). By focusing specifically on short trips, the study addresses a travel segment often overlooked in planning, despite its relevance for sustainability and public health (Mackett, 2003; Maibach et al., 2009).

From a societal perspective, the transport sector continues to be a major contributor to CO_2 emissions in the Netherlands. Therefore, reducing car use for short trips can support climate goals in a more accessible way (Hached & L'Hostis, 2022; Goudappel, n.d.). In addition, if hubs are well-designed, according to the needs of different user groups, they have the potential to improve the perceived accessibility and furthermore help address issues of transport poverty (Lucas, 2012; Friman et al., 2020). This study therefore seeks to explore under what conditions the location and design of mobility hubs affect the use of sustainable mobility for short trips in a suburban, car-oriented environment. Using Nieuwegein as a case study, the research combines spatial reasoning with survey data to examine its subjective factors. Furthermore, by identifying which design elements are most valued by residents and how these influence mobility behaviour, this thesis aims to support more targeted and effective mobility hub strategies. For this, the following research question therefore needs to be answered:

How do the location and design of mobility hubs in Nieuwegein affect the use of sustainable mobility for short trips?

To answer this research question, the study is structured around four sub questions:

1. *What are the dominant mobility patterns of Nieuwegein residents for short trips (under 2.5 km)?*
2. *How do Nieuwegein residents perceive the concept of mobility hubs in their neighbourhoods?*
3. *What design elements and facilities do Nieuwegein residents consider most important in a mobility hub?*
4. *To what extent are Nieuwegein residents willing to reduce their car use for short trips if well-designed mobility hubs were available?*

By addressing these step by step, the thesis provides insight into the dominant travel patterns of Nieuwegein residents for short trips and how residents perceive mobility hubs in their context. The last two steps allow to identify which design elements are considered most important by its potential users and whether residents are willing to reduce their car use for short trips if well-designed hubs were available in their neighbourhood, as well as what conditions influence this willingness.

This thesis is structured as follows. It will begin with a review of the most relevant academic literature while situating the study within existing research. This synthesis leads to a conceptual model that underpins the analysis. The next chapter will then outline the methodology, after which the results will be provided according to the order of the sub questions. Finally, the discussion and conclusion provide an integrated answer to the research question and offer several recommendations for policy and future research.

2. Literature review

In this chapter, key definitions, theories, and characteristics interconnecting the location and design of mobility hubs with modal choice are discussed. First, the definitions of modal choice and mobility hubs are clarified, after which the underlying relationships and possible interconnected characteristics are reviewed.

2.1 Sustainable (urban) development

Sustainable development is generally understood as the search for a balanced, long-term improvement in urban environments across environmental, economic, social, and institutional dimensions (Jabareen, 2008). Michalina, Mederly, Diefenbacher, and Held (2021) highlight the synergy between these four dimensions rather than treating them as isolated pillars. In a similar way, Hassan and Lee (2015) refer to sustainable urban development as "strategies and processes that balance ecological, social, and economic goals to promote long-term urban sustainability". Furthermore, the authors emphasise that sustainability is not a fixed outcome but a continuous transformation influenced by both local and global dynamics. Based on this, Rasoolimanesh, Badarulzaman, and Jaafar (2011) describe sustainable development as a tool to respond to urbanisation pressures such as globalisation, decentralisation, and population growth. Despite agreement on its importance, many studies note the lack of a universally accepted definition of sustainable development. Hassan and Lee (2015) argue that this lack is a consequence of the complex and context specific nature of sustainability. This thus accounts for a pluralist view with strategies which are adjusted to the local scale.

This complexity leads to practical challenges. Mengiste, Shi, and Wong (2024) state that a combination of economic growth and social goals will in the future lead to struggles in urban policy. The authors emphasise that there is a need for integrated approaches that address energy consumption, transportation, climate change, land use, and liveability in a holistic manner. This aligns with Rasoolimanesh et al. (2011), who advocate that the governance structures need to be improved to be able to deal with these multidimensional challenges. Saiu (2017) therefore identifies three pitfalls that could undermine sustainable urban development: the dominance of economic interests at the expense of social equity, the oversimplification of urban complexity through technocratic solutions, and unintended social inequalities resulting from green technologies. To address these pitfalls, the author proposes a framework that can better evaluate these sustainability initiatives which has the potential to bridge the gap between theoretical concepts and real-life cases. Overall, sustainable (urban) development should be seen as a dynamic process rather than a checklist of indicators. Within this broader understanding, mobility is seen as an emerging dimension that is closely related to spatial and social justice, environmental performance, and economic productivity. Herein, the opportunities and contradictions of sustainable urban development become visible because mobility shapes access to opportunities, patterns of urban growth, and levels of carbon emissions (Holden, Banister, Gössling, Gilpin & Linnerud, 2020).

2.1.1 Sustainable mobility

Mobility is the main concern in current debates towards more sustainable consumption and production patterns. Mobility refers to the ability to move people and goods across space and time through various modes of transportation, including walking, cycling, driving, and public transport (Sharifi-Asl & Audirac, 2024). Sustainable mobility refers to "transport systems that meet the economic, social, and environmental needs of society, while minimising their negative impacts on these same dimensions" (Gallo & Martinelli, 2020, p. 10). This definition can be helpful, but it often lacks the ability to find out how mobility is framed in urban studies and research on sustainability in a holistic way.

As stated by Holden et al. (2020), the concept of mobility has shifted paradigms from focusing on how vehicles and goods move to one that wants to understand how this relates to accessibility, spatial justice, and societal well-being. Therefore, mobility can be seen as something that is relational and context specific, and thus embedded in urban form, social structures, and governance arrangement. The authors therefore propose three 'grand narratives' that focus on achieving sustainable mobility: efficiency, alteration, and reduction. The electromobility narrative is focused on improving technological efficiency, the collective transport narrative wants to achieve a modal shift from private to public transport modes, and the low-mobility society narrative is dealing with reducing the overall travel demand. Holden et al. (2020) further note that to achieve sustainable mobility in a complementary way, interventions need a broad stakeholder support and public acceptance.

However, transition towards sustainable mobility is often incremental, contested, and fragmented. It has led to spatial mismatches between urban development and public transport capacity, strong car dependency reinforced by historical path dependencies, and regional differences in individual mobility needs. Within the European Union for instance, mobility is a key sector of its economy, with citizens travelling more frequently, over longer distances, and faster than before (Berger, Feindt, Holden & Rubik, 2014). Banister (2008) therefore emphasises that a successful transition depends on supportive land-use planning and institutional frameworks. In addition, promoting sustainable mobility needs integrating transport and urban development strategies.

However, other authors mention the complexity of implementing these strategies and the gap between theory and practice. Foltýnová, Vejchodská, Rybová, and Květoň (2020) state that many governments struggle to translate theoretical concepts into effective policy, stressing fragmented governance structures and conflicting stakeholder interests. On the other hand, Gillis, Semanjski, and Lauwers (2015) try to close this gap by proposing practical indicators that stimulate moving from theoretical goals to actions that are visible in practice. However, the authors acknowledge that the coordination of these actions is essential for its effectiveness and should therefore align with broader planning strategies (Holden et al., 2020).

2.1.2 Compact city

One model that can be seen as an example of these spatial strategies, is the compact city. This model focuses on accessibility, modal shift, and reduced travel demand (Holden et al., 2020). The compact city can be defined as a high-density, mixed use urban form that offers more efficient land use and thereby promotes sustainable mobility by reducing the need to travel long distances (Holden et al., 2020; Morrison, 1998). According to De Vos (2015), the high-density and mixed land use of compact cities provide good preconditions for short trips by public transport and active modes like walking and cycling. A compact city can also reduce its ecological footprint through efficient spatial and sectoral planning (Kjærås, 2020). This strategy has become central to urban sustainability policies in many high-income countries to counter urban sprawl and motorised transport (Stevenson et al., 2016). Shorter trips lengths in compact cities improve access to amenities and enhance the attractiveness of active transport options. In addition, Bin Sulaiman (2023) states that more compact urban forms could not only improve access to public transport but also reduce car dependency and traffic congestion.

The benefits coming from the compact city are also underlined by other empirical research. For instance, Mouratidis (2017) found that neighbourhood satisfaction and liveability are positively associated with the features of a compact city. Furthermore, these features play a crucial role in the stimulation of sustainable urban transformations (Bibri, Krogstie & Kärrholm, 2020). Lastly, compact city features need to be integrated with spatial planning, and environmental and social goals which can enhance the overall balance between environmental, economic, and social sustainability goals (Salim & Lakshmi, 2023). This however requires strategic planning and a well-designed process.

Despite these advantages, Kjærås (2020) states that the question about the possibility of the compact city achieving sustainability in practice, remains. This is sometimes referred to as the *compact city paradox*, where compact development is perceived as something that affects the liveability in a negative way (Mouratidis, 2017). The author states that current compact city implementations often ignore societal and environmental consequences, which potentially leads to a lower liveability. However, Mouratidis (2017) found little empirical support for this paradox in his study, while other studies support it. Nevertheless, European compact cities still face challenges such as poor environmental quality and health outcomes (Iungman et al., 2024), reduced urban greenspace (Balikçi, Giezen & Arundel, 2022), and increased land and housing prices (Bibri et al., 2020).

These challenges have mobility implications as well. Bin Sulaiman states that overcrowding and longer commuting times may occur if public transport infrastructure does not keep up with densification processes. Melia, Parkhurst, and Barton (2011) stress that urban intensification must be accompanied by strong traffic restraint measures to avoid localised congestion. Therefore, the success of the compact city depends on implementation that balances social, environmental, and infrastructural factors. However, the mobility choices people make play an important role in how effective the implementation of these factors is, even when they are perfectly aligned (Rasouli & Timmermans, 2015). It is therefore crucial to understand how people make their mobility decisions to find to what extent it influences sustainable urban development strategies.

2.2 Defining modal choice for short trips

2.2.1 Defining modal choice

Nevertheless, travel behaviour is shaped by multiple interacting factors. Hence, modal choice can be defined as ”the process of choosing between different transport alternatives, determined by a combination of individual sociodemographic factors and spatial characteristics and influenced by sociopsychological factors” (Rasouli & Timmermans, 2015). De Witte et al. (2013) note that the interpretation of modal choice depends on the theoretical lens that is used: a rationalist perspective (individuals the optimal mode based on cost-benefit analysis), a socio-geographical perspective (modal choice is a consequence of daily driven activities and derived travel demand), or a sociopsychological perspective (choices are driven by perceptions, habits, and intentions). Rather than treating these as mutually exclusive, Rasouli and Timmermans (2015) advocate a multidisciplinary perspective that incorporates all three approaches, which is used in this study. Mackett (2003) similarly argues for examining the behaviours underlying specific short trips by car and suggests a multidisciplinary perspective.

Building on this, Banister (2008) introduces the Sustainable Mobility Paradigm which focuses on improving transport infrastructure to promote behavioural change through planning, governance, and public engagement. With this, sustainable mobility cannot be achieved without public understanding and acceptance. Therefore, this paradigm underlines the importance of motivational factors that influence modal choice, especially for intermodal travel. Likewise, Van Doorne (2023) and Van Rooij (2020) stress that user motivation is crucial to whether people will use multiple transport modes and that this intermodal travel is often perceived as too much effort for short daily trips, which reinforces the findings of Mackett (2003) regarding the difficulty of altering people’s habits.

Nevertheless, case studies show that specific interventions can influence mode choice in a positive way. For example, placing mobility hubs at strategic locations in Enschede stimulated the use of shared mobility services (Van Bezooijen, 2023). This however needs to be complemented with convenient alternatives to the private car, especially for short-distance trips (Maibach, Steg & Anable, 2009; De Nazelle, Morton, Jerrett & Crawford-Brown, 2010). For instance, offering free public transportation can function as one of these alternatives. However, Stadnichuk, Merten, Larisch, and Walther (2024) concluded that although this lead to a higher use of this mode, it mainly

attracted pedestrians and cyclists instead of car users. This suggests that improving infrastructure alone cannot achieve this, but that it needs to be supplemented with targeted communication, user-oriented policies, and marketing strategies. This can overcome psychological and behavioural barriers to modal shift.

2.2.2 Modal choice for short trips

Short trips have the potential to reduce private car use and thus support a modal shift. For instance, walking, cycling, and shared mobility are perfect alternatives for this car dependency (Black, Collins & Snell, 2001). Ciari and Becker (2017) also state that trips currently made with the car can be replaced with shared bicycles and shared cars. Similarly, Mackett (2013) observes that short trips can often be made by walking or cycling, modes that require relatively low investment to make widely available. Neves and Brand (2019) found that active travel (walking and cycling) could replace almost 70 percent of all short car trips, highlighting huge potential for shifting travel behaviour. Despite this potential, short trips are still dominated by private car use. One reason for this is that alternatives are often seen as less convenient or flexible, and urban form plays a crucial role here (Thomas, La Paix Puello & Geurs (2019). De Vos, Van Acker, and Witlox (2012) for example show that cities with low-density, single land use, or suburban forms stimulates car dependency, even when good public transport is available. This is because these characteristics do not support active modes.

On the other hand, public transport will continue to show potential to reduce car use for short trips when integrated into broader urban planning (De Vos et al., 2012; Mackett, 2003). This is supported by Van Bezooijen (2023), who found that placing multimodal alternatives at strategic locations increases its use for daily travel. Electric bicycles for instance are a promising substitute for short car trips. Lee, Molin, Maat, and Sierzchula (2015) indicate that over 60 percent of trips made by e-bike would have been done by car if the e-bike were not available. However, the remaining share of e-bike trips replaces walking, public transport, or traditional cycling, which questions the net environmental impact. Therefore, targeted modal shift policies must account for such trade-offs, especially because these short trips are interlinked with the multiple trip purposes that make modal shifts more complex.

For instance, short-distance trips by car are primarily driven by daily routines such as work, education, shopping, and trip chaining (Neves & Brand, 2019). Studies in different contexts confirm these patterns. For example, in Beijing common short trip purposes include commuting, school drop-offs/pick-ups, and shopping (Li, Song, Chen & Yu, 2015), while in Los Angeles commuting, transporting goods, and trip chaining are key drives of short car trips (Lee, He & Sohn, 2017). Trip chaining emerges across multiple studies and focuses on combining multiple purposes into one continuous journey. Policy interventions should address entire trip chains because overlapping purposes complicates behavioural change (Scheepers, Slinger, Wendel-Vos & Schuit, 2014). For instance, even extremely short car trips in Norway are often part of larger chains, especially those involving shopping or accompanying children, which makes them harder to replace (Vagane, 2007).

Environmental and contextual factors also influence modal choices for short trips. For example, darkness or rain strongly influence parental decisions to drive children instead of encouraging walking (Mackett, 2003). The accessibility of shops and services, and the quality of infrastructure also play a crucial role in which mode is chosen. Walking for example is chosen when the destinations of people are closer to each other, and public transport and cycling require high-quality street networks, regional connectivity, and safe infrastructure (Lee et al., 2017). However, not only the built environment but also the destination of where people travel, and its complexity, play a role here.

It is known that the main trip purposes are the same in many regions. However, these purposes can differ in their outcomes when looking at specific contexts. In Los Angeles for example, important trip purposes were trips just focused on shopping rather than driving past multiple stops (Lee et al., 2017). This trip chaining is however evident in countries as the

Netherlands and Norway (Scheepers et al., 2014; Vagane, 2007). Therefore, the type of intervention must relate to local travel patterns and its urban context to avoid a one-size-fits-all implementation.

Beyond trip purpose, cost and convenience are important underlying drivers. Mackett (2003) states that individuals sometimes switch from driving to walking without a particular reason, suggesting that minor shifts in perceived effort or cost can alter travel behaviour. For instance, altering the perceived convenience of using a car for combined activities can encourage modal shifts (Vagane, 2007). Additionally, providing affordable, nearby alternatives (e.g. local shops or services) can significantly reduce car dependency. However, without addressing deeply rooted preferences and habits, behavioural change is unlikely (Vagane, 2007).

2.2.3 Modal choice, short trips, and sociodemographics

Travel behaviour of people for short trips also depends on sociodemographic characteristics such as age, gender, income, household composition, and employment status. These for example affect the capability of the individual and play a role in how individuals perceive safety, convenience, and the efficiency of certain transport modes. For example, the presence of young children increases reliance on the car for short distances, especially in bad weather or darkness (Mackett, 2003). This aligns with Lee et al. (2017), who found that life stage and role-based responsibilities influence mode choice across various contexts. Similarly, Kim and Ulfarsson (2008) and Loukopouloz and Gärling (2005) found that working-age adults are more likely to use the car for distances.

He et al. (2020) further show that car ownership and employment status strongly predict car use for trips under 5 km. These factors also influence the availability and access to certain vehicles, where purposes like daily responsibilities like work and caregiving depend on. Furthermore, a Dutch case study found that neighbourhood walkability and access to public transport can either reinforce or mitigate mobility disadvantages related to personal demographics (Scheepers et al., 2014). This underlines that the built environment interacts with sociodemographic factors to influence trave behaviour.

In Norway, men and younger adults (18-34) are more likely to drive short distances, especially in suburban or rural settings (Vagane, 2007). Gender also influences travel behaviour, men often drive for shopping trips involving heavy goods, whereas women are more likely to drive for child-related trips such as school drop-offs (Mackett, 2003; Vagane, 2007). These demographic patterns are also linked to deeper behavioural patterns. Vagane (2007) for example states that the convenience of trip chaining not only depends on daily travel patterns, but also on its social expectations. Therefore, modal shift strategies need to consider the behavioural aspects of all demographic groups to be effective.

2.2.4 Behavioural aspects

The Theory of Planned Behaviour provides a useful framework for understanding how people decide their transport mode, especially when distance does not specifically exclude walking or cycling (Ajzin, 1991). Applying this theory, He et al. (2020) identify three core dimensions influencing car use: attitudes (e.g. the perceived convenience of using a car), subjective norms (e.g. social pressure or expectations), and perceived behavioural control (e.g. time constraints or trip complexity). This aligns with the findings of Steg (2005), who states that symbolic and affective modes such as status, sense of freedom, or self-expression significantly contribute to car use. Specifically, when the car is part of someone's identity or lifestyle, other factors like cost or efficiency are ignored. Mantouka et al. (2019) similarly argue that travel happiness means that people are more tolerant for disruptions, or satisfied, when they feel emotionally in control. This may explain why even small inconveniences in alternative transport modes can discourage modal shift away from their cars.

Mackett (2001) expands this perspective by arguing that policy interventions must bridge structural and psychological gaps to challenge deep-rooted behaviours. For instance, promoting walking as a healthy activity or providing subsidies for cycling equipment can alter perceptions of

alternatives and increase peoples' overall travel happiness (Mantouka et al., 2019). However, Mackett (2001) emphasises that interventions must align with individuals' lifestyles to avoid resistance. Policies that ignore these nuances may lead to inequalities and in the worst case to refusal among vulnerable groups. Vagane (2007) adds to this that behavioural patterns are closely linked to sociodemographic factors, especially when looking at the varying car dependency across population subgroups. Young adults, suburban residents, and parents with young children often show a strong preference for driving due to complex daily demands (i.e. time constraints and trip chaining). In these cases, interventions should target specific barriers to effectively encourage modal shift such as trip chaining, lifestyle demands, and household structure.

Bösehans et al. (2021) apply Rogers' Innovation Adoption Curve to deal with behavioural segmentation and thereby create appropriate mobility interventions. This framework groups populations based on their openness to change. Innovators and early adopters may accept new transport concepts like e-bike sharing programs or app-based mobility solutions. On the other hand, late adopters and laggards may require stronger nudges such as car-use fees or restricted parking. These user profiles are therefore an important reference for strategies that try to match its incentives with these profiles. Based on this, Beerman, Harskamp, Marx, and Uebernickel (2023) stress that nudges can be an essential tool to reduce car use. The authors for example propose reframing short distance travel as an intentional and therefore a flexible choice. Mackett (2001) further states that subtle, user-centred interventions are necessary for the alignment of people's behaviour with these interventions.

2.3 Defining mobility hubs

Behavioural insights thus increasingly inform how urban mobility infrastructure should be designed. Mobility hubs are emerging as one of these strategic interventions concerned with behavioural complexity. Mobility hubs are central in an ongoing debate in both academic and policy contexts. Across the literature, mobility hubs are defined in various ways but Arias-Molinares et al. (2023) describe a mobility hub as "a place where various shared and public transportation services, supported by information technologies, converge to provide users with seamless intermodal connections". Similarly, Ku, Choi, Lee, and Lee (2022) emphasise multiple transport modes and digital services, viewing smart mobility hubs as integrated urban elements that enhance flows of people, energy, and resources. Hached and L'Hostis (2022) stress that the primary objective of a shared mobility hub is to reduce private car ownership, defining it as a place where different transport modes are integrated seamlessly, promoting efficient and sustainable urban mobility. Dutch literature also highlights these themes. For example, the Knowledge Institute for Mobility defines a mobility hub as a physical link between transport modalities that can also serve as a focal point for spatial development (Witte et al., 2021). Similarly, Goudappel (n.d.) refers to mobility hubs as "accessible nodes that encourage efficient and sustainable transport, focusing on the convergence of various forms of transportation".

While definitions differ in emphasis, they show similar concepts such as integration of modes, connectivity, and multimodality (Roukouni, Junyent, Casanovas & De Almeida Correia, 2023; Weustenenk & Mingardo, 2023; Blad et al., 2022). However, a consensus on the definition remains ambiguous. Mobility hubs are an emerging concept within limited literature and no comprehensive definition (Saravanan, 2022). Different interpretations exist: some consider the inclusion of public transport desirable but not essential, whereas others place public transport at the core of the concept (Hached & L'Hostis, 2022; Coenegrachts, Beckers, Vanelslander & Verhetsel, 2021; Geurs, Münzel & Grigolon, 2022).

Current research tends to focus on identifying mobility hub characteristics rather than exploring their broader context. Ren and Chow (2025) not three benefits of mobility hubs from a wider perspective: supporting multimodal travel, strengthening public transport, and promoting environmental sustainability. Other authors highlight the societal impacts of mobility hubs and their role in broader urban development strategies (Hernandez & Monzon, 2016; Frank, Dirks &

Walther, 2021; Province of North Holland, 2023). Although some research has proposed typologies (Weustenenk & Mingardo, 2023; Roukouni et al., 2023) or introduced a Smart Hubs Integration Ladder (Geurs et al., 2022), a consensus on the most suitable classification has not yet been reached.

2.4 Relationship between mobility hubs and modal choice for short trips

As shown above, mobility hubs have the potential to reduce car dependency for short distance trips. Research in Dutch cases for example found that combining mobility hubs with limited parking capacity and parking fees in The Hague and Rotterdam decreased car use for short trips (Zhou, Dorsman, Mandjes & Snelder, 2023). On the other hand, the implementation of e-bike at mobility hubs caused a decline in the amount of walking trips instead those made with a car. Therefore, these measures relate to modal shift strategies which can reduce car use. In addition, Bösehans et al. (2021) found that shared mobility hubs in Amsterdam mainly attracted public transport users instead of car users. These authors however also found that hubs located around commuting and grocery shopping better match the actual travel patterns and is seen as a key determinant for using the car for short trips. Hubs in these locations enable users to combine trips (trip chaining), which is proved to shift people away from private cars (Mackett, 2003; Lee et al., 2017; Scheepers et al., 2014). Studies on demographic factors influencing modal outcomes also show these unintended or negative effects. Van Rooij (2020) found that in many cases mobility hubs replaced public transport rather than car use, especially among suburban and older users. Similarly, Zuurbier (2023) states that less than a third of car-owning households over the age of 45 used hubs, especially when weather, parking costs, and trip purpose play a role.

Long-term modal shift depends not only on hub interventions, but also on user behaviour. Liao et al. (2024) found that integrated apps can help reduce cognitive effort and build trust in alternatives. Moreover, the authors note that long-term exposure sustains modal shifts. Bösehans, Kavta, Bell, and Dissanayake (2023) propose adaptive hubs which can align with fluctuating trip patterns. This allows experts to follow these developments for a longer period and react on possible fluctuations. This focus on long-term planning is also argued by the International Association of Public Transport (UITP, 2023) but adds that involving all relevant stakeholders is also essential for the effectiveness of mobility hubs.

2.4.1 Designing mobility hubs

Even with all stakeholders involved, studies suggest that well-designed hubs offer more than just transport services. Weustenenk and Mingardo (2023) stress that including additional amenities such as retail, workplaces, or parcel pick-up points enhance the economic value of mobility hubs. However, this depends on the location and scale of the hub. Rongen et al. (2020) emphasise the implementation of adaptable hubs to make them responsive to changing mobility patterns and user needs over time. Similarly, Witteveen+Bos (n.d.) introduced a HUB ME-NU concept that prioritises the preferences of end users and stakeholders rather than seeing mobility as the single function of the hubs (Arseneault, 2022; Van Rooij, 2020). Empirical studies also found that residents prioritise a diverse availability of vehicles, ease of use, and overall safety (Van Rooij, 2020). Furthermore, residents of the provinces of Groningen and Drenthe expressed the need for safe parking for cars and bicycles, toilets, shops, weatherproof shelters, good lighting, or staff to ensure safety (Van Doorne, 2023). Furthermore, the implementation of digital technological innovations like integrated apps or real-time travel information improve the connectivity of multiple transport modes, and thus the overall ease of use (Maas, 2020; Liao et al., 2024; Ku et al., 2022).

Not only the functionality, but the social role of mobility hubs is crucial. Van Doorne (2023) for example suggests that hubs must be designed to encourage social interaction in areas where people for instance feel isolated. This increased social interaction could also lead to mobility hubs that express community values, especially in urban areas (Blad et al., 2022; Weustenenk &

Mingardo, 2023). For this to happen, a flexible and user-oriented approach is crucial to ensure a design that is inclusive and comfortable (Arseneault, 2022).

2.4.2 Locating mobility hubs

However, allocating mobility hubs is a strategic decision in the planning process with long-term implications (Arias-Molinares et al., 2023). Therefore, strategic placement highly defines its effectiveness. A well-placed hub can for example lead to a more efficient transport network, while on the other hand, choosing poor locations could result in underutilisation, congestion, and wasted investments (Stadnichuk et al., 2024). Ren and Chow (2025) also warn for focussing too much on expert judgement, assumed demand, or proxy indicators. Such approaches can be criticised for its limited generalisation to different urban contexts and the chance to overlook observed user behaviour (Xanthopoulos, Van der Tuin, Azadeh, De Almeida Correia, Van Oort & Snelder, 2024). Instead, implementing broader incremental development strategies that consider observed user behaviour is essential (Frank et al., 2021; Xanthopoulos et al., 2024).

Similar studies also recognise that the placement of hubs should align with people's daily routines and key destinations. Rongen et al. (2022) use the Transit-Oriented Development (TOD) and Park & Ride (P+R) frameworks to define optimal hub locations. Together with findings by Blad et al. (2022), this suggests that that hubs must be positioned where flows of jobs, commercial areas, and leisure intersect to naturally integrate them into residents' travel patterns. Aydin et al. (2022) similarly propose centralised locations near existing transport infrastructure to improve accessibility and encourage modal shifts. Additionally, Arias-Molinares et al. (2023) identify station density, surrounding commercial activity, and existing cycling infrastructure as key factors for effective hub placement.

