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School of Transportation Sciences

Master of Transportation Sciences

Master's thesis

Perceptions of Policy ChangeHow Users and Non-Users of Shared E-Scooters Experience the Helmet Requirement in Utrecht and The Hague

Sophie Alkema

Thesis presented in fulfillment of the requirements for the degree of Master of Transportation Sciences, specialization Transport Policy and Planning

SUPERVISOR :

Prof. dr. Muhammad ADNAN

MENTOR :

De heer Roeland PAUL

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Preface

This research has been inspired by my interest in shared mobility and the adaptation of micro-mobility in cities. The integration of shared scooters in the mobility network is a given for me, however this is not the case everywhere as the availability of these services vary. With the introduction of the helmet requirement this presents a interesting and time-relevant topic for exploration.

This thesis aims to understand the perception and attitude of users and non-users regarding the helmet requirement that has been introduced as of January 2023. The location of this research has been limited to two Dutch cities: Utrecht and The Hague. The difference in availability of shared scooter services between these two cities, suggest an interesting comparison.

Conducting a qualitative research, using interviews as the method to collect data, was interesting yet challenging. I have had some experience regarding interviews, but approaching people you do not know and asking them questions, is still nerve wracking. I did find it a very rewarding experience in which I have learned very much.

I would like to sincerely thank my supervisor Prof. Dr. Muhammad Adnan, and my second supervisor De heer Roeland Paul for their guidance, constructive feedback, and encouragement during this process. I am also very grateful to all of the respondents who have agreed to be part of my research, and help me finish this thesis. Finally, I would like to thank my friends and family for supporting me in this time, and thank them for their patience as I finish this thesis.

I hope this thesis provides valuable insights into the perception and attitude of users and non-users regarding the helmet requirement. Writing this thesis has been a journey of which I am proud.

Sophie Alkema

The Hague, 04/06/2025

Summary

In the Netherlands, scooter-related traffic fatalities dropped by 37% from 2022 to 2023. One of the reasons for the reduction is the introduction of the mandatory helmet requirement that has been implemented in January 2023. This measure aims to improve the road safety and the safety of scooter users. Shared mobility (the use of vehicles that the users does not own) includes modes such as cars, bicycles, and scooters. Shared e-scooters are generally rented via an application of the provider the user can access through their phone. As of 2025, 74 municipalities in the Netherlands offer such a shared service, through two providers: Check and Felyx.

The use of shared scooters offers advantages such as reduced travel times and flexibility to get from door-to-door. They also help reduce greenhouse gas emissions and urban congestion. Shared scooters can replace trips otherwise taken by car, bike, and walking. Users can experience carriers including safety concerns, limited availability, high costs, and discomfort, which prevents them from using a shared e-scooter service.

This thesis explores how users and non-users in Utrecht and The Hague perceive the helmet requirement, with a focus on safety, hygiene concerns, and willingness to use shared scooters under the new law.

The safety of shared scooters varies depending on which mobility modes it is replacing. To address safety concerns the Dutch government has implemented a helmet requirement for all scooters. This requirement has gone into effect as of January 2023, mandating the use of helmets for scooters travelling 45 km/h as well as scooter travelling 25 km/h. Research supports the effectiveness of helmets in reducing facial and brain trauma.

Despite this, many users find the helmet requirement inconvenient and inconsistent with the flexible nature of shared scooters. Hygiene concerns over shared helmet and lack of supporting infrastructure further reduce compliance. In contrast, non-users are more supportive of mandatory helmet use with studies showing higher approval rates among them compared to current users.

The study adopts a qualitative research approach, which is suited to exploring people's experiences and perspectives. Semi-structured interviews have been used to collect the data, as they allow flexibility and deeper understanding of individual experiences. Participants were randomly selected on the streets of Utrecht and The Hague, with interviews conducted over 6 days. A total of 60 respondents were interviewed: 17 users and 43 non-users.

All interviews were transcribed and analysed, using the three coding-phases: open, axial, and selective coding. The results are structured along the three main categories: experience, attitude, and usage.

The outcomes indicate that while some users perceive the helmet requirement as a barrier to using shared scooters, other do not. Many users have raised concerns about hygiene, regarding the shared helmets, which was a recurring reluctance to use shared scooters in the future.

Non-users were generally more positive about the helmet requirement. A majority viewed it as a reasonable safety measure, and some indicated the rule might make them more inclined to use a shared scooter in the future. The highlights a key difference in attitude between the users and non-users. Nonetheless, while several non-users expressed interest in trying shared scooters in the future, others have also expressed no intention of doing so, due to unfamiliarity or fundamental disinterest.

The research also indicates how public perception plays a role in the acceptance of the helmet requirement. The perception of a negative influence on appearance and aesthetic due to wearing a helmet also plays a role in the reduced use of shared scooters.

Overall, the outcomes show that availability alone does not determine the use of shared scooters. Perceptions of hygiene, safety, and convenience strongly influence behaviour. Although shared scooters offer environmental and mobility benefits, user experience and public attitudes must be considered in policy design.

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1. Introduction

In 2022, 51 people died in traffic while travelling by scooter in the Netherlands (Rijkswaterstaat, n.d.(a)). In 2023, 32 people died in traffic while riding a scooter in the Netherlands (Centraal Bureau voor Statistiek, 2024). This means there was a reduction of 37% in deathly accidents. This reduction is caused by multiple factors, off which the obligation to wear a helmet that has been implemented for all scooters in the Netherlands as of January 2023, is one. The goal of the implementation of the helmet requirement is to reduce traffic deaths and injuries (Rijksoverheid, 2022).

The statistics of the deadly traffic accidents include all privately owned scooters, as well as all shared electric scooters. Shared mobility can be defined in multiple ways, depending on the author (Castellanos, Grant-Muller & Wright, 2022). Castellanos, Grant-Muller & Wright (2022) have analysed the different terminology used for the term shared mobility and have come to the conclusion that the term shared mobility entails more than just sharing a vehicle, it is also other types of mobility assets and services.

Goudappel (n.d.) defines it as: the use of cars, scooters and bicycles, without owning them. It can also be defined as the short-term access to shared vehicles according to the user's needs and convenience (Machado, de Salles Hue, Berssaneti & Quintanilha, 2018). The Dutch *Kennisinstituut voor Mobiliteitsbeleid* [KiM] defines shared e-scooters as: an electrical scooter that is used for a short period of time, rented from a commercial provider (Knoope, Uitbeijerse & Van der Knokke, 2024). Based on these definitions this research will define the term shared mobility as the use of a vehicle that is not their own, but the user can use for the distance/duration that they need.

The shared mobility system contains several different modes of transportation, such as cars, scooters, and bicycles. The shared mobility modes are spread out over the service area. This service area is the region in which the scooters can operate. The scooters can be parked scattered throughout the city (free-floating) or located at certain docking stations, meaning they have a set location where the vehicle needs to be returned (Goudappel, n.d.).

The helmet requirement is introduced for all scooters, however the effect of the helmet requirement on privately owned scooters and shared scooters will be different. Therefore this research will only focus on shared scooters. The term scooter can mean a different type of mobility, based on where you are from. The mobility mode meant in this research is shown in figure 1.

Figure 1: Scooter (cleanrider.com, 2019)

Several cities in the Netherlands have a shared scooter system. The shared scooters were first introduced back in 2017 and have since more than doubled (Rijkswaterstaat, n.d.(b)). Currently there are two different shared scooter providers in the Netherlands, Check and Felyx (Knoope, Uitbeijerse &. Van der Knokke, 2024; CROW, 2025). In 2022 18.5 million trips were made with shared scooters in the Netherlands. The reason for shared scooter trips is mostly because it is quick and easy. Shared scooter trips are also frequently used in combination with public transport (Movares, 2023). Although each shared scooter already transports 1750 people per year on average, there is still room for expansion.

Currently 74 municipalities in the Netherlands offer some sort of shared electric scooter system. The shared scooters are owned by two different providers: Check and Felyx and there are 13.645 shared

scooters in the Netherlands (Movares, 2023). Providers do not necessarily have to have a permit in order to be able to operate in a city, unless it is stated otherwise by the city in an *Algemene Plaatselijke Verordening [APV]* (General Local Regulation) (Rijkswaterstaat, n.d.(b)).

The Hague is one of the cities where the two providers are active. Besides Check and Felyx, Go Sharing and Tier were also a provider in the Netherlands. Tier operated the shared scooters in Utrecht. However, after a period of 1.5 years the permit has expired, and the city did not renew the permit. So currently there are no shared scooters in Utrecht. Go Sharing has declared bankruptcy and at the beginning of 2025 it was announced that all shared scooters from Go sharing will be removed from the streets in the Netherlands (CROW, 2025).

The shared scooters are divided into scooters that can drive up to 25 kilometres per hour [km/h] and scooters that can drive up to 45 km/h. The shared scooters are available through an app from the provider. The user can sign up through the app and provide a driver's licence and a payment method. After both have been approved the user can use the shared scooters scattered throughout the city. The users pay per minute, and depending on the provider a starting fee. The providers have a service area, where the shared scooters can be operated and parked (Rijkswaterstaat, n.d.(b)).

1.1 Problem statement

As defined in the introduction shared mobility is the use of a vehicle that is not their own, but the user can use for the distance/duration that they need. Shared mobility is stimulating the shift from an owner-based transportation system to a user-based system. This results in a decrease of private cars in the city, which contributes to the reduction of greenhouse gas emissions as well as the parking problem in cities (Goudappel, n.d.).

25% of the current shared scooter trips replace a trip otherwise taken by car. 50% of all car trips in the Netherlands are currently shorter than 7.5 kilometre [km] and, and ⅓ of the trips is shorter than 5 km. This gives municipalities the opportunity to promote the use of sustainable mobility modes, such as shared scooters (Movares, 2023).

The advantage experienced by the users of shared scooters is the shorter travel times and the increased flexibility when it comes to door-to-door trips (Badia & Jenelius, 2023; CROW, 2025). The barriers users experience with the use of shared scooters are among other (Badia & Jenelius, 2023):

- A low feeling of safety
- Type of vehicle
    - Weather
    - Transportation of goods
- Service
    - Restrictive deployment areas
    - Low availability
    - Technical problems
    - High price

Another barrier mentioned by Badia & Jenelius (2023) is the mandatory helmet requirement on the use of the shared scooter. Knoope, Uitbeijerse & Van der Knokke (2024) shows that there has been a shift from users to the 45 km/h scooters instead of the 25 km/h scooters. Before the helmet requirement 60% of trips were taken on the 25 km/h scooter and 40% on the 45 km/h scooters. Now

80-90% of the trips are taken on the 45 km/h scooter (CROW, 2024; Knoope, Uitbeijerse & Van der Knokke, 2024). Furthermore, the providers do see a decline in the use of shared e-scooters, which they attribute to the helmet requirement. However, it is also mentioned that the long term effects of the helmet requirement need to be researched, before a proper conclusion can be drawn (CROW, 2024; Knoope, Uitbeijerse & Van der Knokke, 2024; Movares, 2023).

1.2 Research objectives and questions

Different cities in the Netherlands have a different perspective on the subject of shared scooters. This difference can also lead to a different perspective of the users and non-users of shared scooters. The objective of this thesis is to understand the perspective of users and non-users on the helmet requirement on shared scooter. The central question for this thesis is therefor:

“How do users and non-users of shared scooters experience the introduction of the helmet requirement in Utrecht and The Hague?”

In order to answer the main question a set of sub-questions have been constructed:

- Do users and non-users of shared scooter perceive the helmet requirement as a discouragement to use a shared scooter?
- Do users and non-users of shared scooter find wearing a helmet unhygienic?
- Are users and non-users willing to wear a helmet when using a shared scooter?
- Do users and non-users find the helmet requirement a necessary safety precaution?
- Has the willingness to use a shared scooter changed due to the helmet requirement?
- Will there be a difference between The Hague and Utrecht due to the availability of shared scooters?

The sub-questions will formulate the answer to the main question, which will be answered in the conclusion.

2. Literature review

In order to answer the main question of this paper, a literature review needs to be conducted. The literature review will give a definition of micro-mobility, and shared mobility. It will also explore the current situation in the Netherlands, regarding micro-mobility and shared mobility. I will also explore the stance on mandatory helmet wearing in existing literature.

2.1 Micro-mobility

Micro-mobility has become almost indispensable in the transportation system in big cities around the world. However, what is micro-mobility and what is needed to make sure they can operate in a city?

Micro-mobility usually consists of light-weight devices or mini-vehicles that typically do not exceed speeds of 45 km/h. Micro-mobility can include bicycles, scooters, skateboards, and segways. Micro-mobility is either human or electric powered, making them a sustainable mode of transportation. Just like other modes of transport, micro-modes can either be privately owned or shared (Abduljabbar, Liyanage, & Dia, 2021; Shaheen & Cohen, 2020).

Micro-mobility is used for short-distance travel and, including first and last kilometre trips (Guo & Zhang, 2021). Micro-mobility is becoming increasingly popular as an alternative to using a car and bicycles (Allem & Majmundar, 2019). Factors that motivate people to use micro-mobility include the flexibility, sustainability, cost-effective, and on-demand, services the micro-mobility provides, making it an appealing mode of transportation (Abduljabbar, Liyanage, & Dia, 2021). Other motivation factors include that it is faster to get around, fun to ride, and it saves money (Guo & Zhang, 2021). It is not only appealing for users, it is also appealing for cities to implement, as it is a sustainable mode which results in lower carbon emissions as it replaces the amount of short-distance trips by privately owned cars (Abduljabbar, Liyanage, & Dia, 2021).

