

MASTER'S THESIS

User-centric Requirements for Integrated Mobility Concepts and Conceptualization of Mobility Plans

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Abstract

In a world plagued by the climate crisis, private cars are increasingly viewed critically, especially in metropolitan areas. Many innovative Mobility-as-a-Service solutions are supposed to enable the comfort of a private vehicle without one. These are usually citywide concepts which are not very personal. Integrated mobility concepts, on the other hand, are implemented on a smaller scale in a neighborhood. They are intended to provide an alternative to private cars. It is essential to cover individual needs to make such concepts successful and attractive for residents and workers. The bundling of relevant mobility offers is a modern method to support behavior change.

In this work a mixed-method approach is used. To meet the complex demand structure, mobility types are used to create a comprehensive approach. The data *Mobilität in Deutschland* is mapped to mobility types along their attitudes towards transportations modes and evaluated. This quantitative approach is qualitatively complemented by sixteen semi-structured interviews. As a teaser for the interviews, an online survey was conducted to pre-identify the mobility types and further relevant mobility data, 126 people participated. Cooperative residents enrich findings with experience reports on an implemented mobility concept. Based on the results, initial user-oriented needs, components, and mobility plans are identified.

The outcomes of the data analysis show that mobility types differ in their choice of modes but not in the time spent on a given activity by a given mode of transport. The analysis of the interviews highlight the following key components: Car and cargo bike sharing, a (bookable) parking space, tenant tickets, bike parking and service offerings, a workshop, and a mobility manager. The consideration of individual plans has allowed the derivation of four aggregated final mobility plans: '*pay-as-you-go*', '*car-owner*', '*getting-rid-of-car*', and '*cargo-bike*'. They are composed of a base (tenant ticket, bike parking + service, workshop, mobility manager) and a respective combination of parking, car and cargo bike sharing. The volume for a mobility plan can be estimated at around ten to fifteen hours per month for car sharing and four hours per month for cargo bike sharing. A pay-as-you-go option seems essential in order not to discourage people.

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1 Introduction

Neighborhood mobility concepts are getting increasingly more attention since the transportation sector is one of the main sectors to target to reach certain climate goals. Although Germany reduced emissions in 2020 due to the COVID-19 pandemic, it is still approx. 40 % off its 2035 objectives (Umweltbundesamt, 2022). Population growth and urbanization are additionally straining urban infrastructure. In Munich, private cars are still used for every fourth trip (Nobis & Kuhnimhof, 2019). An uncontrolled introduction of autonomous fleets could cause this ratio to rise in the future (Hörl et al., 2019). Therefore, it is essential to offer people alternatives.

Integrated mobility concepts (IMC) in residential and workplace areas can be a cornerstone in mobility management. On the one hand, it is important to offer people mobility options to reduce car dependence. On the other, decreasing car usage may lead to more carless households (HH) and consequently fewer parking space needs, reducing construction costs of new real estate developments. Due to the difficulty in predicting the usage, little planning security and low economic efficiency can be achieved. Bundling mobility offers might address the use and acceptance of residents.

Currently, research is focused on city-wide MaaS concepts (Esztergár-Kiss & Kerényi, 2020; Guidon et al., 2018; Matyas, 2020; Whim Helsinki, 2022). This work focuses on a smaller neighborhood unit. In addition, a combination of quantitative data analysis and qualitative interviews will provide a first basis for further research in this field. IMCs on a neighborhood scale might be more personal and, therefore, more effective in addressing behavioral change.

This work aims to identify the different demands of different mobility types from literature mapped to *Mobilität in Deutschland* Data. In addition, the individual perspectives of people in Munich will help to understand the user perspective and relevant components. Questions like 'What is essential, what is less pertinent, and how can it be put together in a mobility plan?' are answered. The focus is on the latter because it is a physical concept whose success lives through the application and use of people.

This thesis looks at the pertinent factors, starting in chapter 2 with the results of literature research on the different mobility types, followed by an overview of integrated mobility concepts in their current state in Germany. Finally, literature on bundling mobility plans is highlighted. Then, the methodology underlying this work is described, and the results from the data analysis and interviews are illustrated. After, the discussion of the results in chapter 5, chapter 6 notes the most important findings and provides an outlook for further scientific research. The appendix contains additional information. It is referred to in the text in each case.

2 Literature Review

This chapter briefly discusses the theories around travel behavior and how and when habits can change. Next, it looks at different mobility types and their composition and demands. Subsequently, integrated mobility concepts, around which everything evolves, are presented. The legal situation is examined, the components are described, and the effect on traffic behavior is analyzed. Finally, scientific studies on the bundling of mobility offers combined with Mobility-as-a-Service are introduced.

2.1 Travel Behavior

I would like to look at the theoretical background of traffic generation and how individuals eventually decide to participate in traffic. In addition, I would like to briefly show which effects can change habitual behavior, which is relevant to establishing more sustainable behavior in the course of the climate crisis.

As a rule, one agrees that there are needs that need to be satisfied. The motivation to overcome space arises, and travel demand is generated. A distinction is usually made between mobility derived from other needs and those where mobility itself is taken as the need (Mokhtarian & Salomon, 2001; Zängler, 2000). However, this is increasingly viewed critically as to whether it does justice to the complex structure of people's needs (Rammert & Hausigke, 2021). Rammert and Hausigke (2021) argue that these previously intrinsic defined mobility needs (going for a walk or a cruise) can also be seen as derived from other needs such as exercise or self-expression.

How and whether we ultimately overcome space is subject to a complex decision-making process. Thus, it is either assumed that people make conscious decisions based on the evaluation of perceptions and missing/available information (Ajzen, 1991). Or, through the repetition of such behaviors, we get into habits that are no longer regularly consciously questioned and decided upon (Ronis et al., 1989). This represents, in short, the *Theory of Planned Behavior* (TPB), supplemented by the *Theory of Repeated Behavior* (TRB) (Ajzen, 1991; Ronis et al., 1989). In principle, it is assumed that our behavior is a mutual influence of intrinsic and extrinsic influences, which can be controlled, impulsive or habitual. Van Ackern et al. (2010) bring together the different theories of transport geography (accessibility planning) and social psychology (TPB, TRB) in their conceptual model of transport behavior, which is shown in Fig. 2.1.

Figure removed due to possible copyright infringements.

Fig. 2.1 Conceptual model of travel behavior (van Acker et al., 2010)

When and how can (habitual) behavior be changed?

Another important theory I would like to mention is the theory of cognitive dissonance. It says that if attitudes and behavior do not fit together, stress arises, which is sought to be relieved (Festinger, 2009). Allowing to conclude that behavioral changes are likely to occur, especially in individuals where beliefs and actions do not match. This theory is thus also used in segmentation studies to identify groups with the most significant dissonance (Kroesen et al., 2017).