2.4.3 Relationship between mobility hub design and location

The interconnectedness of the location and design of mobility hubs is essential for their long-term success. Hached and L'Hostis (2022) identify key spatial and functional parameters for hub development: proximity to high-density residential or commercial areas and integration with existing public transport networks. These are the foundation for hub design and defines which design choices should be made and what services the hub should provide.

Therefore, the design of a mobility hub must be context sensitive. Tran and Draeger (2021) also stress that the types of services and amenities should strongly depend on the urban setting of the hub in which it is located. Arnold et al. (2022) add that observing how these amenities encourage the overall use of the hub is insufficient, and how amenities help integrating hubs into its local environment should also be considered, which boosts the sense of familiarity and convenience. However, the inclusivity of the design process, which is essential for creating mixed-use and multimodal locations, should not be underestimated (Bell, 2019; Weustenenk, 2021; Nolmark et al., 2025).

A user-centred approach also calls for flexibility in the design of mobility hubs. As mobility patterns evolve, the functionality of mobility hubs should be able to do it the same way. Arseneault (2022) shows that insights from pilot projects and participatory processes with early adopters can reveal both challenges and opportunities regarding the spatial and functional factors of mobility hubs. This not only improves the overall fit of the hub, but also stimulates long-term sustainability (Van Doorne, 2023).

2.5 User perceptions and sociodemographic factors

Beyond the spatial and functional design of mobility hubs, user perceptions and experiences are of equal importance. Perceived accessibility, safety, reliability, and ease of use are strongly associated with people's willingness to shift from private car use to more sustainable modes of

transport (Kamargianni, Li, Matyas & Schäfer, 2016; Van Gerrevink et al. (2021). Although well-designed, a hub will have less users if perceived as confusing, unsafe, or unreliable.

Furthermore, these perceptions are never static but develop over time when people use the mobility hub more often and thereby increase their familiarity with it (Fraser & Lock, 2011). Because this user-centred approach is essential, real-time information, user-friendly layouts, and a comfortable public space can be provided to turn uncertainty into a more positive experience (Sochor, Arby, MariAnne Karlsson & Sarasini, 2018). However, people will need to have both the ability and willingness to engage with these services (Ku et al. (2022). This trust is strengthened through availability and punctuality of public transport and shared mobility (Mulley & Nelson, 2020).

This can however not be implemented in a uniform way, because sociodemographic factors such as age, gender, income, education, and car ownership determine how users are shaped and how they in their way use mobility hubs (Delbosc & Currie, 2011; Friman, Lättman & Olsson, 2020). Therefore, Van Wee & Geurs (2011) emphasise that mobility systems should be able to manage diverse user needs, routines, and capabilities. For instance, younger adults and students will use shared and flexible mobility options more often, while older users will prefer elements such as personal safety, physical accessibility, and clear wayfinding. For lower income groups who rely on public transport, mobility hubs have the potential to serve as access points to affordable services (Lucas, 2012). However, the same groups often face barriers such as digital exclusion or limited knowledge of the available services (Nikitas, Michalakopoulou, Njoya & Karampatzakis, 2020). Similarly, lower educated people deal with limited digital skills or participate less in planning processes. This means they need targeted, low-threshold initiatives for accessing digital services or joining participation processes and ensure inclusivity at mobility hubs (Geurs et al., 2024; Van Rooij, 2020). Furthermore, suburban or car-dependent residents are confronted with convenience, travel time, and cost-efficiency as barriers for shifting away from car use (Dashtestaninejad, Van de Coevering & De Kruijf, 2023).

Furthermore, gender can show differences in how a mobility hub is perceived and can therefore influence by who the hub is used more often. Women for example prefer to have elements at hubs that increase safety, accessibility, and the ability to combine mobility tasks with care responsibilities like taking care of children or elderly people within their families. This will not only lead to an increased complexity of their travel patterns, but also a higher chance of trip chaining. This makes women in its way again more specifically sensitive to the design and location of a mobility hub. Therefore, elements such as lighting, visibility, and proximity to essential services can attract women to change transport modes (Nolmark et al., 2025; Perez-Bobadilla, 2024). That is why mobility hubs need to be implemented in such a way that it can interact with different user groups to make them more accessible, equitable, and efficient.

2.6 Knowledge gap and definition

Despite the growing attention to mobility hubs in academic and policy contexts, several knowledge gaps persist. First, the literature focuses on either large cities or rural areas and thus shows gaps in understanding mobility hubs in medium-sized cities like Nieuwegein (a Dutch New Town). Second, research on how mobility hubs influence mode choice for short trips in such cities is limited. Third, most studies often focus on either spatial or design aspects of mobility hubs without integrating both, despite recent authors stress the need for a holistic approach (Roukouni et al., 2023; Weustenenk & Mingardo, 2023).

Based on these gaps, this research combines the design-oriented definition by Blad et al. (2022), with the location and scale aspects proposed by Weustenenk and Mingardo (2023). This results in an integrated definition that includes both spatial and design aspect of mobility hubs. This research thus defines mobility hubs as:

'A mobility hub is a location where multiple sustainable transport modes come together at one place, providing a seamless connection between modes, offering besides public transport several shared mobility options, but also potentially including other amenities dependent on the location and scale.'

3. Methodology

The goal of this research is to find how the location and design of mobility hubs affect the use of sustainable mobility for short trips in Nieuwegein. This chapter first addresses knowledge gaps in the literature and proposes a new definition of a mobility hub. In addition, it presents a conceptual model that links mobility hub location and design to travel behaviour, describes the case study context of Nieuwegein, and outlines the research method. This includes the survey design, data collection, and analysis. Finally, it discusses the survey layout, sample characteristics, and considerations of ethics, validity, and reliability.

3.1 Conceptual model

The theories and insights that were discussed in the literature review are used to create a conceptual model (Figure 3.1) and will be the basis for this research. Furthermore, it aims to explain how the location and design of mobility hubs may affect the use of sustainable mobility for short trips. This is specifically done within the context of medium-sized cities such as Nieuwegein. The model integrates three interrelated dimensions: the urban context in which a hub is embedded, the design features of the hub, and behavioural and sociodemographic characteristics of residents.

Because these elements are seen as interconnected, it becomes clear that a well-designed hub in a strategic location is not sufficient on its own. Whether the hub is used depends on user-perceptions, travel routines, and habits, should be considered in relation to daily practices like trip chaining. The model therefore provides insights into the conditions under which mobility hub can contribute to an increase in sustainable mobility use. It will be used to guide the collection and analysis of data on hub locations, design features, and user perceptions and routines, which supports a better understanding of user group behaviour and the effectiveness of mobility interventions in Nieuwegein.

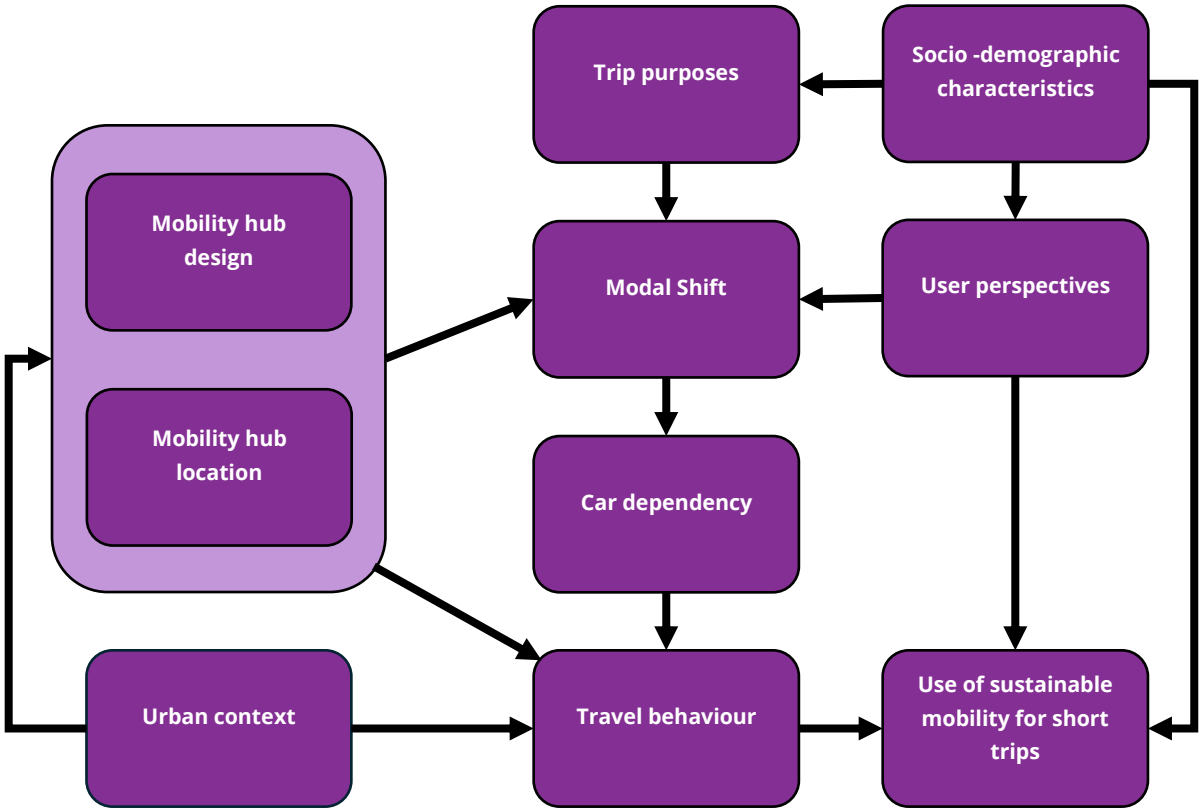

Figure 3.1: Conceptual model

3.2 Nieuwegein as a case study

Nieuwegein, a medium-sized city in the south of Utrecht (Figure 3.2) and was designated in the 1970s as a 'Growth Centre' (Nowadays New Town). It was part of the Dutch 'Groeikernenbeleid' (growth centres policy) which had the goal to decrease the demographic pressure on Utrecht while maintaining green spaces (Bruinsma & Koomen, 2018; De Meere et al., 2024). Therefore, Nieuwegein was shaped by post-war planning ideals of 'gebundelde deconcentratie' (bundled deconcentration). The city prioritised green spaces, car-oriented infrastructure, and a safe living environment. The city also enjoys high connectivity, both with the A2, A12, and A27 highways and a light-rail connection to Utrecht (De Meere et al., 2024).

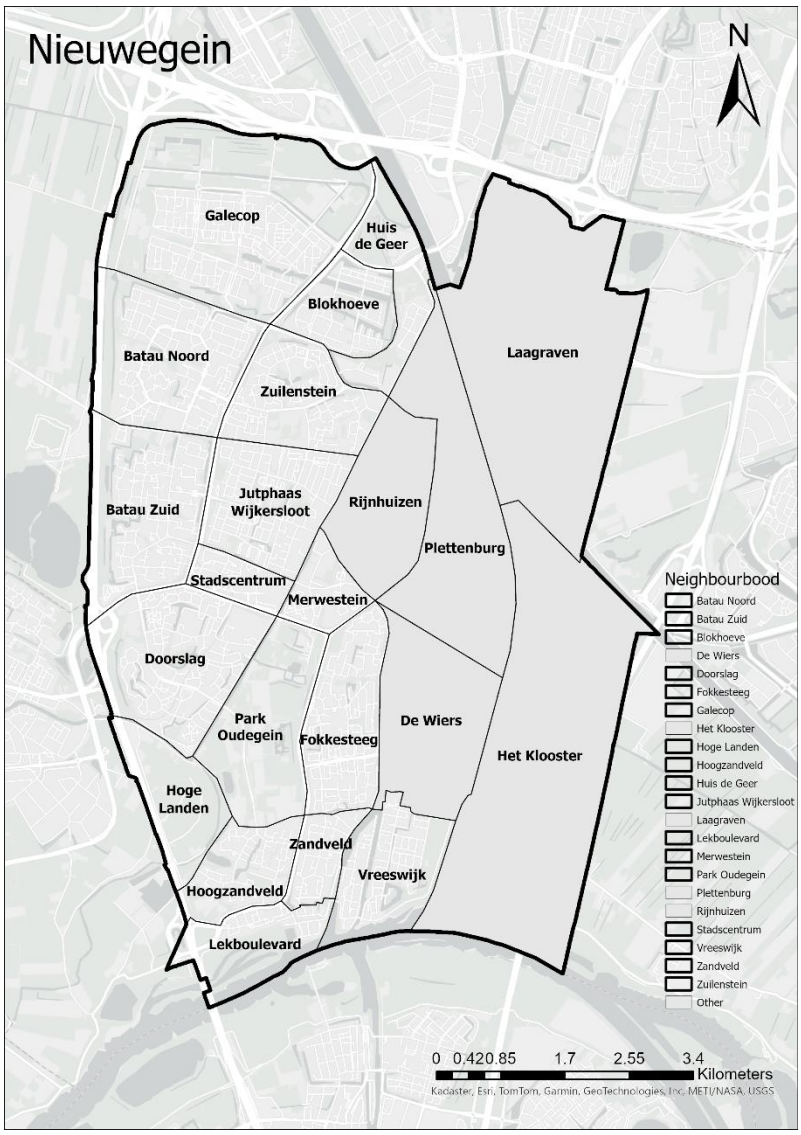

Figure 3.2: Map of Nieuwegein with its neighbourhoods. Grey coloured neighbourhoods are not part of this research

Nowadays, Nieuwegein faces socio-spatial challenges such as ageing infrastructure, demographic shifts, and socioeconomic segregation. Multiple studies for example indicate a growing share of lower-income households and residents with a migration background, often strengthened by higher-income households moving out of the city (Van Gent & Hostenbach, 2020; Musterd, Marcińczak, Van Ham & Tammaru, 2016). These socio-spatial challenges are primarily caused by changing planning paradigms in the 1980s-1990s, when policy shifted towards compact urbanisation and sustainable development. This meant New Towns had their own responsibilities to reinvent themselves (Bruinsma & Koomen, 2018). Nieuwegein reinvented itself by creating a Mobility Vision 2030 focusing on promoting sustainable travel behaviour. Specifically, the municipality introduced mobility hubs, particularly to serve short distance trips (Gemeente Nieuwegein, 2021; KiM, 2022). Because 70 percent of all urban trips in the Netherlands are of short distance (under 7.5 km) (KiM, 2022), mobility hubs are seen as an essential tool by the municipality for stimulating more sustainable urban development.

These challenges thus make Nieuwegein a suitable case for studying mobility hubs. Its spatial layout, historical development, and current ambitions make it interesting to find out in what way mobility hubs can achieve modal shift and sustainable urban transformation in New Towns. Furthermore, insights from this case study may provide resourceful information that can be adopted by similar New Towns (e.g., Zoetermeer, Almere), contributing to broader urban debates on sustainability, equity, and accessibility (De Meere et al., 2024).

3.3 Research method

To investigate how mobility hub design and location affect the use of sustainable mobility for short trips in Nieuwegein, a survey is seen as a suitable method. A structured survey was chosen to find residents' current travel behaviour, attitudes, and their willingness to shift from the car to sustainable modes of transport for short trips. In addition, surveys allow generating standardised data and robust comparisons between sub-groups, which help to identify trends and correlations in mobility behaviour (Cresswell & Cresswell, 2018; Babbie, 2020). Above all, this research format is familiar to respondents, and a relatively quick way of gathering information. This improves overall response rates and reliability of data (Scheepers, Tobi & Boeije, 2016), and in the end enhances the generalisation which allows for translating data into meaningful insights (Bryman, 2016, p. 11). The survey is aimed at collecting data related to their current travel behaviour, focusing on both car-dependency and current use of sustainable transport modes, their familiarity with both sustainable transport and mobility hubs, and their willingness to make use of mobility hubs. Furthermore, this study focuses on short trips, which is defined as those under 2.5 km. Lastly, sociodemographic questions (gender, age, education, and postal codes) were included to both create profiles of the potential users and thereby have the potential to link the design and location to its potential users.

The survey was carried out in collaboration with the municipality of Nieuwegein to ensure this study not only addresses academic questions, but also local policy concerns. The municipal experts provided feedback on question wording (to ensure accessibility and neutrality) and supported with technical implementation of the survey. The final survey was programmed in the digital environment of the municipality (Survalizer) and provided the anonymised results for analysis after two weeks of data collection in SPSS and Excel formats.

3.4 Survey layout

The survey consists of 33 questions divided into five sections, corresponding to the research sub-questions. Because it was digitally programmed, it improved the respondent experience by only showing relevant questions (Scheepers et al., 2016). A full list of the survey questions is provided in the appendix (see appendix A1), and the sections can be summarised as follows:

The first section provides information about household car ownership (number of cars) and general car usage for short trips. Respondents were asked to report how often they drive these short trips, for what purposes (e.g. commuting, grocery shopping, school drop-offs), and their motivations for choosing the car. These questions address the first sub question on the dominant mobility patterns for short trips.

The second section provides information about how often respondents use sustainable modes for short trips (walking, cycling, moped/scooter, public transport, or shared mobility options) on a five-point scale (from daily to never). In addition, their motivations for these choices were asked. For respondents who use shared mobility, the frequency and distance of the use of these vehicles is asked. Together, this section also relates to the first sub question by indicating potential use of sustainable mobility versus the car.

The third section deals with awareness and attitudes towards mobility hubs (second sub-question). Respondents were asked about their familiarity with mobility hubs, and whether they see this as something positive or negative. An open answer option allowed respondents to explain their thoughts. Furthermore, questions related to the maximum distance that respondents would be willing to walk and cycle to reach a mobility hub were asked. The distance options provided tried to ensure equal travel times for both transport options so that a catchment area can be created. Rijsman, Van Oort, Ton, Hoogendoorn, Molin & Teijl (2019) for example discovered a 380-meter median for walking and a 1.2 km median for cycling to tram stops, which roughly takes the same time to complete. Moreover, aligning with the idea of hubs as neighbourhood transfer points,

research suggest that public transport is most efficient when combined with strong first/last-mile connections by active modes (Arup & Go-Ahead, 2021; Los Angeles Department of City Planning, 2016). This, combined with the fact thar car use for short trips should be reduced, led to the decision to not include these modes in the maximum distance questions. In short, the questions in this section reveal the maximum distance residents are willing to travel to these hubs, which uncovers possible spatial considerations of hub placement and accessibility.

The fourth section contributes to the understanding of which design recommendations should be made according to the needs and preferences of residents (sub-question 3). Respondents rated multiple potential features on a five-point importance scale. The elements provided are drawn from the literature and other related work, and included physical amenities (e.g. secure bicycle parking, good lighting, shelter), services (e.g. parcel points, a small coffee bar or convenience shop, (co-)working space), and integration features (e.g. real-time information signs, mobility app). The user perspective is further stressed by asking whether respondents think it is important to have them involved in the design process of these hubs. This underlines the importance of taking the perspective of potential users seriously during the process of designing and implementing these hubs (Kamargianni et al., 2016; Van Gerrevink et al., 2021).

Finally, section four asked to what extent respondents would use their car less if a well-designed mobility hub (meeting their needs) were available in their neighbourhood. Additionally, for the relevance of the municipality, this question is asked for both the short (under 2.5 km) and longer (from 2.5 km) trips. Additionally, due to the importance of digital integration at mobility hubs, respondents were asked to what extent they are willing to use this app, and its preferred functionalities such as real-time travel information, route planning, or vehicle availability and reservation.

3.5 Research population and sample

The survey was distributed to the citizen research panel of the Municipality of Nieuwegein, which includes 1500 residents. However, participation to surveys remains voluntary. The survey had a duration of two weeks, during which 653 panel members responded. After data collection, the sample was refined to ensure data quality and relevance to the target population: adult residents of Nieuwegein. To realise this, respondents younger than 18 and those living outside Nieuwegein, recognisable by the provided zip code. Furthermore, responses that lacked critical sociodemographic information were filtered out of the dataset. This includes the 'prefer not to say' option, or answers left blank for gender, age, education, or zip code, because of the necessity to analyse subgroup differences. The procedure of data selection is summarised in Table 3.3.

Action	Number of respondents left	Number of removed respondents
Start number	653	
Removal of respondents with zip code filled in the incorrect way (either forgot to fill in or filled in outside the zip code area of Nieuwegein (3431-3439), and when living in the area with postal code 3439.	601	52
Removal of respondents who chose for the option 'prefer not to say' on the questions regarding gender, age, and/or education	572	29
Final number of respondents	572	

Table 3.3: Cleaning process of the data

After the cleaning process, the sample consists of 572 respondents. This sample size is sufficient for robust analysis, because it is a representative sample for the city of Nieuwegein to a 95% confidence level with a 5% margin of error. However, this final sample is not fully representative on all characteristics. Specifically, higher educated residents are overrepresented, whereas younger adults (18-44) are underrepresented, according to the city's demographics (Central Bureau Statistics, 2024). Therefore, conclusions primarily could reflect the views of the participating respondents rather than the entire population (Table 3.4).

Variable	Operationalisation	Survey sample N = 572	Percentage
Gender	Male	331	57,9%
	Female	241	42,1%
Age	18 to 44	63	11,0%
	45 to 54	82	14,3%
	55 to 64	111	19,4%
	65 to 74	200	35,0%
	75 or older	116	20,3%
Education	Primary school	2	0,3%
	Secondary school	55	9,6%
	Vocational (MBO)	130	22,7%
	Applied sciences (HBO)	267	46,7%
	University (WO)	118	20,6%

Table 3.4: Sociodemographic characteristics of the research sample

3.6 Operationalisation and data preparation

The complete operationalisation can be found in Appendix A2.

3.6.1 Dependent variable

The primary outcome of this variable is the use of sustainable transport modes for short trips. In the survey, this corresponds to questions about their frequency of using alternative transport modes for short trips and their familiarity with shared mobility use (Q10-Q15). Additionally, respondents' motivations were asked for using these alternatives. This all indicates a potential modal shift towards sustainable mobility based on current use.

3.6.2 Independent variables

In relation to the dependent variable, the research question defines mobility hub location and design as the two most important independent variables. As for the location, respondents were asked to provide their view on an acceptable walking and/or cycling distance that they are willing to travel to the hub. This ensures a user-centric operationalisation of the location variable and is essential for evaluating the influence of hub placement on sustainable mobility use (Rongen et al., 2022; Arias-Molinares et al., 2023). For mobility hub design, respondents were asked to give their valuation on a range of physical and digital hub amenities that based on their perceived importance (Q22, Q26). These amenities reflect both the economic (e.g. parcel lockers, retail, workplaces) and social (e.g. safety, accessibility, social interaction) roles that hubs can fulfil (Weustenenk & Mingardo, 2023; Van Doorne, 2023). Additionally, questions related to the willingness to use a mobility hub app and its desired functionalities (e.g. real-time travel info, trip planning, vehicle availability) were included (Liao et al., 2024; Ku et al., 2022). Overall, this links perceived design quality with potential modal shift behaviour.

3.6.3 Other variables

Both the location and design of mobility hubs highly depend on the urban context. For this concept, respondents were asked for their full zip code (Q28), which serves as a spatial proxy for the density,

land-use mix, and level of urbanisation of their residential area. This allows for spatial analysis in combination with external datasets that provide this spatial data (e.g. Central Bureau Statistics). Identifying urban form as a determinant of travel behaviour and car dependency is consistent with other literature (De Vos, 2015; Bin Sulaiman, 2023). Travel behaviour is measured through questions that explore respondents' motivations for owning the car (Q4), and their grounds for using the car for short trips (Q7). These indicators help assess behavioural patterns and mode choice logic. Modal shift is measured by asking respondents whether they have the feeling to make less use of their (leased) cars when mobility hub is located nearby, according to their wishes (Q24). This overall underlines the importance of taking the perspective of potential users seriously during the process of designing and implementing these hubs (Kamargianni et al., 2016; Van Gerrevink et al., 2021). Modal shift will hopefully in the end lead to less car dependency and is measured trough current car use and availability of cars within the household (Q1, Q2, Q3, and Q5). Trip purposes are also related to this, as it provided important information about for example trip chaining, or other purposes that are related to the willingness to shift modes (Q6). User perspectives are measured through the awareness of and attitude towards mobility hubs (Q17-Q19), and the importance of involvement in hub design (Q23), as underlined by Fraser and Lock (2011). Lastly, Q29 to Q31 ask the respondents' gender, age, and highest degree of education. Although income was not directly included in the survey, the respondents' level of education is used as a proxy for their socioeconomic status. CBS data shows a strong correlation between educational attainment and average income (gen Bureau Statistics, 2022).

3.6.4 Data management

For questions allowing multiple responses, such as trip purposes or preferred hub features, each option was divided into a separate binary variable (selected/not selected). Analysing these all at once required the Multiple Response Sets functionality from SPSS. Furthermore, a question that allowed an 'Other, namely:' option, got created a separate variable to be able to analyse these open responses for qualitative insights. In addition, some multiple response questions required to fill in a Likert scale. In every case, also within the separate Likert scale questions, each scale has been coded with the lowest value (1) being the most frequent/highest/most likely/most important/most positive option, whereas the highest value (5) corresponds to never/lowest/most unlikely/most unimportant/most negative option. However, the two question regarding the maximum distance respondents are willing to walk and cycle to mobility hubs is coded the other way (Q20 and Q21). Thus, value 1 represents the shortest distance option, and value 5 the longest.

To make group comparisons possible, some demographic categories needed adjustments. For example, the youngest age groups (18-24, 25-34, 35-44) had relatively few respondents and were therefore merged into a single 18-44 group to create a more equal distribution. Furthermore, very few respondents with Primary education were excluded when analysing differences between education levels due to insufficient sample size in this category but added back for other analyses. For the zip code, two new variables were created, the first one being the zip code on neighbourhood level (six digits), and the second one being on zip code level (four digits). For the neighbourhood level, a minimum of five respondents is chosen to be able to do analyses, while at the zip code level, the area with zip code 3439 was filtered out of all spatial analyses due to few respondents in this area, and mainly an industrial area.

3.7 Data analysis

A combination of descriptive and statistical analyses is used to answer the research questions. All these analyses were done using SPSS. For the descriptive analyses, frequency tables, cross-tabulations, and compare means were used to summarise general trends and certain tendencies in attitudes. To explore differences between subgroups (by gender, age, education, or neighbourhood), statistical tests were applied. For nominal data with sufficient cell counts, Chi-

square tests were used on cross-tabulations. This corresponds to comparing perceptions of hubs across different groups to answer the second sub question. For ordinal variables, non-parametric tests were used. When comparing two groups, such as gender differences, the Mann-Whitney U test is used, and for comparing more than two groups, such as differences across age groups, the Kruskal-Wallis test is used. In addition, to examine relationships between ordinal variables, the Spearman's rho is used. All statistical tests were evaluated at a 0.05 significance level and reported in the results chapter when statistically significant. Non-significant results are noted if relevant to show that there was no strong evidence, difference, or association, and all can be found in the Appendix. To understand the perceptions and suggestions of the respondents, qualitative findings from the open answer options are used to enrich the interpretation of the quantitative results.