2.2 Shared mobility

Shared mobility can be defined in multiple ways, depending on the author (Castellanos, Grant-Muller & Wright, 2022). Castellanos, Grant-Muller & Wright (2022) have analysed the different terminology used for the term shared mobility and have come to the conclusion that the term shared mobility entails more than just sharing a vehicle, it is also other types of mobility assets and services.

Goudappel (n.d.) defines it as: the use of cars, scooters and bicycles, without owning them. It can also be defined as the short-term access to shared vehicles according to the user's needs and convenience (Machado, de Salles Hue, Berssaneti & Quintanilha, 2018). The Dutch *Kennisinstituut voor Mobiliteitsbeleid* [KiM] defines shared e-scooters as: an electrical scooter that is used for a short period of time, rented from a commercial provider (Knoope, Uitbeijerse & Van der Knokke, 2024). Shaheen & Cohen (2018) define shared mobility as the shared use of a vehicle, bicycle, or other travel mode, that allows the user to access the mode for a short period of time on an as-needed basis. Based on these definitions this research will define the term shared mobility as the use of a vehicle that is not their own, but the user can use for the distance/duration that they need.

The use of shared mobility as a transportation strategy has expanded following the widespread adoption of cell phones that have GPS capabilities. The shared mobility system contains several different modes of transportation, such as cars, scooters, and bicycles. The shared mobility modes are

spread out over the service area. This service area is the region in which the scooters can operate (Goudappel, n.d.).

There are various different ways in which shared mobility can be organised: roundtrip service, one-way station-based service, or one-way free-floating service. The roundtrip service means that the travel mode must be returned to the same location as where the trip started. The one-way station-based service entails that travel modes are returned to a different designated docking station. In the one-way free-floating service travel modes can be returned anywhere within a specified geographical area, but it does not have a specific docking station (Shaheen & Cohen, 2018).

Shared mobility can mean different forms of travel modes, such as carsharing, scooter sharing, and bike sharing. When using shared mobility the person gains the advantages of a vehicle, without the costs and responsibilities (Shaheen, Chan, Bansal, & Cohen, 2015).

2.3 Shared Micro-mobility

The concepts micro-mobility and shared mobility can also be combined into shared micro-mobility. Shared micromobility is used in urban transportation systems to solve problems such as congestion and air pollution (Hamerska, Ziółko & Stawiarski, 2022). Other goals community stakeholders are trying to achieve through implementing a shared micro-mobility system include emission reduction, financial savings, reduce fuel use, health benefits, improved multimodal transport connections, “last mile” connection to public transport, and equity (Midgley, 2019).

The flexibility of using shared e-scooters does come into question with the introduction of the helmet requirement. At least, that is how it may appear to users (James, Swiderski, Teoman & Buehler, 2021). Other reasons not to use shared micro-mobility include safety considerations, bad weather conditions, and costs (Pimentel, Lowry, & Pacific Northwest Transportation Consortium, 2020). Other negative impacts of shared micro-mobility are related to the non-users of shared micro-mobility. These people often experience that shared micro-mobility creates a disturbance on the streets in cities. For instance if a shared e-scooter is parked on the sidewalk, which can result into people being unable to pass through. Another concern non-users have regarding shared e-scooters is the unsafe driving behaviour they show in traffic (Brown, Klein & Thigpen, 2021).

In modern cities congestion and air pollution are among the biggest problems the urban transport systems are facing. As well as parking, poor safety standards, and noise pollution. These transportation problems translate into a poorer quality of life for the inhabitants of these cities (Hamerska, Ziółko & Stawiarski, 2022).

Shared micro-mobility can be organised in different ways, via a docking station model or a free floating model as well as the transport modes used in the system. However, a shared micro-mobility system does not have to be limited to just one transport mode (Shaheen & Cohen, 2018; Midgley, 2019).

The use of shared micro-mobility can be predicted using the product life cycle. The product life cycle consists of four stages (Pimentel, Lowry, & Pacific Northwest Transportation Consortium, 2020):

- Introduction;
- Growth;
- Maturity;
- Decline.

The introduction stage starts with the introduction of shared micro-mobility. This usually starts with one or a few providers that introduce their product to the market. During the growth stage more providers are introduced to the market, as well as the overcoming of uncertainty. It is also during this stage that a broader variety of modes is introduced into the system. For example other than the e-scooter and e-bike is also introduced (Pimentel, Lowry, & Pacific Northwest Transportation Consortium, 2020). The maturity stage defines a stage where the customers have accepted the product and the profit increases. The market also shows signs of saturation, which results in a slowdown in sales, due to the competition. The decline stage happens because the market share for that product decreases. The interest of the customers reduces, as there are a lot of alternative products emerging. The provider can choose to discontinue the product or update the existing product and start the product life cycle new (Pimentel, Lowry, & Pacific Northwest Transportation Consortium, 2020).

2.4 The Netherlands

The use of shared mobility is becoming more popular in the Netherlands. The share of shared cars in the modal split is still relatively low, however the use is growing. The shared mobility in the Netherlands does not only contain shared cars, shared bicycles, shared scooters, ride sharing and demand-driven shared mobility services, such as Uber, are also part of the shared mobility network. Shared mobility is mostly used in urban environments. The shared car can be a substitute for private car use and train travel, while shared bicycles and scooters can substitute bus, tram, metro, walking, private bicycle use, and for 25% of the trips the car (Jorritsma, Witte, Alonso-Gonzáles, & Hamersma, 2021; Rijkswaterstaat, n.d.(b)).

The shared scooters in the Netherlands are all electric scooters. The shared e-scooters in the Netherlands can be differentiated into two categories: *snorfietsen* and *bromfietsen*. The *snorfietsen* have a speed up to 25 km/h, the *bromfietsen* can have a speed up to 45 km/h (Knoope, Uitbeijerse & Van der Knokke, 2024).

The use of shared scooters was introduced in 2017 and has since grown exponentially. The shared scooter is the fastest growing form of shared mobility in the Netherlands. The use of shared scooters has increased from 4% in 2021 to 5% in 2022 (Rijkswaterstaat, n.d.(b)).

The users of shared scooters are mostly millennials, students, tourists, expats, freelancers and commuters that do not own a private car. The shared scooter is used to visit friends or family, commute between work and home, or even to go grocery shopping. The average length of a trip taken on a shared scooter is 3.5 km. Most trips are taken as standalone trips, however ⅓ of the trips are taken as part of a multimodal trip. The reasons for using a shared scooter is the flexibility and how quick it can bring you from one location to another (Knoope, Uitbeijerse & Van der Knokke, 2024; Rijkswaterstaat, n.d.(b)).

The future use of shared e-scooters is uncertain and dependable on different factors. One factor that has an influence on the future use is the availability of e-scooters. Other factors include the cost of use for an e-scooter, The alternative options, and personal choices from users. The personal choices from users are for instance linked to whether or not the user owns a car (Knoope, Uitbeijerse & Van der Knokke, 2024).

However, shared scooters are also a cause for concern in the Netherlands. The parking of the shared scooters has been a topic of discussion since the introduction of shared scooters in 2017. The effect of

shared scooters on traffic safety is dependent on which mode the shared scooter is replacing. If the shared scooter is replacing the private car, the traffic safety is improved, however if the shared scooter is replacing a public transportation trip, bicycle trip or a walk, the traffic safety will be negatively impacted (Rijkswaterstaat, n.d.(b)).

2.4.1 The helmet requirement

In regards to the traffic safety and the safety of e-scooter users the Dutch government has implemented a helmet requirement for all scooters. The helmet requirements demands all users must wear a helmet, without exceptions. The helmet has to be an approved helmet for scooters. If a user does not abide this law, a fine of €120,- must be paid (Rijksoverheid, n.d.). This helmet requirement has gone into effect on January 1, 2023 (Rijksoverheid, 2022).

The goal of the helmet requirement is to enhance road safety and reduce/prevent head and brain injuries for riders and passengers. Although in the total distance travelled the share of e-scooters is only small, the risk of a fatal injury is 30 times higher for a user of an scooter, compared to an occupant of a car (SWOV, 2024).

Studies show that wearing a helmet can reduce the risk of injuries, such as maxillofacial injuries. These injuries are traumas that affect the face and jaw. These injuries can occur by direct impact to the face, by falling of the scooter or a collision with another vehicle. As these injuries can occur to direct impact to the face a full cover helmet can prevent or at least reduce the severity of the injury (Hamzani, Bar Hai, Cohen, Drescher, Chaushu & Yahya, 2021) Stassen, Atalik, Haagsma, Wolvius, Verdonschot & Rozeboom (2024) have determined in their study that wearing a helmet creates a 32% risk reduction for maxillofacial injuries.

Although the reason behind the helmet requirement is to improve the safety of scooter users, the helmet requirement is still not always accepted by users. Users can find the helmet requirement an inconvenience. Users feel like the requirement to wear a helmet does not match the flexibility of the transport mode (Guo & Zhang, 2021; Sievert, Roen, Craig & Morris, 2023). Frank et al. (2024) have observed that the supporting infrastructure is vital to an increased helmet wear for users of e-scooters. If the infrastructure is not provided through helmet rental systems or on-board helmets, users will either use the e-scooters without a helmet or avoid using the e-scooter. Another concern for users is the hygiene in shared helmets (Haworth & Schramm, 2023; Ssi Yan Kai, Haworth & Schramm, 2024).

Contrary to users, non-users are significantly more supportive of helmet wearing than users. 66,6% of non-users strongly agreed with the statement that helmet wearing should be mandatory, compared to only 32,1% of the users. Of the users 40,5% disagreed or strongly disagreed with the suggestion to make helmet wearing mandatory (Speak, Taratula-Lyons, Clayton & Shergold, 2023).

2.5 Situation Utrecht and The Hague

Multiple municipalities in the Netherlands have some form of a shared micro-mobility system. A shared scooter system does not cost the government extra money, as the e-scooters are operated by private companies, the government still influences the use and existence of shared scooters. Local governments can influence the existence of shared scooters by either providing a licence to the provider or not (Rijkswaterstaat, n.d.(b)). This is also the reason why the shared scooters have disappeared from the streets of Utrecht, since 2022 (Gemeente Utrecht, n.d.).

2.5.1 Utrecht

As mentioned before, Utrecht currently does not have any shared scooters. Utrecht used to have shared scooters and shared bicycles from the provider Tier. Tier had 300 shared scooters in the city and 500 shared bicycles, however the permit was not renewed by the city, so the provider had to remove the scooters. Thus having completed the product life cycle, and choosing to discontinue this service (Pimentel, Lowry, & Pacific Northwest Transportation Consortium, 2020).

The permit for the shared e-scooter was not renewed as the city wants to focus on pedestrians and cyclists in the city (CROW, 2024). The permit for the shared bicycles was renewed, and the fleet even doubled in size. According to the municipality the scooters did not add value to the mobility system, as users covered the same amount of distance on the scooter as on the bicycles (CROW, 2022).

One of the complaints about shared scooters is that they could not be parked outside the borders of the municipality. The municipality is exploring the possibility of having shared scooters in a regional setting, but they are not open for a shared scooter network only in the city of Utrecht. Another concern from the municipality is also that the scooters provided nuisance when it came to parking within the city. The shared bikes do not have this problem as they fit in the already existing bicycle racks (CROW, 2022).

2.5.2 The Hague

The municipality The Hague defines shared mobility as mobility everyone can use, that is accessible through an app. The shared mobility modes in The Hague are bicycles, cargo bikes, scooters, and cars (Gemeente Den Haag, n.d.(a)). The shared scooters in The Hague are provided by two different providers: Check and Felyx. A third provider was also active in The Hague: GoSharing. However, this provider went bankrupt and thus had to withdraw. Placing The Hague market in the maturity stage of the product life cycle (Pimentel, Lowry, & Pacific Northwest Transportation Consortium, 2020).

The municipality also mentions the advantages of using the shared scooters, namely that the user only pays the use and not the maintenance, as well as that the shared scooter makes it possible to get closer to the users place or destination, than they would by car or public transport, and lastly, the scooters are electric, and therefore climate friendly (Gemeente Den Haag, n.d.(b)).

2.6 Conceptual model

All the information can be combined into the conceptual model. The model (shown in figure 2) shows the relationship between the variables. The model shows that there is a difference between the users and the non-users of shared micro-mobility (e-scooters). Users are categorised as people who have used a shared scooter in the Netherlands, non-users are categorised as people who have not used a shared scooter in the Netherlands before. People who have used a shared scooter in a different country, but have not used a shared scooter in the Netherlands are also categorised as non-users.

The model also shows the reasoning for both users and non-user why they would or would not use shared micro-mobility. The safety concerns on non-users and the government have led to a policy change, the helmet requirement. The helmet requirement was introduced to improve the traffic safety and to reduce the injuries. The acceptance of the helmet requirement is different for the users and the non-users. The non-users could be influenced by the reduction in injuries and improvement of traffic safety if their reasoning for not using shared micro-mobility were safety concerns. The acceptance of the helmet requirement among users of shared micro-mobility is influenced by their view of hygiene,

willingness to comply, availability, and safety concerns they may have had previously. The behavioural outcomes are influenced by the acceptance of users and non-users. The behavioural outcomes are either the further (users) or future (non-users) use of shared micro-mobility or no longer (users) or continued non-use (non-users) of the shared micro-mobility.