In addition, some researchers found that specific life events also lead to changes in travel behavior. For example, events such as a birth, a move or job transfer are often mentioned (Bauer, Frank, et al., 2022; Müggenburg, 2017; Scheiner & Holz-Rau, 2013). To exert external influence, the city of Munich, for example, has put together an information package for new citizens that provides comprehensive information on mobility in the city (Landeshauptstadt München [LHM], 2022).

Usually, specific traffic behaviors are studied along sociodemographic dimensions. These are easy to collect and allow for an objective evaluation. Criticism is the strong simplification of a complex process. For this reason, attempts are increasingly being made to do more justice to the subject via lifestyles and mobility types. This approach is described in the following chapter.

2.2 Mobility Styles, Types, Attitudes, and Personas

The previous chapter shows how complex decisions are and when one is more likely to change habitual behavior. It also illustrates that behavior and attitudes can diverge. To develop measures for more sustainable mobility, researchers adopted an approach from market research: segmentation. This approach simplifies complex structures, and similar people are grouped in attitudes and behavior (Anable, 2005). The underlying reason is the need for more effective measures since different people require different measures.

2.2.1 Background and Composition

It is common to statistically evaluate and cluster the mobility types (MT) via factors, which are a series of items, usually attitude statements on a specific topic, e.g., 'I am trying to use the car less for environmental reasons' (Anable, 2005). Occasionally, there are also other approaches. Markvica et al. (2016), for example, formed their MTs by conducting and evaluating focus group sessions against the background of the *Sinus Milieus*.

Ultimately, the different types can be composed of the categories in Tab. 2.1. The most important factors being the attitude towards means of transport and other norms. Secondary variables not used in the clustering process but subsequently assignable are demographic and mobility characteristics such as place of residence, age, or car ownership.

Tab. 2.1 Categories into which mobility types can be broken down into

Behavior (Mode + Usage)	
general style (uni-/multimodal)	(Gebhardt and Oostendorp 2021); (Bartz 2015); (Magdolen et al. 2021)
level of mobility (high to low)	(Bartz 2015); (Lanzendorf 2002); (Magdolen et al. 2021); (Markvica et al. 2016); (Semanjski et al. 2016)
Attitudes (Mode + Emotions)	
attitudes towards specific modes (attached, open, neutral, resentful)	(Bartz 2015); (Lanzendorf 2002); (Anable 2005); (Hinkeldein et al. 2015); (Magdolen et al. 2021); (Rode et al. 2015); (Gebhardt and Oostendorp 2021); (Semanjski et al. 2016)
reasons for/against certain modes (e.g., efficiency, fun, stress)	(Markvica et al. 2016); (Lanzendorf 2002); (Bartz 2015); (Semanjski et al. 2016)
Lifestyle (Norms + Attitudes)	
environment	(Rode et al. 2015); (Bartz 2015); (Lanzendorf 2002); (Magdolen et al. 2021); (Hinkeldein et al. 2015); (Semanjski et al. 2016); (Markvica et al. 2016); (Anable 2005)
technology	(Rode et al. 2015); (Bartz 2015); (Lanzendorf 2002); (Hinkeldein et al. 2015); (Markvica et al. 2016)
innovation	(Rode et al. 2015); (Hinkeldein et al. 2015); (Markvica et al. 2016)
information medium	(Markvica et al. 2016)
social life/norms (culture, socializing, family, sports)	(Lanzendorf 2002); (Bartz 2015)
Demo- + sociodemographic Characteristics	
car ownership/availability/dependency	(Bartz 2015); (Lanzendorf 2002); (Gebhardt and Oostendorp 2021); (Rode et al. 2015)
PuT transit tickets	(Gebhardt and Oostendorp 2021); (Lanzendorf 2002)
carsharing memberships	(Gebhardt and Oostendorp 2021)
place of residence	(Bartz 2015); (Rode et al. 2015); (Gebhardt and Oostendorp 2021); (Hinkeldein et al. 2015); (Magdolen et al. 2021)
employment status	(Bartz 2015); (Rode et al. 2015); (Gebhardt and Oostendorp 2021)
household characteristics	(Rode et al. 2015); (Gebhardt and Oostendorp 2021); (Magdolen et al. 2021)
age	(Bartz 2015); (Rode et al. 2015); (Gebhardt and Oostendorp 2021); (Magdolen et al. 2021)
gender	(Rode et al. 2015); (Gebhardt and Oostendorp 2021)
income	(Magdolen et al. 2021)

The authors chosen approaches determine the different clusters related to either traffic behavior, attitudes, or lifestyles. The statements are independently clustered into behavioral or attitudinal types, and finally assigned proportionally (Prillwitz & Barr, 2011; Redmond & Lothorien, 2000; Schweer & Hunecke, 2006). More common also in current research is a combination of

both components and a clustering process across them (Bartz, 2015; Lanzendorf, 2002; Rode et al., 2015)

The origin of this type of research varies. The segmentation can serve as a basis for information and communication strategies for sustainable mobility, new mobility concepts, or policies (Anable, 2005; Dangschat, 2018; Hinkeldein et al., 2015; Lanzendorf, 2002; Markvica et al., 2016; Prillwitz & Barr, 2011; Rode et al., 2015; Semanjski et al., 2016; Ton et al., 2020). In general, this type of research tries to explain travel behavior based on attitudes and norms and to determine the resulting group-specific needs. The focus can further be on leisure mobility (Lanzendorf, 2002), multi- or unimodal behavior (Oostendorp et al., 2019), or international comparisons (Bartz, 2015; Magdolen et al., 2019).

Of course, behavioral changes in the wake of the climate crisis play a major role in this context. Anable (2005), for example, segments the types according to their 'degrees of mode switching potential'. Building on TPB, she finds that Die-Hard-Drivers have the lowest potential to switch to car alternatives. The Car-less-Crusaders have the greatest and already did so. She also tries to show that behavior and intention vary and do not always coincide. Thus, all the types identified by Anable show a greater intention to use alternatives than they did on the day of data collection. At the same time, her research also shows that the same attitude can lead to different behavior. As an example, she cites environmental concerns that lead to less car use for some and not for others.

All types of researchers differ in one or the other field; Ton et al. (2020) cluster only five types, whereas Magdolen et al. (2019) identify eleven. However, there are similarities among the variety of researchers. This can probably be traced back to the attitude statements. E.g. Bartz (2010) uses 'Public transportation has the advantage for me that I can do other things at the same time (e.g., read, play, work)).'¹ and Magdolen et al. (2019) 'I can easily use the traveling time on the bus or train for other things.'

¹ 'Die öffentlichen Verkehrsmittel haben für mich den Vorteil, dass ich andere Dinge nebenher tun kann (z.B. lesen, spielen, arbeiten).' Bartz (2015)

There are very different approaches, and the ultimate types/segments come from the researcher's variables collection. Nevertheless, it is possible to form upper categories under which the respective individual types fit:

1. There are unimodal car users with emotional or functional attachments to cars. This does not automatically mean a rejection of other modes.