3.8 Ethics, validity and reliability

This research was conducted in close collaboration with the Municipality of Nieuwegein and is done conform to the ethical standards of survey research. Participation was fully voluntary, respondents were informed about the purpose of the survey, and acceptance on informed consent was needed to proceed with the survey. Furthermore, respondents had the ability to stop at any point, and their responses were deleted from the data set. The survey was distributed via a secure municipal platform (Survalizer) managed by the municipality's research and communication department. This ensured that the handling of the data met the privacy guidelines. All responses were anonymised so that individual respondents could not be identified. Although full zip codes were collected, it is only used for spatial analysis on neighbourhood level so that the results do not trace back to any specific respondent or address. Furthermore, open answers were optional and reported in an anonymous way, although it sometimes includes personal views. Income is also seen as a sensitive topic, which might discourage participation. Therefore, no specific question handling income levels is asked to respect a certain amount of privacy. Despite this, education level can serve as an acceptable proxy for socioeconomic status in this context.

The validity of the results is supported using context-specific questions and were developed in close collaboration with municipal experts to ensure relevance and clarity. However, this research uses a case study and should therefore be interpret with caution when it comes to the generalisation of these findings to similar cases. As Bryman (2016) notes, case studies can provide in-depth insights but are limited in their external validity. Nevertheless, the use of Nieuwegein as case study offers valuable insights for similar Dutch New Town contexts. Regarding the reliability, the digital nature of the survey and the systematic collection via a municipal platform reduces the risk of data handling errors. The use of the Survalizer application for example helped create an overview of how the survey was built up, how the questions were asked, how the questions followed a specific order (see 3.7), and possible coding that was done to improve the overall user experience of the survey (Appendix A1). Not only the coding of the online survey, but many other proceedings show that the position of the researcher is still essential to acknowledge. For instance, the wording and structure of the questions may reflect certain assumptions or framings. Although developed with the municipality, this can influence participant responses. However, this was avoided as much as possible by continuously discussing the survey design with several people from the municipality. This group ensured that multiple versions were continuously tested, and the questions were formulated as neutral as possible. Finally, representativity should be considered. While the number of respondents is sufficient, the overrepresentation of higher educated and older respondents (thus an underrepresentation of younger adults) means that certain results can be distorted. Therefore, the results of this research primarily reflect the views of the participating residents and are interpret with the city's demographic context in mind.

4. Results

This chapter presents the main findings of this research and is structured around the sub-questions. These results will be supported by sociodemographic or correlation analyses when found significant in the discussed literature. For convenience, only results directly relevant to the research aims are described in detail. Non-significant findings are briefly summarised; the full analyses can be found back in the appendix.

4.1 Dominant mobility patterns

To determine the dominant mobility patterns of Nieuwegein residents, chapter 4.1 explores both the frequency of use of different transport modes, and its underlying purposes and motivations for short trips. Answering this question required making use of frequency and cross tables and is also checked for sociodemographic variables.

4.1.1 Use of transport modes

Figure 4.1 shows the use of several transport modes for short trips. A substantial share of respondents (32.7%) indicates (almost) never using the car, while only 5.2% use it daily. Nevertheless, the share of respondents who use the car a few times per week is particularly higher (21%).

Car use for short trips differs between sociodemographic groups. While no significant differences exist between males and females (U = 29.999, p = 0.386), there are small but significant differences across age groups ($H(4)$ = 9.666, p = 0.046, η^2 = 0.011) (Appendix B5-B7). Similarly, the level of education shows differences with a small effect size ($H(3)$ = 8.711, p = 0.033, η^2 = 0.011) (Appendix B8-B10). However, pairwise comparisons using the Bonferroni test shows no significant group differences for both age and education (p > 0.05).

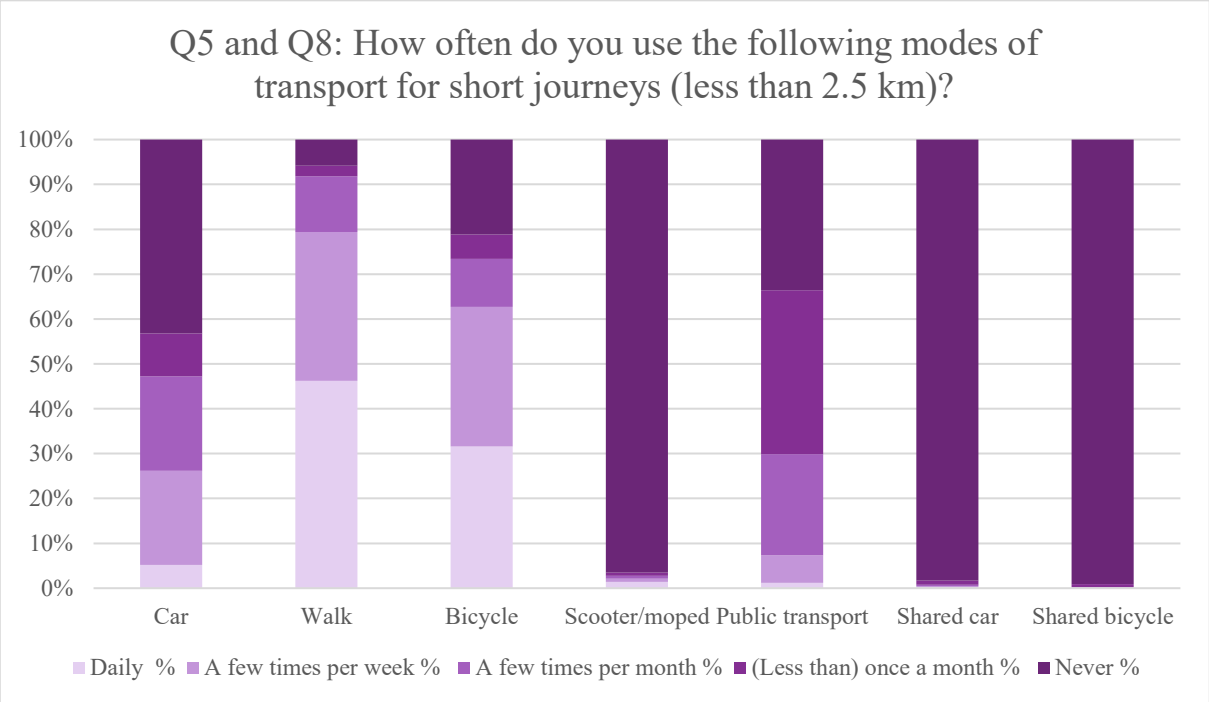

Figure 4.1: Use of different transport modes

Walking and cycling emerge as the dominant transportation modes for short trips. Where 46.2% walks daily, 31.6% cycles daily. The frequency of walking furthermore shows significant differences between age groups, with a small to moderate effect ($H(4)$ = 16.540, p = 0.002, η^2 =

0.022) (Appendix B12-B14)[1]. Here, the Bonferroni test shows that respondents aged 75 and older walk significantly less than those aged 45-54 (p = 0.001), 55-64 (p = 0.030), and 65-74 (p = 0.033). Cycling also differs by age group with a smaller effect ($H(4)$ = 13.034, p = 0.011, η^2 = 0.016)[2]. However, only the difference between respondents aged 65-74 and those 75 and older shows significance (p = 0.009) (Appendix B15-B17).

Other transport modes such as public transport or shared mobility options are almost never used for short trips. Nevertheless, public transport is still used a few times per month by 22.6% of the respondents, suggesting that public transport use only seems occasionally.

4.1.2 Purposes for short car trips

Among respondents who use the car for short trips, shopping or doing groceries is the most common purpose (82.2%) (Table 4.2). Males (83.2%) do this slightly more often than females (80.5%) but shows no significant differences (χ^2 (1, N = 325) = 0.409; p = 0.522). Age also potentially influences this trip purpose, as 88.4% of respondents aged 75 and older indicate using the car for shopping or groceries, while this is 77.5% for respondents aged 18-44. Furthermore, respondents aged 45-54 also show higher usage (85.7%), but all these are not significant differences (χ^2 (4, N = 325) = 3.813; p = 0.432).

Picking up or dropping off people or items is the second most frequently short trip purpose for using the car, chosen by 37.2% of the respondents. Females (39.1%) do this slightly more than males (36%) but shows no significant differences (χ^2 (1, N = 325) = 0.303; p = 0.582). However, age shows significant differences, with respondents aged 18-44 (57.5%) and 45-54 (51%) more likely to use the car for this purpose than respondents aged 75 and older (26.1%). These differences are statistically significant and show a weak to moderate effect (χ^2 (4, N = 325) = 16.012; p = 0.003, V = 0.222) (Appendix B27).

In addition, 16.9% of the respondents indicated other purposes short using the car for short trips. The option 'other, namely:' shows visiting friends and family, personal care or health-related appointments, and leisure or recreational activities.

Q6: When I use the car for short trips (<2.5 km), it is for:	**Responses**		
	N	%	Percent of cases
Work	35	6.2%	10.8%
Shopping or groceries	267	47.2%	82.2%
School or study	4	0.7%	1.2%
Picking up/dropping off people or items (e.g. children, parcels)	121	21.4%	37.2%
Sports or hobbies	84	14.8%	25.8%
Other, namely:	55	9.7%	16.9%
Total	566	100%	174.2%

Table 4.2: Purposes for short car trips

4.1.3 Motivations for using transport mode for short trips

Respondents who use the car for short trips indicate the need to carry many or heavy items (80.7%) (Table 4.3). This suggests that physical effort plays a key role in choosing the car over alternative options. Although females do this slightly more than males, this difference shows no significance (χ^2 (1, N = 275) = 0.202; p = 0.654). Age differences are also not significant (χ^2 (4, N = 275) = 6.997; p = 0.136), respondents aged 75 or older (67.4%) report this motivation least often and those aged 45-54 and 65-74 (85.1%) most often. Bad weather also plays a crucial role in car use for short trips

[1] 18-44 years (*Mean Rank* = 292.88), 45-54 years (*Mean Rank* = 270.30), 55-64 years (*Mean Rank* = 276.27), 65-74 years (*Mean Rank* = 268.02), and 75 or older (*Mean Rank* = 336.14).
[2] 18-44 years (*Mean Rank* = 261.94), 45-54 years (*Mean Rank* = 289.72), 55-64 years (*Mean Rank* = 296.93), 65-74 years (*Mean Rank* = 264.26), and 75 or older (*Mean Rank* = 325.92)

and is mentioned by 52.% of the respondents. Differences appear between age groups with a weak to moderate association (χ^2 (4, N = 275) = 10.985; p = 0.027, V = 0.200) (Appendix B35 and B36). In addition, unsafe routes are indicated by 10.9% of respondents. Furthermore, 6.5% mentions other motivations, often linked to reasons stated at the trip purposes (e.g. visiting friends or family, health-related trips).

Q7: What are the main reasons you sometimes choose the car for a short trip (up to 2.5 km)?	**Responses**		
	N	%	Percent of cases
When the weather is bad	145	25.8%	52.7%
I have little time	74	13.1%	26.9%
I am tired or not in the mood to walk or cycle	43	7.6%	15.6%
I feel unsafe on the route (e.g. in the dark)	30	5.3%	10.9%
I must carry many/heavy items	222	39.4%	80.7%
There is no good route to walk or cycle	12	2.1%	4.4%
Public transport does not go to my destination	19	3.4%	6.9%
Other, namely:	18	3.2%	6.5%
Total	563	100%	204.7%

Table 4.3: Motivations for short car trips

As for the motivations for using alternative modes of transport, health benefits is the most frequently mentioned reason (75.5%). This percentage increases with age, which indicates that older respondents are more motivated by sustaining their health (Table 4.4). These age differences are however not significant (χ^2 (4, N = 564) = 4.621; p = 0.328). Environmental considerations and the perception that car use for short trips is redundant are also frequently mentioned, especially by higher educated respondents. Within this group, 50% cites environmental motivations, and 45.8% indicates that car use for short distances is unnecessary (Appendix B40 and B42). The former shows no significant differences (χ^2 (3, N = 562) = 6.590; p = 0.086), the latter shows significant differences between education levels and a weak to moderate effect (χ^2 (4, N = 562) = 9.253; p = 0.026, V = 0.128). Less frequently mentioned motivations for using alternative modes of transport include the relaxing experience of the trip (21.8%), cost savings (19.7%), time efficiency (14.4%), no issues with parking (12.4%), and avoiding traffic congestion (2.3%). Furthermore, most of the respondents who provided additional information mentioned that they do not own a car or cannot use one for medical reasons, which makes these respondents structurally dependent on alternative modes on transport.

Q9: What are your main reasons for often or sometimes choosing another mode of transport for short trips (up to 2.5 km)?	**Responses**		
	N	%	Percent of cases
It is better for the environment	243	16.4%	43.1%
It is good for my health	427	28.8%	75.7%
It is cheaper (no travel costs)	123	8.3%	21.8%
It is cheaper because I do not have to pay for parking	111	7.5%	19.7%
I do not have issues finding a parking lot	70	4.7%	12.4%
I arrive faster	81	5.5%	14.4%
I find it relaxing	150	10.1%	26.6%
There is less chance of delay (e.g. traffic jams)	13	0.9%	2.3%
I do not think it is necessary to use a car for short distances	221	14.9%	39.2%
Other, namely:	42	2.8%	7.4%

Total	1481	100%	262.6%

Table 4.4: Motivations for short trips with alternative transport modes

4.1.4 Summarising remarks

The results from this chapter show that walking and cycling are the dominant transport modes for short trips in Nieuwegein. Notable is that car use is relatively limited, but when they are used, it is mainly for practical purposes such as grocery shopping or transporting people or goods. Furthermore, these purposes are often motivated by situational factors like bad weather or the need to carry heavy items. Alternative transport modes are primarily chosen for their health benefits, environmental impact, and the overall perception that car use is unnecessary for short distances. Mobility hubs therefore should focus on supporting active travel rather than replacing it and offering practical alternatives to car use like shopping and transporting goods.

4.2 Mobility hub perceptions

The implementation of mobility hubs should not only depend on a top-down process, but also on the perceptions of potential users. Only this way, possible spatial considerations that influence accessibility and adoption potential can be formulated. This part focuses on the familiarity with and perceptions of mobility hubs by residents, their maximum acceptable travel distance to these hubs, and how these aspects differ between sociodemographic groups. These insights can help inform more inclusive and context-sensitive planning, according to the specific needs and expectations of the local population.

4.2.1 Familiarity with shared mobility and mobility hubs

This part of the survey first explored the familiarity of respondents with the concept of shared mobility (e.g. shared cars, bikes and mopeds/scooters). A large share (92.1%) indicated that they were familiar with it, but 83.4% stated they do not intend to use this form of mobility soon, and only 2.4% currently makes use of it (Appendix C1). From the 2.1% of respondents that use a shared car, 1.4% uses this mode for (less than) once a month (Appendix C2 and C3).

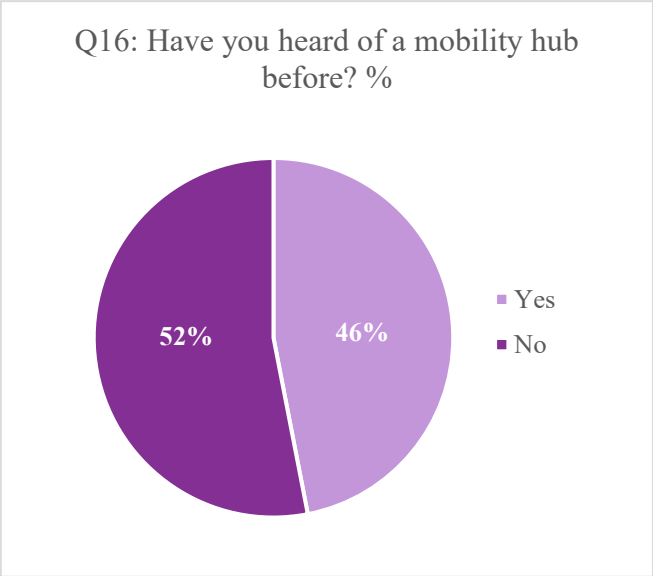

Figure 4.5: Familiarity with the concept of mobility hubs

The familiarity with the concept of mobility hubs is remarkably lower. Here, only 54% stated being familiar with mobility hubs (Figure 4.5). This familiarity also decreases with an increasing age, but the difference not significant (χ^2 (4, N = 572) = 7.975; p = 0.093). Education on the other hand shows significant differences, with respondents with Secondary school education (23.6%) showing notable lower familiarity than respondents with University (WO) education (58.5%) (Appendix C7). This association between education level and familiarity is significant with a weak to moderate effect (χ^2 (3, N = 570) = 24.051; p < 0.001, V = 0.205) (Appendix C8 and C9).

4.2.2 Perceptions of mobility hubs

The idea of implementing mobility hubs in neighbourhoods is positively received by 34.4% of the respondents, while 12.7% do this very negatively (Figure 4.6). These attitudes vary across age groups with a small significant effect (H(4) = 10.522, p = 0.032, η^2 = 0.012) [3]. The Bonferroni test shows that respondents aged 18-44 are most positive, while those aged 75 and older are the least (p = 0.045) (Appendix C12-C14). What is however interesting to note is that the oldest respondents are not necessarily more negative about these hubs than younger groups. Furthermore, differences between educational levels were not significant (H(3) = 6.154, p = 0.104).

Among the positive perspectives, a reduction of the amount of cars is expected in their neighbourhood (55.5%), and similarly, 35% thinks it will lead to decreased parking issues (Appendix C15). Additionally, 47.7% believes that mobility hub will improve the transfers between multiple transport modes. Extra answers by 8.1% of respondents indicate sustainability goals, accessibility for residents without private transport modes, and interests in trying out the hub (Table 4.7)

[3] 18-44 years (*Mean Rank* = 244.62), 45-54 years (*Mean Rank* = 308.14), 55-64 years (*Mean Rank* = 275.26), 65-74 years (*Mean Rank* = 282.51), and 75 or older (*Mean Rank* = 311.59).

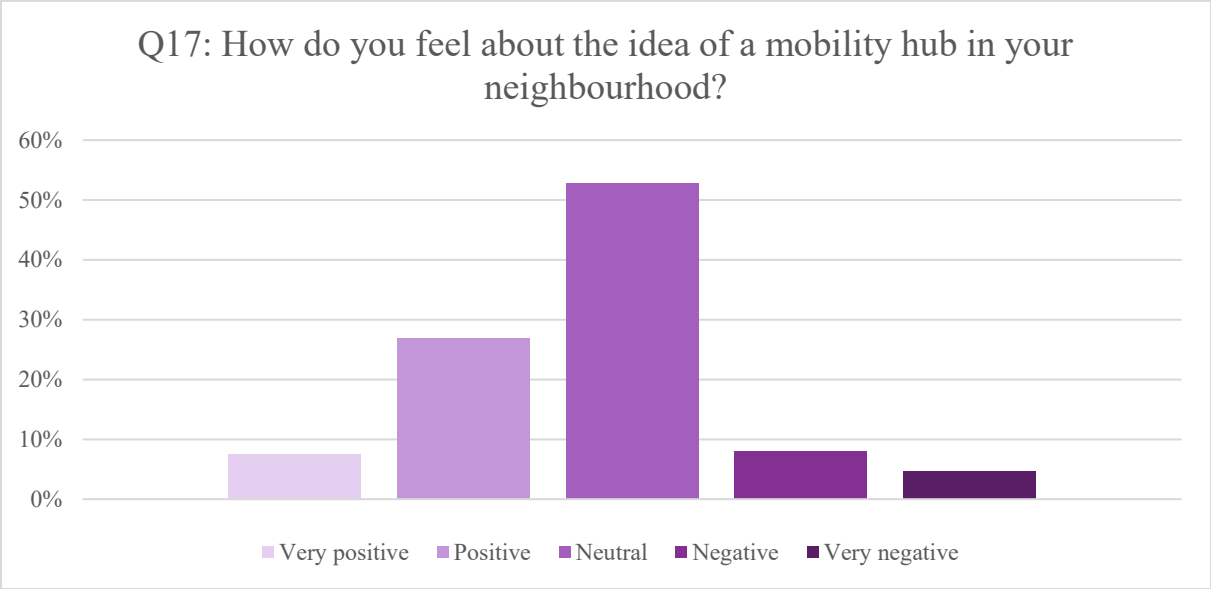

Figure 4.6: Attitudes towards mobility in neighbourhood

Despite this, respondents also showed negative perceptions. For instance, 68.5% shows their doubts about hub implementation and 50.7% wonders whether hubs will reduce car use in the area. The same share shows a preference for using their own car or bicycle (Appendix C16). Open comments (21.9%) reveal concerns about hub implementation, its equity, and its actual effectiveness (Table 4.7).

Q18: Example positive views on mobility hubs	
Theme	**Relevant quotes**
Sustainability and the living environment	"My car could go away, good for the environment."
Accessibility and social value	"The people in the neighbourhood who do not have a car can make use of it."
Personal use and future intentions	"I would like to try this sometime."
Q19: Example negative views on mobility hubs	
Theme	**Relevant quotes**
Practical and spatial concerns	"There is no space for this in the neighbourhood."
Negative experiences and perceived nuisance	"I often notice shared bikes being left everywhere, it causes nuisance."
Structural critiques	"A mobility hub is just a cosmetic solution that does not solve the real problems."

Table 4.7: Additional comments on either being positive or negative about a mobility hub in neighbourhood

4.2.3 Maximum travel distance to mobility hubs

Most respondents prefer a maximum walking distance of 250-500 meters (4-7.5 minutes) to reach a mobility hub (Figure 4.8). However, respondents aged 65 and older will prefer a shorter distance. For instance, 23.2% indicates a maximum walking distance of less than 100 meters (1-1.5 minutes) (Appendix C17-C18). There are significant differences for age with a small effect ($H(4) = 10.966$, $p = 0.027$, $\eta^2 = 0.013$[4]. The Bonferroni test shows that respondents aged 75 and older are significantly less likely to accept a longer walking distance than those aged 45-54 ($p = 0.045$) (Appendix C19-C21). The level of education also plays a role in what walking distance is accepted. With significant differences and a small effect ($H(3) = 8.522$, $p = 0.041$, $\eta^2 = 0.010$), respondents with University (WO) education are willing to walk longer distances than those with Vocational (Mbo) education ($p = 0.028$)[5] (Appendix C22-C24).

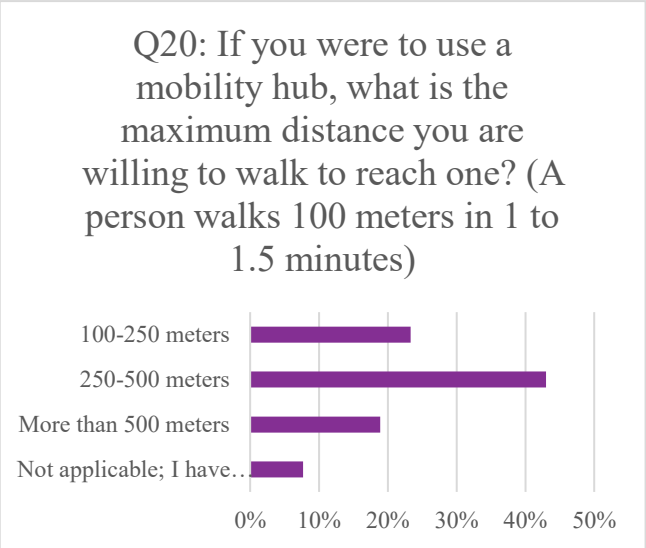

Figure 4.8: Maximum walking distance to mobility hub

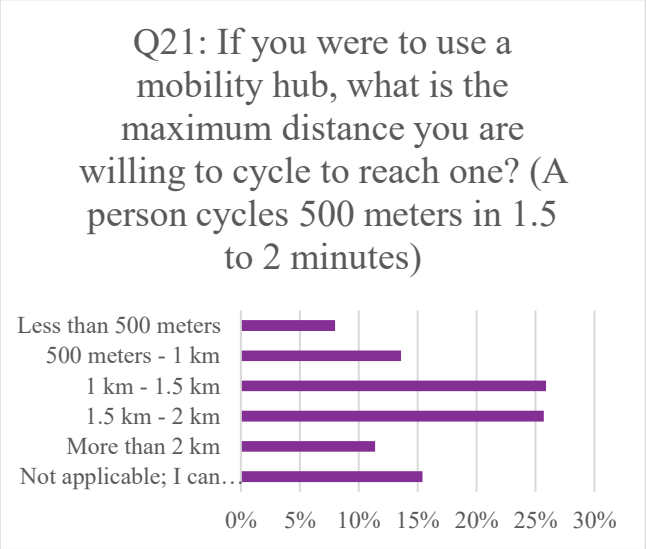

Figure 4.9: Maximum cycling distance to mobility hub

Regarding cycling, most respondents indicate a maximum acceptable distance of 1-2 km (4-8 minutes) (Figure 4.9). For instance, respondents ages 18-44 (52.4%) are more willing to cycle 1.5 km or more. On the other hand, 44.9% of respondents ages 65 or older indicates they are either unable or not allowed to cycle (Appendix C25 and C26). While these differences are not significant, education shows significant differences with a small to moderate effect ($H(3) = 15.889$, $p = 0.001$, $\eta^2 = 0.027$)[6]. Respondents with University (WO) education are significantly more likely to accept longer cycling distances than those with Vocational (MBO) education ($p < 0.001$) (Appendix C27-31).

Finally, the perception of mobility hubs both show differences across the neighbourhoods of Nieuwegein. Residents in Merwestein and Vreeswijk indicate the most negative attitudes, while those in Galecop and Blokhoeve, both in the northern part of the city, show more favourable perceptions (Appendix C32-C34). Nevertheless. A positive perception does not go along with a greater willingness to walk or cycle (*Spearman's rho* = 0.058, $p = 0.168$) (Appendix C10). This suggests that the local context may play an important role in determining accessibility behaviours than perception alone.

[4] 18-44 years (*Mean Rank* = 287.21), 45-54 years (*Mean Rank* = 288.09), 55-64 years (*Mean Rank* = 273.38), 65-74 years (*Mean Rank* = 261.43), and 75 or older (*Mean Rank* = 227.41

[5] Secondary school (*Mean Rank* = 273.47), Vocational (MBO) (*Mean Rank* = 237.14), Applied sciences (HBO) (*Mean Rank* = 262.74), and University (WO) (*Mean Rank* = 290.09).

[6] Secondary school (*Mean Rank* = 244.17), Vocational (MBO) (*Mean Rank* = 206.20), Applied sciences (HBO) (*Mean Rank* = 241.21), and University (WO) (*Mean Rank* = 279.47).