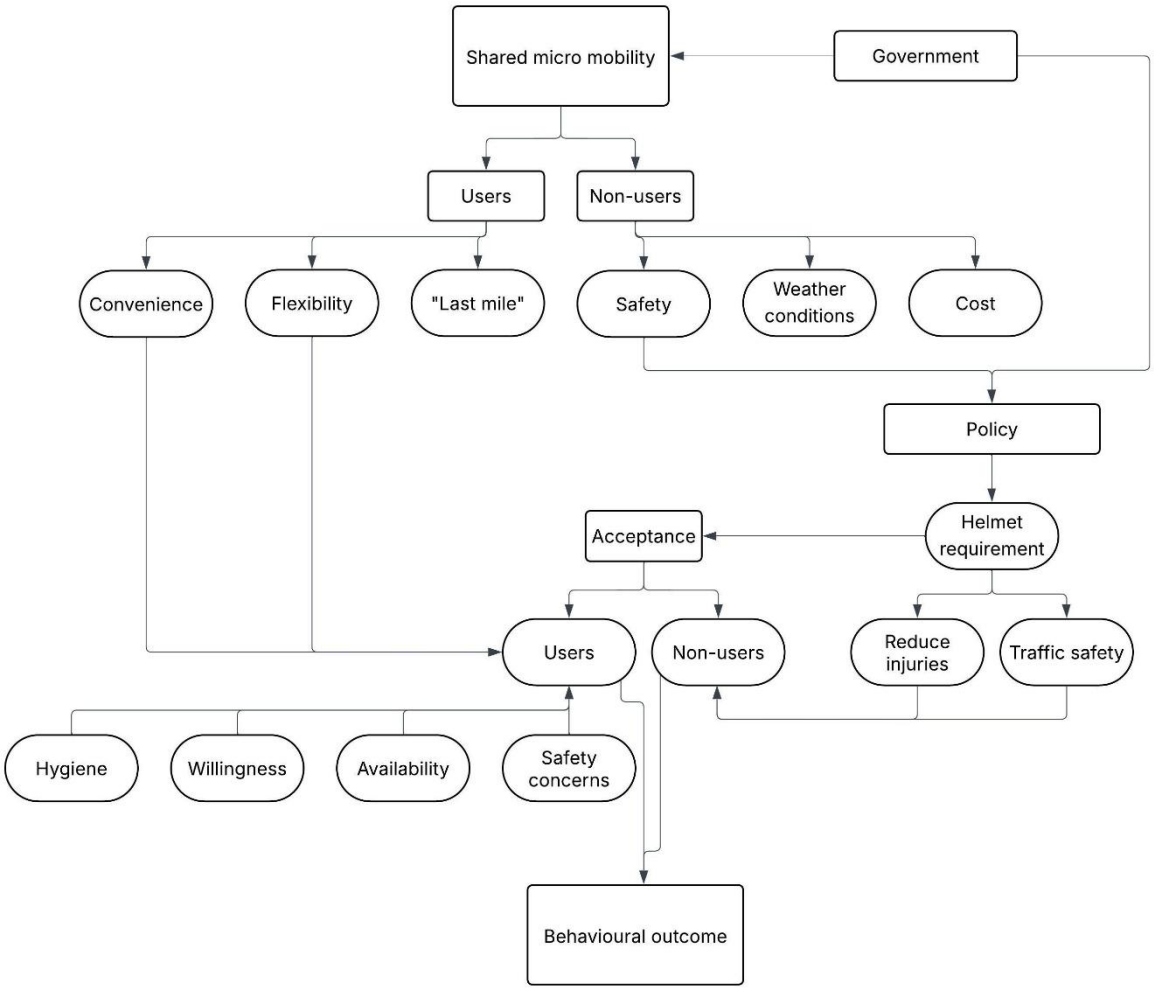

Figure 2: Conceptual model

3. Methodology

This chapter outlines the research approach that has been used to investigate the main question. The main question of this research is: “How do users and non-users of shared scooters experience the introduction of the helmet requirement in Utrecht and The Hague?”. This chapter will contain an explanation of the research method, the operationalisation, the operationalisation diagram, and the limitations of this research.

3.1 Research method

The main question will be answered through the analysis of this research. In order to answer this question qualitative research will be done. Qualitative research is the appropriate method to use, as this approach allows questions to be answered about the understanding of peoples experiences (Adeoye-Olatunde & Olenik, 2021; Creswell & Poth, 2016; Sofaer, 1999; Winchester & Rofe, 2000).

A qualitative approach includes multiple steps. These steps need to be taken in a research to ensure a valid outcome. The steps are (Winchester & Rofe, 2000):

- Defining the research problem;
- Develop hypotheses;
- Research design;
- Gather data;
- Analysis.

3.1.1 Research problem and hypothesis

The first step of a qualitative research is to define the research problem (Winchester & Rofe, 2000). The research problem has already been defined by the main question of the research: “How do users and non-users of shared scooters experience the introduction of the helmet requirement in Utrecht and The Hague?”. From the literature review it becomes clear that there has already been research into the positive effects of helmet use (Hamzani, et al., 2021; Stassen et al., 2024), as well as the impact the helmet requirement has on the use of shared micro-mobility for users (Frank et al., 2024; Guo & Zhang, 2021; Haworth & Schramm, 2023; Sievert et al., 2023; Ssi Yan Kai et al., 2024) and non-users (Speak et al., 2023). However, from the literature it is not clear what the experiences of users and non-users are, as most of the research that has been done is quantitative.

Based on the literature review the hypothesis can be drafted. The hypotheses are open-ended and exploratory. The hypotheses act as initial expectations or assumptions based on the knowledge of the literature review (Winchester & Rofe, 2000). The hypotheses for this research are:

a) Users of shared scooters perceive the helmet requirement as a discouragement to shared scooter usage.
b) Users of shared scooters find wearing a helmet unhygienic.
c) The willingness to wear a helmet is higher among non-users than among users of shared scooters.
d) Non-users of shared scooters find the helmet requirement a necessary safety precaution.
e) Non-users of shared scooters are more likely to try to use a shared scooter.

3.1.2 Research design

Qualitative research can entail multiple different methods divided into three categories: oral, textual, and observational (Winchester & Rofe, 2000). In this research interviews will be used to gather data, which falls into the oral category. An interview is defined as a data-gathering method in which there is a spoken exchange of information (Dunn, 2000; Karatsareas, 2022).

There are three different types of interviews: structured, semi-structured, and unstructured. A structured interview follows a predetermined and standardised list of questions. The questions are asked is almost the same way in the same order in each interview. An unstructured interview does not follow a set list of questions and is directed by the respondent. The semi-structured interview has some degree of predetermined questions, but also remain flexible in the way the questions are addressed (Adeoye-Olatunde & Olenik, 2021; Dunn, 2000).

This research will use semi-structured interviews, as semi-structured interviews are the most useful to understand the participants unique perspective, rather than a general understanding. Semi-structured interviews are useful to understand if a proposed service is warranted and how a service is performing (Adeoye-Olatunde & Olenik, 2021).

The respondents will be chosen based on probability sampling. Probability sampling uses random selection (Adeoye-Olatunde & Olenik, 2021). In this research random selection is used as participants are approached on the street, making it impossible to select based on certain characteristics. The only criteria that has been taken into account is whether the respondent is over the age of 18 and thus legally able to use the shared scooters. The final sample included 25 participants (10 users and 15 non-users) in The Hague and 35 participants (7 users and 28 non-users) in Utrecht. A standard for sampling size in qualitative research is almost nonexciting. However, the sample size relies on saturation. Saturation entails the point in which no new information will be gathered by conducting more interviews. Research suggests that saturation will be reached between six and twelve interviews. This sample size was deemed sufficient to reach thematic saturation (Guest, Bunce & Johnson, 2006). The group of non-users is bigger than the six to twelve interviews, however since some of the interviews were quite short it was deemed necessary to conduct more than the six to twelve interviews.

3.1.3 Data collection

The semi-structured interviews have been conducted on the streets of The Hague and Utecht. The interviews have been conducted in The Hague and Utecht as these are the two cities the research focuses on. The interviews have been conducted over a week period (3 days in Utrecht and 3 days in The Hague). Each interview was between 5 and 10 minutes. The interviews have purposely been kept short, in the form of a go-along interview, as respondents were interviewed in a non-controllable situation (Gobo & Marciniak, 2016; Kusenbach, 2003).

During the interviews an interview guide is used. An interview guide is an overview of the questions or general topics the interviewer wants to discuss during the interview (Dunn, 2000). The interview guide is not meant to be read in the same order during each interview. It is meant as a structure and reminder to make sure all topics have been discussed (Adeoye-Olatunde & Olenik, 2021).

All interviews have been audio-recorded. All participants have been asked consent before the interview whether the participant agreed to the audio-recording. It is important that all interviews have been audio-recorded, as this allows researchers to focus on the conversation, which ensures accuracy and completeness (Adeoye-Olatunde & Olenik, 2021; Braun & Clarke, 2013; Dunn, 2000).

After collecting the data from the interviews, the transcripts have been written out. In order to transcribe all of the interviews Amberscript software was used. This software transcribes the interview recording into a written script (Amberscript, n.d.). After the software was done, the researcher has gone over the script again to remove any mistakes and add any missing information (Davidson, 2009). All interviews were audio-recorded and transcribed.

Most interviews have been conducted in Dutch, as the research setting is in the Netherlands and Dutch is the native language of the respondents. If Dutch was not the native language of the respondent the interviews were conducted in English. This was possible as the researcher speaks Dutch as a native language, as well as having a very good comprehension of English. All interviews were transcribed in Dutch and subsequently translated into English by the researcher. This approach was chosen to minimise the risk of misinterpretation (van Nes, Abma, Jonsson & Deeg, 2010)

3.1.4 Data analysis

The transcripts of the interviews will be used for the analysis. The analysis needs to be conducted as it seeks meaning from the data. Through the analysis themes, relations between variables, and patterns are constructed (Dunn, 2000). In order to analyse the data, the interview transcripts are coded and organised into categories. The codes and categories are then used to answer the research questions (Winchester & Rofe, 2000).

Since qualitative research does not aim to generalise the outcomes, but to understand the experiences of a situation, the conclusion should be grounded in the data (Winchester & Rofe, 2000). In qualitative research it is nearly impossible to articulate a generally representative conclusion. It is however possible to indicate a general sense of the experiences expressed in the interviews (Dunn, 2000).

3.2 Operationalisation

The literature review discusses various different concepts that are important for answering the main question. The operationalisation will enlighten how the concepts of the literature review will be made measurable. Firstly, the general questions will be explained. Secondly, the concepts from the literature review will be explained. Lastly, the concepts will be visualised in the operationalisation diagram.

3.2.1 Key concepts

The main question of the research contains several concepts that need to be defined before the data collection and analysis: shared scooter, users and non-users, experience, and helmet requirement. As defined in the introduction the shared scooter is defined as the use of an e-scooter that is not their own, but the user can use for the distance/duration that they need. Users are defined as anyone that has ever used a shared e-scooter in the Netherlands. A non-user is anyone who has never used a shared scooter in the Netherlands. People who have used a shared scooter abroad will be classed as a non-user in this research. The experience in the main question is defined as the perception of the respondent based on the emotions, behaviour, and attitude of shared scooters. The helmet requirement has been defined in the literature review, however it is the law that has been implemented in the Netherlands stating it is mandatory to wear a helmet while riding a scooter in the Netherlands, regardless of the maximum speed.

3.2.2 Themes

The themes discussed in the interviews are derived from the literature review. The literature review mentions several concepts that have an influence on the acceptance of the helmet requirement. These concepts will be operationalised based on concepts, which are explained in table 1.

Table 1: Theme operationalisation

Concept	*Operationalisation*	*Source*
Experience	Perceived convenience	Guo & Zhang (2021)
	Comfort while using e-scooters with/without helmet	Sievert et al. (2023)
Attitude	Acceptance of the helmet requirement	Speak et al. (2023)
	Effect of the helmet requirement on willingness to use e-scooters	
Usage	Availability of helmet infrastructure	Frank et al. (2024)
	Perceived hygiene of shared helmets	Haworth & Schramm (2023) and SSI Yan Kai et al. (2024)

3.3 Operationalisation diagram

The operationalisation diagram (table 2) shows how the concepts from the literature review were questioned in the interview. The diagram gives an overview of the concepts from the literature review and which questions from the interviews suit the concept, therefore showing how the concept is made measurable.

Table 2: operationalisation diagram

Concept	*Questions*

General	• Are you familiar with what a shared e-scooter is?
	• Have you ever used a shared e-scooter in The Hague or Utrecht?
	  • If not, why?
	• Would you use an e-scooter again?
	  • Why yes or no?
	• Which factors have influenced your choice to (not) use a shared e-scooter?

Experience	• Do you feel safe when you are using a shared e-scooter? • Do you feel like (shared) e-scooters are respected in traffic? • Do you feel like users of (shared) e-scooters respect other traffic? • Have you ever experienced troubles when using a shared e-scooter? • Have you ever had technical issues when wanting to or using a shared e-scooter? • Have you ever had trouble parking a shared e-scooter? • Has this ever led to needing help using a shared e-scooter? • If yes, did you know how you could contact customer service? • If yes, was customer service able to help you to you satisfaction?