Tab. 2.2 Types of emotional or functional attached to cars

Name of Type	Source
car lovers	(Bartz 2015)
devoted drivers	(Semanjski et al. 2016)
all-purpose car driver	(Gebhardt and Oostendorp 2021)
traditional car-oriented	(Rode et al. 2015)
car addicts	(Magdolen et al. 2021)
traditional car-lovers	(Hinkeldein et al. 2015)
pragmatic car drivers	(Bartz 2015)
die hard drivers	(Anable 2005)
complacent car drivers	(Anable 2005)

2. The emotional/functional bond does not stand out as firmly for this second group as does in the first one. Car use results from the aversion to other modes or, in addition to main car use, other transport means also matter in certain situations.

Tab. 2.3 Types not as emotionally attached to cars

Name of Type	Source
self-steering mobile	(Bartz 2015)
image-improvers	(Semanjski et al. 2016)
pragmatic transit skeptic	(Rode et al. 2015)
car-oriented everyday performer	(Magdolen et al. 2021)
flexible car lovers	(Hinkeldein et al. 2015)
malcontent drivers	(Anable 2005)

3. Then several types in the literature are positively inclined toward public transport. This is often closely linked to the idea of sustainability. However, the use of public transport can also arise because it is the least evil for them.

Tab. 2.4 Types that define themselves through attitudes towards public transport (PuT)

Name of Type	Source
PuT transit enthusiasts	(Magdolen et al. 2021)
PuT dependent	(Semanjski et al. 2016)
PuT-Users	(Gebhardt and Oostendorp 2021)
green travel oriented	(Rode et al. 2015)
Urban-oriented PuT lovers	(Hinkeldein et al. 2015)
eco. PuT/bike lovers	(Hinkeldein et al. 2015)

4. This group does not necessarily have an affinity to one specific means of transport but uses a range of modes and does not commit itself here.

Tab. 2.5 Multimodal mobility types (MT)

Name of Type	Source
intermodal PuT/car users	(Gebhardt and Oostendorp 2021)
young intended mobiles	(Bartz 2015)
functional mobiles	(Bartz 2015)
multimobiles	(Bartz 2015)
practical travelers	(Semanjski et al. 2016)
env. oriented multimodals	(Magdolen et al. 2021)
situational multimodal user	(Gebhardt and Oostendorp 2021)
multimodal traveler	(Magdolen et al. 2021)
pragmatic transit oriented	(Rode et al. 2015)
innovative access oriented	(Rode et al. 2015)
tech. focused individualists	(Rode et al. 2015)

5. The last and smallest group I would like to mention is characterized by increased use of bicycles. This can either be due to sustainability reasons or the urge for exercise.

Tab. 2.6 Bicycle-oriented mobility types

Name of Type	Source
active aspires	(Semanjski et al. 2016)
car-free choosers	(Semanjski et al. 2016)
intermodal bicycle combiners	(Gebhardt and Oostendorp 2021)
conventional bicycle lovers	(Hinkeldein et al. 2015)

The above groups are not complete. Not every mobility type of each author appears because they are defined by a different, not so typical, setting profile. E.g., Semanjski et al.'s (2016) car contemplators may later belong to the first group (Tab. 2.2) because they see cars as prestige objects. However, at the time being, do not use or own a car. At the same time, one can form other complementary, overlapping groups, such as one defined by the technology/innovation

attitude or the environmental thought. Magdolen et al. (2021) categorize eight types into four groups according to their potential for adapting sustainable mobility solutions: one 'little potential', two 'already sustainable, but not due to their norms', three 'sustainable due to their norms' and four 'unsustainable, even though they have a high ecological norm'.

2.2.2 Derivation of Relevant Measures

After the insight into the different segmentation approaches, the authors derive some approaches that they find relevant for the various types. Some of the push/pull measures are discussed in the following. At the same time, it is pertinent to point out that these measures are derived from distinct personas and are aimed at their specific attitudes. I.e., these are assumptions about how to address these types and not scientifically proven measures. Therefore, I would like to draw attention to a research gap. The practical application and scientific monitoring of the type's tailored measures and ultimate failures/successes have hardly been applied.

The measures can have different foci depending on the background of the work. Rode et al. (2015) focus on political policies. For car-oriented types, they rely on monetary push measures that increase the price of car ownership and use (higher parking fees, congestion charge). The same conclusions are reached by Anable (2005) and Magdolen et al. (2021), who also believe that innovative low-carbon cars such as electric ones could be attractive alternatives. At the same time, these must be accompanied by extensive campaigns and actions (Rode et al., 2015). They count on test days for e-vehicles, the promotion of flexible CS offers and destigmatizing public transport services (Anable, 2005; Magdolen et al., 2019; Magdolen et al., 2021; Rode et al., 2015).

For the already sustainably oriented types, Rode et al. see challenges in maintaining this behavior and, if necessary, expanding it with modern and innovative solutions. They focus on strategies to increase the use of technologies in this regard and emphasize the need for flexibility when life circumstances change (e.g., having children) (Rode et al., 2015). A similar approach to 'reinforcement of environmental message' sees Anable (2005).

According to the authors, the advantages of personalized and new mobility services should be communicated to the highly mobile and technically oriented personas (Magdolen et al., 2021; Rode et al., 2015). In addition, attributes such as health and fun can be helpful. Noteworthy, is the steady addressing through online channels (Rode et al., 2015).

2.3 Neighbourhood Mobility Concepts

Another component of this work is the configuration of neighborhood-based mobility concepts. Therefore, I provide the current state of research in the subsequent section. The focus is set on Germany.

2.3.1 Background and Implementation

The all-encompassing element of this work is Integrated Mobility Concepts (IMCs), which are described by Heldt et al. (2018) as 'a coordinated plan for both urban development and transport planning on the neighborhood scale, as opposed to a more strategic scale and concepts such as transit-oriented development' (Heldt et al., 2021). Integrated mobility concepts in neighborhoods are not restricted to residence areas but need to be planned for all kinds of neighborhoods. Even if German literature is very much concerned with residential mobility concepts, the creation of an IMC does not distinguish between residential, office, or commercial. Whether they are mixed used, which usually gives the best synergies, (e.g., alternating parking space occupancy) or whether they are industrial or business campus areas. Corporate mobility management is becoming more common (B.A.U.M. Consult, 2021). However, the companies initiate this themselves and does not take place across quarters until now (B.A.U.M. Consult, 2021).

While in English, one often finds literature content about mobility concepts under the terms of 'car-free' neighborhoods (Baehler, 2019; Foletta & Field, 2011; Rodier & Shaheen, 2003). In German literature more recent papers on 'residential mobility concepts' were published (Bauer, Frank, et al., 2022; Bitter & Schnell, 2021; Oostendorp et al., 2020).