4.2.4 Perceptions and maximum travel distance to mobility hub

A Spearman's rank-order correlation shows a weak but statistically significant negative correlation between attitude and walking distance (*Spearman's rho* = -0.156, $p < 0.001$), as well as cycling distance (*Spearman's rho* = -0.114, $p = 0.009$). This indicates that that respondents with a more positive attitude towards mobility hubs are generally willing to walk and cycle longer distances to reach one. Additionally, there is a moderate positive correlation between walking and cycling distance (*Spearman's rho* = 0.434, $p < 0.001$), suggesting a certain consistency in the willingness to travel a distance across these active transport modes (Appendix C35).

4.2.5 Summarising remarks

Overall, the results show that while shared mobility is well known among these Nieuwegein residents, the concept of mobility hubs is less familiar. This is especially true for older and lower educated respondents. Despite this, more respondents are positive than negative about implementing hubs in their neighbourhoods. The main motivations for this are the expected reduced car use and better modal integration. Furthermore, respondents with a more positive attitude towards hubs are generally willing to walk or cycle longer distances to reach them. However, this willingness varies by age, education, and to a lesser extent neighbourhood/postal area. These patterns suggest that hub design and communication must consider varying levels of familiarity and acceptance to ensure inclusivity across demographic groups.

4.3 Perceptions of design elements

Where the questions regarding respondents' willingness to walk or cycle contribute to determining potential mobility hub locations, the third sub question tries to understand which design recommendations should be made so that the hubs meet the needs and preferences of potential users. Therefore, this chapter will first investigate to what extent respondents agree that they should be involved in the design process, after which all design elements will be ranked based on what respondents consider most important. The following section dives deeper into the respondents' preferences regarding a potential mobility hub 'app' and its features.

4.3.1 Participatory design process

A large share of respondents (73.7%) finds it (very) important to be involved in the design process of mobility hubs, while only 4.8% think it is (not at all) necessary (Figure 4.10). This support for participation significantly differs with a small effect between males and females (U = 34616.500, p = 0.004, r = 0.121)[7], with the latter group more likely valuing the ability to participate (Appendix D1).

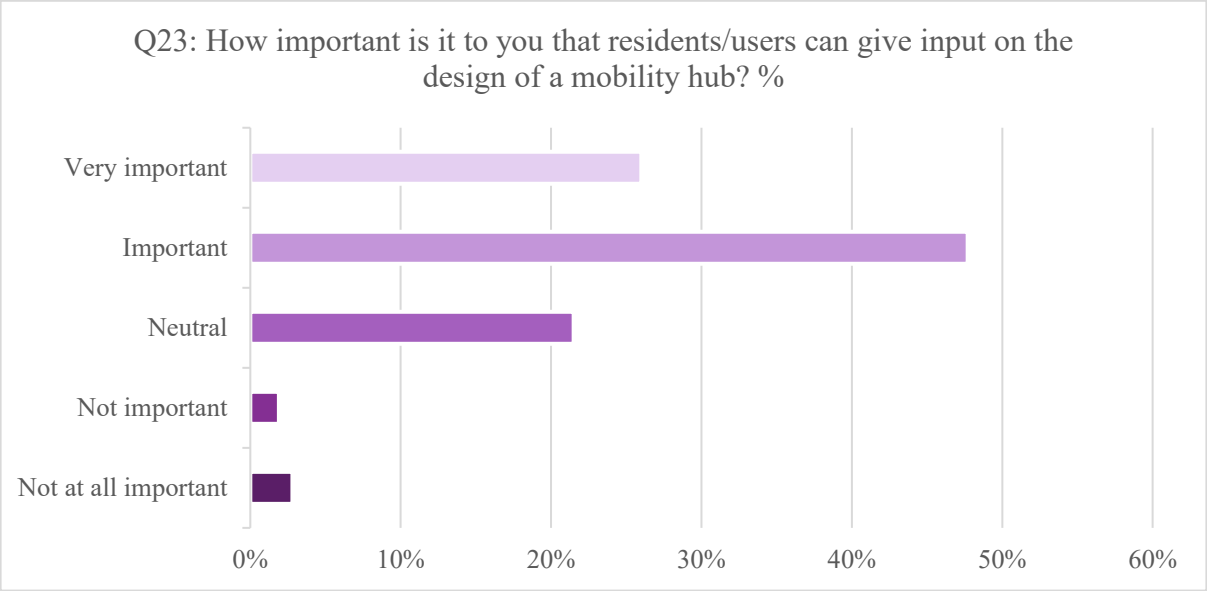

Figure 4.10: Opinions on being able to participate in the design process of mobility hubs

This perception also shows differences between age groups with a small to moderate effect (H(4) = 20.487, p < 0.001, η^2 = 0.029)[8]. The Bonferroni test shows respondents ages 75 and older are significantly less willing to participate than those aged 18-44 (p = 0.011), 55 and 64 (p = 0.000), and 65 and 74 years (p = 0.015). This suggests that respondents aged 75 and older see significantly less potential in being able to participate in the design process. On the contrary, no significant differences were found across education levels (H(3) = 4.057, p = 0.255). Despite this, higher educated respondents indicate more positive perceptions towards participation processes (Appendix D2-D8).

Furthermore, a weak but significant correlation is found between the attitude towards mobility hubs and the preference to participate in the design process of these hubs (*Spearman's rho* = 0.185, p < 0.001) (Appendix D9). This suggests that respondents that stand positive against the idea of implementing a mobility hub in their neighbourhood, also value the ability for residents and users to participate in the designing process somewhat more.

[7] Males (*Mean Rank* = 302.42) and Females (*Mean Rank* = 264.64).
[8] 18-44 years (*Mean Rank* = 259.04), 45-54 years (*Mean Rank* = 293.84), 55-64 years (*Mean Rank* = 253.43), 65-74 years (*Mean Rank* = 280.83), and 75 or older (*Mean Rank* = 337.65).

4.3.2 Ranking design preferences

The results in Figure 4.11 show that respondents prioritise functional and safety related design elements in mobility hubs. Elements such as good lighting, seamless connectivity between transport modes, and real-time travel information are considered most important. A mobile app for planning, booking, and payment are also valued, as well as the availability of toilets. On the contrary, shared mopeds, childcare facilities, and (co-)working spaces are seen as less essential. This suggests that suggesting that respondents mainly focus on the functional infrastructure of mobility hubs rather than seeing it as a multifunctional community space.

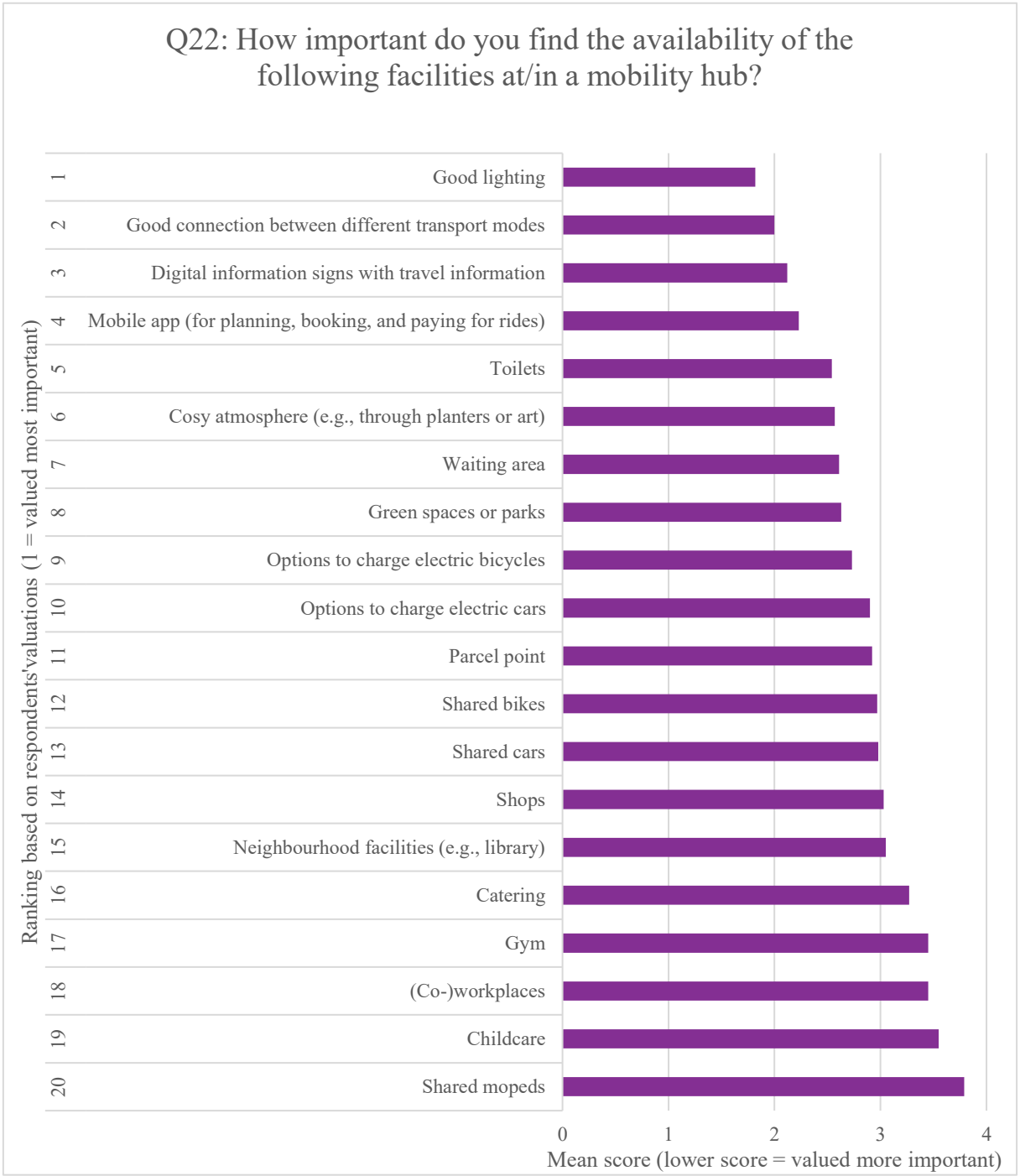

Figure 4.11: Ranking of design elements based on preferences of respondents

While respondents generally prioritise functional design elements, their relative importance varies across sociodemographic groups (Table 4.12). Female respondents significantly put more emphasis on good lighting and multimodal connectivity compared to male respondents, suggesting that females are concerned with the safety and ease of use of hubs. Furthermore, generational differences in the need for clear wayfinding and safety are highlighted. Younger respondents value clear information signs and good lighting more than older groups. Higher educated respondents consider multimodal integration more important than lower educated people, indicating a stronger preference for seamless travel. Interestingly, even among the features that are valued as less important such as childcare, female respondents show a higher willingness for these services than males.

Design element	Gender (*rho/p)*	Age (rho/p)	Education (rho/p)
Sufficient lighting	-0.175 / <0.001	0.086 / 0.039	x
Connectedness	-0.210 / < 0.001	x	-0.164 / <0.001
Information signs	x	0.106 / 0.011	Not significant
Mobility hub app	x	x	Not significant
Childcare	-0.103 / 0.013	x	x

Table 4.12

In terms of spatial differences, residents of neighbourhoods such as Blokhoeve, Batau Noord, and Fokkesteeg tend to give higher overall importance to design elements. On the other hand, respondents from Galecop and Doorslag rate them slightly lower (Appendix D19)). Nevertheless, the relative ranking of individual design elements is consistent across all areas. Elements such as good lighting, strong modal connectivity, and real-time travel information are seen as most important, while services as shared mopeds, childcare, and a gym are ranked lowest (Appendix D20). This suggests that despite minor differences in overall importance, residents across Nieuwegein share the same design preferences for mobility hubs.

4.3.3 Mobility hub 'app'

Many respondents indicate a willingness to use a potential mobility hub app. Whereas 34.4% would probably use it, 27.8% is already certain of this. Despite this, 25.3% is unsure about using it and only 4.4% is sure about not using it (Figure 4.13). Age groups however show significant differences within these perceptions with a small to moderate effect ($H(4) = 21.293$, $p < 0.001$, $\eta^2 = 0.032$)[9]. The Bonferroni test reveals that respondents aged 75 and older are significantly less likely to use the potential app than those aged 55-64 ($p = 0.000$) and 65-74 ($p = 0.007$) (Appendix D22-D24). Furthermore, a significant positive correlation with a relatively small effect also shows that the willingness to use the potential app declines with an increasing age (Appendix D25).

Education level also shows significant differences with a small to moderate effect ($H(3) = 16.055$, $p = 0.001$, $\eta^2 = 0.024$)[10]. Respondents with Applied Sciences (HBO) or University (WO) education are significantly more likely to use the potential app compared to those with a Vocational (MBO) education (Appendix D26-D28). This is supported by a significant, but weak negative correlation (*Spearman's rho* = -0.153, $p < 0.001$ (Appendix D29).

[9] 18-44 years (*Mean Rank* = 265.61), 45-54 years (*Mean Rank* = 282.89), 55-64 years (*Mean Rank* = 234.46), 65-74 years (*Mean Rank* = 264.96), and 75 or older (*Mean Rank* = 326.98).

[10] Secondary school (*Mean Rank* = 297.59), Vocational (MBO) (*Mean Rank* = 315.06), Applied sciences (HBO) (*Mean Rank* = 259.13), and University (WO) (*Mean Rank* = 248.32).

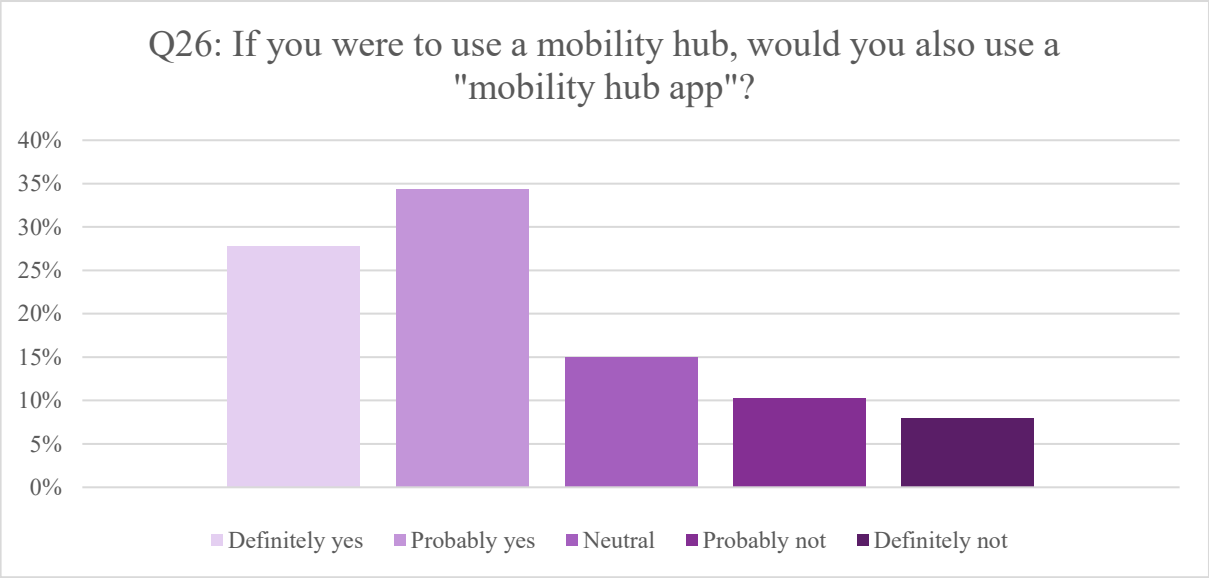

Figure 4.13: Willingness to use potential mobility hub app

Looking at the possible functionalities of this app, respondents show a high interest in features such as planning and booking vehicles, and real-time information. However, only 16.3% would like to see their travel history and contribution to sustainability (Table 4.14). In addition, open comments by 6.6% of respondents show less interest in the potential app due to continuing to rely on private cars or bicycles, or their view on mobility hubs as irrelevant. Despite this, functionalities as the need for a user-friendly design to get real-time information about potential delays, the location of the hubs themselves, and its available services. Lastly, respondents suggested a uniform access system to improve the overall ease of use.

Which features would you use in a mobility hub app?	**Responses**		
	N	%	Percent of cases
Reserve shared vehicles	287	24.3%	64.9%
Plan routes with various transport modes	262	22.2%	59.3%
Pay for transport in the app	225	19.1%	50.9%
See live availability of shared vehicles	305	25.8%	69%
View travel history and sustainability data	72	6.1%	16.3%
Other, namely:	29	2.5%	6.6%
Total	1180	100%	267%

Table 4.14: Preferences for the functionalities of the potential mobility hub app

Finally, a moderate, positive significant correlation between respondents' attitudes towards the idea of a mobility hub in their neighbourhood and their willingness to use a mobility hub app is found (*Spearman's rho* = 0.347, $p < 0.001$) (Appendix D30). This indicates that respondents more positive towards implementing a mobility in their neighbourhood relates to a higher willingness to use a potential mobility hub app. On the other hand, respondents not in favour of these hub being implemented in their neighbourhoods show less support for this potential app.

4.3.4 Summarising remarks

Overall, it can be stated that respondents show a clear preference for practical and safety-related design elements in mobility hubs. These include good lighting, real-time travel information, and multimodal connectivity. While these preferences are broadly consistent across neighbourhoods, some sociodemographic groups prefer specific elements. For instance, women and higher-

educated respondents attach more importance to safety and ease of transfer. Additionally, most of the potential users express interest in using a mobility hub app, especially for reserving different transport modes and checking real-time availability. This implies that the willingness to use mobility hubs and make less use of the car may depend on how well these hubs align with how users perceive safety, convenience, and digital accessibility, especially among groups already more open to shared mobility.

4.4 Willingness to reduce short car trips

Now that respondents have gained more insights into the concept of mobility hubs, how their perceptions on locating these hubs in their neighbourhood and were able to provide their preferences on the overall design of the hubs, it is however not self-evident that they are willing to change their travel behaviour by using these hubs. Therefore, respondents were asked whether they would change their mobility behaviour if well-designed mobility hubs were available in their neighbourhood. With this, the potential impact of implementing a mobility hub in certain neighbourhoods can be assessed, which in the end potentially leads to user-designed hubs, located where the total use of these hubs can be maximised.

The results indicate that the overall willingness to reduce car use for short trips is limited. A substantial share of respondents (33.4%) suggest that they will very unlikely change transport mode, compared to 19.7% that states being very likely to reduce car usage. These indications show no significant differences for gender, age, and education (Appendix E2-E7). However, some descriptive patterns show that slightly more males (19.3%) report a higher willingness than females (14.7%). In addition, respondents aged 45-54 has the highest share unwilling to reduce car usage for short trips, whereas respondents aged 18-44 (25%) and 75 or older (26.1%) show higher willingness to reduce car use. As for education, respondents with University (WO) (71.4%) education are the least willing to reduce their car use for short trips. Conversely, respondents with Secondary school (21.5%) or Vocational (MBO) (21.1%) education indicate higher willingness (Appendix E8-E10).

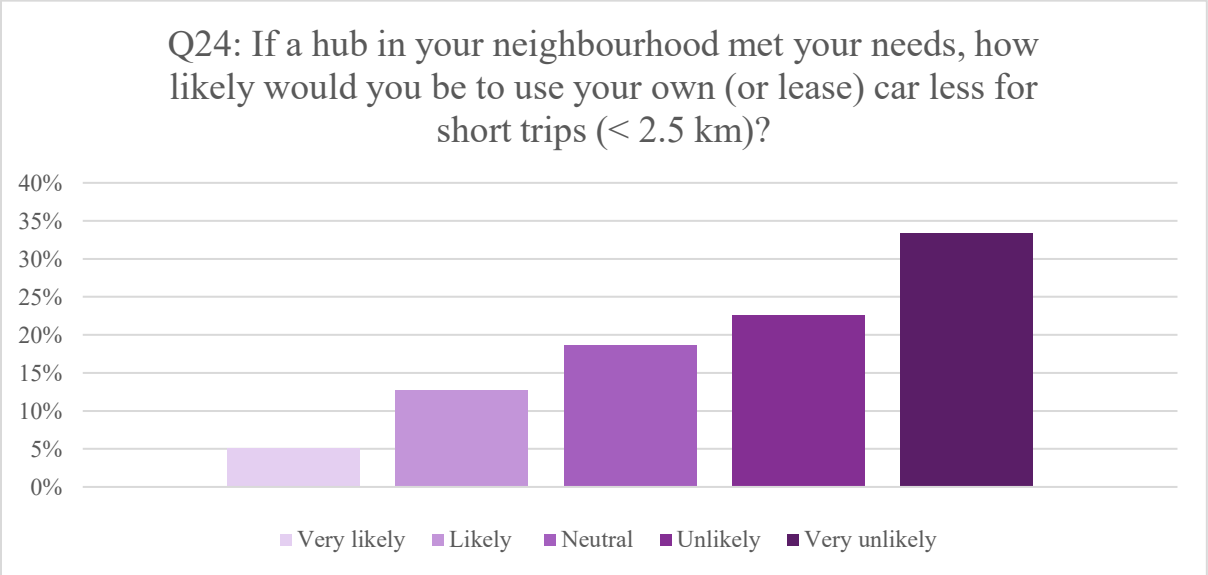

Figure 4.15: Willingness to reduce short car trips if there is a mobility hub available to their preferences

There is also a significant positive correlation (*Spearman's rho* = 0.430, $p < 0.001$) which indicates that respondents with an overall positive attitude towards mobility hubs are also more likely to show willingness to reduce their use of a (leased) car for short trips. This suggests that the share of very positive respondents declines as the attitude becomes increasingly negative (Appendix E11).

Although no significant differences were found between neighbourhoods, respondents in Merwestein and Blokhoeve indicate a greater willingness, while those in Jutphaas Wijkersloot, Zuilenstein, and Lekboulevard show the least willingness to reduce car use for short trips. This suggests that the local spatial and social context may offer more favourable conditions for modal shift than others.

4.4.1 Summarising remarks

Although mobility hubs are generally viewed positively by some residents, the willingness to reduce car use for short trips remains limited. Nevertheless, a moderate positive correlation indicates that a positive attitude towards mobility hubs relates to a greater willingness to change mobility behaviour by using the car less for short distance trips. While no significant spatial differences were found across neighbourhoods and postal areas, targeted interventions need to be made to stimulate a, in this case moderate, behavioural impact of mobility hubs. These findings therefore imply that the behavioural impact of mobility hubs is not automatic but depends on user attitudes and everyday travel routines. To encourage modal shift, interventions must align with local needs and perceptions, especially in medium-sized urban contexts.

5. Discussion

The findings of this study outlined the potential contribution of mobility hubs to sustainable mobility in Nieuwegein. The central themes can be identified here: (1) the context-dependent car use for short trips, (2) the spatial dimension of hub accessibility, and (3) the crucial role of user perceptions, sociodemographics, and public engagement in shaping socially accepted hubs. This chapter will discuss each of these themes and will reflect on how the results contribute to broader debates on sustainable mobility and the implementation of mobility hubs.

5.1 Context-dependence of car use

The research reveals that car use for trips under 2.5 kilometres in Nieuwegein is relatively limited, but is still used for doing groceries, shopping, trip chaining, transporting children or goods, or during bad weather. On the other hand, walking and cycling dominate most short-distance trips. This indicates that modal shift depends on its context. The car is thus mainly chosen because alternative transport modes are not able to compete with this level of flexibility or convenience, and not because of habits or preferences. This challenges several assumptions in sustainable mobility discourse that view availability of alternatives alone as sufficient to encourage behavioural change (Mackett, 2003; Neves & Brand, 2019). This is linked to broader mobility transitions with the goal to reduce car dependency in suburban areas. In these broader debates, the implementation of nodes in car dependent contexts are seen as a viable factor for behavioural change (Krüger & Altrock, 2023).

To put more specific, the findings suggest that sustainable transport modes must be designed to accommodate these practical trip purposes if short car trips want to be reduced effectively. For instance, a lack of weather protection, difficulty with carrying loads, or the need to chain trips can strengthen car dependency despite the short distance or the availability of its infrastructure (Vagane, 2007; He et al., 2020). These findings nuance existing perspectives by stressing that the decision to use a car is often a simple response to constraints in alternative transport options. Thus, mobility hubs should not only offer a diverse range of transport options, but must support daily routines that outperforms the convenience of travelling by car. Only this way, mobility hubs are not only available, but also addresses the practical needs coming from everyday activities. In this way, mobility hubs can work beyond compact city models (Krüger & Altrock, 2023).

5.2 Spatial dimension of hub accessibility

While urban form plays a role in shaping mobility patterns, this research shows that how perceived accessibility has the potential to better determine willingness to use mobility hubs. Although Nieuwegein is relatively compact and well-connected, may respondents indicated that their willingness lies at walking short distances to reach a hub, especially older adults. This thus challenges simplistic assumptions that proximity is equal to its usage. Instead, it suggests that spatial accessibility must be seen as a subjective and relational concept. This is shaped by the physical ability of users, perceptions of distance, and situational factors such as the purpose of the trip.

This also adds to the compact city debate by stressing a gap between theoretical and perceived accessibility (De Vos, 2015; Kjærås, 2020). The infrastructure of compact cities will also be used to a low extent when this is not aligned with the routines and perceptions of its users. These users especially prefer hubs that are located close to destination that they visit everyday such as shops, schools, or public transport nodes, but also fit into their existing travel patterns (Bösehans et al., 2023; Van Bezooijen, 2023).

Moreover, the acceptance of walking or cycling varies by sociodemographic characteristics such as age and education. Therefore, policy strategies that view mobility hub accessibility as

uniform across population can potentially overlook significant differences in user expectations. Therefore, transitions towards more sustainable forms of mobility must incorporate perceived as well as actual accessibility into planning processes.

5.3 Perceptions, sociodemographics, and participation

The third finding of this study referred to what extent perceptions play a role in the acceptance and potential use of mobility hubs. The awareness of shared mobility is high, but the concept of mobility hubs is less familiar. Older respondents and those with a lower education level specifically showed more cautious or neutral attitudes here. Nevertheless, residents that showed more positive attitudes towards mobility hubs not only indicated a higher willingness to walk or cycle longer distances, but also tended to reduce their car use by choosing other modes of transport. By referring back to the broader literature on behavioural change and sustainable mobility, it can be stated that the perceptions of trust and acceptance are essential for modal shift (Banister, 2008; Holden et al., 2020).

These perceptions are however shaped by elements such as good lighting, multimodal connectivity, and real-time digital information are features. As the results showed, respondents prioritised practical, reliable, and safe infrastructure. On the other hand, multifunctional characteristics like coworking spaces or childcare facilities were considered less important, suggesting that users in the first place view mobility hubs as functional rather than community-oriented. This challenges several policy narratives that frame hubs as multifunctional urban nodes. While this multifunctionality is well grounded, it must not come at the expense of basic functionality. This is especially true when not the entire population trusts public infrastructure (Roukouni et al., 2023).