Attitude	• Are you familiar with the helmet requirement that has been put into effect on January 1 2023? • Has the helmet requirement changed your usages of shared e-scooters? • If yes, why?
Usage	• If non-user, would the helmet requirement change your mind about using a shared e-scooter in the future? • Is there any reason why you would (not) use a shared e-scooter in the future?

3.4 Limitations

Each research comes with its own set of limitations which will be discussed in this section. The first limitation is the short interview duration. The interviews were all between 5 and 10 minutes, which is short for a standard interview. The interviews were conducted on a go-along basis, with a street sitting. This all limits the amount of time an interview can be, as it will otherwise defer possible respondents. The short duration of the interviews can reflect in the deepness of the insights (Brown & Durrheim, 2009).

A second limitation is the sample size. The sample size in qualitative research is generally small. This results in the fact that the results cannot be generalised to the broader perspective of all users and non-users of shared e-scooters in the Netherlands or other cities (Bryman, 2016).

A third limitation is the language translation in the transcripts of the interviews. The interviews were conducted in Dutch, but the analysis has been conducted in English. Therefore, the transcripts have first been written out in Duch and then translated into English by the researcher. With the translation inaccuracies or loss of meaning can happen (Temple & Young, 2004).

A fourth limitation is the selection of the respondents. The respondents are approached on the streets whether they would be available for an interview. With this approach a selection-bias comes into play as the people who agree to be interviewed on the street may be more opinionated or time-flexible. Which can introduce a bias in the outcomes (Patton, 2015).

A fifth limitation is a bias based on the respondents thinking they have to give an answer based om social expectations. The interviews have been conducted fact-to-face in a public setting, which can result in respondents tailoring their answer to avoid judgement (Grimm, 2010).

A sixth and final limitation is the urban context in which the research has been conducted. As the research was only conducted in The Hague and Utrecht, the outcomes of this research are influenced by the urban context of these cities (Fishman, Washington & Haworth, 2013).

4. Results

This chapter presents the main outcomes of the interviews that were conducted. The main outcomes are regarding the experiences of users and non-users of shared scooters in Utrecht and The Hague. The results are structured around the three main concepts: experience, attitude, and usage.

The results and the analysis will be used to formulate an answer to the main question of the research: "How do users and non-users of shared scooters experience the introduction of the helmet requirement in Utrecht and The Hague?"

As mentioned the main question has been split into multiple sub-questions:

- Do users and non-users of shared scooter perceive the helmet requirement as a discouragement to use a shared scooter?
- Do users and non-users of shared scooter find wearing a helmet unhygienic?
- Are users and non-users willing to wear a helmet when using a shared scooter?
- Do users and non-users find the helmet requirement a necessary safety precaution?
- Has the willingness to use a shared scooter changed due to the helmet requirement?
- Will there be a difference between The Hague and Utrecht due to the availability of shared scooters?

The sub-questions can also be divided into the three main concepts. Table 3 shows the overview of which sub-questions fits in which category.

Table 3: Categorisation sub-questions

Category	***Sub-question***
Experience	• Has the willingness to use a shared scooter changed due to the helmet requirement? • Will there be a difference between The Hague and Utrecht due to the availability of shared scooters?
Attitude	• Are users and non-users willing to wear a helmet when using a shared scooter? • Do users and non-users find the helmet requirement a necessary safety precaution?
Usage	• Do users and non-users of shared scooter perceive the helmet requirement as a discouragement to use a shared scooter? • Do users and non-users of shared scooter find wearing a helmet unhygienic?

In the research, 41 interviews with conducted with in total 60 respondents. 24 interviews, with 35 respondents in Utrecht and 17 interviews, with 25 respondents in The Hague. Table 4 shows the division between users and non-users. The interviews were conducted on a go-along basis on the streets of The Hague and Utrecht. The respondents were not asked about any characteristics, such as age and gender, as this was deemed irrelevant for the research.

Table 4: Users and non-users

	Users	*Non-users*
Respondents Utrecht	2, 3, 11, 19, 26, 32, 33	1, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24, 25, 27, 28, 29, 30, 31, 34, 35
Respondents The Hague	41, 45, 50, 53, 54, 55, 56, 57, 58, 60	36, 37, 38, 39, 40, 42, 43, 44, 46, 47, 48, 49, 51, 52, 59

4.1 Coding

The transcribed interviews are analysed based on a three-step coding process: open coding, axial coding, and selective coding. This provides a structured yet flexible framework to identify patterns and construct themes grounded in the respondents experiences (Braun & Clarke, 2006). The coding is done with the help of NVivo. NVivo is a computer-assisted qualitative data analysis software designed to support the systematic examination of unstructured textual and multimedia content, such as interview transcripts (QSR International, 2023).

4.1.1 Open coding

The first phase is open coding. In this phase each transcript is examined line-by-line to generate the initial codes. These initial codes describe ideas, actions, or meanings. The transcripts are broken into discrete parts to capture the nuances in how participants discuss their behaviour, attitude, and experiences with shared e-scooters following the helmet requirement. An example of the open coding is shown in table 5. The full coding scheme from the open coding can be found in appendix A: Open coding scheme. The open coding scheme consists of 206 codes. These 206 codes are applied to the text excerpts from the interviews.

Table 5: Open coding example

Name	*References*
Acceptance of recurring technical failure	2
Accessibility may increase risk due to inexperienced users	4
Advocates broader helmet requirements	5
Against helmet requirement	1
Against helmet requirement for e-bikes	4
Annoyance by helmet system	1
Annoyance due to helmet requirement	1
Annoyance with certain rider behaviour	2
App interface and parking unclear	2
Awareness of helmet requirement	25

4.1.2 Axial coding

In the second phase, axial coding, the codes are grouped into broader conceptual categories. This is done by identifying the relationship between the broad codes of the open coding. Not each code from the open coding is relevant for answering the sub-research questions. Only the codes relevant to answering these sub-questions are used in the axial coding. From the 206 open codes, seven overarching themes, and thus axial codes, can be established:

- Functional & technical problems;
- Hygiene & helmet related experiences;
- Mobility behaviour & mode choice;
- Perception & attitude;
- Regulation, legislation & compliance;
- Safety & risk-perception;
- User experience & accessibility.

An example of the axial coding is shown in table 6. The full coding scheme from the axial coding can be found in appendix B: Axial coding scheme. All the relevant open codes are categorised in an appropriate axial code (shown in appendix B).

Table 6: Axial coding scheme example

Axial code	***Open code***
Functional & technical problems	Acceptance of recurring technical failure
	Inaccuracy of geo-location feature
	Responsive customer service
	Ride termination issues
	Technical issues
	Technical issues can cause fine
	Workaround for technical failure
	Inconvenient parking zone regulations
	Parking challenges and restrictions for shared scooters
	Parking difficulties, not locking
	Parking restrictions affect usage

4.1.3 Selective coding

The third and final phase is the selective coding. This phase identifies the central themes that integrate and explain the main categories. From the axial codes (functional & technical problems; hygiene & helmet related experiences; mobility behaviour & mode choice; perception & attitude; regulation, legislation & compliance; safety & risk-perception; user experience & accessibility) three selective codes can be constructed: experience, attitude, and usage. These three codes can also formulate the answer to the sub-questions as table 3 also shows. Table 7 shows which axial code is coded into which selective code.

Table 7: Axial codes to selective code

Selective code	*Axial code*
Experience	Hygiene & helmet-related experiences
	Functional & technical problems
	User experience & accessibility
	Safety & risk perception
Attitude	Perception & attitude
	Regulation, legislation & compliance
Usage	Mobility behaviour & mode choice

4.2 Experience

The first selective code focusses on two sub-questions:

- Has the willingness to use a shared scooter changed due to the helmet requirement?
- Will there be a difference between The Hague and Utrecht due to the availability of shared scooters?

Of the 60 respondents, 13 respondents were not familiar with the helmet requirement, or not familiar enough that they could explain what the helmet requirement is. The other 47 were familiar with the helmet requirement that has been introduced. The respondents who were unfamiliar with the helmet requirement, were explained the requirement in the interview, before continuing to the other questions.

> *"Um yes, I'm not that familiar with it because I don't ride a scooter, but I can very well imagine that it has been introduced" (Resp. 6)*

The analysis shows that for multiple respondents the helmet requirement is not a barrier to use the shared scooters in the future. During the coding 33 excerpts from interviews are coded to *helmet requirement not a barrier.* The excerpts show various ways of describing why the helmet requirement is not a barrier for them.

> *"Wouldn't matter to me, because I would wear a helmet anyway" (Resp. 12)*
>
> *"It doesn't matter. Seems like a reasonable idea to put on a helmet on" (Resp. 18)*
>
> *"No, if I need it then I don't mind putting a helmet on with it" (Resp. 49)*

For some respondents the helmet requirement is even a reason to use a shared scooter more in the future. Respondent 17 (non-user, Utrecht) even mentioned that they think it is completely justified that the helmet requirement has been put into place, and they would even like to see it extended to

other modalities, such as e-bikes. Respondent 13 (non-user, Utrecht) would also like to see an extension of the helmet requirement to e-bikes and normal bicycles.

"So for me the helmet requirement helps. (Resp. 9)

"Yes. Actually, regular bikes too" (Resp. 13)

"I think it is completely justified that it is compulsory. … I'm in favour of mandatory helmets on e-bikes" (Resp. 17)

"No, I think it's good that it was introduced anyway" (Resp. 32)

Other respondents have also mentioned that they feel it is safer to wear a helmet while using a shared scooter, and thus have no problem with the helmet requirement that has been put into place.

"Just seems safe to me" (Resp. 7)

"Yeah. Why not? Because it's for safety" (Resp. 28)

"I think the helmet makes sense. You look a bit silly, but it's safety first" (Resp. 37)

"No, I actually like the helmet requirement. That it's safe" (Resp. 52)

For some respondents that had no problems with the helmet requirement, there was a stipulation, namely that the helmet needed to come with the shared scooter.

"Oh those are included. OK, well, then the threshold is already a bit lower" (Resp. 15)

"No, no, no. If those helmets just come with it, No, then that would not change" (Resp. 20)

"I wouldn't use it anymore. Or does the helmet come with the scooter?" (Resp. 39)

The analysis has also shown that the willingness to use a shared e-scooter in the future is dependent on several factors. Respondent 45 (user, The Hague) mentioned that the future use depends on the service area and the cost. As they feel that the service area does not meet their needs and that the service is to expensive currently. However, if these two factors would change, the future use of shared

e-scooters is not excluded. Other factors that influence future use are the current inexperience with scooters in general and past negative experiences.

"Yes, so if you have a bigger range, bigger area and that it is cheaper then yes" (Resp. 45)

"Yes suppose I have driven a scooter and I have experience. Then maybe" (Resp. 43)

"I just think it should work properly, and that's kind of another reason why I just don't really use it now" (Resp. 60)

Another factor mentioned is the reluctant use in the future based on the implementation of the helmet requirement. Respondents 55 (user, The Hague) and 60 (user, The Hague) have mentioned that future use is impacted by the helmet requirement. Both respondents have mentioned that they would rather not use a shared scooter in the future and that they would avoid it if possible. Respondent 21 (non-user, Utrecht) has also mentioned that they would like to use a shared scooter in the future. However, they view the helmet requirement as a reason not to use it.

"Yes, maybe when I move into town. Only those helmets are not nice these days" (Resp. 21)

"If necessary, but only then. I'd rather not actually" (Resp. 55)

"Uhm yes, tricky question. If I can avoid it I'd rather avoid it. But if I really had to then I would use it" (Resp. 60)

A reason not to use a shared scooter in the future is the hassle the helmets bring with them. Respondent 51 (non-user, The Hague) mentioned that the helmet system with the bins on the back of the scooter would be a hassle to use and that this is the reason that they do not use a shared scoter. Respondent 60 (user, The Hague) also mentioned that they have had problems with putting the helmet back in the bins after they have finished their rides.

"Yes it is a hassle to get it in. Because there are always two of them and then it just doesn't go in" (Resp. 19)

"But I don't because I find it so much hassle" (Resp. 51)

"The moment I want to finish a ride and you want to put the case or helmet back in the case, I get an error message every time saying that the helmet wasn't back" (Resp. 60)

One of the reasons respondents have mentioned to not use a shared scooter in the future is due to the hygiene concerns regarding sharing the helmets. Respondent 46 (non-user, The Hague) replied immediately after explaining the content of the helmet requirement with "yuck", indicating the disgust regarding the helmet requirement and sharing the helmet while using the shared scooter.

"Yes I don't know. Doesn't seem nice to me if you then just have everybody wearing helmets and stuff. Everybody the same helmet" (Resp. 21)

"Well, it just stinks. Yes, of course I find that dirty. Well, that also depends a bit on whether I washed my hair. But yes, in general I do think so. Yes, it does stop me from taking the scooter" (Resp. 26)

"Oh yes, yuck sometimes I think about that too, that doesn't seem like anything I want to use at all" (Resp. 46)

"Because then you have to put one of those things on again and then yes I just find that dirty because other people have had their heads in there as well" (Resp. 54)

Respondent 26 (user, Utrecht) has explained that they always carry a canvas bag with her. If they then wants to use a shared scooter they puts the canvas bag on their head to cover their hair and puts the helmet on over the canvas bag. If they are not carrying the canvas bag, they would rather walk that use a shared scooter, and thus a shared helmet.

"If I don't have that with me, I'd rather walk. I find it really dirty, the helmets" (Resp. 26)

Respondent 59 (non-user, The Hague) has acknowledge the hygiene concerns, but does not see it as a reason not to use a shared scooter in the future.