In the following, I would like to refer to the paper by attorney Mayer which appeared in 2018 in the periodical RAW. He succinctly summarizes the background, legal and design frameworks of such mobility concepts. In Germany, so-called parking space statutes define the number of parking spaces to be created for real estate developers for various uses. The city of Munich, for example, stipulates that one parking space per apartment must be built for housing developments or one parking space per five beds for student residences (StPIS 926, 2007). Often, these statutes are outdated. For example, Munich's statutes date back to 2007 (StPIS 926, 2007).

Since free space is valuable in a densely built-up city like Munich, underground garages have to be built, which are expensive and contradict the need for cheaper housing (Mayer, 2018). Deckert (2022) shows the different aspects and cost factors to be considered. According to the data, costs can reach up to 50 thousand euros per parking space. Converted to square meters with the purchase price of condominiums in Munich, that would be almost 20 % that would go for the parking space (Deckert, 2022; Statista, 2022).² As a result of these aspects and to

² 1600 (Deckert (2022))/9100 (Statista (2022))= 18%

enforce more sustainable mobility, cities like Munich, Dresden, Mainz, and Augsburg (and some more) implemented legal instruments to reduce the number of parking spaces (Bauer, Frank, et al., 2022; Mayer, 2018). These are coupled with the parking space statutes and allow a reduction under defined circumstances, which vary considerably.

I emphasize this here because this is the legal and, at the same time, monetary motivation for free enterprise to break with traditional planning guidelines and allow mobility concepts to emerge that go beyond car and bicycle parking. However, the German regional building regulations provide an obligation to provide parking spaces. This can be suspended for a limited period of time using a mobility concept provided for in the parking space statutes and must be evaluated regularly; in the worst case, the reduced parking spaces must be restored. (Bauer, Gies, et al., 2022; Mayer, 2018) Thus, it poses a risk for developers and underscores the demand for user-oriented mobility concepts that enable people to live without their own (second) car. Typical concepts and elements for IMCs are introduced next. .

2.3.2 Components

Mobility concepts of this kind are composed of the components for own modes such as the car or the bicycle (here, especially parking) and the additional offers in the push and pull format. Tab. 2.7 shows relevant components of mobility concepts. They are categorized into measures based on sharing concepts, service offers, actual infrastructural and regulatory measures. Some of these features can be summarized at a mobility point. Usually, such concepts, at least the sharing offers, are accompanied by an app. The topic of Mobility as a Service is described in chapter 2.4.1.

Schreier and Karbaumer (2021) evaluated IMCs in Bremen and concluded that reduced parking space and effective marketing and communication strategies are the key to success. Furthermore, a stable legal framework, stakeholder coordination, and a certain level of boldness for practice are not to be neglected. (Schreier & Karbaumer, 2021)

Tab. 2.7 Overview of common IMCs components

Category	Sources
<i>Sharing</i>	
carsharing	Köfler et al. 2019; Foletta and Field 2011; Bauer et al. 2022b; Oostendorp et al.
bicycle and cargo bike rental systems	Köfler et al. 2019; Foletta and Field 2011; Oostendorp et al.; Bauer et al. 2022b
tenant tickets, bookable transferable monthly tickets for public transport, are available in the neighborhood.	Bauer et al. 2022b; Oostendorp et al.; Köfler et al. 2019;
<i>Infrastructure</i>	
parking space reduction	Oostendorp et al.;
high-quality bicycle parking with sufficient security and space	Köfler et al. 2019; Bauer et al. 2022b; Oostendorp et al.;
charging possibilities (bike and car)	Oostendorp et al.;
workshop for small (bike) repairs	Bauer et al. 2022b; Bauer et al. 2022a;
parcel lockers	Oostendorp et al.
public transport accessibility, well-developed bicycle/walking network, restricted car access	Foletta and Field 2011;
<i>Services</i>	
carpooling services	Oostendorp et al.
activities and workshops on the different elements of the MCs	Oostendorp et al.
bicycle repair services	Köfler et al. 2019; Oostendorp et al.
information and consulting regarding any mobility topic	Bauer et al. 2022a; Köfler et al. 2019; Foletta and Field 2011; Oostendorp et al.;
<i>Rules and Regulations</i>	
temporary allocation and booking systems for parking spaces	Oostendorp et al.;
allocation of parking spaces based on a catalog due to decoupling housing from parking	Bauer et al. 2022a; Foletta and Field 2011; Bauer et al. 2022b;
surrounding parking space management to prevent parking pressure (e.g., short-term parking, resident parking in public areas)	Foletta and Field 2011; Bauer et al. 2022b; Oostendorp et al. 2020;

2.3.3 Effects and Example

What **effects** or impacts do mobility concepts have on travel behavior? It is not easy to draw objective comparisons. Chapter 2.1 and the 'Model of Conceptual Behavior' show that many different individuals, spatial and social aspects play a role. To create comparability, the approach is simplified. Indicators such as the modal split, average car ownership or average mode usage are considered. These are then usually compared to similar areas without intervention or the whole city or before and after comparisons of residents are investigated (Foletta & Field, 2011; Klein et al., 2021).

Thus, in the 'low carbon neighborhoods' studied by Foletta and Field (2011), in 7 out of 8 cases, a lower modal share can be observed compared to the reference areas. In addition, lower car ownership can be documented in 5 of the areas. Not all of them have a lower modal split or car ownership due to missing data.

Klein et al. (2021) report positive statistically significant changes in car ownership, car-, car-sharing- and public transport-use in the before and after comparison of the behavior of residents in the Lincoln settlement in Darmstadt. The growing use of personal and rental bicycles is not as strongly and positively pronounced but still trending. (Klein et al., 2021)

As a prominent **example**, I would like to mention the Franklin settlement in Dortmund, Germany. It has won the 'Deutscher Verkehrsplanungspreis 2018'. Franklin has mastered the challenge of bringing together a large number of different stakeholders. The highlight of the implementation is that it incorporates a very versatile combination of push and pull measures. In addition to the classic sharing offers, there are also car-pooling options, which are supported by a good integration with the public transport system. Furthermore, parking spaces are allocated in a centralized, and socially equitable manner. Moreover if one is interested, they can get advice on their mobility behavior at the 'MobiCheck'. (Wissenschaftsstadt Darmstadt, 2018)

Franklin mobile operates sharing cars, scooters, and cargo bikes from a single provider. They also offer a precursor to packages by offering discounted rates for a monthly fee (FRANKLIN Mobil GmbH, 2022). What serves as an excellent transition to the last topic of this literature research the bundling of mobility offers in packages.

2.4 MaaS and Mobility Plans

The chapter starts with the concept of Mobility as a Service (MaaS) as it is a prerequisite and ends with a brief review of papers on the topic of mobility plans and bundles.