Furthermore, demographic analysis shows important differences in design preferences. Women and older users for example prefer safety and ease of use, and younger and higher-educated respondents favour digital features and multimodal connectivity (Ku et al., 2022, Liao et al., 2024). These patterns imply that uniform hub design pose a risk marginalising specific groups with different mobility needs. The full range of user profiles must therefore be addressed by inclusive planning, both in the physical design and communication strategies, usability, and participatory engagement.

The findings also show strong support for the participation of residents in the design process. Respondents positively towards hubs were associated with a higher willingness to participate. This supports the assumption that engagement also builds trust and ensures aligning practical needs with users next to increasing democratic legitimacy (Van Gerrevink et al., 2021). If residents do not have the ability to involve, there is a risk that hubs will be perceived as imposed by a top-down process or misaligned with user priorities.

Finally, while mobility hubs show potential, their ability to transform modal choices should not be overestimated. This can be explained by underlining that there still is a gap between a high awareness of shared mobility and low behavioural change. This indicates that availability does not automatically lead to adoption. Mobility hubs thus can lower the barrier to sustainable mobility, but it might when supported with measures such as parking policies, active travel incentives, and public transport improvements (Zhou et al., 2023; Stadnichuk et al., 2024). Overall, mobility hubs can be seen as essential, but not sufficient on their own.

6. Conclusion

This study examined how the location and design of mobility hubs Nieuwegein affect the use of sustainable mobility for short trips. By using this medium-sized Dutch New Town that is based on car-oriented infrastructure, the research tried to integrate spatial analysis, user perceptions, and behavioural intentions to identify the key conditions under which mobility hubs can effectively support modal shift. The findings reveal that although short-distance trips are often already made by walking or cycling, the car is still being used for specific purposes. These include practical constraints such as transporting goods or accompanying others.

The results reinforce the arguments of Banister (2008) that behavioural change depends more on user perceptions and attitudinal shifts rather than the presence of alternative transport modes. The correlation between a positive attitude towards mobility hubs and the willingness to reduce car use or accept a longer walking or cycling distance further underlines that the presence of infrastructure alone is insufficient. Potential users must trust and vale the transport modes offered at the hub to encourage modal shift. Therefore, this insight suggests that a stronger emphasis should be placed on communication and user engagement when mobility hubs are introduced. This again aligns with the emphasis on social acceptance of sustainable transport by Banister (2008).

Second, the findings support the critique of Kjærås (2020) of current mobility policy that assume spatial proximity and accessibility as equal. Policy frameworks often presume that people will use infrastructure because it is nearby, but this research shows that proximity alone does not assures this. This is underlined by the findings of this study that the willingness to use a mobility hub differs between sociodemographic groups, and also depends on perceived safety, effort, and daily routines. This further underlines the findings of Kjærås (2020) that accessibility is subjective, context-sensitive, and shaped by the perceptions and experiences of users. Standard distance measurements thus are not sufficient, and stresses the need to include more qualitative factors when thinking of planning strategies.

Third, mobility hubs should not be viewed as objects that can transform modal shifts by itself but rather as a infrastructure that enables it, as argued by Bösehans et al., 2021). Respondents indicated a preference for practical and reliable features such as good lighting, digital travel information, and multimodal connectivity. These preferences confirm that hubs should meet these requirements in order to enable behavioural change. Therefore, the success of a mobility hub depends on how well it is implemented in daily travel routines, including trip chaining and its purposes. This is supported by Bösehans et al. (2021).

Overall, these findings extents the debate on how mobility infrastructure can support sustainable travel behaviour. These show that successful hub design must align with physical accessibility, functional design, and user perceptions. However, this needs to be combined with a context-sensitive focus on spatial and sociodemographic diversity.

6.1 Limitations, future research, and policy recommendations

This study provides important insights into how mobility hubs can support sustainable mobility, but also faced several limitations. First, the ability to generalise the results to cites with different spatial layouts, demographic structures, or planning histories is constrained because of the focus on a single case (Nieuwegein). Furthermore, there could be a gap between the actual behaviour of the respondents and how it is perceived and measured by the researcher. An example of this is in some way the presence of hypothetical scenarios instead of observed behaviour. Additionally, the survey sample was skewed towards older and higher educated respondents, which could have led to the overrepresentation of positive attitudes towards hubs and digital features. Also, the data selection process could lead to filtering out respondents containing relevant information. Finally, although some spatial differences were noticed across neighbourhoods, further research into how

socio-spatial characteristics play a role in hub accessibility and acceptance was beyond the scope of this study.

Building on these limitations, future research should for instance focus on longitudinal studies for assessing actual behavioural shifts as a result of hub implementation. In addition, comparative analyses across different urban contexts could find potential relations or differences. As described above, further research into how physical and social characteristics at the neighbourhood level influences the adoption of mobility hubs is also needed. This includes looking into population density, local amenities, or social cohesion. Additionally, the experiences and needs of underrepresented groups need to understand to achieve a more inclusive planning and design process for hubs, especially for young people, migrants, and impaired persons.

In terms of policy, three implications can be underlined. First, accessibility should also be based on perceived barriers such as safety and effort rather than just in terms of physical distance. Second, functional design elements like good lighting, shelter, digital information, and multimodal transfer are consistently ranked as essential. Therefore, mobility hubs should prioritise these functional features, which is why public participation must be an integral part of the planning process. Because of this, the overall trust and acceptance of hubs can be increased by involving residents at an early stage because local routines and preferences are aligned. Only when mobility hubs are planned and implemented conform these findings, they have the potential to not only improve its accessibility and attractivity, but also its capability of promoting behavioural change.

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Appendix A – Methodology

List A1: Original survey layout in Dutch as send to the municipal panel

Survey

Duurzaam onderweg

Survey Details

Survey Description	
Date of export	28-04-2025 12:39
Number of Questions and Content Elements	79
Survey Language	Dutch
Anonymous Link	https://onderzoek.nieuwegein.nl/yulonqskxo?l=nl

Table of Contents

q21: Stel, u zou gebruik maken van een mobiliteitshub, wat is de maximale afstand die u bereid bent te fietsen naar een mobiliteitshub? (Een persoon fietst gemiddeld 1,5 tot 2 minuten over 500 meter)

q22: Kunt u van de volgende voorzieningen aangeven hoe belangrijk u het vindt dat deze beschikbaar zijn in/bij een mobiliteitshub?

q23: Hoe belangrijk vindt u het dat (buurt)bewoners/mogelijke gebruikers mogen meedenken over de inrichting van een mobiliteitshub?

q24: Als er een mobiliteitshub in uw buurt zou zijn die aan uw wensen voldoet, hoe waarschijnlijk is het dan dat u minder vaak uw eigen (of lease) auto zou gebruiken voor korte ritten (korter dan 2,5 km)?

q25: Als er een mobiliteitshub in uw buurt zou zijn die aan uw wensen voldoet, hoe waarschijnlijk is het dan dat u minder vaak uw eigen (of lease) auto zou gebruiken voor langere ritten (langer dan 2,5 km)?

q26: Als u gebruik zou maken van een mobiliteitshub, zou u dan ook gebruik maken van een ‘mobiliteitshub-app’?

q27: Welke mogelijkheden zou u gebruiken in een mobiliteitshub-app?

q28: Wat is uw postcode?

q29: Wat is uw geslacht?

q30: Wat is uw leeftijd?

q31: Wat is uw hoogst voltooide opleiding?

q32: Wilt u per e-mail de resultaten van dit onderzoek ontvangen?

q33: Heeft u nog vragen of opmerkingen naar aanleiding van deze vragenlijst? Deze kunt u hieronder kwijt.

Sectie 1

Welkom!

Fijn dat u deze vragenlijst over "duurzaam onderweg" in wilt vullen.

Klik op "Volgende" om naar de vragen te gaan.

Autobezit en autogebruik

q1: Maakt u wel eens gebruik van een auto?

Meerdere antwoorden mogelijk

¨ Ja, ik rijd zelf auto (eigen auto of lease auto)
¨ Ja, ik gebruik wel eens een deelauto (bijvoorbeeld van MyWheels of Greenwheels)
¨ Ja, ik rijd zelf niet, maar rijd wel eens met een ander mee (bijvoorbeeld naar een uitje, of carpoolen naar werk)
¨ Nee, ik maak nooit gebruik van een auto

Show if	Question	Maakt u wel eens gebruik van een auto? / Ja, ik rijd zelf auto (eigen auto of lease auto)	IsEqualTo	checked
Or	Question	Maakt u wel eens gebruik van een auto? / Ja, ik gebruik wel eens een deelauto (bijvoorbeeld van MyWheels of Greenwheels)	IsEqualTo	checked

q2: Hoeveel auto’s zijn er in uw huishouden?

¡ Geen auto’s
¡ 1 auto
¡ 2 auto’s
¡ 3 auto’s
¡ 4 of meer auto’s

Show if	Question	Hoeveel auto’s zijn er in uw huishouden?	IsNotEqualTo	Geen auto’s
And	Question	Maakt u wel eens gebruik van een auto? / Ja, ik rijd zelf niet, maar rijd wel eens met een ander mee (bijvoorbeeld naar een uitje, of carpoolen naar werk)	IsEqualTo	unchecked
And	Question	Maakt u wel eens gebruik van een auto? / Nee, ik maak nooit gebruik van een auto	IsEqualTo	unchecked

q3: De auto die ik het meest gebruik is:

¡ Mijn eigen auto
¡ Een private lease auto
¡ Een lease auto van werk
¡ Een deelauto
¡ Anders, namelijk::
_____

Show if	Question	Hoeveel auto’s zijn er in uw huishouden?	IsNotEqualTo	Geen auto’s
And	Question	Maakt u wel eens gebruik van een auto? / Ja, ik rijd zelf niet, maar rijd wel eens met een ander mee (bijvoorbeeld naar een uitje, of carpoolen naar werk)	IsEqualTo	unchecked

And	Question	Maakt u wel eens gebruik van een auto? / Nee, ik maak nooit gebruik van een auto	IsEqualTo	unchecked

q4: Wat zijn voor u de belangrijkste redenen om een auto te hebben?

U kunt maximaal 3 redenen kiezen

- ¨ Ik ben daardoor onafhankelijk en flexibel
- ¨ Voor mijn gezondheid (bijvoorbeeld slecht ter been)
- ¨ Voor mijn gemak
- ¨ Het is noodzakelijk voor mijn werk (bijvoorbeeld lange afstand of onregelmatige werktijden)
- ¨ Gezin en familie (bijvoorbeeld kinderen of zorg voor familie)
- ¨ Ik kan alleen met de auto op mijn bestemming komen (openbaar vervoer komt daar niet)
- ¨ Met een ander vervoermiddel (bijvoorbeeld openbaar vervoer) ben ik veel langer bezig om op mijn bestemming te komen
- ¨ Hobby's of activiteiten in mijn vrije tijd waar ik een auto voor nodig heb
- ¨ Status of persoonlijke voorkeur
- ¨ Het is goedkoper dan andere manieren van vervoer (bijvoorbeeld openbaar vervoer)
- ¨ Anders, namelijk::

  _____

Show if	Question	Maakt u wel eens gebruik van een auto? / Nee, ik maak nooit gebruik van een auto	IsEqualTo	unchecked
And	Question	Maakt u wel eens gebruik van een auto? / Ja, ik rijd zelf niet, maar rijd wel eens met een ander mee (bijvoorbeeld naar een uitje, of carpoolen naar werk)	IsEqualTo	unchecked

q5: Hoe vaak gebruikt u een auto voor ritten korter dan 2,5 km?

¡ Dagelijks
¡ Een paar keer per week
¡ Een paar keer per maand
¡ (Minder dan) 1 keer per maand
¡ (Bijna) nooit

Show if	Question	Maakt u wel eens gebruik van een auto? / Ja, ik rijd zelf niet, maar rijd wel eens met een ander mee (bijvoorbeeld naar een uitje, of carpoolen naar werk)	IsEqualTo	unchecked
And	Question	Maakt u wel eens gebruik van een auto? / Nee, ik maak nooit gebruik van een auto	IsEqualTo	unchecked
And	Question	Hoe vaak gebruikt u een auto voor ritten korter dan 2,5 km?	IsNotEqualTo	(Bijna) nooit

U heeft aangegeven dat u de auto wel eens gebruikt voor een korte rit (korter dan 2,5 km). We zijn benieuwd waar u naartoe gaat als u een korte autorit maakt.

Show if	Question	Hoe vaak gebruikt u een auto voor ritten korter dan 2,5 km?	AnyIsEqual	1,2,3,4

q6: Ik gebruik de auto dan voor:

Meerdere antwoorden mogelijk

¨ Werk
¨ Winkelen of boodschappen doen
¨ School/studie
¨ Ophalen/brengen van personen of spullen (bijvoorbeeld kinderen ophalen, of pakketten ophalen)
¨ Sport of hobby
¨ Anders, namelijk::
_____

Show if	Question	Wat zijn voor u de belangrijkste redenen om een auto te hebben? / Voor mijn gezondheid (bijvoorbeeld slecht ter been)	IsEqualTo	unchecked
And	Question	Hoe vaak gebruikt u een auto voor ritten korter dan 2,5 km?	IsNotEqualTo	(Bijna) nooit
And	Question	Maakt u wel eens gebruik van een auto? / Nee, ik maak nooit gebruik van een auto	IsEqualTo	unchecked
And	Question	Maakt u wel eens gebruik van een auto? / Ja, ik rijd zelf niet, maar rijd wel eens met een ander mee (bijvoorbeeld naar een uitje, of carpoolen naar werk)	IsEqualTo	unchecked

U heeft aangegeven dat u de auto wel eens gebruikt voor een korte rit (korter dan 2,5 km). Voor korte afstanden is het ook mogelijk om bijvoorbeeld lopend of met de fiets te gaan.

Show if	Question	Wat zijn voor u de belangrijkste redenen om een auto te hebben? / Voor mijn gezondheid (bijvoorbeeld slecht ter been)	IsEqualTo	unchecked
And	Question	Hoe vaak gebruikt u een auto voor ritten korter dan 2,5 km?	IsNotEqualTo	(Bijna) nooit
And	Question	Maakt u wel eens gebruik van een auto? / Nee, ik maak nooit gebruik van een auto	IsEqualTo	unchecked
And	Question	Maakt u wel eens gebruik van een auto? / Ja, ik rijd zelf niet, maar rijd wel eens met een ander mee (bijvoorbeeld naar een uitje, of carpoolen naar werk)	IsEqualTo	unchecked

q7: We zijn benieuwd wat voor u de belangrijkste redenen zijn om wel eens voor de auto te kiezen voor een korte rit (tot 2,5 km).

Ik kies voor de auto als:

U kunt maximaal 3 antwoorden kiezen

- ¨ Het slecht weer is
- ¨ Ik weinig tijd heb
- ¨ Ik moe ben of geen zin heb om bijvoorbeeld te lopen of met de fiets te gaan
- ¨ Ik me niet veilig voel op de route (bijvoorbeeld in het donker)
- ¨ Ik veel/zware spullen moet vervoeren
- ¨ Er geen goede route is naar mijn bestemming om bijvoorbeeld te lopen of fietsen
- ¨ Er geen openbaar vervoer naar mijn bestemming gaat
- ¨ Anders, namelijk::

  _____

Andere vervoermiddelen

q8: Hoe vaak maakt u gebruik van de volgende vervoermiddelen voor korte ritten (korter dan 2,5 km)?

	Dagelijks	Een paar keer per week	Een paar keer per maand	(Minder dan) 1 keer per maand	Nooit
Lopen	¡	¡	¡	¡	¡
(Elektrische) fiets	¡	¡	¡	¡	¡
(Elektrische) Scooter/brommer	¡	¡	¡	¡	¡
Openbaar vervoer	¡	¡	¡	¡	¡
Deelauto	¡	¡	¡	¡	¡
Deelfiets	¡	¡	¡	¡	¡

Hide if	Question	Hoe vaak maakt u gebruik van de volgende vervoermiddelen voor korte ritten (korter dan 2,5 km)? / Lopen	AnyIsEqual	Nooit
And	Question	Hoe vaak maakt u gebruik van de volgende vervoermiddelen voor korte ritten (korter dan 2,5 km)? / (Elektrische) fiets	AnyIsEqual	Nooit
And	Question	Hoe vaak maakt u gebruik van de volgende	AnyIsEqual	Nooit

		vervoermiddelen voor korte ritten (korter dan 2,5 km)? / (Elektrische) Scooter/brommer		
And	Question	Hoe vaak maakt u gebruik van de volgende vervoermiddelen voor korte ritten (korter dan 2,5 km)? / Openbaar vervoer	AnyIsEqual	Nooit
And	Question	Hoe vaak maakt u gebruik van de volgende vervoermiddelen voor korte ritten (korter dan 2,5 km)? / Deelauto	AnyIsEqual	Nooit
And	Question	Hoe vaak maakt u gebruik van de volgende vervoermiddelen voor korte ritten (korter dan 2,5 km)? / Deelfiets	AnyIsEqual	Nooit

U heeft aangegeven dat u vaak of soms een ander vervoermiddel dan de auto gebruikt voor een korte afstand (korter dan 2,5 km).

Hide if	Question	Hoe vaak maakt u gebruik van de volgende vervoermiddelen voor korte ritten (korter dan 2,5 km)? / Lopen	IsEqualTo	Nooit
And	Question	Hoe vaak maakt u gebruik van de volgende vervoermiddelen voor korte ritten (korter dan 2,5 km)? / (Elektrische) fiets	IsEqualTo	Nooit
And	Question	Hoe vaak maakt u gebruik van de volgende vervoermiddelen voor	IsEqualTo	Nooit

		korte ritten (korter dan 2,5 km)? / (Elektrische) Scooter/brommer		
And	Question	Hoe vaak maakt u gebruik van de volgende vervoermiddelen voor korte ritten (korter dan 2,5 km)? / Openbaar vervoer	IsEqualTo	Nooit
And	Question	Hoe vaak maakt u gebruik van de volgende vervoermiddelen voor korte ritten (korter dan 2,5 km)? / Deelauto	IsEqualTo	Nooit
And	Question	Hoe vaak maakt u gebruik van de volgende vervoermiddelen voor korte ritten (korter dan 2,5 km)? / Deelfiets	IsEqualTo	Nooit

q9: Wat zijn voor u de belangrijkste redenen om vaak of soms voor een ander vervoermiddel te kiezen voor een korte afstand (tot 2,5 km)?

U kunt maximaal 3 antwoorden kiezen

- ¨ Het is beter voor het milieu
- ¨ Het is goed voor mijn gezondheid
- ¨ Het is goedkoper (geen reiskosten)
- ¨ Het is goedkoper omdat ik dan niet betaald hoef te parkeren
- ¨ Ik heb dan geen problemen om een parkeerplek te vinden
- ¨ Ik ben dan sneller op mijn bestemming
- ¨ Ik vind het ontspannend
- ¨ Met een ander vervoermiddel heb ik minder kans op vertraging (zoals file) onderweg dan met de auto
- ¨ Ik vind het niet nodig om de auto te gebruiken voor korte afstanden
- ¨ Anders, namelijk::

  _____

Deelvervoer

Deelvervoer betekent dat meerdere mensen gebruik maken van hetzelfde voertuig, zoals een auto of fiets. Je huurt een deelauto of deelfiets voor een korte tijd als je deze nodig hebt. Zo hoef je zelf geen auto of fiets te kopen en te onderhouden.

q10: Wist u hiervoor al wat deelvervoer is?

¡ Ja, en ik maak er ook gebruik van
¡ Ja, ik maak er nog geen gebruik van, maar ben dat wel van plan
¡ Ja, maar ik ben niet van plan er gebruik van te maken
¡ Nee

Show if	Question	Wist u hiervoor al wat deelvervoer is?	AnyIsEqual	Ja, en ik maak er ook gebruik van

q11: Van welk soort deelvervoer maakt u wel eens gebruik?

¡ Ik gebruik een deelauto
¡ Ik gebruik een deelfiets
¡ Ik gebruik beide

Show if	Question	Van welk soort deelvervoer maakt u wel eens gebruik?	AnyIsEqual	1,3

q12: U heeft aangegeven dat u wel eens gebruik maakt van een deelauto.
Hoe vaak maakt u gebruik van een deelauto?

¡ Dagelijks
¡ Een paar keer per week
¡ Een paar keer per maand
¡ (Minder dan) 1 keer per maand

Show if	Question	Van welk soort deelvervoer maakt u wel eens gebruik?	AnyIsEqual	1,3

q13: Hoeveel kilometer is een gemiddelde rit die u maakt met een deelauto?

¡ Korter dan 2,5 km
¡ 2,5 - 5 km (binnen Nieuwegein)
¡ 5 – 10 km (bijvoorbeeld naar Houten, Vianen of Utrecht)
¡ 10 – 50 km (bijvoorbeeld naar Amsterdam, Amersfoort, Den Bosch)
¡ 50 - 100 km (bijvoorbeeld naar Den Haag, Zwolle, Eindhoven)
¡ Meer dan 100 km
¡ Dat weet ik niet

Show if	Question	Van welk soort deelvervoer maakt u wel eens gebruik?	AnyIsEqual	2,3

q14: U heeft aangegeven dat u wel eens gebruik maakt van een deelfiets.
Hoe vaak maakt u gebruik van een deelfiets?

¡ Dagelijks
¡ Een paar keer per week
¡ Een paar keer per maand
¡ (Minder dan) 1 keer per maand

Show if	Question	Van welk soort deelvervoer maakt u wel eens gebruik?	AnyIsEqual	2,3

q15: Hoeveel kilometer is een gemiddelde rit die u maakt met een deelfiets?

¡ Korter dan 2,5 km
¡ 2,5 - 5 km (binnen Nieuwegein)
¡ 5 – 10 km (bijvoorbeeld naar Houten, Vianen of Utrecht)
¡ 10 – 25 km (bijvoorbeeld naar Zeist, Culemborg, Maarssen)
¡ Meer dan 25 km
¡ Dat weet ik niet

Mobiliteitshubs

Een mobiliteitshub is een plek waar verschillende vormen van (duurzaam) vervoer bij elkaar komen, zoals openbaar vervoer en (gedeelde) fietsen of auto's. Het zorgt ervoor dat je makkelijk van het ene vervoermiddel naar het andere kunt overstappen. Daarnaast kunnen er ook andere voorzieningen bij een mobiliteitshub zijn, zoals winkels, werkplekken of pakketpunten, afhankelijk van de locatie.

q16: Had u hiervoor wel eens van een mobiliteitshub gehoord?

¡ Ja
¡ Nee

Een mobiliteitshub is een centrale plek in een buurt waar verschillende soorten vervoer samen kunnen komen. Je kunt er bijvoorbeeld een deelauto, -fiets of -scooter gebruiken, of overstappen op de bus of tram. Je loopt of fietst er naartoe en reist makkelijk verder. Zo'n hub is vaak te vinden dichtbij een tram- of bushalte, of op een plek waar al voorzieningen aanwezig zijn, zoals winkels. Dit zijn plekken waar de mobiliteitshub geen negatief effect heeft op het verkeer. Het kan op de locatie zelf wat drukker zijn, maar er zijn ook veel positieve kanten. Een mobiliteitshub kan zorgen voor minder auto’s in de rest van de buurt. Dat kan mogelijk zorgen voor minder parkeerdruk en minder drukte op straat. De buurt wordt dan veiliger en rustiger. Vaak zijn er ook handige extra’s, zoals pakketautomaten of oplaadpunten voor bijvoorbeeld een elektrische auto.

q17: Hoe staat u tegenover het idee van een mobiliteitshub in uw buurt of wijk?

¡ Heel positief
¡ Positief
¡ Neutraal
¡ Negatief
¡ Heel negatief

Show if	Question	Hoe staat u tegenover het idee van een mobiliteitshub in uw buurt of wijk?	AnyIsEqual	1,2

q18: Waarom staat u (heel) positief tegenover een mobiliteitshub in uw buurt of wijk?

Meerdere antwoorden mogelijk

¨ Ik kan makkelijker overstappen op ander vervoer
¨ Er komen minder auto's in de buurt
¨ Er zijn minder problemen met parkeren
¨ Er komen handige voorzieningen bij, zoals een pakketpunt
¨ Ik heb minder een eigen auto nodig
¨ Ik kan een deelauto of deelfiets gebruiken als ik die nodig heb
¨ Het past bij hoe ik reis en woon
¨ Anders, namelijk::
_____

Show if	Question	Hoe staat u tegenover het idee van een mobiliteitshub in uw buurt of wijk?	AnyIsEqual	4,5

q19: Waarom staat u (heel) negatief tegenover een mobiliteitshub in uw buurt of wijk?

Meerdere antwoorden mogelijk

- ¨ Ik denk niet dat er minder auto's in de buurt komen
- ¨ Ik ben bang dat het juist drukker wordt met auto's in de buurt
- ¨ Ik heb geen behoefte aan een mobiliteitshub in mijn buurt
- ¨ Ik gebruik liever mijn eigen auto of fiets
- ¨ Ik denk dat er parkeerproblemen komen door de komst van de mobiliteitshub
- ¨ Ik ben bang dat het voor geluidsoverlast zal zorgen in de buurt
- ¨ Het past niet bij hoe ik reis en woon
- ¨ Anders, namelijk::

  _____

Een mobiliteitshub in een buurt of wijk werkt het beste als mensen er makkelijk kunnen komen zonder auto. Daarom willen we graag weten hoe ver u wilt lopen of fietsen naar een hub. Dit helpt ons om de hubs op de juiste plekken te zetten.

q20: Stel, u zou gebruik maken van een mobiliteitshub, wat is de maximale afstand die u bereid bent te lopen naar een mobiliteitshub? (Een persoon loopt gemiddeld 1 tot 1,5 minuut over 100 meter)

- ¡ Minder dan 100 meter (minder dan 1,5 minuten)
- ¡ 100 – 250 meter (1,5 tot 4 minuten)
- ¡ 250 – 500 meter (4 tot 7,5 minuten)
- ¡ Meer dan 500 meter (meer dan 7,5 minuten)
- ¡ Niet van toepassing, ik ben slecht ter been

q21: Stel, u zou gebruik maken van een mobiliteitshub, wat is de maximale afstand die u bereid bent te fietsen naar een mobiliteitshub? (Een persoon fietst gemiddeld 1,5 tot 2 minuten over 500 meter)

¡ Minder dan 500 meter (minder dan 2 minuten)
¡ 500 meter – 1 km (2 tot 4 minuten)
¡ 1 km – 1,5 km (4 tot 6 minuten)
¡ 1,5 km – 2 km (6 tot 8 minuten)
¡ Meer dan 2 km (meer dan 8 minuten)
¡ Niet van toepassing, ik kan/mag niet fietsen

Mobiliteitshub: voorzieningen en gebruik

q22: Kunt u van de volgende voorzieningen aangeven hoe belangrijk u het vindt dat deze beschikbaar zijn in/bij een mobiliteitshub?