"And yes, I, I can understand that people might find that a bit dirty. But yeah. You know, you wash your hair afterwards and then that's okay again" (Resp. 59)

Another concern regarding the helmet requirement is the aesthetic. Respondents feel like their outfits or hair will be ruined due to the helmet requirement. The concerns about appearance do influence their decision to use a shared scooter in the future.

"Yes well if you, have your hair looking nice for example" (Resp. 7)

"I don't like that very much because then my hair gets all messed up" (Resp. 45)

"Yes, it sounds very vain, but I think my hair is also ruined by such a stupid helmet. So I actually do think it does influence it" (Resp. 47)

Other respondent are also concerned about their appearance, however they do not feel like it would directly impact their willingness to use a shared scooter in the future.

"I don't think it affects me. But imagine you're on the way to a fancy event and you've just had your hair done. Then of course you don't go on the scooter, you just go by bike. Or by public transport" (Resp. 8)

"If you want your hair to stay in place or something. I don't know, but I'm just not into it myself" (Resp. 20)

"Well, I did think about the fact that I am less comfortable putting such a thing on my head. So if I've just washed my hair, I don't always do it. But no, I just take it" (Resp. 50)

To conclude, the experiences of users regarding the helmet requirement vary. Most users express negative views regarding the helmet requirement. The respondents have expressed discomfort or dissatisfaction regarding hygiene and convenience. A few users have expressed that they feel safer when using a helmet, however the overall conclusion was that the helmet requirement impact the spontaneous, easy-to-use appeal of the shared scooters. These views were particularly strong among the respondents from The Hague.

4.3 Attitude

The second selective code focusses on two sub-questions:

- Are users and non-users willing to wear a helmet when using a shared e-scooter?
- Do users and non-users find the helmet requirement a necessary safety precaution?

Out of the 60 respondents not one has replied that they would not wear a helmet while using a shared scooter. However, some respondents have expressed their hatred or displeasure towards helmets.

"I hate helmets" (Resp. 48)

"Everyone is whining because of that" (Resp. 50)

Although, respondent 48 has admitted to running red lights while driving a scooter. They still wear a helmet when driving a scooter, as they otherwise will be fined.

"they often drive through red lights, but so do I" (Resp. 48)

"Yes. Otherwise you will be fined" (Resp. 48)

Other respondents have mentioned that they would no longer be willing to use a shared scooter in the future, if that means they have to wear a helmet. With respondent 53 (user, The Hague) actually mentioning that they would like to see the helmet requirement being revoked. And respondent 20 (non-user, Utrecht) also finds the helmet requirement excessive.

"Everything is so protected and so on and so forth. You really do have to wear a helmet and sometimes I think that's just a bit excessive" (Resp. 20)

"I'm actually against it for scooters going for that 25. So yeah" (Resp. 53)

Respondents 3 and 48 also mentioned they have their own scooter, which they have used less since the helmet requirement.

"I had my own scooter, I haven't touched it since then" (Resp. 3)

"I did start using my own scooter less" (Resp. 48)

However, just because these respondents make less use of a scooter, does not mean that they would refuse to wear a helmet when using a scooter.

A reason for respondents that actually encourages them to wear helmets is the improved safety. Many respondents have answered that they view the helmet requirement has improved the safety from their perspective.

"Because it does get a bit safer with a helmet than without" (Resp. 12)

"But from a safety point of view. Yes I would. Because I mean, even if you hit the ground at fifteen kilometres an hour or ten kilometres an hour, you can have quite a lot of injury. So yes" (Resp. 45)

While people see the perceived safety improvements with the helmet requirements for scooter, when asked about a helmet requirement for e-bikes most reacted negatively. E-bikes can also reach speeds up to 25 km/h, the same as some of the shared scooters, however there is no helmet requirement for e-bikes.

"I wouldn't find it so nice myself, because then I'd also be walking all the time with one of those helmets like now in the city. Yes, I won't put it on my bike of course, because it gets stolen or gets dirty or whatever. So no, from a practical point of view I don't think I want one" (Resp. 45)

The attitude towards the helmet requirement were mixed. A large number of respondents perceive the helmet requirement positively, seeing it as improving the safety even if they find it a little inconvenient. Other respondents perceive the helmet requirement as a barrier to use the shared scooter in the future. Aesthetic and discomfort were common factors mentioned by the respondents, with respondents mentioning *messing up their hair* or being disgusted by the shared helmet. Even the non-users perceive the shared helmets as unhygienic.

4.4 Usage

The third selective code focuses on two sub-questions:

- Do users and non-users of shared scooter perceive the helmet requirement as a discouragement to use a shared scooter?
- Do users and non-users of shared scooter find wearing a helmet unhygienic?

The analysis from the experience selective code has already shown that there are respondents who do not mind wearing the helmet and respondents who do mind wearing the helmet while using a shared scooter. However, the comparison between users and non-users has not been made yet. Users are categorised as people who have used a shared scooter in the Netherlands, non-users are categorised as people who have not used a shared scooter in the Netherlands before. People who have used a shared scooter in a different country, but have not used a shared scooter in the Netherlands are also categorised as non-users.

Table 8 shows the division between the respondents who perceive the helmet requirement as a barrier and those who do not. Table 4 shows the division between the respondents who are users and who are non-users.

Table 8: Helmet requirement (not) a barrier

Helmet requirement	*a barrier*	*not a barrier*
Utrecht	2, 3, 5, 21, 26	1, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22, 23, 24, 25, 27, 28, 29, 30, 31, 32, 33, 34,
The Hague	39, 45, 46, 47, 48, 51, 53, 54, 55, 57, 60	36, 37, 38, 40, 41, 42, 43, 44, 49, 50, 52, 56, 58, 59

Respondent 35 (non-user, Utrecht) has not answered the question regarding the impact of the helmet requirement on the usage. Therefor for this analysis the answers of the other 59 respondents will be taken into consideration. Of the 59 respondents 16 (27%) (5 from Utrecht (31%) and 11 from The Hague (69%)) replied that the helmet requirement is a barrier, and 43 respondents (73%) (29 from Utrecht (67%) and 14 from The Hague (33%)) replied that the helmet requirement was not a barrier, as shown in table 9.

Table 9: Helmet requirement (not) a barrier by users and non-users

Helmet requirement	*A barrier*	*not a barrier*
Users Utrecht	2, 3, 26	11, 19, 32, 33
Non-users Utrecht	5, 21	1, 4, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 20, 22, 23, 24, 25, 27, 28, 29, 30, 31, 34
Users The Hague	45, 46, 47, 48, 53, 54, 55, 57, 60	41, 50, 56, 58
Non-users The Hague	39, 51	36, 37, 38, 40, 42, 43, 44, 49, 52, 59

To visualise these findings, figure 3 compares how users and non-users on both cities perceive the helmet requirement and whether they view it as a barrier or not. Figure 3 shows that only the category of users in The Hague have a different trend than the other groups. There are more users in The Hague that view the helmet requirement as a barrier than that there are users that do not view the helmet requirement as a barrier.

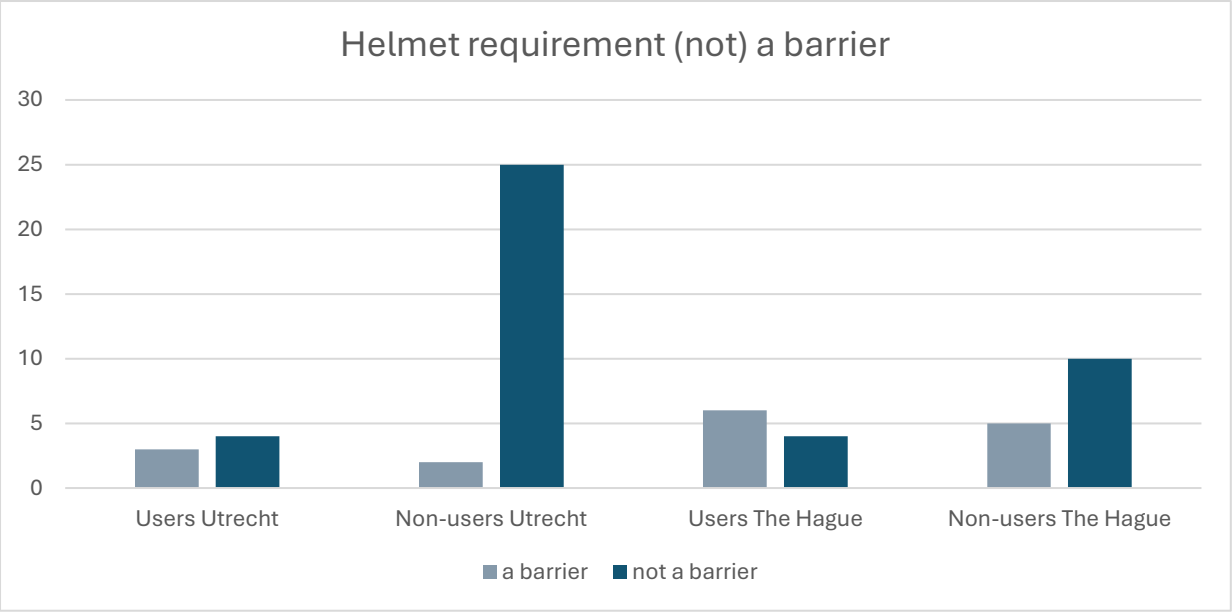

Figure 3: Helmet requirement (not) a barrier by users and non-users

Users in The Hague view the helmet requirement as a barrier, because they are worried about the hygiene of the shared helmet, as well as the troubles they have experienced with putting back the helmet and ending their ride.

> *"Yes, I just think it's dirty. With those helmets, I think it just got dirty. So I prefer to use my car or my bike" (Resp. 55)*

Non-users in The Hague view the helmet requirement as a barrier, because they do not like the effects the helmet has on their appearance, as well as that they are worried about the hygiene of the shared helmet. The non-users also indicated that they would rather use a different type of shared mobility, such as a bike or car for which they do not need a helmet.

> *"I don't, because I don't like anything on my head, so I'd rather take a shared bike then. Because yes, I go just as fast, but I don't need anything on it to use such a thing" (Resp. 51)*

Users in The Hague do not view the helmet requirement as a barrier, because they value the convenience of the shared scooter over the reasons why they would not want to use it anymore.

> *"Well, I did think about the fact that I am less comfortable putting such a thing on my head. So if I've just washed my hair, I don't always do it. But no, I just take it" (Resp. 50)*

Non-users in The Hague do not view the helmet requirement as a barrier, because they view it as making the shared scooters safer.

"No, I actually like the helmet requirement. That it's safe" (Resp. 52)

The difference between the amount of respondents that do or do not view the helmet requirement as a barrier in the group: users Utrecht is very minimal. The group consists only of 7 respondents. Of those 3 (43%) view the helmet requirement as a barrier and 4 (57%) do not view the helmet requirement as a barrier. The respondents who view the helmet requirement as a barrier find it inconvenient as the shared scooter loses its quick and easy usage, as well as the flexibility that comes with using a shared scooter. They are also worried about the hygiene of the shared helmets.

"I haven't used a shared scooter since then because I just find it inconvenient" (Resp. 2)

The users in Utrecht who do not view the helmet requirement as a barrier, view the helmet requirement as a positive. Since it becomes easier for them to choose between the shared scooters that go up to 25 km/h and those that go up to 45 km/h. However the respondents also recognise that the helmet requirement can affect the usage of other people.

"But I do think for some people that they would do those 25 kilometres that at first they would say well, I'll just take it real quick, but now that with a helmet because they think well I just don't" (Resp. 11)

"No, I think it's good that it was introduced anyway. And uhm now it is also easier to choose whether you go for a blue or a yellow licence plate (25km/h or 45km/h)" (Resp. 32)

The non-users in Utrecht who do view the helmet requirement as a barrier, do so because they view the helmet requirement as an extra step that they do not need to take with a different modality, such as a bike. They are also worried about the hygiene aspects of sharing a helmet with other people they do not know.

"I totally get it though. I just find it an extra barrier to use such a thing … Just another step I don't have to take by bike" (Resp. 5)

The non-users in Utrecht who do not view the helmet requirement as a barrier, do so because they view it as a necessary safety precaution. Some respondents have even mentioned that they would be

more likely to use the shared scooter now than before the helmet requirement as they find it much safer with a helmet.

> *"If the helmet comes with it. I would do it sooner yes. Because it does get a bit safer with a helmet than without. And if the helmet comes with it why not then" (Resp. 12)*

There are three respondents who have mentioned that it is not the helmet requirement that determines whether or not they would use it in the future, it is a fundamental disinterest in using a scooter, shared or private.

> *"No, no, no" Int.: Would the helmet requirement affect that? "No, I just really don't want to use a scooter ever" (Resp. 42)*

Out of all the respondents, 1 respondent has not answered the question regarding the influence of the helmet requirement on the future use. Of the other 59 respondents, 12 users and 4 non-users (in total 27%) find the helmet requirement a barrier. 8 users and 35 non-users (in total 73%) do not view the helmet requirement as a barrier.

One barrier is mentioned by both users and non-users from The Hague and Utrecht: hygiene. Multiple respondents have mentioned they are concerned about the hygiene regarding the shared helmets. These respondents have also said that these hygiene concerns are the reason why they are no longer use a shared scooter, or would never use a shared scooter in the future. The hygiene concern is the only factor that is consistent across cities and user type. This points to a universal concern that transcends experience and local context.