2.4.1 Mobility as a Service

MaaS is seen as integrating of different mobile services into one digital app (Canale et al., 2019; MaaS Alliance, 2022; Whim Helsinki, 2022). Examples are the apps developed by public transport operators, such as Jelbi in Berlin or MVGgo in Munich. (Jelbi, 2022; mvg.de, 2022). IMCs are a combination of different and sometimes independent offers (as per Seestadt, 2022). For this reason, several apps are currently being developed that bundle such offerings. The focus is not always on mobility but can concern very different areas in a neighborhood (Animus, 2022; Isarwatt eG, 2022), so they are Software as a Service (SaaS) solution. A prerequisite for a bundling process, is a plan of different modes and offers, bookable on a uniform and simple system (MaaS Alliance, 2022).

As the following chapter shows, there is some research about the MaaS concept and bundles. At the same time, these refer to city-wide systems. This again emphasizes the distinction of this work. The focus is on the smaller unit of an IMC.

2.4.2 Mobility Packages, Plans, or Bundles

Recently, scientific papers were published on how mobility plans can be packaged and investigate the customer's willingness-to-pay (WTP). All deal with offerings throughout the city, and none focus on neighborhood IMCs. Therefore, the findings are only applicable to a limited extent. To close certain gaps, one can rely on findings on station-based offers – at least for car sharing (CS) and bike sharing (BS).

Esztergár-Kiss and Kerényi (2020) developed a top-down model, where city and population data is used to combine mobility plans for cities. Fig. 2.2 shows the available levels that is used for PuT, BS, CS, and Taxi. There is always a pay-as-you-go option. Taxi excluded, there is an unlimited category. CS and BS are specified in hours, whereas taxi is expressed in km. For PuT, the day is used as a unit. However, the method results in one general mobility plan per city regarding one option per mode. Fig. 2.3 shows city-specific plans for Hamburg and Vienna composed of different mode volumes. The authors recognize that this is not a user-friendly approach and point out offering a more comprehensive range of components to meet the user's needs. (Esztergár-Kiss & Kerényi, 2020)

Public Transport Levels	Bikesharing Levels	Carsharing Levels	Taxi Levels
1) pay-as-you-go	1) not used	1) not used	1) not used
2) 10 days per month	2) pay-as-you-go	2) pay-as-you-go	2) pay-as-you-go
3) 20 days per month	3) one hour free per day	3) one hour free per day	3) 10 km free per month
4) unlimited	4) three hours free per day	4) three hours free per day	4) 20 km free per month
5) unlimited within agglomeration	5) unlimited	5) unlimited	5) 50 km free per month

Fig. 2.2 Mode volumes for mobility plans based Esztergár-Kiss and Kerényi (2020)

Hamburg	Vienna
3) 20 days per month	5) unlimited within agglomeration
3) one hour free per day	3) one hour free per day
3) one hour free per day	3) one hour free per day
4) 20 km free per month	3) 10 km free per month

Fig. 2.3 Mobility plans for Hamburg and Vienna based on Esztergár-Kiss and Kerényi (2020)

Guidon et al. (2018) are investigating the WTP of consumers. They explore how the WTP of single services (not in bundles) relates to multiple services offered in a bundle. They conduct a discrete choice experiment in Zurich with almost 1000 participants. Their results show that, in principle, there is a higher WTP for bundled services than for individual services. PuT, CS, and Park+Ride are valued more in a bundle, whereas bike sharing, e-bike sharing, and cab components reduce WTP. In their opinion, this micro-mobility should be part of the bundle as a pay-as-you-go component. Their experiment further demonstrates a very high WTP for an app that integrates all the services studied, which is, on average, over 100 fracs. The services (without app) are valued in the bundle with a WTP of 130 to 150 francs. (Guidon et al., 2018)

Tsouros et al. (2021) are also investigating the WTP of potential customers in the greater Manchester area. They discover similar values as in previous literature (Guidon et al., 2018). They find that an additional hour of car sharing would be worth about 7 Eur. For an additional cab ride, the value is 11 Eur. For a monthly bike sharing subscription in a plan, people would pay up to 27 EUR. As with Guidon et al. (2018), public transport is valued at slightly over EUR 100. The four most common plan combinations, regardless of their design (e.g., number of CS hours), can be seen in Fig. 2.4. Colored modes are included in the plan. The combination of all service components is the most common. In total, however, the individual services are the most popular. Almost 40 % of the participants chose a unimodal plan, with unlimited PuT being the most attractive. (Tsouros et al., 2021)

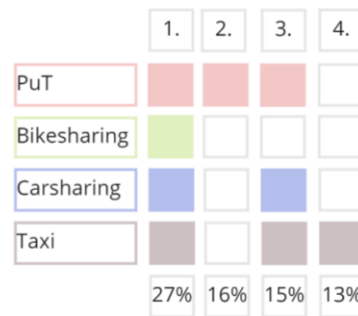


Fig. 2.4 Four most frequent mobility plans according to Tsouros et al. (2021)

Matyas and Kamargianni (2018) used a mixed-method approach to examine different components of mobility plans. A stated preference survey is first sharpened and assessed with focus groups. Potential plans are suggested to the participants based on mobility tracking (i.e., their actual travel behavior). One option was always to assemble the plan themselves. Although the plans are priced, the WTP is not determined. The authors found out that public transport is the most popular component. They pointed out that concerning plans, public transport is the component that reflects habitual transport behavior and therefore results in this significance. (Matyas & Kamargianni, 2018)

One of the first field experiments with integrated offers takes place in Sweden in 2015. About 160 participants use an integrated app for mobility solutions for half a year. They have a monthly subscription which serves as credit for offers. How much of what mode and credits are used is up to the participants. Interestingly, the studied modal split shows public transport as the most used mode (34 %) (Sochor et al., 2014). The authors assume they have an excess representation of PuT users in the study. Across the process, they note that curiosity is the driving factor to participate, sustainable options must also be viable, and the underlying transportation system/mobility concept must have sufficient capacity. (Sochor et al., 2015)

Another large-scale study in the Netherlands (Amsterdam, Utrecht, and Rotterdam) used an Error Components Logit Model based on a stated adaption experiment to investigate the influence of bundles on mode choice (Feneri et al., 2022). Since there are hardly any proven results on the effect on the behavior so far. In this context, I would like to mention the common criticism that users are encouraged to use the purchased services even though this is not necessary (Guidon et al., 2018). Simultaneously, it is highly relevant to investigate how this affects the overall sustainability of mobility (Guidon et al., 2018).