	Heel belangrijk	Belangrijk	Neutraal	Niet belangrijk	Helemaal niet belangrijk
Deelauto’s	¡	¡	¡	¡	¡
Deelfietsen	¡	¡	¡	¡	¡
Deelscooters	¡	¡	¡	¡	¡
Goede aansluiting tussen verschillende vervoermiddelen	¡	¡	¡	¡	¡
Digitale informatieborden met reisinformatie	¡	¡	¡	¡	¡
Mobiele app (voor plannen, boeken en betalen van ritten)	¡	¡	¡	¡	¡
Toiletten	¡	¡	¡	¡	¡
Pakketpunt	¡	¡	¡	¡	¡
Horeca	¡	¡	¡	¡	¡
Winkels	¡	¡	¡	¡	¡
Wachtruimte	¡	¡	¡	¡	¡
Goede verlichting	¡	¡	¡	¡	¡
Gezellige sfeer (bijvoorbeeld door plantenbakken of kunst)	¡	¡	¡	¡	¡
Voorzieningen voor de buurt (bijvoorbeeld bibliotheek)	¡	¡	¡	¡	¡
Sportschool	¡	¡	¡	¡	¡
Kinderopvang	¡	¡	¡	¡	¡
Groene ruimtes of parken	¡	¡	¡	¡	¡
(Co-)werkplekken	¡	¡	¡	¡	¡
Mogelijkheden om elektrische auto's op te laden	¡	¡	¡	¡	¡
Mogelijkheden om elektrische fietsen op te laden	¡	¡	¡	¡	¡

q23: Hoe belangrijk vindt u het dat (buurt)bewoners/mogelijke gebruikers mogen meedenken over de inrichting van een mobiliteitshub?

¡ Heel belangrijk
¡ Belangrijk
¡ Neutraal
¡ Niet belangrijk
¡ Helemaal niet belangrijk

Show if	Question	Hoe vaak gebruikt u een auto voor ritten korter dan 2,5 km?	IsNotEqualTo	(Bijna) nooit
And	Question	Maakt u wel eens gebruik van een auto? / Nee, ik maak nooit gebruik van een auto	IsEqualTo	unchecked
And	Question	Hoeveel auto's zijn er in uw huishouden?	IsNotEqualTo	Geen auto's
And	Question	Maakt u wel eens gebruik van een auto? / Ja, ik rijd zelf niet, maar rijd wel eens met een ander mee (bijvoorbeeld naar een uitje, of carpoolen naar werk)	IsEqualTo	unchecked

q24: Als er een mobiliteitshub in uw buurt zou zijn die aan uw wensen voldoet, hoe waarschijnlijk is het dan dat u minder vaak uw eigen (of lease) auto zou gebruiken voor korte ritten (korter dan 2,5 km)?

¡ Heel waarschijnlijk
¡ Waarschijnlijk
¡ Neutraal
¡ Onwaarschijnlijk
¡ Heel onwaarschijnlijk
¡ Niet van toepassing; ik heb mijn auto nodig vanwege mijn gezondheid

Show if	Question	De auto die ik het meest gebruik is:	AnyIsEqual	1,2,3
And	Question	Hoeveel auto’s zijn er in uw huishouden?	IsNotEqualTo	Geen auto’s

q25: Als er een mobiliteitshub in uw buurt zou zijn die aan uw wensen voldoet, hoe waarschijnlijk is het dan dat u minder vaak uw eigen (of lease) auto zou gebruiken voor langere ritten (langer dan 2,5 km)?

¡ Heel waarschijnlijk
¡ Waarschijnlijk
¡ Neutraal
¡ Onwaarschijnlijk
¡ Heel onwaarschijnlijk
¡ Niet van toepassing; ik heb mijn auto nodig vanwege mijn gezondheid

Show if	Question	Als er een mobiliteitshub in uw buurt zou zijn die aan uw wensen voldoet, hoe waarschijnlijk is het dan dat u minder vaak uw eigen (of lease) auto zou gebruiken voor korte ritten (korter dan 2,5 km)?	IsNotEqualTo	Niet van toepassing; ik heb mijn auto nodig vanwege mijn gezondheid
And	Question	Als er een mobiliteitshub in uw buurt zou zijn die aan uw wensen voldoet, hoe waarschijnlijk is het dan dat u minder vaak uw eigen (of lease) auto zou gebruiken voor langere ritten (langer dan 2,5 km)?	IsNotEqualTo	Niet van toepassing; ik heb mijn auto nodig vanwege mijn gezondheid

Mobiliteitshub-app

Een mogelijkheid om het makkelijker te maken een mobiliteitshub te gebruiken is een zogenaamde ‘mobiliteitshub-app’. Zo'n ‘mobiliteitshub-app’ is een app waarop je alle beschikbare vervoer mogelijkheden en reistijden in één overzicht kan zien. Zo zie je bijvoorbeeld of er een deelauto of deelfiets beschikbaar is en hoe laat het openbaar vervoer vertrekt vanaf de hub. Een andere mogelijkheid is dat je via de app je deelauto of deelfiets kan reserveren en betalen. We zijn benieuwd of u, als u gebruik zou willen maken van een mobiliteitshub, ook gebruik zou maken van een ‘mobiliteitshub-app’.

Show if	Question	Als er een mobiliteitshub in uw buurt zou zijn die aan uw wensen voldoet, hoe waarschijnlijk is het dan dat u minder vaak uw eigen (of lease) auto zou gebruiken voor korte ritten (korter dan 2,5 km)?	IsNotEqualTo	Niet van toepassing; ik heb mijn auto nodig vanwege mijn gezondheid
And	Question	Als er een mobiliteitshub in uw buurt zou zijn die aan uw wensen voldoet, hoe waarschijnlijk is het dan dat u minder vaak uw eigen (of lease) auto zou gebruiken voor korte ritten (korter dan 2,5 km)?	IsNotEqualTo	Niet van toepassing; ik heb mijn auto nodig vanwege mijn gezondheid

q26: Als u gebruik zou maken van een mobiliteitshub, zou u dan ook gebruik maken van een ‘mobiliteitshub-app’?

¡ Ja, zeker
¡ Ja, waarschijnlijk wel
¡ Misschien
¡ Nee, waarschijnlijk niet
¡ Nee, zeker niet

Show if	Question	Als u gebruik zou maken van een mobiliteitshub, zou u dan ook gebruik maken van een ‘mobiliteitshub-app’?	AnyIsEqual	1,2,3

q27: Welke mogelijkheden zou u gebruiken in een mobiliteitshub-app?

Meerdere antwoorden mogelijk

¨ Reserveren van deelvoertuigen
¨ Routeplanning met verschillende vervoersopties
¨ Betalen voor alle vervoersdiensten via de app
¨ Dat je kan zien of deel voertuigen op dat moment beschikbaar zijn
¨ Dat je je eigen reizen terug kan zien en bijvoorbeeld ziet hoe ‘duurzaam’ je reis is
¨ Anders, namelijk::
_____

Over uzelf

q28: Wat is uw postcode?

Bijvoorbeeld 3431 AB

_____

q29: Wat is uw geslacht?

¡ Man
¡ Vrouw
¡ Zeg ik liever niet

q30: Wat is uw leeftijd?

¡ Jonger dan 18 jaar
¡ 18 tot 24 jaar
¡ 25 tot 34 jaar
¡ 35 tot 44 jaar
¡ 45 tot 54 jaar
¡ 55 tot 64 jaar
¡ 65 tot 74 jaar
¡ 75 jaar of ouder
¡ Zeg ik liever niet

q31: Wat is uw hoogst voltooide opleiding?

¡ Basisonderwijs
¡ Middelbaar onderwijs
¡ MBO
¡ HBO
¡ WO
¡ Anders, namelijk::
_____
¡ Zeg ik liever niet

q32: Wilt u per e-mail de resultaten van dit onderzoek ontvangen?

Wij gebruiken uw e-mailadres alleen voor dit doel.

¡ Ja, mijn e-mailadres is::
_____
¡ Nee

q33: Heeft u nog vragen of opmerkingen naar aanleiding van deze vragenlijst? Deze kunt u hieronder kwijt.

Heeft u geen vragen of opmerkingen, dan kunt u deze vraag overslaan.

_____

Hartelijk dank!

U bent aan het einde gekomen van deze vragenlijst.
Bedankt voor uw tijd en moeite!

Klik op “Antwoorden versturen” om de vragenlijst af te ronden.

Hartelijk dank voor uw deelname. Uw antwoorden zijn verstuurd.

Table A2: Operationalisation table for data analysis

Concept	Indicator(s)	Survey question	Scale
		Dependent variable	
Use of sustainable mobility for short trips	Frequency of using alternative transport modes for short trips	**Q8:** How often do you use the following modes of transport for short journeys (less than 2.5 km)?	Ordinal
		Q9: What are the main reasons for you to often or sometimes choose another means of transport for a short distance (up to 2.5 km)?	Nominal
	Familiarity with shared mobility use	**Q10:** Did you already know what shared mobility is?	Nominal
		Q11: What type of shared mobility do you sometimes use?	Nominal
		Q12: You have indicated that you sometimes use a shared car. How often do you use a shared car?	Ordinal
		Q13: How many kilometres is an average journey you make with a shared car?	Nominal
		Q14: You have indicated that you sometimes use a shared bicycle. How often do you use a shared bike?	Ordinal
		Q15: How many kilometres is an average journey you make with a shared bike?	Nominal
		Independent variables	
Mobility hub location	Acceptable walking/cycling distance to hub	**Q20:** Suppose you were to use a mobility hub, what is the maximum distance you are willing to walk to a mobility hub? (A person walks an average of 1 to 1.5 minutes over 100 meters)	Ordinal
		Q21: Suppose you were to use a mobility hub, what is the maximum distance you are willing to cycle to a mobility hub? (A person cycles for an average of 1.5 to 2 minutes over 500 meters)	Nominal
Mobility hub design	Valuation of hub amenities	**Q22:** Can you indicate how important it is to you that the following facilities are available in/near a mobility hub?	Ordinal
	Willingness to use mobility hub app	**Q26:** If you were to use a mobility hub, would you also use a 'mobility hub app'?	Ordinal
	Desired functions	**Q27:** What capabilities would you use in a mobility hub app?	Nominal
Urban context	Residential area (zip code as a proxy for density/degree of urbanisation)	**Q28:** What is your zip code?	Nominal
Travel behaviour	Reasons for car use	**Q4:** What are the main reasons for you to have a car?	Nominal
	Preferences for short-distance travel modes	**Q7:** We are curious what the most important reasons are for you to choose the car for a short trip (up to 2.5 km). I choose the car if:	Nominal

Modal shift	Expected reduction in car use if a mobility is available	**Q24:** If there were a mobility hub in your area that meets your needs, how likely is it that you would use your own (or leased) car less often for short trips (shorter than 2.5 km)?	Ordinal
		Q25: If there were a mobility hub in your area that meets your needs, how likely is it that you would use your own (or leased) car less often for longer trips (longer than 2.5 km)?	Ordinal
Car dependency	Current car use and availability	**Q1:** Do you ever use a car?	Nominal
		Q2: How many cars are there in your household?	Ordinal
		Q3: The car I use the most is:	Nominal
		Q5: How often do you use a car for journeys shorter than 2.5 km?	Ordinal
Trip attributes	Purpose of short trips	**Q6:** I then use the car for:	Nominal
User perspectives	Awareness of and attitude towards mobility hubs	**Q16:** Have you ever heard of a mobility hub before?	Dichotomous
		Q17: What do you think about the idea of a mobility hub in your neighbourhood or district?	Ordinal
		Q18: Why are you (very) positive about a mobility hub in your neighbourhood or district?	Nominal
		Q19: Why are you (very) negative about a mobility hub in your neighbourhood or district?	Nominal
	Importance of involvement in hub design	**Q23:** How important do you think it is that (local) residents/potential users are allowed to contribute ideas about the design of a mobility hub?	Ordinal
Sociodemographics	Age, gender, education level	**Q29:** What is your gender?	Dichotomous
		Q30: What is your age?	Ordinal
		Q31: What is your highest degree of education?	Ordinal

Appendix B – Results 4.1

4.1.1 Frequency of the use of transport modes

Table B1: Frequency table car use for short trips

How often do you use a car for trips shorter than 2.5 km?		N	%
Daily		30	5,2%
A few times per week		120	21,0%
A few times per month		120	21,0%
(Less than) once a month		55	9,6%
(Almost) never		187	32,7%
Missing	System	60	10,5%

Table B2: Descriptive statistics non parametric test gender and car use short trips

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
How often do you use a car for trips shorter than 2.5 km?	512	3,49	1,343	1	5
What is your gender?	572	1,42	,494	1	2

Table B3: Mean Ranks Mann-Whitney test gender and car use for short trips

Ranks				
	What is your gender?	N	Mean Rank	Sum of Ranks
How often do you use a car for trips shorter than 2.5 km?	Male	309	252,08	77894,00
	Female	203	263,22	53434,00
	Total	512		

Table B4: Test Statistics Mann-Whitney test gender and car use for short trips

Test Statistics[a]	
	How often do you use a car for trips shorter than 2.5 km?
Mann-Whitney U	29999,000
Wilcoxon W	77894,000
Z	-,867
Asymp. Sig. (2-tailed)	,386
a. Grouping Variable: What is your gender?	

Table B5: Mean Ranks Kruskal-Wallis test age and car use for short trips

Ranks			
	What is your age?	N	Mean Rank
How often do you use a car for trips shorter than 2.5 km?	18 to 44	59	237,52
	45 to 54	73	256,27
	55 to 64	99	272,83
	65 to 74	176	272,46
	75 or older	105	225,18

	Total	512

Table B6: Test Statistics Kruskal-Wallis test age and car use for short trips

Test Statistics[a,b]	
	How often do you use a car for trips shorter than 2.5 km?
Kruskal-Wallis H	9,666
df	4
Asymp. Sig.	,046

a. Kruskal Wallis Test
b. Grouping Variable: What is your age?

Table B7: Pairwise Comparisons/Bonferroni test age and car use for short trips

Pairwise Comparisons of What is your age?					
Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
75 or older-18 to 44	12,341	23,140	,533	,594	1,000
75 or older-45 to 54	31,098	21,673	1,435	,151	1,000
75 or older-65 to 74	47,281	17,537	2,696	,007	,070
75 or older-55 to 64	47,657	19,923	2,392	,017	,168
18 to 44-45 to 54	-18,757	24,898	-,753	,451	1,000
18 to 44-65 to 74	-34,940	21,395	-1,633	,102	1,000
18 to 44-55 to 64	-35,316	23,391	-1,510	,131	1,000
45 to 54-65 to 74	-16,183	19,799	-,817	,414	1,000
45 to 54-55 to 64	-16,559	21,940	-,755	,450	1,000
65 to 74-55 to 64	,376	17,867	,021	,983	1,000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is ,050.
a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

Table B8: Mean Ranks Kruskal-Wallis test education and car use for short trips

Ranks			
	What is your highest completed level of education?	N	Mean Rank
How often do you use a car for trips shorter than 2.5 km?	Secondary school	40	232,96
	Vocational (MBO)	113	242,92
	Applied sciences (HBO)	251	250,80
	University (WO)	107	290,62
	Total	511	

Table B9: Test Statistics Kruskal-Wallis test education and car use for short trips

Test Statistics[a,b]	
	How often do you use a car for trips shorter than 2.5 km?
Kruskal-Wallis H	8,711
df	3
Asymp. Sig.	,033

a. Kruskal Wallis Test
b. Grouping Variable: What is your highest completed level of education?

Table B10: Pairwise Comparisons/Bonferroni test education and car use for short trips

Pairwise Comparisons of What is your highest completed level of education?					
Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
Secondary school-Vocational (MBO)	-9,958	26,120	-,381	,703	1,000
Secondary school-Applied sciences (HBO)	-17,840	24,170	-,738	,460	1,000
Secondary school-University (WO)	-57,654	26,310	-2,191	,028	,171
Vocational (MBO)-Applied sciences (HBO)	-7,882	16,083	-,490	,624	1,000
Vocational (MBO)-University (WO)	-47,696	19,150	-2,491	,013	,077
Applied sciences (HBO)-University (WO)	-39,814	16,391	-2,429	,015	,091

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is ,050.
a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

Table B11: Combined frequency table of use of alternative modes for short trips

Q8: How often do you use the following modes of transport for short journeys (less than 2.5 km)?	**Daily**	**A few times per week**	**A few times per month**	**(Less than) once a month**	**Never**
	%	%	%	%	%
Walk	46,2%	33,2%	12,4%	2,4%	5,8%
Bicycle	31,6%	31,1%	10,7%	5,4%	21,2%
Scooter/moped	1,4%	0,7%	0,7%	0,7%	96,5%
Public transport	1,2%	6,1%	22,6%	36,5%	33,6%
Shared car	0,3%	0,2%	0,3%	0,9%	98,3%
Shared bicycle	0,2%	0,0%	0,0%	0,7%	99,1%

Table B12: Mean Ranks Kruskal-Wallis test age and walking for short trips

Ranks			
	What is your age?	N	Mean Rank
How often do you walk for short trips (less than 2.5 km)?	18 to 44	63	292,88
	45 to 54	82	270,30
	55 to 64	111	276,27
	65 to 74	200	268,02
	75 or older	116	336,14
	Total	572	

Table B13: Test Statistics Kruskal-Wallis test age and walking for short trips

Test Statistics[a,b]	
	How often do you walk for short trips (less than 2.5 km)?
Kruskal-Wallis H	16,540
df	4
Asymp. Sig.	,002

a. Kruskal Wallis Test
b. Grouping Variable: What is your age?

Table B14: Pairwise Comparisons/Bonferroni test age and walking for short trips

Pairwise Comparisons of What is your age?					
Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
65 to 74-45 to 54	2,290	20,131	,114	,909	1,000
65 to 74-55 to 64	8,260	18,171	,455	,649	1,000
65 to 74-18 to 44	24,866	22,180	1,121	,262	1,000
65 to 74-75 or older	-68,123	17,917	-3,802	<,001	,001
45 to 54-55 to 64	-5,970	22,355	-,267	,789	1,000
45 to 54-18 to 44	22,576	25,720	,878	,380	1,000
45 to 54-75 or older	-65,833	22,150	-2,972	,003	,030
55 to 64-18 to 44	16,606	24,217	,686	,493	1,000
55 to 64-75 or older	-59,863	20,384	-2,937	,003	,033
18 to 44-75 or older	-43,257	24,027	-1,800	,072	,718

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is ,050.
a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

Table B15: Mean Ranks Kruskal-Wallis test age and cycling for short trips

Ranks			
	What is your age?	N	Mean Rank
How often do you use the bicycle for short trips (less than 2.5 km)?	18 to 44	63	261,94
	45 to 54	82	289,72
	55 to 64	111	296,93
	65 to 74	200	264,26
	75 or older	116	325,92
	Total	572	

Table B16: Test Statistics Kruskal-Wallis test age and cycling for short trips

Test Statistics[a,b]	
	How often do you use the bicycle for short trips (less than 2.5 km)?
Kruskal-Wallis H	13,034
df	4
Asymp. Sig.	,011

a. Kruskal Wallis Test
b. Grouping Variable: What is your age?

Table B17: Pairwise Comparisons/Bonferroni test age and cycling for short trips

Pairwise Comparisons of What is your age?					
Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
18 to 44-65 to 74	-2,326	22,993	-,101	,919	1,000
18 to 44-45 to 54	-27,783	26,663	-1,042	,297	1,000
18 to 44-55 to 64	-34,996	25,104	-1,394	,163	1,000
18 to 44-75 or older	-63,986	24,908	-2,569	,010	,102
65 to 74-45 to 54	25,457	20,869	1,220	,223	1,000
65 to 74-55 to 64	32,670	18,837	1,734	,083	,829
65 to 74-75 or older	-61,660	18,574	-3,320	<,001	,009
45 to 54-55 to 64	-7,213	23,175	-,311	,756	1,000

45 to 54-75 or older	-36,203	22,962	-1,577	,115	1,000
55 to 64-75 or older	-28,990	21,131	-1,372	,170	1,000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is ,050.
a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

4.1.2 Purposes for using the car for short distances (under 2.5 km)

Table B18: Case Summary Multiple Response set trip purpose for short trips by car

Case Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
$Q6MR[a]	325	56,8%	247	43,2%	572	100,0%

a. Dichotomy group tabulated at value 1.

Table B19: Multiple Response set, Frequencies trip purposes for short trips by car

$Q6MR Frequencies				
When I use the car for short trips (<2.5 km), it is for:		Responses		Percent of Cases
		N	Percent	
$Q6MR[a]	Work	35	6,2%	10,8%
	Shopping or groceries	267	47,2%	82,2%
	School/study	4	0,7%	1,2%
	Picking up/dropping off people or items	121	21,4%	37,2%
	Sports or hobbies	84	14,8%	25,8%
	Other, namely:	55	9,7%	16,9%
Total		566	100,0%	174,2%

a. Dichotomy group tabulated at value 1.

Table B20: Cross tabulation gender and shopping or groceries

Q6_2 * What is your gender? Crosstabulation					
			What is your gender?		Total
			Male	Female	
Q6_2	0	Count	33	25	58
		% within What is your gender?	16,8%	19,5%	17,8%
	Shopping or groceries	Count	164	103	267
		% within What is your gender?	83,2%	80,5%	82,2%
Total		Count	197	128	325
		% within What is your gender?	100,0%	100,0%	100,0%

Table B21: Chi-Square test gender and shopping or groceries

Chi-Square Tests					
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	,409[a]	1	,522		
Continuity Correction[b]	,241	1	,623		
Likelihood Ratio	,406	1	,524		
Fisher's Exact Test				,555	,310
Linear-by-Linear Association	,408	1	,523		
N of Valid Cases	325				

a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 22,84.
b. Computed only for a 2x2 table

Q6_2 * What is your age? Crosstabulation

			What is your age?					Total
			18 to 44	45 to 54	55 to 64	65 to 74	75 or older	
Q6_2	0	Count	9	7	14	20	8	58
		% within What is your age?	22,5%	14,3%	22,2%	19,2%	11,6%	17,8%
	Shopping or groceries	Count	31	42	49	84	61	267
		% within What is your age?	77,5%	85,7%	77,8%	80,8%	88,4%	82,2%
Total		Count	40	49	63	104	69	325
		% within What is your age?	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

Table B22: Cross tabulation age and shopping or groceries

Table B23: Chi-Square test age and shopping or groceries

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	3,813[a]	4	,432
Likelihood Ratio	3,961	4	,411
Linear-by-Linear Association	1,039	1	,308
N of Valid Cases	325		

a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 7,14.

Table B24: Cross tabulation gender and picking up/dropping off people or items

Q6_4 * What is your gender? Crosstabulation

			What is your gender?		Total
			Male	Female	
Q6_4	0	Count	126	78	204
		% within What is your gender?	64,0%	60,9%	62,8%
	Picking up/dropping off people or items (e.g., children, parcels)	Count	71	50	121
		% within What is your gender?	36,0%	39,1%	37,2%
Total		Count	197	128	325
		% within What is your gender?	100,0%	100,0%	100,0%

Table B25: Chi-Square test gender and picking up/dropping off people or items

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)

Pearson Chi-Square	,303[a]	1	,582				
Continuity Correction[b]	,188	1	,665				
Likelihood Ratio	,303	1	,582				
Fisher's Exact Test				,639	,332		
Linear-by-Linear Association	,302	1	,582				
N of Valid Cases	325						

a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 47,66.
b. Computed only for a 2x2 table

Table B26: Cross tabulation age and picking up/dropping off people or items

Q6_4 * What is your age? Crosstabulation

		What is your age?										Total	
		18 to 44		45 to 54		55 to 64		65 to 74		75 or older			
		N	%	N	%	N	%	N	%	N	%	N	%
Q6_4	0	17	42,5%	24	49,0%	42	66,7%	70	67,3%	51	73,9%	204	62,8%
	Picking up/dropping off people or items (e.g., children, parcels)	23	57,5%	25	51,0%	21	33,3%	34	32,7%	18	26,1%	121	37,2%
Total		40	100,0%	49	100,0%	63	100,0 %	104	100,0%	69	100,0%	325	100,0%

Table B27: Chi-Square test age and picking up/dropping off people or items

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	16,012[a]	4	,003
Likelihood Ratio	15,796	4	,003
Linear-by-Linear Association	14,396	1	<,001
N of Valid Cases	325		

a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 14,89.

Table B28: Effect size (Cramer's V) for age and picking up/dropping off people or items

Symmetric Measures

		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	,222			,003
	Cramer's V	,222			,003
Interval by Interval	Pearson's R	-,211	,055	-3,875	<,001[c]
Ordinal by Ordinal	Spearman Correlation	-,202	,054	-3,707	<,001[c]
N of Valid Cases		325			

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
c. Based on normal approximation.

4.1.3 Motivations for using different transport modes for short distances (under 2.5 km)

Table B29: Multiple Response set, Frequencies for main reasons for using the car for short trips

$Q7MR Frequencies				
What are the main reasons you sometimes choose the car for a short trip (up to 2.5 km)?		Responses		Percent of Cases
		N	Percent	
$Q7MR[a]	When the weather is bad	145	25,8%	52,7%
	I have little time	74	13,1%	26,9%
	I am tired or not in the mood to walk or cycle	43	7,6%	15,6%
	I feel unsafe on the route (e.g. in the dark)	30	5,3%	10,9%
	I have to carry many/heavy items	222	39,4%	80,7%
	There is no good route to walk or cycle	12	2,1%	4,4%
	Public transport does not go to my destination	19	3,4%	6,9%
	Other, namely:	18	3,2%	6,5%
Total		563	100,0%	204,7%

a. Dichotomy group tabulated at value 1.

Table B30: Cross tabulation gender and carrying many/heavy items

Q7_5 * What is your gender? Crosstabulation							
		What is your gender?				Total	
		Male		Female			
		N	%	N	%	N	%
Q7_5	0	34	20,1%	19	17,9%	53	19,3%
	I have to carry many/heavy items	135	79,9%	87	82,1%	222	80,7%
Total		169	100,0%	106	100,0%	275	100,0%

Table B31: Chi-Square test gender and carrying many/heavy items

Chi-Square Tests					
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	,202[a]	1	,654		
Continuity Correction[b]	,085	1	,770		
Likelihood Ratio	,203	1	,652		
Fisher's Exact Test				,754	,388
Linear-by-Linear Association	,201	1	,654		
N of Valid Cases	275				

a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 20,43.
b. Computed only for a 2x2 table

Table B32: Cross tabulation age and carrying many/heavy items

Q7_5 * What is your age? Crosstabulation													
		What is your age?										Total	
		18 to 44		45 to 54		55 to 64		65 to 74		75 or older			
		N	%	N	%	N	%	N	%	N	%	N	%
Q7_5	0	8	20,5%	7	14,9%	10	17,9%	13	14,9%	15	32,6%	53	19,3%
	I have to carry many/heavy items	31	79,5%	40	85,1%	46	82,1%	74	85,1%	31	67,4%	222	80,7%
Total		39	100,0%	47	100,0%	56	100,0%	87	100,0%	46	100,0%	275	100,0%

Table B33: Chi-Square test age and carrying many/heavy items

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	6,997[a]	4	,136
Likelihood Ratio	6,427	4	,169
Linear-by-Linear Association	1,272	1	,259
N of Valid Cases	275		

a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 7,52.