> *"Yes, then you have to put on a helmet like that and then, you don't know who has had that on before you and how many people have had that helmet on before you. And I just find that really, really dirty" (Resp. 60)*

The helmet requirement appears to have a tangible impact on shared scooter usage patterns, especially among infrequent or potential users. Several respondents explicitly stated that they avoided using shared scooters due to the helmet requirement, with hygiene and spontaneity cited as the most important reasons. The effect was more evident in The Hague. One of the users has found a workaround, opting to carry a canvas bag with them to use over their head to protect their hair when using a shared helmet. The data suggests that the helmet requirement has a negative impact on the usage of shared scooters.

5. Discussion

This chapter interprets the outcomes of the results in relation to the main question and the sub-questions. The aim of this research was to explore the attitudes of users and non-users toward shared scooters in The Hague and Utrecht, in relation to the implementation of the helmet requirement. The results were interpreted through the lens of the existing literature on micro-mobility, shared mobility, and policy implementation, as outlined in the literature review.

The main question of this research is:

"How do users and non-users of shared scooters experience the introduction of the helmet requirement in Utrecht and The Hague?"

In order to answer the main question a set of sub-questions have been constructed:

- Do users and non-users of shared scooters perceive the helmet requirement as a discouragement to use a shared scooter?
- Do users and non-users of shared scooter find wearing a helmet unhygienic?
- Are users and non-users willing to wear a helmet when using a shared scooter?
- Do users and non-users find the helmet requirement a necessary safety precaution?
- Has the willingness to use a shared scooter changed due to the helmet requirement?
- Will there be a difference between The Hague and Utrecht due to the availability of shared scooters?

The sub-questions have also been translated into hypotheses. These hypotheses will either be supported or not by the literature review and the results from the qualitative research that has been conducted.

5.1 Helmet requirement as a barrier

The first hypothesis: "users of shared scooters perceive the helmet requirement as a discouragement to shared scooter usage" is partially supported by the data. Of the 60 respondents in this research, 17 are categorised as users. Meaning they have used a shared scooter in the Netherlands previously. Out of the 17 users, 9 have indicated that the helmet requirement would be a barrier for them while 8 have indicated that it would not be a barrier for them.

Previous research has indicated that regulations that are perceived as inconvenient act as a deterrent to micromobility use (Guo & Zhang, 2021; Sievert et al., 2023). As the results have also shown, the users who perceive the helmet requirement as an inconvenience also view the helmet requirement as a barrier. So the results support the literature findings, however the difference between those who do find it a barrier and those who do not, is very minimal. Speak et al. (2023) suggests that only 32,1% of users supports the mandatory helmet wearing, however the results of this research do not reflect these numbers. A reason for this can be the small group of respondents who fit this criteria (being a user of shared mobility).

5.2 Hygiene concerns and helmet use

The second hypothesis: "users of shared scooters find wearing a helmet unhygienic" is supported by the data. Users frequently mentioned hygiene as a concern and a reason not to use the shared scooter. Hygiene is also the factor that is both mentioned by users and non-users of shared scooters. This also

matches the findings from the literature, as Haworth & Schramm (2023) and Ssi Yan Kai et al. (2024) have mentioned cleanliness and hygiene negatively influence the use of shared mobility.

Frank et al (2024) have indicated that the available infrastructure of the shared helmets is vital in the success of usage. The results also reflects this, as respondents go from seeing the helmet requirement a barrier to not finding it a barrier once they found out that the helmet is provided with the shared scooter.

5.3 Willingness to wear a helmet: users vs. non-users

The third hypothesis: “the willingness to wear a helmet is higher among non-users of shared scooters” is supported by the data. The fourth hypothesis: “non-users of shared scooters find the helmet requirement a necessary safety precaution” is also supported by the data. As mentioned 9 users find the helmet requirement a barrier for shared scooter usage, while 8 users do not. Of the 43 non-users, 7 non-users find the helmet requirement a barrier, while 35 do not. This data indicated that non-users are indeed more inclined to wear a helmet

The data also suggests that non-users find the helmet requirement a good safety precaution, indicating that some of them would use a shared scooter since the helmet requirement, while before the helmet requirement they would not. This is also supported by the literature, as Speak et al. (2023) shows that non-users have more favourable attitudes toward safety regulations, with 66,6% indicating helmet wearing should be mandatory.

5.4 Future usage potential

The fifth hypothesis: “non-users of shared scooters are more likely to try to use a shared scooter” is partially supported by the data. James et al. (2021) and Frank et al. (2024) indicate that safety and infrastructure improvements could convert some non-users to trying to use a shared scooter. 18 non-users have indicated they are interested in using shared scooters in the future, however 25 non-users have indicated they are not open to trying shared scooters in the future. Some non-users even expressing a fundamental disinterest in ever using a scooter, shared or privately owned. Some of the users who have indicated to be open to trying in the future were not familiar with shared scooters before the interview, so it cannot be determined whether these people are open to shared scooters due to the improved safety or due to wanting to explore a different mobility.

5.5 Implications for shared mobility in the Netherlands

While shared mobility is growing across urban centres (Jorritsma et al., 2021), the success of shared scooters depends heavily on local policy decisions, infrastructure support, and public perception. The helmet requirement, although rooted in safety goals, introduces a clear friction point between regulation and user convenience. As seen in Utrecht, where shared scooters were phased out due to limited added value and user overlap with shared bicycles, policy must align with user needs and behaviour. Although, shared micro-mobility continues to help reach environmental goals (Hamerska et al., 2022; Midgley, 2019), this research shows that the behavioural adaptation of safety policies is dependent on the attitude of users towards the policy. If they have a negative attitude towards it, due to for instance hygiene, safety, and convenience, the possibility exists that the mobility mode will no longer be used, or will be used less.

5.6 Limitations

Just like any research, this research and the interpretation of the results has its limitations. While the results still give a valuable insight into the perception of users and non-users, several limitations must be acknowledged.

First of all, the research was based on a sample size of 60 respondents. Of these 60 respondents only 17 were categorised as users, thus the small sample size limits the generalisation of the outcomes. However, as this is a qualitative research this was to be expected.

Second, the qualitative approach prioritises depth over generalisation. The research has provided rich data, which give an insight, the data cannot be generalised and interpretations based on characteristics such as gender, age, and ethnicity cannot be made.

Third, the research has been conducted in two specific cities: Utrecht and The Hague. These cities both have distinct landscapes for micro-mobility, which can influence the outcomes of this research. The outcomes cannot be directly translated to other urban (or rural) cities, as these circumstances might bring other outcomes, that are not present in this research.

Fourth, as any data-collection based on self-reported perception, a social desirability in the answers cannot be excluded.

Fifth, the outcomes of this research only have a limited timeframe in which they are relevant. Perceptions and attitude towards the helmet requirement may change, based on the familiarisation and improvement of infrastructure and awareness campaigns.

6. Conclusion

This research set out to explore how users and non-users of shared scooter in The Hague and Utrecht perceive the helmet requirement that has been put into place as of January 2023. By connecting the research outcomes to the existing theories, this research can highlight the contrast between the attitude of users non-users regarding the helmet requirement.

The results suggest that the acceptance of users regarding the helmet requirement is mixed. Some view it as a necessary safety measure, others perceive it as a barrier, particularly due to hygiene and inconvenience concerns. These concerns are also visible in previously conducted research, which emphasises that regulatory measures, such as the helmet requirement can hinder acceptance and adoption, if not implemented with users experiences in mind.

In contrast, non-users tend to view the helmet requirement more favourable. Many regard it as a necessity in regards to safety improvements. With also non-users indicating they are more likely to use a shared scooter due to the implementation of the helmet requirement than before its introduction. Although fundamental resistance to scooters as a form of transportation persists among other non-users.

The research also concludes that the urban context between locations matter. In The Hague user experiences are influenced by direct interaction, as shared scooters are available throughout the city. The experiences of respondents in Utrecht are influenced by the absence of shared scooter in the city. This highlights the importance of infrastructure and policies, which continue to shape the perception of the people.

All in all, this research has contributed to a better understanding of the experiences of users and non-users of shared scooters in regards to the helmet requirement. The outcomes emphasis the need to include citizens in the implementation of policies in the future, so they can express their concerns and ideas. By being able to express their opinions, it could have an effect on whether or not they accept the policy change.

7. Recommendations

Based on the findings and limitations of this research, this chapter presents recommendations for both practice and future research. The recommendations aim to give practical recommendations that policymakers, shared scooter providers, and researchers can implement in their policies and research.

7.1 Practical recommendations

First, municipalities should invest in communication strategies that promote helmet use as a socially accepted and responsible safety measure. This can include campaigns highlighting the personal stories of people who have had an accident or other situations in which the helmet is perceived positively. Other options are visual media presentations of helmet-wearing, making it the norm, and partnerships with influencers or other visible people in the community.

Second, to stimulate helmet wearing becoming the norm, it should be incorporated into traffic education. Incorporating the advantages, such as safety improvements, that come with wearing a helmet in traffic lessons in school or the theoretical exam when getting a driver's license, could improve the acceptance of helmet wearing in the long term.

Third, to address hygiene concerns, municipalities can work with shared mobility providers to ensure that helmets are well maintained and visibly clean. Possible solutions could be a disinfectant spray in the bin with the helmets or disposable hairnets that people can use. These measures can reduce resistance related to shared helmet use.

Fourth, peoples perception can change when they feel included. Municipalities should create a system in which citizens can share their feedback on planned policies. When citizens have had a chance to express their opinion, they might be more likely to accept the policy changes. This system could make use of surveys, panels, or focus groups.

Fifth, given the use of e-bikes and fat bikes, municipalities should monitor how these developments evolve in response to the helmet requirement. The mobility modes can reach the same speeds as a scooter. However, a helmet requirement for these mobility modes has not yet been introduced. Future improvements regarding regulations might be necessary if these mobility modes are becoming more popular, which could result in more accidents with these mobility modes.

Sixth, municipalities with a shared scooter system should work together with the shared scooter providers to develop user-friendly systems. One of the concerns was the inconvenience of putting the helmets back in the bin, which impacted the future usages of shared scooters. Other benefits from working together could be early indicators of dissatisfaction from users and early information about possible policy changes. It also provides the opportunity to collaborate on testing, as the shared scooter providers could run real-life tests, for changes the municipality might like to make.

7.2 Research recommendations

Several ideas for further research can be identified based on the limitations presented. Firstly, this research has identified in-depth qualitative insights into the perceptions of users and non-users regarding the helmet requirement. Quantitative research based on a larger scale would be valuable in examining the broader statistical impact of the helmet requirement on shared scooter usage in the Netherlands. This could help predict to what extent user patterns have changed across different

demographic groups and geographical contexts. Broader quantitative research could also provide more insight into trends in the Netherlands, not just in The Hague and Utrecht.

Second, future research could also investigate what the effect of the helmet requirement is on other micro-modes. Several respondents have mentioned that due to the helmet requirement they feel like more people have started using e-bikes and fat bikes. A research into this topic could confirm these hunches. Moreover, if this trend is confirmed, it could also be researched whether a helmet requirement is necessary for the mobility modes. The outcomes of this research could offer a new perspective on how safety regulations influences urban transport systems and user behaviour.

Third, building on the second recommendation a research into the necessity and acceptance of a helmet requirement for other micro-modes, such as e-bikes and fat bikes could give valuable insights in future development. E-bikes and fat bikes can reach the same speed as the scooters (25 km/h), but a helmet requirement has not been implemented for these mobility modes. Understanding the implications of a helmet requirement for these modes as well as the possible safety improvements, could open the discussion about the necessity. Research into the acceptance of such a helmet requirement could provide valuable insights for the implementation process.

8. References

Abduljabbar, R. L., Liyanage, S., & Dia, H. (2021). The role of micro-mobility in shaping sustainable cities: A systematic literature review. Transportation research part D: transport and environment, 92, 102734.

Adeoye-Olatunde, O. A., & Olenik, N. L. (2021). Research and scholarly methods: Semi-structured interviews. *Journal of the american college of clinical pharmacy*, *4*(10), 1358-1367.

Allem, J.-P., & Majmundar, A. (2019). Are electric scooters promoted on social media with safety in mind? *Journal of Health Psychology, 24*(4), 557–560. https://doi.org/10.1177/1359105318802530

Amberscript. (n.d.). *Amberscript [Transcription software]*. https://www.amberscript.com/

Badia, H., & Jenelius, E. (2023). Shared e-scooter micromobility: review of use patterns, perceptions and environmental impacts. *Transport reviews*, *43*(5), 811-837.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology*, *3*(2), 77-101.

Braun, V., & Clarke, V. (2013). *Successful qualitative research: A practical guide for beginners*. SAGE Publications.

Brown, A. E., Klein, N. J., & Thigpen, C. G. (2021). Impacts of e-scooters on sidewalk accessibility and social equity. *Transportation Research Part D: Transport and Environment, 94*, 102783. https://doi.org/10.1016/j.trd.2021.102783

Brown, A., & Durrheim, K. (2009). Different kinds of knowing: Generating qualitative data through mobile interviewing. *Qualitative Inquiry*, *15*(5), 911–930. https://doi.org/10.1177/1077800409333440

Bryman, A. (2016). *Social research methods*. Oxford university press.

Castellanos, S., Grant-Muller, S., & Wright, K. (2022). Technology, transport, and the sharing economy: Towards a working taxonomy for shared mobility. *Transport reviews*, *42*(3), 318-336.