Feneri et al. (2022) investigate the effects of travel time, parking time, and waiting time in addition to the different pricing of bundles. Likewise, it is found that people increasingly choose public transport. An expensive plan (399 Eur) with free public transport use is not found to have as great an influence on public transport use as the combination of a lower monthly amount (99 Eur) with a percentage discount on public transport tickets (40 %). According to the model, it is mainly the expenses that are considered negatively in the case of car sharing. Concerning the bundles, the same can be observed with PuT. For bike sharing, the free use in the plans can lead to an increase in usage. However, this is not the case for the expensive plan. No

statistically reliable statement can be made for cabs due to a minimal selection of this mode of transport. (Feneri et al., 2022)

The best-known concept, which is already being applied in the free market economy, is *Whim*. A Finnish company that provides different services from different providers bundled in one app. The basic principle is that by purchasing a monthly ticket for public transport, you get access to special offers for other modes. One can choose what level of quota someone wants per mode and whether someone wants it at all. *Whim*, interestingly, does not offer one price for everything but gives discounts for different deals. Offers are shown in Fig. 2.5. (Whim Helsinki, 2022)

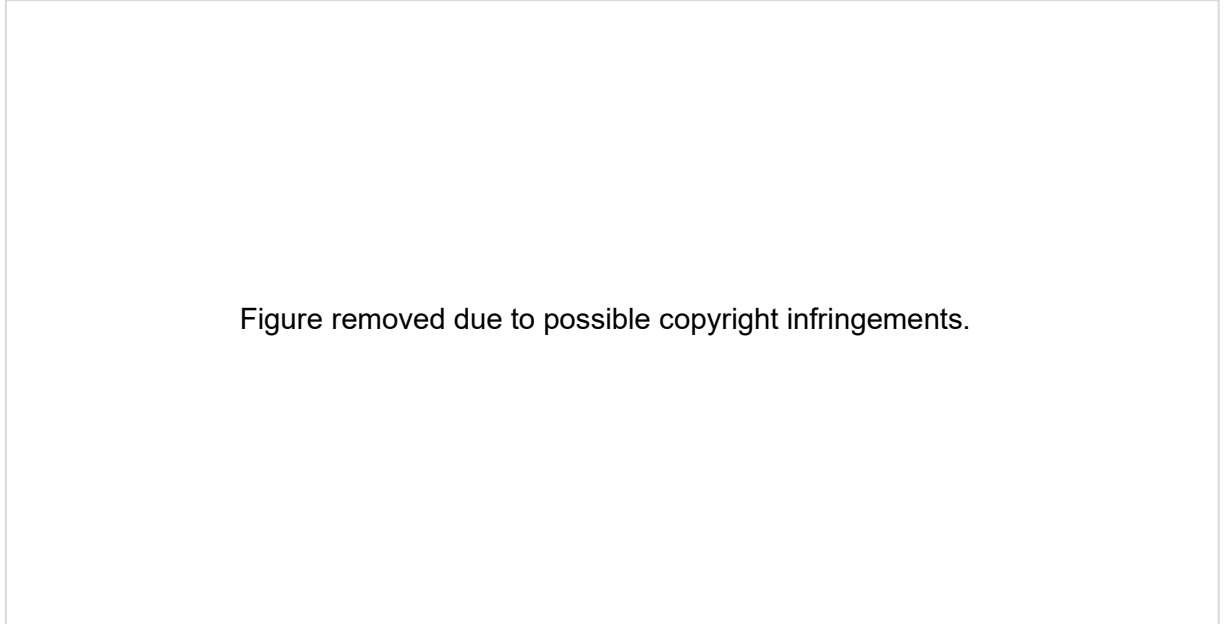


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Fig. 2.5 *Whim* benefits when purchasing a PuT Ticket (Whim Helsinki, 2022)

Criticism of bundling services is that one is encouraged to travel more distances to use up the acquired quotas or services without this being explicitly necessary (Guidon et al., 2018). All presented studies show that public transport is essential for creating plans. The transfer to local mobility concepts is limited but shows that strategies for cooperation with public transport operators can be quite relevant. Only Guidon et al. (2018) incorporate an element of car ownership, the Park+Ride component; no other study integrates parking costs or push measures for car ownership. This might be because parking is a municipal issue and private companies mostly operate PuT, CS, and BS. However, there are also more and more apps for booking parking spaces and paying parking fees. Do operators not want to scare customers with the emotional topic of cars and parking?

3 Methodology

The methodological approach is shown in Fig. 3.1. The foundation is literature research on the topics of travel behavior, different mobility types, neighborhood mobility concepts, and mobility plans. Furthermore, a quantitative analysis of the MiD data is combined with qualitative interviews on people's demands on mobility concepts and plans. The survey serves as a teaser for the interviews.

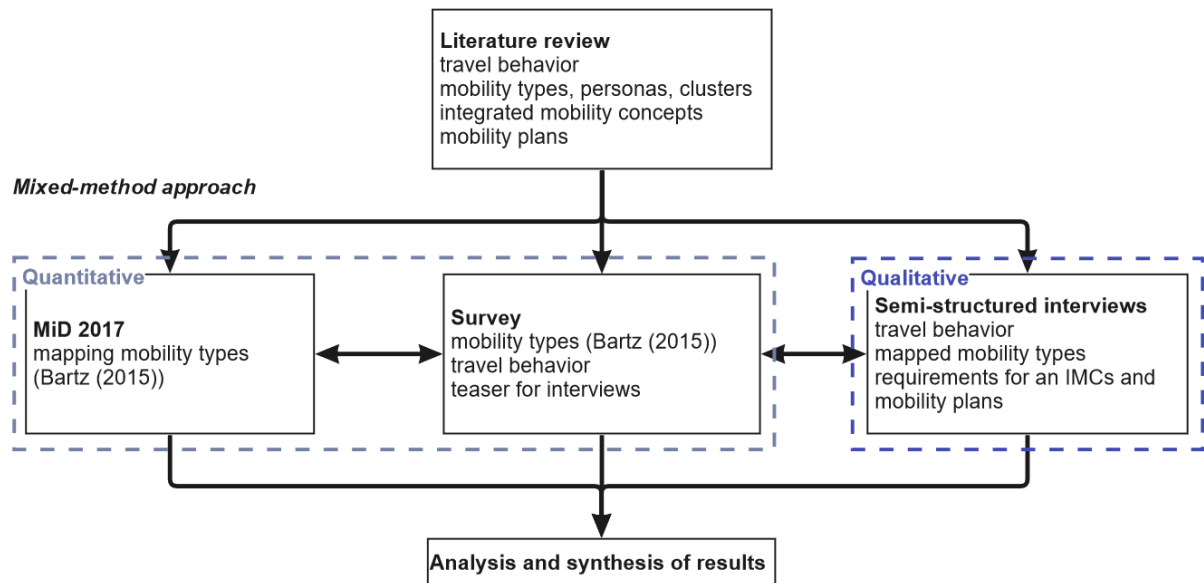


Fig. 3.1 Overview of the methodological elements

Next, the literature used to create the survey is presented. Then a filter and mapping process of the MiD data is following. Subsequently, the procedure for the survey is explained as well as the approach to the interviews.