Table B34: Cross tabulation age and bad weather

What are the main reasons you sometimes choose the car for a short trip (up to 2.5 km)? * What is your age? Crosstabulation

		What is your age?										Total	
		18 to 44		45 to 54		55 to 64		65 to 74		75 or older			
		N	%	N	%	N	%	N	%	N	%	N	%
Q7_1	0	16	41,0%	24	51,1%	33	58,9%	44	50,6%	13	28,3%	130	47,3%
	When the weather is bad	23	59,0%	23	48,9%	23	41,1%	43	49,4%	33	71,7%	145	52,7%
Total		39	100,0%	47	100,0%	56	100,0%	87	100,0%	46	100,0%	275	100,0%

Table B35: Chi-Square test age and bad weather

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	10,985[a]	4	,027
Likelihood Ratio	11,265	4	,024
Linear-by-Linear Association	1,146	1	,284
N of Valid Cases	275		

a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 18,44.

Table B36: Effect size (Cramer's V) for age and using the car for short trips due to bad weather

Symmetric Measures					
		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	,200			,027
	Cramer's V	,200			,027
Interval by Interval	Pearson's R	,065	,060	1,071	,285[c]
Ordinal by Ordinal	Spearman Correlation	,081	,060	1,349	,179[c]
N of Valid Cases		275			

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
c. Based on normal approximation.

Table B37: Multiple Response set, Frequencies for main reasons for using alternative modes for short trips

$Q9MR Frequencies				
What are you main reasons for often or sometimes choosing another mode of transport for a short distance (up to 2.5 km)?		Responses N	Percent	Percent of Cases
$Q9MR[a]	It is better for the environment	243	16,4%	43,1%
	It is good for my health	427	28,8%	75,7%
	It is cheaper (no tavel costs)	123	8,3%	21,8%
	It is cheaper because I do not have to pay for parking	111	7,5%	19,7%
	I do not have issues finding a parking lot	70	4,7%	12,4%
	I arrive faster	81	5,5%	14,4%
	I find it relaxing	150	10,1%	26,6%
	There is less chance of delay (e.g. traffic jams)	13	0,9%	2,3%
	I do not think it is necessary to use a car for short distances	221	14,9%	39,2%
	Other, namely:	42	2,8%	7,4%
Total		1481	100,0%	262,6%

a. Dichotomy group tabulated at value 1.

Table B38: Cross tabulation age and health benefits

Q9_2 * What is your age? Crosstabulation													
		What is your age?										Total	
		18 to 44		45 to 54		55 to 64		65 to 74		75 or older			
		N	%	N	%	N	%	N	%	N	%	N	%
Q9_2	0	21	33,3%	23	28,0%	26	23,4%	44	22,2%	23	20,9%	137	24,3%
	It is good for my health	42	66,7%	59	72,0%	85	76,6%	154	77,8%	87	79,1%	427	75,7%
Total		63	100,0%	82	100,0%	111	100,0%	198	100,0%	110	100,0%	564	100,0%

Table B39: Chi-Square test age and health benefits

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	4,621[a]	4	,328
Likelihood Ratio	4,440	4	,350
Linear-by-Linear Association	4,109	1	,043
N of Valid Cases	564		

a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 15,30.

Table B40: Cross tabulation education and better for the environment

What are you main reasons for often or sometimes choosing another mode of transport for a short distance (up to 2.5 km)? * What is your highest completed level of education? Crosstabulation					
	What is your highest completed level of education?				Total
	Secondary school	Vocational (MBO)	Applied sciences (HBO)	University (WO)	

		N	%	N	%	N	%	N	%	N	%
What are you main reasons for often or sometimes choosing another mode of transport for a short distance (up to 2.5 km)?	0	34	64,2%	82	64,1%	144	54,8%	59	50,0%	319	56,8%
	It is better for the environment	19	35,8%	46	35,9%	119	45,2%	59	50,0%	243	43,2%
Total		53	100,0%	128	100,0%	263	100,0%	118	100,0%	562	100,0%

Table B41: Chi-Square test education and better for the environment

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	9,253[a]	3	,026
Likelihood Ratio	9,516	3	,023
Linear-by-Linear Association	2,599	1	,107
N of Valid Cases	562		

a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 20,75.

Table B42: Cross tabulation education and necessity to use a car for short trips

Q9_9 * What is your highest completed level of education? Crosstabulation											
		What is your highest completed level of education?								Total	
		Secondary school		Vocational (MBO)		Applied sciences (HBO)		University (WO)			
		N	%	N	%	N	%	N	%	N	%
Q9_9	0	40	75,5%	71	55,5%	167	63,5%	64	54,2%	342	60,9%
	I do not think it is necessary to use a car for short distances	13	24,5%	57	44,5%	96	36,5%	54	45,8%	220	39,1%
Total		53	100,0%	128	100,0%	263	100,0%	118	100,0%	562	100,0%

Table B43: Chi-Square test education and necessity to use a car for short trips

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	6,590[a]	3	,086
Likelihood Ratio	6,638	3	,084
Linear-by-Linear Association	5,930	1	,015
N of Valid Cases	562		

a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 22,92.

Appendix C – Results 4.2

4.2.1 Familiarity with shared mobility and mobility hubs

Table C1: Frequency table familiarity with mobility hubs

Were you already familiar with shared mobility?	N	%
Yes, and I use it	14	2,4%
Yes, I do not use it yet, but I plan to	36	6,3%
Yes, but I do not plan to use it	477	83,4%
No, I am not familiar with shared mobility	45	7,9%

Table C2: Frequency table use of shared transport modes

What type of shared transport do you use?		N	%
I use a shared car		12	2,1%
I use a shared bike		1	0,2%
I use both		1	0,2%
Missing	System	558	97,6%

Table C3: Frequency table amount of use of shared transport modes

You indicated you use a shared car. How often do you use a shared car?	N	%
Daily	1	0,2%
A few times per week	1	0,2%
A few times per month	3	0,5%
(Less than) once a month	8	1,4%
Missing System	559	97,7%

Table C4: Frequency table familiarity with mobility hubs

Have you heard of a mobility hub before?	N	%
Yes	263	46,0%
No	309	54,0%

Table C5: Cross tabulation age and familiarity with mobility hubs

Have you heard of a mobility hub before? * What is your age? Crosstabulation	What is your age?	Total

		18 to 44		45 to 54		55 to 64		65 to 74		75 or older			
		N	%	N	%	N	%	N	%	N	%	N	%
Have you heard of a mobility hub before?	Yes	36	57,1%	40	48,8%	57	51,4%	80	40,0%	50	43,1%	263	46,0%
	No	27	42,9%	42	51,2%	54	48,6%	120	60,0%	66	56,9%	309	54,0%
Total		63	100,0%	82	100,0%	111	100,0%	200	100,0%	116	100,0%	572	100,0%

Table C6: Chi-Square test age and familiarity with mobility hubs

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	7,975[a]	4	,093
Likelihood Ratio	7,985	4	,092
Linear-by-Linear Association	5,406	1	,020
N of Valid Cases	572		
a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 28,97.			

Table C7: Cross tabulation education and familiarity with mobility hubs

Have you heard of a mobility hub before? * What is your highest completed level of education? Crosstabulation											
		What is your highest completed level of education?								Total	
		Secondary school		Vocational (MBO)		Applied sciences (HBO)		University (WO)			
		N	%	N	%	N	%	N	%	N	%
Have you heard of a mobility hub before?	Yes	13	23,6%	48	36,9%	132	49,4%	69	58,5%	262	46,0%
	No	42	76,4%	82	63,1%	135	50,6%	49	41,5%	308	54,0%
Total		55	100,0%	130	100,0%	267	100,0%	118	100,0%	570	100,0%

Table C8: Chi-Square test eduaction and familiarity with mobility hubs2

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	24,051[a]	3	<,001
Likelihood Ratio	24,813	3	<,001
Linear-by-Linear Association	23,729	1	<,001
N of Valid Cases	570		
a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 25,28.			

Table C9: Effect size (Cramer's V) for education and familiarity with mobility hubs

Symmetric Measures				
	Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance

Nominal by Nominal	Phi	,205			<,001
	Cramer's V	,205			<,001
Interval by Interval	Pearson's R	-,204	,039	-4,972	<,001[c]
Ordinal by Ordinal	Spearman Correlation	-,200	,040	-4,865	<,001[c]
N of Valid Cases		570			

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
c. Based on normal approximation.

Table C10: Spearman's rank-order correlation for familiarity with mobility hubs and attitude towards hubs in neighbourhood

Correlations

			Have you heard of a mobility hub before?	How do you feel about the idea of a mobility hub in your neighbourhood?
Spearman's rho	Have you heard of a mobility hub before?	Correlation Coefficient	1,000	,058
		Sig. (2-tailed)	.	,168
		N	572	572
	How do you feel about the idea of a mobility hub in your neighbourhood?	Correlation Coefficient	,058	1,000
		Sig. (2-tailed)	,168	.
		N	572	572

4.2.2 Perceptions of mobility hubs in neighbourhood

Table C11: Frequency table attitude towards mobility hub in neighbourhood

How do you feel about the idea of a mobility hub in your neighbourhood?		
	N	%
Very positive	43	7,5%
Positive	154	26,9%
Neutral	302	52,8%
Negative	46	8,0%
Very negative	27	4,7%

Table C12: Mean Rank Kruskal-Wallis test age and attitude towards mobility hub in neighbourhood

Ranks

	What is your age?	N	Mean Rank
How do you feel about the idea of a mobility hub in your neighbourhood?	18 to 44	63	244,62
	45 to 54	82	308,14
	55 to 64	111	275,26
	65 to 74	200	282,51
	75 or older	116	311,59
	Total	572	

Table C13: Test Statistics Kruskal-Wallis test age and attitude towards mbility hubs in neighbourhood

Test Statistics[a,b]	
	How do you feel about the idea of a mobility hub in

	your neighbourhood?
Kruskal-Wallis H	10,522
df	4
Asymp. Sig.	,032

a. Kruskal Wallis Test
b. Grouping Variable: What is your age?

Table C14: Pairwise Comparisons/Bonferroni test age and attitude towards mobility hubs in neighbourhood

Pairwise Comparisons of What is your age?					
Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
18 to 44-55 to 64	-30,638	23,783	-1,288	,198	1,000
18 to 44-65 to 74	-37,886	21,782	-1,739	,082	,820
18 to 44-45 to 54	-63,521	25,259	-2,515	,012	,119
18 to 44-75 or older	-66,976	23,596	-2,838	,005	,045
55 to 64-65 to 74	-7,248	17,845	-,406	,685	1,000
55 to 64-45 to 54	32,883	21,955	1,498	,134	1,000
55 to 64-75 or older	-36,338	20,019	-1,815	,069	,695
65 to 74-45 to 54	25,635	19,770	1,297	,195	1,000
65 to 74-75 or older	-29,090	17,596	-1,653	,098	,983
45 to 54-75 or older	-3,455	21,753	-,159	,874	1,000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is ,050.
a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

Table C15: Multiple Response set, Frequencies age and positive motivations towards mobility hubs in neighbourhood

$Q18MR Frequencies				
Why do you feel (very) positive about a mobility hub in your neighbourhood?		Responses		Percent of Cases
		N	Percent	
$Q18MR[a]	Easier to transfer to other transport modes	94	20,8%	47,7%
	Fewer cars in the neighbourhood	109	24,1%	55,3%
	Fewer parking issues	69	15,2%	35,0%
	Useful amenities added, like a parcel pick-up point	55	12,1%	27,9%
	Less need to own a car	39	8,6%	19,8%
	I can use shared or bikes when needed	47	10,4%	23,9%
	It fits how I travel and live	24	5,3%	12,2%
	Other, namely:	16	3,5%	8,1%
Total		453	100,0%	229,9%

a. Dichotomy group tabulated at value 1.

Table C16: Multiple Response set, Frequencies age and negative motivations towards mobility hubs in neighbourhood

$Q19MR Frequencies				
Why do you feel (very) negative about a mobility hub in your neighbourhood?		Responses		Percent of Cases
		N	Percent	
$Q19MR[a]	I do not believe it will reduce car use in the neighbourhood	37	16,0%	50,7%
	I think it will increase traffic	31	13,4%	42,5%
	I do not want a hub in my neighbourhood	37	16,0%	50,7%

	I prefer to use my own car or bike	50	21,6%	68,5%
	I expect parking problems	28	12,1%	38,4%
	I worry about noise disturbance	11	4,8%	15,1%
	It does not match my travel and lifestyle	21	9,1%	28,8%
	Other, namely:	16	6,9%	21,9%
Total		231	100,0%	316,4%

a. Dichotomy group tabulated at value 1.

4.2.3 Perceptions: maximum distance to mobility hubs

Table C17: Frequency table maximum walking distance to mobility hub

If you were to use a mobility hub, what is the maximum distance you are willing to walk or reach one? (A person walks 100 meters in 1 to 1.5 minutes)		
	N	%
Less than 100 meters (Less than 1 to 1.5 minutes)	41	7,2%
100 - 250 meters (1,5 to 4 minutes)	133	23,3%
250 - 500 meters (4 tot 7,5 minutes)	246	43,0%
More than 500 meters (More than 7.5 minutes)	108	18,9%
Not applicable; I have limited mobility	44	7,7%

Table C18: Cross tabulation age and maximum walking distance to mobility hub

If you were to use a mobility hub, what is the maximum distance you are willing to walk or reach one? (A person walks 100 meters in 1 to 1.5 minutes) * What is your age? Crosstabulation

		What is your age?										Total	
		18 to 44		45 to 54		55 to 64		65 to 74		75 or older			
		N	%	N	%	N	%	N	%	N	%	N	%
If you were to use a mobility hub, what is the maximum distance you are willing to walk or reach one? (A person walks 100 meters in 1 to 1.5 minutes)	Less than 100 meters (Less than 1 to 1.5 minutes)	3	4,8%	4	4,9%	10	9,0%	10	5,0%	14	12,1%	41	7,2%
	100 - 250 meters (1,5 to 4 minutes)	13	20,6%	15	18,3%	20	18,0%	52	26,0%	33	28,4%	133	23,3%
	250 - 500 meters (4 tot 7,5 minutes)	31	49,2%	44	53,7%	50	45,0%	87	43,5%	34	29,3%	246	43,0%
	More than 500 meters (More than 7.5 minutes)	15	23,8%	18	22,0%	23	20,7%	34	17,0%	18	15,5%	108	18,9%
	Not applicable; I have limited mobility	1	1,6%	1	1,2%	8	7,2%	17	8,5%	17	14,7%	44	7,7%
Total		63	100,0%	82	100,0%	111	100,0%	200	100,0%	116	100,0%	572	100,0%

Table C19: Mean Rank Kruskal-Wallis test age and maximum walking distance to mobility hub

Ranks			
	What is your age?	N	Mean Rank
If you were to use a mobility hub, what is the maximum	18 to 44	62	287,21
	45 to 54	81	288,09

distance you are willing to walk or reach one? (A person walks 100 meters in 1 to 1.5 minutes)	55 to 64	103	273,38
	65 to 74	183	261,43
	75 or older	99	227,41
	Total	528	

Table C20: Test Statistics Kruskal-Wallis test age and maximum walking distance to mobility hub

Test Statistics[a,b]	
	If you were to use a mobility hub, what is the maximum distance you are willing to walk or reach one? (A person walks 100 meters in 1 to 1.5 minutes)
Kruskal-Wallis H	10,966
df	4
Asymp. Sig.	,027

a. Kruskal Wallis Test
b. Grouping Variable: What is your age?

Table C21: Pairwise Comparisons/Bonferroni test age and maximum walking distance to mobility hub

Pairwise Comparisons of What is your age?					
Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
75 or older-65 to 74	34,015	17,793	1,912	,056	,559
75 or older-55 to 64	45,969	20,073	2,290	,022	,220
75 or older-18 to 44	59,796	23,098	2,589	,010	,096
75 or older-45 to 54	60,672	21,367	2,839	,005	,045
65 to 74-55 to 64	11,955	17,568	,680	,496	1,000
65 to 74-18 to 44	25,781	20,957	1,230	,219	1,000
65 to 74-45 to 54	26,657	19,033	1,401	,161	1,000
55 to 64-18 to 44	13,826	22,925	,603	,546	1,000
55 to 64-45 to 54	14,703	21,180	,694	,488	1,000
18 to 44-45 to 54	-,877	24,066	-,036	,971	1,000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is ,050.
a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

Table C22: Mean Rank Kruskal-Wallis test education and maximum walking distance to mobility hub

Ranks			
	What is your highest completed level of education?	N	Mean Rank
If you were to use a mobility hub, what is the maximum distance you are willing to walk or reach one? (A person walks 100 meters in 1 to 1.5 minutes)	Secondary school	48	273,47
	Vocational (MBO)	117	237,14
	Applied sciences (HBO)	247	262,74
	University (WO)	115	290,09
	Total	527	

Table C23: Test Statistics Kruskal-Wallis test education and maximum walking distance to mobility hub

Test Statistics[a,b]

	If you were to use a mobility hub, what is the maximum distance you are willing to walk or reach one? (A person walks 100 meters in 1 to 1.5 minutes)
Kruskal-Wallis H	8,255
df	3
Asymp. Sig.	,041

a. Kruskal Wallis Test
b. Grouping Variable: What is your highest completed level of education?

Table C24: Pairwise Comparison/Bonferroni test education and maximum walking distance to mobility hub

Pairwise Comparisons of What is your highest completed level of education?					
Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
Vocational (MBO)-Applied sciences (HBO)	-25,596	15,980	-1,602	,109	,655
Vocational (MBO)-Secondary school	36,328	24,407	1,488	,137	,820
Vocational (MBO)-University (WO)	-52,946	18,697	-2,832	,005	,028
Applied sciences (HBO)-Secondary school	10,732	22,461	,478	,633	1,000
Applied sciences (HBO)-University (WO)	-27,350	16,074	-1,701	,089	,533
Secondary school-University (WO)	-16,618	24,468	-,679	,497	1,000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is ,050.
a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

Table C25: Frequency table maximum cycle distance to mobility hub

If you were to use a mobility hub, what is the maximum distance you are willing to cycle to reach one? (A person cycles 500 meters in 1.5 to 2 minutes)		
	N	%
Less than 500 meters (Less than 2 minutes)	46	8,0%
500 meters - 1 km (2 to 4 minutes)	78	13,6%
1 km - 1,5 km (4 to 6 minutes)	148	25,9%
1,5 km - 2 km (6 to 8 minutes)	147	25,7%
More than 2 km (More than 8 minutes)	65	11,4%
Not applicable; I cannot/am not allowed to cycle	88	15,4%

Table C26: Cross tabulation age and maximum cycling distance to mobility hub

If you were to use a mobility hub, what is the maximum distance you are willing to cycle to reach one? (A person cycles 500 meters in 1.5 to 2 minutes) * What is your age? Crosstabulation													
		What is your age?										Total	
		18-44		45-54	55-64		65-74		75-older				
		N	%	N	%	N	%	N	%	N	%	N	%
If you were to use a mobility hub, what is the maximum distance you are willing to cycle to reach one? (A person cycles 500 meters in 1.5 to 2 minutes)	Less than 500 meters (Less than 2 minutes)	6	9,5%	6	7,3%	10	9,0%	9	4,5%	15	12,9%	46	8,0%
	500 meters - 1 km (2 to 4 minutes)	7	11,1%	12	14,6%	11	9,9%	28	14,0%	20	17,2%	78	13,6%
	1 km - 1,5 km (4 to 6 minutes)	16	25,4%	23	28,0%	36	32,4%	50	25,0%	23	19,8%	148	25,9%
	1,5 km - 2 km (6 to 8 minutes)	24	38,1%	26	31,7%	26	23,4%	54	27,0%	17	14,7%	147	25,7%
	More than 2 km (More than 8 minutes)	9	14,3%	9	11,0%	15	13,5%	21	10,5%	11	9,5%	65	11,4%
	Not applicable; I cannot/am not allowed to cycle	1	1,6%	6	7,3%	13	11,7%	38	19,0%	30	25,9%	88	15,4%
Total		63	100,0%	82	100,0%	111	100,0%	200	100,0%	116	100,0%	572	100,0%

Table C27: Mean Rank Kruskal-Wallis test age and maximum cycling distance to mobility hub

Ranks			
	What is your age?	N	Mean Rank
If you were to use a mobility hub, what is the maximum distance you are willing to cycle to reach one? (A person cycles 500 meters in 1.5 to 2 minutes)	18 to 44	62	262,70
	45 to 54	76	247,32
	55 to 64	98	245,89
	65 to 74	162	251,27
	75 or older	86	203,28
	Total	484	

Table C28: Test Statistics Kruskal-Wallis test age and maximum cycling distance to mobility hub

Test Statistics[a,b]	
	If you were to use a mobility hub, what is the maximum distance you are willing to cycle to reach one? (A person cycles 500 meters in 1.5 to 2 minutes)
Kruskal-Wallis H	9,447
df	4
Asymp. Sig.	,051
a. Kruskal Wallis Test	
b. Grouping Variable: What is your age?	

Table C29: Mean Rank Kruskal-Wallis test education and maximum cycling distance to mobility hub

Ranks			
	What is your highest completed level of education?	N	Mean Rank
If you were to use a mobility hub, what is the maximum distance you are willing to cycle to reach one? (A person cycles 500 meters in 1.5 to 2 minutes)	Secondary school	41	244,17
	Vocational (MBO)	112	206,20
	Applied sciences (HBO)	226	241,21
	University (WO)	103	279,47
	Total	482	

Table C30: Test Statistics Kruskal-Wallis test education and maximum cycling distance to mobility hub

Test Statistics[a,b]	
	If you were to use a mobility hub, what is the maximum distance you are willing to cycle to reach one? (A person cycles 500 meters in 1.5 to 2 minutes)
Kruskal-Wallis H	15,889
df	3
Asymp. Sig.	,001
a. Kruskal Wallis Test b. Grouping Variable: What is your highest completed level of education?	

Table C31: Pairwise Comparison/Bonferroni test education and maximum cycling distance to mobility hub

Pairwise Comparisons of What is your highest completed level of education?					
Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
Vocational (MBO)-Applied sciences (HBO)	-35,005	15,566	-2,249	,025	,147
Vocational (MBO)-Secondary school	37,970	24,589	1,544	,123	,735
Vocational (MBO)-University (WO)	-73,265	18,390	-3,984	<,001	,000
Applied sciences (HBO)-Secondary school	2,965	22,867	,130	,897	1,000
Applied sciences (HBO)-University (WO)	-38,260	16,015	-2,389	,017	,101
Secondary school-University (WO)	-35,295	24,875	-1,419	,156	,936
Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed. The significance level is ,050. a. Significance values have been adjusted by the Bonferroni correction for multiple tests.					

Table C32: Mean perception on mobility hubs in their own neighbourhood

Report			
How do you feel about the idea of a mobility hub in your neighbourhood?			
In which neighbourhood do you live?	Mean	N	Std. Deviation

Jutphaas Wijkersloot	2,77	57	,945
Stadscentrum	2,33	3	1,155
Fokkesteeg	2,79	58	,833
Merwestein	3,00	7	,000
Park Oudegein	4,00	1	.
Vreeswijk	2,96	23	,878
Zandveld	2,75	16	,856
Hoogzandveld	2,73	15	,594
Lekboulevard	2,73	22	,935
Doorslag	2,71	62	,733
Batau Zuid	2,77	74	1,092
Batau Noord	2,79	82	,857
Galecop	2,65	49	,694
Huis de Geer	2,80	5	,447
Zuilenstein	2,76	59	1,006
Blokhoeve	2,62	16	1,025
Total	2,76	549	,881

Table C33: Mean willingness to walk a maximum distance to mobility hub per neighbourhood

Report			
If you were to use a mobility hub, what is the maximum distance you are willing to walk or reach one? (A person walks 100 meters in 1 to 1.5 minutes)			
In which neighbourhood do you live?	Mean	N	Std. Deviation
Jutphaas Wijkersloot	3,11	57	1,080
Stadscentrum	1,67	3	1,155
Fokkesteeg	3,09	58	,996
Merwestein	2,00	7	,577
Park Oudegein	1,00	1	.
Vreeswijk	3,22	23	,998
Zandveld	3,25	16	1,065
Hoogzandveld	3,00	15	1,069
Lekboulevard	2,77	22	,922
Doorslag	2,97	62	,923
Batau Zuid	2,82	74	1,064
Batau Noord	2,78	82	,832
Galecop	2,71	49	1,021
Huis de Geer	3,40	5	,894
Zuilenstein	3,19	59	1,074
Blokhoeve	3,69	16	,946
Total	2,96	549	1,015

Table C34: Mean willingness to cycle a maximum distance to mobility hub per neighbourhood

Report			
If you were to use a mobility hub, what is the maximum distance you are willing to cycle to reach one? (A person cycles 500 meters in 1.5 to 2 minutes)			
In which neighbourhood do you live?	Mean	N	Std. Deviation
Jutphaas Wijkersloot	4,16	57	1,709
Stadscentrum	1,67	3	1,155
Fokkesteeg	3,74	58	1,396
Merwestein	2,86	7	1,574
Park Oudegein	1,00	1	.
Vreeswijk	3,52	23	1,563
Zandveld	3,75	16	1,390
Hoogzandveld	4,07	15	1,438

Lekboulevard	3,95	22	1,463
Doorslag	3,42	62	1,350
Batau Zuid	3,31	74	1,461
Batau Noord	3,59	82	1,217
Galecop	3,69	49	1,503
Huis de Geer	4,00	5	1,225
Zuilenstein	3,63	59	1,564
Blokhoeve	4,25	16	1,342
Total	3,65	549	1,468

4.2.4 Correlation between perceptions and maximum distance to mobility hubs

Table C35: Spearman's rank-order correlation for attitude towards hubs in neighbourhood and maximum walking/cycling distance to mobility hub

Correlations

			How do you feel about the idea of a mobility hub in your neighbourhood?	If you were to use a mobility hub, what is the maximum distance you are willing to walk or reach one? (A person walks 100 meters in 1 to 1.5 minutes)	If you were to use a mobility hub, what is the maximum distance you are willing to cycle to reach one? (A person cycles 500 meters in 1.5 to 2 minutes)
Spearman's rho	How do you feel about the idea of a mobility hub in your neighbourhood?	Correlation Coefficient	1,000	-,156**	-,114**
		Sig. (2-tailed)	.	<,001	,009
		N	527	527	527
	If you were to use a mobility hub, what is the maximum distance you are willing to walk or reach one? (A person walks 100 meters in 1 to 1.5 minutes)	Correlation Coefficient	-,156**	1,000	,434**
		Sig. (2-tailed)	<,001	.	<,001
		N	527	527	527
	If you were to use a mobility hub, what is the maximum distance you are willing to cycle to reach one? (A person cycles 500 meters in 1.5 to 2 minutes)	Correlation Coefficient	-,114**	,434**	1,000
		Sig. (2-tailed)	,009	<,001	.
		N	527	527	527

**. Correlation is significant at the 0.01 level (2-tailed).

Appendix D – Results 4.3

4.3.1 Perspective on participatory design process

Table D1: Frequency table importance of being able to participate in the design process of mobility hubs

How important is it to you that residents/users can give input on the design of a mobility hub?		
	N	%
Very important	149	26,0%
Important	273	47,7%
Neutral	123	21,5%
Not important	11	1,9%
Not at all important	16	2,8%

Table D2: Mean rank Kruskal-Wallis test gender and participation into design process of mobility hubs

Ranks				
	What is your gender?	N	Mean Rank	Sum of Ranks
How important is it to you that residents/users can give input on the design of a mobility hub?	Male	331	302,42	100100,50
	Female	241	264,64	63777,50
	Total	572		

Table D3: Test Statistics Kruskal-Wallis test gender and participation into design process of mobility hubs

Test Statistics[a]	
	How important is it to you that residents/users can give input on the design of a mobility hub?
Mann-Whitney U	34616,500
Wilcoxon W	63777,500
Z	-2,905
Asymp. Sig. (2-tailed)	,004
a. Grouping Variable: What is your gender?	