Centraal Bureau voor Statistiek (2024, 10 April). 684 verkeersdoden in 2023. Obtained on 19/04/2024. Obtained from https://www.cbs.nl/nl-nl/nieuws/2024/15/684-verkeersdoden-in-2023

Cleanrider.com (2019). Libre-service: les scooters électriques de Felyx débarquent à Bruxelles. Obtained on 12/05/2025. Obtained from https://www.cleanrider.com/actus/libre-service-scooters-lectriques-felyx-bruxelles/

Creswell, J. W., & Poth, C. N. (2016). *Qualitative inquiry and research design: Choosing among five approaches*. Sage publications.

CROW & Rijksoverheid (2022). Evaluatie City Deal elektrische deelmobiliteit in stedelijke gebiedsontwikkeling. *Ede: Centrum voor Regelgeving en Onderzoek in de Grond-, Water- en Wegenbouw en de Verkeerstechniek.* Obtained on 23/05/2024. Obtained from https://www.rijksoverheid.nl/documenten/rapporten/2022/03/31/evaluatie-city-deal-elektrische-deelmobiliteit-in-stedelijke-gebiedsontwikkeling

CROW (2022). Utrecht kiest voor de deelfiets in plaats van de deelscooter. *Ede: Centrum voor Regelgeving en Onderzoek in de Grond-, Water- en Wegenbouw en de Verkeerstechniek.* Obtained on 23/05/2024. Obtained from https://fietsberaad.nl/Kennisbank/Utrecht-kiest-voor-de-deelfiets-in-plaats-van-de-d

CROW (2024). Staat van de Deelmobiliteit 2023. Kennisplatform CROW.

CROW (2025). Staat van de Deelmobiliteit 2024. Kennisplatform CROW.

Davidson, C. (2009). Transcription: Imperatives for qualitative research. *International Journal of Qualitative Methods, 8*(2), 35–52. https://doi.org/10.1177/160940690900800206

De gelderlander (2022, 20 September). Felyx en Check gaan deelscooters naar Nijmegen brengen, GO Sharing en Bolt 'krijgen' de fietsen. Obtained on 26/04/2024. Obtained from https://www.gelderlander.nl/nijmegen/felyx-en-check-gaan-deelscooters-naar-nijmegen-brengen-go-sharing-en-bolt-krijgen-de-fietsen~a81eeded/

Dunn, K. (2000). Interviewing. In Hay, I. *Qualitative research methods in human geography* (p. 149-188. Oxford.

Fishman, E., Washington, S., & Haworth, N. (2013). Bike share: A synthesis of the literature. *Transport Reviews*, *33*(2), 148–165. https://doi.org/10.1080/01441647.2013.775612

Frank, S., Sator, T., Kinsky, R. M., Frank, J. K., Frank, R., Fialka, C., Mittermayr, R. & Boesmueller, S. (2024). Continuously increasing e-scooter accidents and their possible prevention in a large European city. European journal of trauma and emergency surgery, 1-10.

Gemeente Den Haag (n.d.(a)). Reis gemakkelijk met deelvervoer. Obtained on 23/05/2024. Obtained from https://duurzamestad.denhaag.nl/deelvervoer/

Gemeente Den Haag (n.d.(b)). Deelscooter voor langere ritjes. Obtained on 23/05/2023. Obtained from https://duurzamestad.denhaag.nl/deelvervoer/deelscooter/

Gemeente Utrecht (n.d.). Deelvervoer. Obtained on 23/05/2024. Obtained from https://utrecht-monitor.nl/fysieke-leefomgeving/mobiliteit/deelvervoer#:~:text=Sinds%20december%202022%20zijn%20er%20geen%20deelscooters%20meer%20in%20de%20gemeente%20Utrecht.

Gobo, G., & Marciniak, L. T. (2016). *Street ethnography: The go-along as a new form of ethnographic interviewing*. *Qualitative Research*, 16(6), 604–620. https://doi.org/10.1177/1468794116668035

Goudappel (n.d.). Deelmobiliteit is hét middel voor minder autobezit in de stad. Obtained on 23/05/2024. Obtained from https://www.goudappel.nl/nl/themas/klimaat-en-energie/duurzame-mobiliteit/deelmobiliteit

Grimm, P. (2010). Social desirability bias. In Sheth, J. N., & Malhotra, N. K. (Eds.), *Wiley International Encyclopedia of Marketing*. Wiley. https://doi.org/10.1002/9781444316568.wiem02057

Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field methods*, *18*(1), 59-82.

Guo, Y., & Zhang, Y. (2021). Understanding factors influencing shared e-scooter usage and its impact on auto mode substitution. *Transportation research part D: transport and environment*, *99*, 102991.

Guo, Y., & Zhang, Y. (2021). Understanding factors influencing shared e-scooter usage and its impact on auto mode substitution. Transportation research part D: transport and environment, 99, 102991.

Hamerska, M., Ziółko, M., & Stawiarski, P. (2022). A sustainable transport system—The MMQUAL model of shared micromobility service quality assessment. *Sustainability*, *14*(7), 4168.

Hamzani, Y., Bar Hai, D., Cohen, N., Drescher, M. J., Chaushu, G., & Yahya, B. H. (2021). The impact of helmet use on oral and maxillofacial injuries associated with electric-powered bikes or powered scooter: a retrospective cross-sectional study. *Head & Face Medicine*, *17*, 1-8.

Haworth, N., & Schramm, A. (2023). Factors associated with helmet use by e-scooter riders. In *Proceedings of the 2023 Australasian Road Safety Conference* (pp. 221-223). Australasian College of Road Safety (ACRS).

HLN.be (2021). Antwerpen heeft er in een klap 400 deelscooters bij: felgroene brommertjes van Go Sharing komen voor het eerst naar België. Obtained on 12/05/2025. Obtained from https://www.hln.be/antwerpen/antwerpen-heeft-er-in-een-klap-400-deelscooters-bij-felgroene-brommertjes-van-go-sharing-komen-voor-het-eerst-naar-belgie~a28a103b/?referrer=https%3A%2F%2Fwww.ecosia.org%2F

James, O., Swiderski, J., Hicks, J., Teoman, D., & Buehler, R. (2021). Pedestrians and e-scooters: Perceptions and reactions to a new mode. *Transportation Research Part F: Traffic Psychology and Behaviour, 75*, 295–307. https://doi.org/10.1016/j.trf.2020.10.006

Jorritsma, P., Witte, J., Alonso-Gonzáles, M., & Hamersma, M. (2021). Deelauto-en deelfietsmobiliteit in Nederland; Ontwikkelingen, effecten en potentie. *Den Haag: Kennisinstituut voor Mobiliteitsbeleid*.

Karatsareas, P. (2022). Semi-structured interviews. *Research methods in language attitudes*, 99-113.

Knoope, M.M.J., Uitbeijerse, G.C.M. &. Van der Knokke, Q.I. (2024). Deelscooters: impact op de leefomgeving. Klimaatimpact en andere milieuaspecten over de hele levenscyclus. Achtergrondrapport. Den Haag: Kennisinstituut voor Mobiliteitsbeleid (KiM).

Kusenbach, M. (2003). Street phenomenology: The go-along as ethnographic research tool. Ethnography, 4(3), 455-485.

Machado, C. A. S., de Salles Hue, N. P. M., Berssaneti, F. T., & Quintanilha, J. A. (2018). An overview of shared mobility. *Sustainability*, *10*(12), 4342.

Midgley, P., 2019. Global Consultation for Decision-Makers on Implementing Sustainable Transport: Bike Sharing. United Nations.

Movares (2023). Synthese deelscooters. In opdracht van Check, Flyx en Go Sharing. Utrecht: Movares

Movares (2023, 14 July). Rapport deelscootermarkt: miljoenen autoritten vervangen door deelscooter. Obtained on 19/04/2023. Obtained from https://movares.nl/nieuws/rapport-deelscootermarkt-miljoenen-autoritten-vervangen-door-deelscooter/

Patton, M. Q. (2015). *Qualitative research and evaluation methods* (4th ed.). SAGE Publications.

Pimentel, R. W., Lowry, M. B., & Pacific Northwest Transportation Consortium. (2020). *If you provide, will they ride? Motivators and deterrents to shared micro-mobility* (No. 2018-S-WSU-1). Pacific Northwest Transportation Consortium (PacTrans)(UTC).

QSR International. (2023). *NVivo (Version 14) [Computer software]*. https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home

Rijksoverheid (2022, 30 June). Helmplicht op snorfiets vanaf 1 januari 2023. Obtained on 19/04/2024. Obtained from https://www.rijksoverheid.nl/actueel/nieuws/2022/06/30/voorstel-nieuwsbericht-helmplicht

Rijksoverheid (n.d.). Moet ik een helm dragen op mijn brommer, snorfiets of speedpedelec?. Obtained on

Rijkswaterstaat (n.d.(a)). Actuele verkeersongevallen cijfers. Obtained on 19/04/2024. Obtained from https://www.rijkswaterstaat.nl/wegen/wegbeheer/onderzoek/verkeersveiligheid-en-ongevallencijfers/actuele-verkeersongevallencijfers

Rijkswaterstaat (n.d.(b)). Factsheet Deelscooters. Obtained on 19/04/2024. Obtained from https://rwsduurzamemobiliteit.nl/slag/toolbox-slimme-mobiliteit/factsheet-deelscooters/

Scheepers, P., Tobi, H. & Boeije, H. (2016). Onderzoeksmethoden. Amsterdam: Boom uitgevers.

Shaheen, S., & Cohen, A. (2018). Shared mobility policy briefs: Definitions, impacts, and recommendations.

Shaheen, S., & Cohen, A. (2020). Mobility on demand in the United States: From operational concepts and definitions to early pilot projects and future automation (pp. 227-254). Springer International Publishing.

Shaheen, S., Chan, N., Bansal, A., & Cohen, A. (2015). Shared mobility: A sustainability & technologies workshop: definitions, industry developments, and early understanding.

Sievert, K., Roen, M., Craig, C. M., & Morris, N. L. (2023). A survey of electric-scooter riders' route choice, safety perception, and helmet use. Sustainability, 15(8), 6609.

Sofaer, S. (1999). Qualitative methods: what are they and why use them?. *Health services research*, *34*(5 Pt 2), 1101.

Speak, A., Taratula-Lyons, M., Clayton, W. & Shergold, I., (2023) "Scooter Stories: User and Non-User Experiences of a Shared E-Scooter Trial", *Active Travel Studies* 3(1). doi: https://doi.org/10.16997/ats.1195

Ssi Yan Kai, N., Haworth, N., & Schramm, A. (2024). Understanding nonuse of mandatory e-scooter helmets. *Traffic injury prevention*, *25*(5), 757-764.

Stassen, H. S., Atalik, T., Haagsma, J. A., Wolvius, E. B., Verdonschot, R. J. C. G., & Rozeboom, A. V. J. (2024). Effect of helmet use on maxillofacial injuries due to bicycle and scooter accidents: a systematic literature review and meta-analysis. *International journal of oral and maxillofacial surgery*, *53*(1), 28-35.

SWOV (2024). Moped and light moped riders. Obtained on 23/05/2025. Obtained from https://swov.nl/en/fact-sheet/moped-and-light-moped-riders

Temple, B., & Young, A. (2004). Qualitative research and translation dilemmas. *Qualitative Research*, *4*(2), 161–178. https://doi.org/10.1177/1468794104044430

Universiteit Twente (2021). Slimme mobiliteitshubs veranderen vervoer. Obtained on 23/05/2023. Obtained from https://www.utwente.nl/onderzoek/themas/resilient/nieuws/2021/2/954487/slimme-mobiliteitshubs-veranderen-vervoer

van Nes, F., Abma, T., Jonsson, H., & Deeg, D. (2010). Language differences in qualitative research: Is meaning lost in translation? *European Journal of Ageing,* *7*(4), 313–316. https://doi.org/10.1007/s10433-010-0168-y

Winchester, H. P. M. & Rofe, M. W. (2000). Qualitative Research and Its Place in Human Geography. In Hay, I. (Red.). *Qualitative research methods in human geography* (p. 3-28). Oxford.