3.1 Selection of Relevant Mobility Types

There is a large amount of literature on the indistinguishable mobility types, mobility styles, or personas. I have given a thorough overview in chapter 2.2. Due to the wide selection of types in the literature, I decided to use Bartz's (2010) mobility types for the survey and later for the interviews. Since this is a doctoral thesis, I have very extensive descriptions of the types at hand. Whereas in some papers, the description is reduced to the necessary, e.g. Magdolen et al. (2021). For this reason, I would like to introduce the six types in a little more detail. The different properties are listed in Tab. 3.1 (p. 20).

Bartz's methodology is based on attitudinal statements that were questioned in surveys and then evaluated using statistical methods. First, a factor analysis is performed to identify relevant statements, and finally, a clustering/segmentation algorithm is run on the data.

Summarizing Tab. 3.1, Car Lovers (CL) have the greatest emotional attachment to the car. Other modes are viewed as more neutral and less emotional attachment. Pragmatic Car Drivers (PCDs) and their attachment to the car is less emotional and more functional, but at the same time, they are not open to other modes. A great urge for independence characterizes self-steering Mobiles (SSM). They want to determine themselves and not be dependent on others. Therefore, individual modes such as cars and bikes are relevant here. The next three types are more multimodal. For Functional Mobiles (FM) and Multi Mobiles (MM), the idea of the environment also plays a role. MMs are open to all modes of transport and enjoy traveling. The FMs, on the other hand, are less fond of traveling, dislike cars the most, and show high sensitivity towards costs. The Young Intended Mobiles (YIM) are very situational transport users. They use a wide range of transport modes.

Tab. 3.1 Mobility types, according to Bartz (2015) own depiction

<i>Mobility Type</i> <i>Mobility Attributes</i>	Young Intended Mobile YIM	Pragmatic Car Drivers PCD	Self-Steering Mobiles SSM	Car Lovers CL	Multi Mobiles MM	Functional Mobiles FM
Behavior high - moderate - low multimodal - unimodal	- highly mobile, with stable working conditions and many recreational activities - multimodal	- do not like to be mobile - low mobility - unimodal car usage	Behavior (mode + use) - mobility is something positive - like to be on the road - unimodal car usage	- highly mobile	- highly mobile - multimodal	- moderate to low mobility - multimodal
Modes and Attitudes positive - neutral - negative (car, bicycle, walking, public transport)	- neutral emotions towards all modes - little interest in G7specific modes	- not emotionally attached to car but functionally attached - negative judgment of other modes - public transport gets the most dislike (independent of available infrastructure) - cycling is dangerous - taxis are too expensive	Attitudes (mode + emotions) - emotionally attached to car - design and brand are used for self-representation - negative judgment of public transport and taxis - bicycles and motorbikes are used for recreation	- most attached cluster to car (passionate relationship): tuning, high care/maintenance, individual design - not attached to specific vehicle classes - neutral emotions towards other modes	- positive towards all modes - disadvantages are disregarded	- negative toward mobility - car gets most dislike: environmental damage, driving stress, price - positive eval. of public transport: price, environmentally friendly - positive eval. of cycling: fast, flexible, price, healthy, environmentally friendly
Mobility Attributes	- functionality of modes > transportation as means to an end - reliability, safety, accessibility, efficient	- efficient, senseful, and direct - highly habitual mobility patterns	- driving fun, freedom, self-determined		- the use of technology in mobility - efficiency, fun, environmentally friendly, availability - mode choice is situational	- mode choice on a rational level -> cost-utility function - price, environmental friendly
Lifestyle and Norms	cultural interests, socializing, traveling	family and home	independence (also regarding mobility)	socializing, traveling, cultural activities	technology affine, environment, socializing, traveling	low cost lifestyle, environment
Car Ownership	in comparison a lower car ownership rate	high car ownership	high car ownership	high car ownership		lower car ownership
Demographics and Geographics	- young urban community - high educational levels	suburban and rural places of residence	larger proportion of pensioners	- young urban community - high incomes	urban places of residence	fewer full-time employees

3.2 Quantitative Assessment MiD Data

Mobility in Germany (MiD) is a significant data collection on everyday mobility in Germany. It collects data on household, personal, and travel characteristics. The federal data set is supplemented with additional regional data. I worked with the most recent data from 2017, so no effects of COVID-19 were documented. In 2017, the MiD study was conducted for the third time. Previous datasets date back to 2002 and 2008 and thus represent a reasonable basis for comparison over the years. I work with the standard dataset (B1), which does not allow explicit spatial inferences. The spatial distinctions are from rural to small town to metropolitan. MiD data and preprocessing code were provided by the Professorship of Travel Behavior. (Nobis & Kuhnimhof, 2019)

The data review on mapping mobility types shows that the MiD data is useful for further in-depth analysis. The MiD surveyed variables regarding satisfaction and attitude with/towards specific modes (walking, car, public transport, bicycle). This facilitates a simplified classification by mobility type. Initially, the MOP data, the most extensive data collection on mobility behavior in Germany of people over a more extended period, was also considered. However, the data does not include attitudinal statements.

The filter process includes preparing the trips, persons, and household data information by various filter steps described in Fig. 3.2. By joining the tables together, it is ensured that only people and trips in urban households are used.