Table D4: Mean rank Kruskal-Wallis test age and participation into design process of mobility hubs

Ranks			
	What is your age?	N	Mean Rank
How important is it to you that residents/users can give input on the design of a mobility hub?	18 to 44	63	259,04
	45 to 54	82	293,84
	55 to 64	111	253,43
	65 to 74	200	280,83
	75 or older	116	337,65
	Total	572	

Table D5: Test Statistics Kruskal-Wallis test age and participation into design process of mobility hubs

Test Statistics[a,b]

	How important is it to you that residents/users can give input on the design of a mobility hub?
Kruskal-Wallis H	20,487
df	4
Asymp. Sig.	<,001

a. Kruskal Wallis Test
b. Grouping Variable: What is your age?

Table D6: Pairwise Comparisons/Bonferroni Test age and participation into design process of mobility hubs

Pairwise Comparisons of What is your age?					
Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
55 to 64-18 to 44	5,612	24,227	,232	,817	1,000
55 to 64-65 to 74	-27,402	18,178	-1,507	,132	1,000
55 to 64-45 to 54	40,407	22,365	1,807	,071	,708
55 to 64-75 or older	-84,223	20,393	-4,130	<,001	,000
18 to 44-65 to 74	-21,790	22,189	-,982	,326	1,000
18 to 44-45 to 54	-34,796	25,731	-1,352	,176	1,000
18 to 44-75 or older	-78,611	24,037	-3,270	,001	,011
65 to 74-45 to 54	13,005	20,140	,646	,518	1,000
65 to 74-75 or older	-56,821	17,925	-3,170	,002	,015
45 to 54-75 or older	-43,815	22,159	-1,977	,048	,480

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is ,050.
a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

Table D7: Mean rank Kruskal-Wallis test education and participation into design process of mobility hubs

Ranks			
	What is your highest completed level of education?	N	Mean Rank
How important is it to you that residents/users can give input on the design of a mobility hub?	Secondary school	55	306,99
	Vocational (MBO)	130	301,55
	Applied sciences (HBO)	267	280,12
	University (WO)	118	269,97
	Total	570	

Table D8: Test Statistics Kruskal-Wallis test education and participation into design process of mobility hubs

Test Statistics[a,b]	
	How important is it to you that residents/users can give input on the design of a mobility hub?
Kruskal-Wallis H	4,057
df	3

Asymp. Sig.	,255

a. Kruskal Wallis Test
b. Grouping Variable: What is your highest completed level of education?

Table D9: Spearman's rank-order correlation for attitude towards hubs in neighbourhood and preference of participating in design process of mobility hubs

Correlations

			How do you feel about the idea of a mobility hub in your neighbourhood?	How important is it to you that residents/users can give input on the design of a mobility hub?
Spearman's rho	How do you feel about the idea of a mobility hub in your neighbourhood?	Correlation Coefficient	1,000	,185**
		Sig. (2-tailed)	.	<,001
		N	572	572
	How important is it to you that residents/users can give input on the design of a mobility hub?	Correlation Coefficient	,185**	1,000
		Sig. (2-tailed)	<,001	.
		N	572	572

**. Correlation is significant at the 0.01 level (2-tailed).

4.3.2 Ranking design preferences for mobility hubs

Table D10: Means for importance available design elements/facilities at mobility hub per neighbourhood

How important do you find the availability of the following facilities at/in a mobility hub?

Rank	Design Principle	Mean Score (lower = more important)
20	Shared mopeds	3,79
19	Childcare	3,55
18	(Co-)workplaces	3,45
17	Gym	3,45
16	Catering	3,27
15	Neighbourhood facilities (e.g., library)	3,05
14	Shops	3,03
13	Shared cars	2,98
12	Shared bikes	2,97
11	Parcel point	2,92
10	Options to charge electric cars	2,9
9	Options to charge electric bicycles	2,73
8	Green spaces or parks	2,63
7	Waiting area	2,61
6	Cosy atmosphere (e.g., through planters or art)	2,57
5	Toilets	2,54
4	Mobile app (for planning, booking, and paying for rides)	2,23
3	Digital information signs with travel information	2,12
2	Good connection between different transport modes	2
1	Good lighting	1,82

Table D11: Spearman's rank-order correlation for gender and availability of sufficient lighting at mobility hub

Correlations				
			How important do you find the availability of sufficient lighting at/in a mobility hub?	What is your gender?
Spearman's rho	How important do you find the availability of sufficient lighting at/in a mobility hub?	Correlation Coefficient	1,000	-,175**
		Sig. (2-tailed)	.	<,001
		N	572	572
	What is your gender?	Correlation Coefficient	-,175**	1,000
		Sig. (2-tailed)	<,001	.
		N	572	572

**. Correlation is significant at the 0.01 level (2-tailed).

Table D12: Spearman's rank-order correlation for age and availability of sufficient lighting at mobility hub

Correlations				
			How important do you find the availability of sufficient lighting at/in a mobility hub?	What is your age?
Spearman's rho	How important do you find the availability of sufficient lighting at/in a mobility hub?	Correlation Coefficient	1,000	,086*
		Sig. (2-tailed)	.	,039
		N	572	572
	What is your age?	Correlation Coefficient	,086*	1,000
		Sig. (2-tailed)	,039	.
		N	572	572

*. Correlation is significant at the 0.05 level (2-tailed).

Table D13: Spearman's rank-order correlation for gender and connectiveness of different transport modes at mobility hub

Correlations				
			How important do you find the connectiveness of different transport modes at/in a mobility hub?	What is your gender?
Spearman's rho	How important do you find the connectiveness of different transport modes at/in a mobility hub?	Correlation Coefficient	1,000	-,210**
		Sig. (2-tailed)	.	<,001
		N	572	572
	What is your gender?	Correlation Coefficient	-,210**	1,000
		Sig. (2-tailed)	<,001	.
		N	572	572

**. Correlation is significant at the 0.01 level (2-tailed).

Table D14: Spearman's rank-order correlation for education and connectiveness of different transport modes at mobility hub

Correlations				
			How important do you find the connectiveness of different transport modes at/in a mobility hub?	What is your highest completed level of education?
Spearman's rho	How important do you find the connectiveness of different transport modes at/in a mobility hub?	Correlation Coefficient	1,000	-,164**
		Sig. (2-tailed)	.	<,001
		N	570	570
	What is your highest completed level of education?	Correlation Coefficient	-,164**	1,000
		Sig. (2-tailed)	<,001	.
		N	570	570
**. Correlation is significant at the 0.01 level (2-tailed).				

Table D15: Spearman's rank-order correlation for age and availability of information signs at mobility hub

Correlations				
			How important do you find the availability of information signs at/in a mobility hub?	What is your age?
Spearman's rho	How important do you find the availability of information signs at/in a mobility hub?	Correlation Coefficient	1,000	,106*
		Sig. (2-tailed)	.	,011
		N	572	572
	What is your age?	Correlation Coefficient	,106*	1,000
		Sig. (2-tailed)	,011	.
		N	572	572
*. Correlation is significant at the 0.05 level (2-tailed).				

Table D16: Spearman's rank-order correlation for education and availability of information signs at mobility hub

Correlations				
			How important do you find the availability of information signs at/in a mobility hub?	What is your highest completed level of education?
Spearman's rho	How important do you find the availability of information signs at/in a mobility hub?	Correlation Coefficient	1,000	-,042
		Sig. (2-tailed)	.	,318
		N	570	570
	What is your highest completed level of education?	Correlation Coefficient	-,042	1,000
		Sig. (2-tailed)	,318	.
		N	570	570

Table D17: Spearman's rank-order correlation for education and availability of a mobility hub app

Correlations				
			How important do you find the availability of a mobiliyy hub app at/in a mobility hub?	What is your highest completed level of education?
Spearman's rho	How important do you find the availability of a mobiliyy hub app at/in a mobility hub?	Correlation Coefficient	1,000	-,056
		Sig. (2-tailed)	.	,182
		N	570	570
	What is your highest completed level of education?	Correlation Coefficient	-,056	1,000
		Sig. (2-tailed)	,182	.
		N	570	570

Table D18: Spearman's rank-order correlation for gender and availability of childcare facilities at mobility hub

Correlations				
			How important do you find the availability of childcare facilities at/in a mobility hub?	What is your gender?
Spearman's rho	How important do you find the availability of childcare facilities at/in a mobility hub?	Correlation Coefficient	1,000	-,103*
		Sig. (2-tailed)	.	,013
		N	570	570
	What is your gender?	Correlation Coefficient	-,103*	1,000
		Sig. (2-tailed)	,013	.
		N	570	570

*. Correlation is significant at the 0.05 level (2-tailed).

Table D19: Total mean of importance all design elements mobility hub per neighbourhood

Neighbourhood	Total mean for design elements
Blokhoeve	3,01
Batau Noord	2,93
Fokkesteeg	2,92
Batau Zuid	2,87
Lekboulevard	2,85
Zuilenstein	2,85
Jutphaas Wijkersloot	2,81
Zandveld	2,78
Hoogzandveld	2,78
Vreeswijk	2,77
Doorslag	2,73
Galecop	2,72

Table D20: Cross Tabulation mean for importance design elements at mobility hub per neighbourhood

Design element	Jutphaas Wijkersloot	Fokkesteeg	Vreeswijk	Zandveld	Hoogzandveld	Lekboulevard	Doorslag	Batau Zuid	Batau Noord	Galecop	Zuilenstein	Blokhoeve
	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
Shared cars	3,11	2,97	3,39	3	3	3,05	2,95	2,86	3,13	2,73	3,07	2,75
Shared bikes	3	2,69	3,26	2,75	3,07	2,95	2,95	2,97	3,07	3,08	3,1	2,87
Shared mopeds	3,84	3,84	3,83	3,75	3,53	3,68	3,69	3,84	3,76	3,8	4,02	3,81
Connectivity	2,07	1,93	1,83	1,75	1,93	2,32	1,95	2	2,05	1,88	2,08	2,06
Information signs	2,07	2,14	2,09	1,81	2,27	2,27	2	2,08	2,26	1,88	2,27	2,19
App	2,39	2,09	2,3	2,37	2,27	2,05	2,16	2,14	2,39	2,04	2,27	2,37
Toilets	2,42	2,71	2,26	2,88	2,6	2,45	2,21	2,65	2,5	2,61	2,63	3
Parcel points	2,91	3,19	2,87	2,62	2,27	2,91	2,9	2,89	3,13	2,84	2,8	3,19
Catering	3,12	3,66	2,87	3	3,27	3,27	3,21	3,36	3,35	3,27	3,15	3,44
Shops	2,91	3,45	2,52	2,88	3,07	2,86	3,02	3,19	3,1	2,92	2,97	3,31
Waiting rooms	2,51	2,55	2,7	2,81	2,47	2,59	2,63	2,61	2,68	2,53	2,68	2,88
Sufficient lighting	1,81	1,71	1,96	1,63	1,8	1,82	1,73	1,91	1,95	1,65	1,92	1,94
Atmosphere	2,63	2,66	2,48	2,56	2,73	2,59	2,39	2,62	2,67	2,33	2,59	2,75
Neigb. Amenities	2,95	3,38	2,78	3,06	3,2	2,95	2,89	3,11	3,17	2,88	3,02	3,44
Gym	3,39	3,76	2,91	3,44	3,33	3,55	3,29	3,57	3,59	3,37	3,37	3,88
Childcare	3,49	3,74	3,48	3,44	3,4	3,82	3,39	3,68	3,65	3,49	3,37	3,75
Green spaces	2,46	2,83	2,87	2,81	2,33	2,91	2,34	2,96	2,63	2,43	2,46	2,81
(Co-)workplaces	3,35	3,71	3,39	3,38	3,13	3,45	3,32	3,45	3,62	3,35	3,47	3,69
Charging bikes	3,02	2,86	3	3	3	2,73	2,84	2,81	3,11	2,61	2,9	3,19
Charging cars	2,72	2,62	2,52	2,69	2,93	2,82	2,74	2,64	2,84	2,69	2,88	2,94
Total mean	2,81	2,92	2,77	2,78	2,78	2,85	2,73	2,87	2,93	2,72	2,85	3,01

4.3.3 Implementation of mobility hub 'app'

Table D21: Frequency table willingness to use mobility hub app

If you were to use a mobility hub, would you also use a "mobility hub app"?		
	N	%
Definitely yes	159	27,8%
Probably yes	197	34,4%
Maybe	86	15,0%
Probably not	59	10,3%
Definitely not	46	8,0%
Missing System	25	4,4%

Table D22: Mean rank Kruskal-Wallis test age and willingness to use mobility hub app

Ranks			
	What is your age?	N	Mean Rank
	18 to 44	62	265,61

If you were to use a mobility hub, would you also use a "mobility hub app"?	45 to 54	82	282,89
	55 to 64	105	234,46
	65 to 74	191	264,96
	75 or older	107	326,98
	Total	547	

Table D23: Test Statistics Kruskal-Wallis test age and willingness to use mobility hub app

Test Statistics[a,b]	
	If you were to use a mobility hub, would you also use a "mobility hub app"?
Kruskal-Wallis H	21,293
df	4
Asymp. Sig.	<,001

a. Kruskal Wallis Test
b. Grouping Variable: What is your age?

Table D24: Pairwise Comparisons/Bonferroni test age and willingness to use mobility hub app

Pairwise Comparisons of What is your age?					
Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
55 to 64-65 to 74	-30,499	18,447	-1,653	,098	,983
55 to 64-18 to 44	31,151	24,320	1,281	,200	1,000
55 to 64-45 to 54	48,428	22,378	2,164	,030	,305
55 to 64-75 or older	-92,519	20,858	-4,436	<,001	,000
65 to 74-18 to 44	,652	22,194	,029	,977	1,000
65 to 74-45 to 54	17,930	20,047	,894	,371	1,000
65 to 74-75 or older	-62,021	18,335	-3,383	<,001	,007
18 to 44-45 to 54	-17,277	25,555	-,676	,499	1,000
18 to 44-75 or older	-61,368	24,235	-2,532	,011	,113
45 to 54-75 or older	-44,091	22,286	-1,978	,048	,479

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is ,050.
a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

Table D25: Spearman's rank-order correlation for age and willingness to use mobility hub app

Correlations				
			If you were to use a mobility hub, would you also use a "mobility hub app"?	What is your age?
Spearman's rho	If you were to use a mobility hub, would you also use a "mobility hub app"?	Correlation Coefficient	1,000	,114**
		Sig. (2-tailed)	.	,008
		N	547	547
	What is your age?	Correlation Coefficient	,114**	1,000
		Sig. (2-tailed)	,008	.
		N	547	572

**. Correlation is significant at the 0.01 level (2-tailed).

Table D26: Mean rank Kruskal-Wallis test education and willingness to use mobility hub app

Ranks			
	What is your highest completed level of education?	N	Mean Rank
If you were to use a mobility hub, would you also use a "mobility hub app"?	Secondary school	52	297,59
	Vocational (MBO)	122	315,06
	Applied sciences (HBO)	254	259,13
	University (WO)	117	248,32
	Total	545	

Table D27: Test Statistics Kruskal-Wallis test education and willingness to use mobility hub app

Test Statistics[a,b]	
	If you were to use a mobility hub, would you also use a "mobility hub app"?
Kruskal-Wallis H	16,055
df	3
Asymp. Sig.	,001
a. Kruskal Wallis Test b. Grouping Variable: What is your highest completed level of education?	

Table D28: Pairwise Comparisons/Bonferroni test education and willingness to use mobility hub app

Pairwise Comparisons of What is your highest completed level of education?					
Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
University (WO)-Applied sciences (HBO)	10,813	16,900	,640	,522	1,000
University (WO)-Secondary school	49,266	25,210	1,954	,051	,304
University (WO)-Vocational (MBO)	66,737	19,573	3,410	<,001	,004
Applied sciences (HBO)-Secondary school	38,453	23,023	1,670	,095	,569
Applied sciences (HBO)-Vocational (MBO)	55,924	16,662	3,356	<,001	,005
Secondary school-Vocational (MBO)	-17,471	25,050	-,697	,486	1,000
Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed. The significance level is ,050. a. Significance values have been adjusted by the Bonferroni correction for multiple tests.					

Table D29: Spearman's rank-order correlation for education and willingness to use mobility hub app

Correlations			
		If you were to use a mobility hub, would you also use a "mobility hub app"?	What is your highest completed level of education?
Spearman's rho	Correlation Coefficient	1,000	-,153**
	Sig. (2-tailed)	.	<,001

	If you were to use a mobility hub, would you also use a "mobility hub app"?	N	545	545
	What is your highest completed level of education?	Correlation Coefficient	-,153**	1,000
		Sig. (2-tailed)	<,001	.
		N	545	570

**. Correlation is significant at the 0.01 level (2-tailed).

Table D30: Spearman's rank-order correlation for attitude towards mobility hub in neighbourhood and willingness to use mobility hub app

Correlations

			How do you feel about the idea of a mobility hub in your neighbourhood?	If you were to use a mobility hub, would you also use a "mobility hub app"?
Spearman's rho	How do you feel about the idea of a mobility hub in your neighbourhood?	Correlation Coefficient	1,000	,397**
		Sig. (2-tailed)	.	<,001
		N	572	547
	If you were to use a mobility hub, would you also use a "mobility hub app"?	Correlation Coefficient	,397**	1,000
		Sig. (2-tailed)	<,001	.
		N	547	547

**. Correlation is significant at the 0.01 level (2-tailed).

Appendix E – Results 4.4

Table E1: Frequency table willingness to reduce car use for short trips with mobility hub availability

If a hub in your neighbourhood met your needs, how likely would you be to use your own (or lease) car less for short trips (<2.5 km)?		
	N	%
Very likely	16	5,0%
Likely	41	12,7%
Neutral	60	18,6%
Unlikely	73	22,6%
Very unlikely	108	33,4%
Not applicable; I need my car for health reasons	25	7,7%

Table E2: Mean rank Kruskal-Wallis test gender and willingness to reduce car use for short trips with availability mobility hub

Ranks				
	What is your gender?	N	Mean Rank	Sum of Ranks
If a hub in your neighbourhood met your needs, how likely would you be to use your own (or lease) car less for short trips (<2.5 km)?	Male	196	156,89	30750,50
	Female	127	169,89	21575,50
	Total	323		

Table E3: Test Statistics Kruskal-Wallis test gender and willingness to reduce car use for short trips with availability mobility hub

Test Statistics[a]	
	If a hub in your neighbourhood met your needs, how likely would you be to use your own (or lease) car less for short trips (<2.5 km)?
Mann-Whitney U	11444,500
Wilcoxon W	30750,500
Z	-1,259
Asymp. Sig. (2-tailed)	,208
a. Grouping Variable: What is your gender?	

Table E4: Mean rank Kruskal-Wallis test age and willingness to reduce car use for short trips with availability mobility hub

Ranks			
	What is your age?	N	Mean Rank
If a hub in your neighbourhood met your needs, how likely would you be to use your own (or lease) car less for short trips (<2.5 km)?	18 to 44	40	142,76
	45 to 54	48	187,66
	55 to 64	62	176,13
	65 to 74	104	159,20
	75 or older	69	146,83
	Total	323	

Table E5: Test Statistics Kruskal-Wallis test age and willingness to reduce car use for short trips with availability mobility hub

Test Statistics[a,b]	
	If a hub in your neighbourhood met your needs, how likely would you be to use your own (or lease) car less for short trips (<2.5 km)?
Kruskal-Wallis H	9,187
df	4
Asymp. Sig.	,057
a. Kruskal Wallis Test	
b. Grouping Variable: What is your age?	

Table E6: Mean rank Kruskal-Wallis test education and willingness to reduce car use for short trips with availability mobility hub

Ranks			
	What is your highest completed level of education?	N	Mean Rank
If a hub in your neighbourhood met your needs, how likely would you be to use your own (or lease) car less for short trips (<2.5 km)?	Secondary school	28	153,96
	Vocational (MBO)	76	159,16
	Applied sciences (HBO)	163	160,94
	University (WO)	56	172,96
	Total	323	

Table E7: Test Statistics Kruskal-Wallis test education and willingness to reduce car use for short trips with availability mobility hub

Test Statistics[a,b]	
	If a hub in your neighbourhood met your needs, how likely would you be to use your own (or lease) car less for short trips (<2.5 km)?
Kruskal-Wallis H	1,137
df	3
Asymp. Sig.	,768
a. Kruskal Wallis Test	
b. Grouping Variable: What is your highest completed level of education?	

Table E8: Cross Tabulation gender and willingness to reduce car use for short trip with availability mobility hub

If a hub in your neighbourhood met your needs, how likely would you be to use your own (or lease) car less for short trips (<2.5 km)? * What is your gender? Crosstabulation						
	What is your gender?				Total	
	Male		Female			
	N	%	N	%	N	%
Very likely	9	4,6%	7	5,5%	16	5,0%

If a hub in your neighbourhood met your needs, how likely would you be to use your own (or lease) car less for short trips (<2.5 km)?	Likely	29	14,8%	12	9,4%	41	12,7%
	Neutral	41	20,9%	19	15,0%	60	18,6%
	Unlikely	36	18,4%	37	29,1%	73	22,6%
	Very unlikely	71	36,2%	37	29,1%	108	33,4%
	Not applicable; I need my car for health reasons	10	5,1%	15	11,8%	25	7,7%
Total		196	100,0%	127	100,0%	323	100,0%

Table E9: Cross Tabulation age and willingness to reduce car use for short trip with availability mobility hub

If a hub in your neighbourhood met your needs, how likely would you be to use your own (or lease) car less for short trips (<2.5 km)? * What is your age? Crosstabulation

		What is your age?										Total	
		18 to 44		45 to 54		55 to 64		65 to 74		75 or older			
		N	%	N	%	N	%	N	%	N	%	N	%
If a hub in your neighbourhood met your needs, how likely would you be to use your own (or lease) car less for short trips (<2.5 km)?	Very likely	2	5,0%	2	4,2%	0	0,0%	8	7,7%	4	5,8%	16	5,0%
	Likely	8	20,0%	5	10,4%	9	14,5%	5	4,8%	14	20,3%	41	12,7%
	Neutral	7	17,5%	2	4,2%	9	14,5%	29	27,9%	13	18,8%	60	18,6%
	Unlikely	10	25,0%	10	20,8%	15	24,2%	22	21,2%	16	23,2%	73	22,6%
	Very unlikely	12	30,0%	29	60,4%	23	37,1%	31	29,8%	13	18,8%	108	33,4%
	Not applicable; I need my car for health reasons	1	2,5%	0	0,0%	6	9,7%	9	8,7%	9	13,0%	25	7,7%
Total		40	100,0%	48	100,0%	62	100,0%	104	100,0%	69	100,0%	323	100,0%

Table E10: Cross Tabulation education and willingness to reduce car use for short trip with availability mobility hub

If a hub in your neighbourhood met your needs, how likely would you be to use your own (or lease) car less for short trips (<2.5 km)? * What is your highest completed level of education? Crosstabulation

		What is your highest completed level of education?								Total	
		Secondary school		Vocational (MBO)		Applied sciences (HBO)		University (WO)			
		N	%	N	%	N	%	N	%	N	%
If a hub in your neighbourhood met your needs, how likely would you be to use your own (or lease) car less for short trips (<2.5 km)?	Very likely	1	3,6%	5	6,6%	8	4,9%	2	3,6%	16	5,0%
	Likely	5	17,9%	11	14,5%	21	12,9%	4	7,1%	41	12,7%
	Neutral	7	25,0%	14	18,4%	30	18,4%	9	16,1%	60	18,6%
	Unlikely	4	14,3%	15	19,7%	39	23,9%	15	26,8%	73	22,6%
	Very unlikely	8	28,6%	23	30,3%	52	31,9%	25	44,6%	108	33,4%
	Not applicable; I need my car for health reasons	3	10,7%	8	10,5%	13	8,0%	1	1,8%	25	7,7%
Total		28	100,0%	76	100,0%	163	100,0%	56	100,0%	323	100,0%

Table E11: Spearman's rank-order correlation for attitude towards mobility hub in neighbourhood and willingness to reduce car use for short trips with available mobility hub

Correlations

			How do you feel about the idea of a mobility hub in your neighbourhood?	If a hub in your neighbourhood met your needs, how likely would you be to use your own (or lease) car less for short trips (<2.5 km)?
Spearman's rho	How do you feel about the idea of a mobility hub in your neighbourhood?	Correlation Coefficient	1,000	,430**
		Sig. (2-tailed)	.	<,001
		N	323	323
	If a hub in your neighbourhood met your needs, how likely would you be to use your own (or lease) car less for short trips (<2.5 km)?	Correlation Coefficient	,430**	1,000
		Sig. (2-tailed)	<,001	.
		N	323	323

**. Correlation is significant at the 0.01 level (2-tailed).

Table E12: Total mean of willingness to reduce car use for short trips with availability mobility hub per neighbourhood

Report

If a hub in your neighbourhood met your needs, how likely would you be to use your own (or lease) car less for short trips (<2.5 km)?

In which neighbourhood do you live?	Mean	N	Std. Deviation
Jutphaas Wijkersloot	4,19	26	1,297
Stadscentrum	3,33	3	2,517
Fokkesteeg	4,03	33	1,311
Merwestein	3,33	6	1,506
Park Oudegein	5,00	1	.
Vreeswijk	4,00	15	1,414
Zandveld	3,91	11	1,375
Hoogzandveld	4,09	11	1,375
Lekboulevard	4,17	12	1,403
Doorslag	4,06	33	1,197
Batau Zuid	3,67	36	1,352
Batau Noord	3,71	49	1,258
Galecop	3,59	29	1,211
Huis de Geer	4,67	3	1,528
Zuilenstein	4,19	32	1,469
Blokhoeve	3,36	11	1,690
Total	3,90	311	1,342