Appendix A: Open coding scheme

Name	*References*
Acceptance of recurring technical failure	2
Accessibility may increase risk due to inexperienced users	4
Advocates broader helmet requirements	5
Against helmet requirement	1
Against helmet requirement for e-bikes	4
Age and lack of car influence use	1
Annoyance by helmet system	1
Annoyance due to helmet requirement	1
Annoyance with certain rider behaviour	2
App doesn't work	1
App functionality frustrating	3
App interface and parking unclear	2
App issues annoying but not a dealbreaker	1
Awareness of helmet requirement	25
Awareness of shared scooters	38
Bad customer service experience	1
Bad experience putting the helmet away, reason to not use it in the future	1
Collision wih motor vehicle while on scooter	1
Compliance with regulation	1
Concerns about irresponsible users	1
Concerns about practicality and logistics	1
Conditional helmet use on e-bike	1
Conditional respect for scooter users	5
Convenience of alternative transport	2
Cost-saving	1
Cultural and geographical comparison	3
Customer service experiences vary by provider	1
Custumer service inefficiency	1
Different mode frequently seen	1
Discomfort with shared helmet aesthetics or hygiene	4
Dislike of shared helmet use	2
Distinction between shared and private scooters	2
No distinction between scooter types	6
Emotional impact of parking difficulties	2
Emotional resistance to change in transport	2
Emphasis on personal responsibility	1
Everything within walking distance	1

Familiar with traditional scooters	1
Fear and safety concerns due to others' accidents	1
Feeling of safety while using scooters	10
Feels moderatly safe, but not quite comfortable	1
Frustration with scooter unlocking	1
Functional problems not due to the app itself	1
Future use dependent on experience	1
Future use depends on cost and area	1
Good public transport access	1
Have used shared scooter	11
Helmet condition affects usage	1
Helmet discomfort in warm weather	1
Helmet doesn't change riding habits	1
Helmet hygiene directly affects usage	7
Helmet improves safety for vulnerable groups	2
Helmet requirement as a barrier	16
Helmet inconvenience for appearance	11
Helmet requirement compliance varies by user	2
Helmet requirement has a mixed impact	2
Helmet requirement improves safety	11
Helmet requirement is socially akward	1
Helmet requirement not a barrier	33
Helmet requirement not a barrier - fundamental disinterest	1
Helmet requirement reduces usage	3
Helmet resistance persists despite risk	1
Helmet storage inconvenience	5
Helmet system is time-consuming	3
Helmet use clashes with Dutch cycling culture	1
Helmet use motivated by personal fear	2
Helmet use normalised across different activities	1
Hemet requirement not a deciding factor	1
Hemet requirement reduces spontaneous use	2
Hygiene concern acknowledged, but not a barrier	1
Inaccuracy of geo-location feature	11
Inconvenient parking zone regulations	2
Irresponsible scooter behaviour (general)	18
Knowledge of local scooter history	2
Lack of confidence despite license	1
Lack of confidence in traffic skills	1
Lack of interest in scooter transport	5

Lack of knowledge and experience with scooters	11
Lack of presence in Utrecht	3
Lack of private transport	1
Legal restriction and inconvenience of road use	2
Less care with non-owned property	4
Living in rural area makes scooters unnecessary	1
Low exposure to shared scooters	1
Low perceived accessibility or unfamiliarity with process	1
Minor safety concerns while using scooters in traffic	2
Unfamiliar with the concept of shared scooters	3
Minority of users harm reputation	1
Misunderstanding about shared scooter features	2
Modality shift due to helmet requirement	1
Needed help first time using helmet	1
Negative past experience deters future use	1
Negative past experience shapes attitude	1
Negative perception of delivery scooter users	3
Negative perception of scooter user behaviour	2
Never used shared scooter	30
No app problems with ride termination or zone errors	1
No future interest	16
No issues returning the helmet	1
No issues with other users	2
No opinion on road respect	5
No perceived disrespect towards scooter users	11
No personal need for scooter	3
No strong barriers to scooter use	1
No transport needed	1
Non-use due to inability or lack of skill	1
Normalisation of traffic violations	1
Observations of bad scooter behaviour but not highly annoyed	2
Occasional utility (emergeny use only)	1
Opposition to helmet use on e-bike	4
Other transport modes also seen as reckless	3
Experience with shared e-bikes	1
Parking challenges and restrictions for shared scooters	2
Parking difficulties, not locking	3
Parking restrictions affect usage	3
Partial familiarity with helmet requirement	1
Passive experience with scooters	3

Perceived complexity of use	1
Perceived cost too high	3
Perceived danger to self and others	1
Perceived inconsistency in helmet laws; critique of regulation	1
Perceived irresponsibility of other traffic	1
Perceived legal barrier; license requirement	6
Perceived respect for shared scooters by others	16
Perceived safety depends on driver's skill	1
Perceives inconsistency in regulation	1
Personal accident increases safety awareness	1
Personal identity shapes mobility choice	2
Personal risk due to phone dependent	1
Personal vehicle ownership removes need for sharing	5
Physical and legal constraint to use	1
Practical difficulties with helmet return mechanism	2
Practical need for scooter	1
Preference for bicycle	9
Preference for car over scooter	2
Preference for OV-bike	2
Preference for pasenger role over driving	1
Preference for private transport	5
Preference for shared car over scooter	1
Preference for shared scooter over public transport	1
Preference for walking	3
Prefers cycle path over road for safety reasons	1
Prefers low-traffic or recreational area	1
Previous experience with helmet use	1
Providing helmet reduces barrier	2
Proximity to public transport and bike reduces need for scooters	2
Regional difference in traffic behaviour	1
Regret over removal of shared scooters	1
Relied on others for technical use	1
Reluctance or forgetfulness to report issue	1
Reluctant future use, only if needed	2
Reporting problems to provider; perceived lack of follow-up	1
Responsive customer service	6
Ride termination issues	1
Risk due to quiet electric vehicles	2
Risky (illigal) route choice due to speed mismatch	1
Role-based traffic perception	1

Scooter useage	1
Scooter users are not respected in traffic	5
Scooter users disrespected by cyclists	2
Sees regulation as excessive	1
Shared scooter as last resort	1
Shared scooter seen as alternative for bike theft	1
Shared scooter valued for convenience	2
Shared scooter valued for flexibility	1
Shared scooters used for convenience	4
Shared scooters useful in city centre (parking limitations)	1
Shift in choice toward faster scooters due to helmet requirement	3
Skepticism toward regulation and safety enforcement	1
Speed limitation issues causing unsafe situations	1
Strong dislike of helmets	1
Strong support for helmet requirement	1
Supports helmet requirement	1
Supports helmet requirement for minors only (e-bike)	3
Supports shared scooter concept despite not using	1
Positive overall evaluation of shared scooter system	1
Supports voluntary helmet use	1
Technical issues	4
Technical issues can cause fine	1
Terminology matters (rental vs shared)	2
Time-rich lifestyle reduces need for scooters	1
Traffic should be made safer for micro-mobility	1
Trip context influences transport mode choice	1
Unaware of helmet requirement	12
Unaware of shared scooters	3
Unaware of support channels	1
Uncertainty about liability for shared scooter demage	1
Unclear regulations for users	3
Understands comparison with car sharing	1
Urban bike convenience	2
Urban living increases potential for scooter use	1
Use triggered by public transport disruption	2
Used e-scooters abroad, not in NL	1
User behaviour varies	1
Users cautious due to infrequent use	1
Visibility issues at night	1
Willing to use abroad, not domestically	2

Willingness to use shared scooters again	4
Helmet requirement increases willingness	2
Workaround for helmet hygiene	1
Workaround for technical failure	7
Would use in the future	19
would use in unfamiliar locations	1
Younger people more affected by helmet rule	2
Youth associated with antisocial scooter use	6

Appendix B: Axial coding scheme

Axial code	*Open code*
Functional & technical problems	Acceptance of recurring technical failure
	Inaccuracy of geo-location feature
	Responsive customer service
	Ride termination issues
	Technical issues
	Technical issues can cause fine
	Workaround for technical failure
	Inconvenient parking zone regulations
	Parking challenges and restrictions for shared scooters
	Parking difficulties, not locking
	Parking restrictions affect usage
Hygiene & helmet-related experiences	Annoyance by helmet system
	Annoyance due to helmet requirement
	Bad experience putting the helmet away, reason to not use it in the future
	Discomfort with shared helmet aesthetics or hygiene
	Dislike of shared helmet use
	Helmet condition affects usage
	Helmet discomfort in warm weather
	Helmet doesn't change riding habits
	Helmet hygiene directly affects usage
	Helmet improves safety for vulnerable groups
	Helmet inconvenience for appearance
	Helmet requirement as a barrier
	Helmet requirement compliance varies by user
	Helmet requirement has a mixed impact
	Helmet requirement improves safety
	Helmet requirement increases willingness
	Helmet requirement reduces usage
	Helmet storage inconvenience
	Helmet system is time-consuming
	Helmet use motivated by personal fear
	Helmet use normalised across different activities
	Hemet requirement not a deciding factor
	Hemet requirement reduces spontaneous use
	Hygiene concern acknowledged, but not a barrier

	Modality shift due to helmet requirement
	Needed help first time using helmet
	Practical difficulties with helmet return mechanism
	Previous experience with helmet use
	Providing helmet reduces barrier
	Workaround for helmet hygiene
Mobility behaviour & mode choice	Age and lack of car influence use
	Convenience of alternative transport
	Cost-saving
	Different mode frequently seen
	Everything within walking distance
	Familiar with traditional scooters
	Future use dependent on experience
	Future use depends on cost and area
	Good public transport access
	Have used shared scooter
	No strong barriers to scooter use
	Practical need for scooter
	Personal vehicle ownership removes need for sharing
	Scooter useage
	Shared scooter as last resort
	Shared scooter valued for convenience
	Shared scooter valued for flexibility
	Shared scooters used for convenience
	Shared scooters useful in city centre (parking limitations)
	Shift in choice toward faster scooters due to helmet requirement
	Urban bike convenience
	Urban living increases potential for scooter use
	Use triggered by public transport disruption
	Visibility issues at night
	Willing to use abroad, not domestically
	Would use in the future
	would use in unfamiliar locations
	Younger people more affected by helmet rule
Perception & attitude	Advocates broader helmet requirements
	Against helmet requirement
	Against helmet requirement for e-bikes

Annoyance with certain rider behaviour
Conditional respect for scooter users
Cultural and geographical comparison
Emotional resistance to change in transport
Emphasis on personal responsibility
Helmet requirement is socially akward
Helmet requirement not a barrier
Helmet requirement not a barrier - fundamental disinterest
Helmet resistance persists despite risk
Helmet use clashes with Dutch cycling culture
Lack of interest in scooter transport
Less care with non-owned property
Minority of users harm reputation
Negative past experience shapes attitude
Negative perception of delivery scooter users
Negative perception of scooter user behaviour
No future interest
Observations of bad scooter behaviour but not highly annoyed
Opposition to helmet use on e-bike
Other transport modes also seen as reckless
Passive experience with scooters
Perceived inconsistency in helmet laws; critique of regulation
Perceived irresponsibility of other traffic
Perceives inconsistency in regulation
Personal identity shapes mobility choice
Positive overall evaluation of shared scooter system
Preference for bicycle
Preference for car over scooter
Preference for OV-bike
Preference for pasenger role over driving
Preference for private transport
Preference for shared car over scooter
Preference for shared scooter over public transport
Preference for walking
Regret over removal of shared scooters
Reluctant future use, only if needed

	Role-based traffic perception
	Scooter users are not respected in traffic
	Scooter users disrespected by cyclists
	Sees regulation as excessive
	Shared scooter seen as alternative for bike theft
	Skepticism toward regulation and safety enforcement
	Strong dislike of helmets
	Strong support for helmet requirement
	Supports helmet requirement
	Supports helmet requirement for minors only (e-bike)
	Supports shared scooter concept despite not using
	Supports voluntary helmet use
	Terminology matters (rental vs shared)
	Unaware of shared scooters
	User behaviour varies
	Willingness to use shared scooters again
	Youth associated with antisocial scooter use
Regulation, legislation & compliance	Compliance with regulation
	Conditional helmet use on e-bike
	Distinction between shared and private scooters
	Helmet requirement compliance varies by user
	Legal restriction and inconvenience of road use
	No distinction between scooter types
	Normalisation of traffic violations
	Perceived legal barrier; license requirement
	Perceives inconsistency in regulation
	Physical and legal constraint to use
	Sees regulation as excessive
	Skepticism toward regulation and safety enforcement
	Supports helmet requirement
	Supports helmet requirement for minors only (e-bike)
	Supports voluntary helmet use
	Traffic should be made safer for micro-mobility
	Unclear regulations for users
	Understands comparison with car sharing
	Unaware of helmet requirement
Safety & risk-perception	Collision wih motor vehicle while on scooter

	Concerns about irresponsible users
	Concerns about practicality and logistics
	Emotional impact of parking difficulties
	Fear and safety concerns due to others' accidents
	Feeling of safety while using scooters
	Feels moderatly safe, but not quite comfortable
	Helmet improves safety for vulnerable groups
	Helmet use motivated by personal fear
	Irresponsible scooter behaviour (general)
	Minor safety concerns while using scooters in traffic
	Negative past experience deters future use
	Perceived danger to self and others
	Perceived respect for shared scooters by others
	Personal accident increases safety awareness
	Personal risk due to phone dependent
	Prefers cycle path over road for safety reasons
	Prefers low-traffic or recreational area
	Regional difference in traffic behaviour
	Risk due to quiet electric vehicles
	Risky (illigal) route choice due to speed mismatch
	Speed limitation issues causing unsafe situations
	Users cautious due to infrequent use
User experience & accessibility	Accessibility may increase risk due to inexperienced users
	Awareness of helmet requirement
	Awareness of shared scooters
	Bad customer service experience
	Customer service experiences vary by provider
	Custumer service inefficiency
	Knowledge of local scooter history
	Lack of confidence despite license
	Lack of confidence in traffic skills
	Lack of knowledge and experience with scooters
	Lack of presence in Utrecht
	Lack of private transport
	Low perceived accessibility or unfamiliarity with process
	Misunderstanding about shared scooter features
	Never used shared scooter

No app problems with ride termination or zone errors
No issues returning the helmet
No opinion on road respect
No perceived disrespect towards scooter users
Non-use due to inability or lack of skill
Partial familiarity with helmet requirement
Perceived complexity of use
Perceived cost too high
Perceived safety depends on driver's skill
Reluctance or forgetfulness to report issue
Unaware of support channels
Uncertainty about liability for shared scooter demage
Unfamiliar with the concept of shared scooters