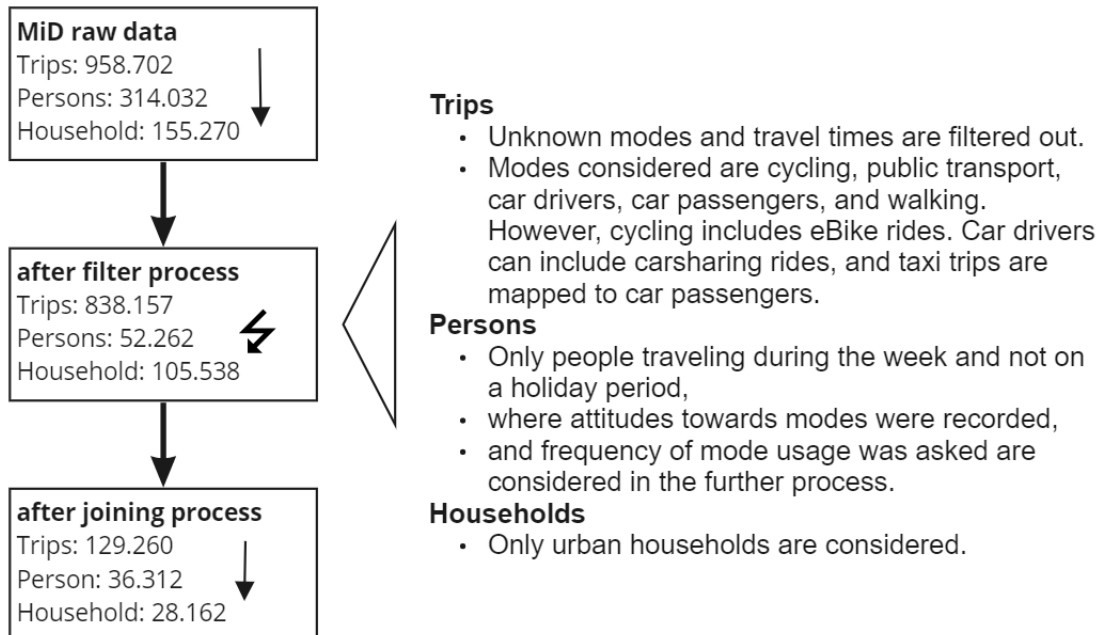


Fig. 3.2 MiD filter process

For **the mapping Process**, the relevant variables for the mapping process were identified (German original name). I decided to reduce the variable to the attitudes of the persons to the modes of walking, driving, cycling, and taking PuT. I based this decision on the fact that I did not include mobility behavior per se in the mapping process and thus made it independent of it. I.e., the different types are composed of different combinations of the variables listed see Tab. 3.2. The settings were evaluated with an explicit agreement (1), an agreement (2), a disagreement (3), or an explicit disagreement (4). In addition, it is possible to make no statement (9).

Tab. 3.2 MiD mapping process and results

Mobility Type + MiD variable value	Functional Mobiles FM	Young Intended Mobile YIM	Pragmatic Car Drivers PCD	Self- Steering Mobiles SSM	Car Lovers CL	Multi Mobiles MM
MiD variable						
P_EINVM_RAD* "I like to cycle."	1,2	2,3,9	3,4	1,2,3	2,3,9	1,2
P_EINVM_AUTO* "I like to drive."	3,4	2,3,9	2,3,4	1	1	1,2
P_EINVM_OPNV* "I like to take public transport."	1,2,3	2,3,9	3,4	3,4	2,3,9	1,2
P_EINVM_FUSS* "I like to walk."	1,2	1,2,3,4,9	1,2,3,4,9	1,2,3,4,9	2,3,4	1,2
possible No. of combinations	24	135	60	30	33	16
persons mapped to type	5477	5184	3622	6598	603	5979
persons mapped to type due to order of mapping process	775 FM instead of YIM distributed on 2321 and 2322		234 PCD instead of YIM distributed on 333(1-4,9)	3308 SSM instead of CL distributed on 213 and 313(2-4)		415 MM instead of CL distributed on 2122
*1) fully agree, 2) agree, 3) do not agree, 4) not not agree at all						

A further process is filtering with *R*. Some types overlap in their values of the variable combination. *R* assigns it to the type that is used first. According to Bartz findings, I have put the types first, which occur more frequently in Germany.

There are the following assessments to consider: there are two types that characterize by indifferent attitudes towards different modes. Indifferent is also described by Bartz (2015) as 'weakly expressed approval or disapproval values'. Thus, the YIMs and CLs are mapped to the values 2 or 3. Latter are additionally mapped to an explicit approval when driving. They are, additionally, described as 'only in the case of walking danger and effort are assessed negatively.', therefore walking is assigned values between 2 and 4.

Regarding the PCDs, Bartz (2015) writes, 'The segment is basically negative about mobility and generally rejects being on the road. The only accepted means of transport is the automobile (...)', so they get mapped 3 and 4 for bicycle and public transport and 2, 3 or 4 for car.

The SSMs prefer to be masters of their mobility and thus individual mobility rather than, for example, public transport and cabs. Moreover, Bartz (2015) adds, 'The car has the highest priority in this.' Values of 3 or 4 for public transport, in combination with 1 for cars and 1 to 3 for cycling, are assigned for SSMs.

Bartz (2015) finds that FMs cluster '(...) has a rather negative attitude towards mobility and does not like to be on the move. (...) The use of the car receives the greatest disapproval from this segment. (...) Public transportation tends to be viewed positively (...). In general, the respondents prefer bicycling to public transport.'. Based on this, walking, cycling, and public transportation are mapped with the values 1 or 2, and public transportation is additionally mapped with 3. On the other hand, the car is defined with 3 or 4 for this type.

'All means of transport are evaluated very positively, and potential disadvantages are rejected. After all, each means of transportation can be the most advantageous in a particular situation.' This is Bartz's (2015) description of the MM cluster. Accordingly, all modes, running it included, are mapped to 1 or 2.

Any other combination was mapped to *Other*. The overlaps of the mapping process and the substantial number of unassigned persons to *Other* show the shortcoming of this methodology. Exact number can be taken from the Tab. 3.2.

Analysis Process

Tours are activities that start and end at the same point. They are programmed as trip/activity chains that start and end at the same point, here home, work, or education. When tours start at work and education places they are defined as **subtours**. Tours start and end from home. Therefore, they can include more than one stop and mode. Their main mode is defined as follows: The modes are assigned levels PuT = 1, car driver = 2, cycle = 3, car passenger = 4, walk = 5. So, whenever there is a combination of modes that includes PuT and other modes, it is always assigned to PuT. When there is a trip chain, including driving and, e.g., walking, it is assigned to car driver. As for the purpose work or education, trip chains are prioritized. If the tour does not relate to any of the latter, it is assigned the purpose of its first stop, which can be accompanying someone, going shopping, a recreational trip, or doing something else which is defined as other.

3.3 Qualitative Assessment

Qualitative approaches are relatively rare in transportation research. An accepted sequence is from interviews/focus groups to large verifying surveys to the final model. Since the topic of IMCs, in particular, is not yet extensively explored in the literature, I decided to start at the qualitative end. The qualitative research approach is based on the desire to obtain results that are close to the people. Not a solution dictated by experts but a people-oriented approach.

Interviews vs. focus groups, both have their advantages and disadvantages. For example, focus groups are more likely to be used when you expect to gain value from the interaction of the participants (Liamputtong, 2011). Interviews allow a deepening of the topics (Patton, 2015). I decided on a semi-structured interview process and formed an interview guide. Simplified time coordination played a role here. A disadvantage could be reduced comparability. An advantage is that it is still systematic but at the same time 'conversational and situational' (Patton, 2015).

3.3.1 Survey Design and Interview Guide

To find out the different requirements of different mobility types for a mobility concept and thus plans, it is relevant to identify these different personas first. A survey is used for this purpose. The design is based on the work of Bartz (2015) (see chapter 3.1). The complete survey can be found in the appendix.

Survey Design

The survey was created with *LimeSurvey*. It is open-source software that offers a great variety of questionnaire design options. My access to all functions was made possible by the Professorship of Travel Behavior. Available languages were German and English. The survey is first revised according to the two criteria of comprehension (Porst, 2014):

In **semantic perception**, terms listed in the survey are checked for their understanding in the context of the topic. In addition, the wording 'öffentlicher Nahverkehr/public transport is supplemented with the relevant means of transport, i.e., bus, tram, subway, and suburban train (Bus, Straßenbahn, U-Bahn, S-Bahn).

The introductory text explicitly addresses the **pragmatic understanding** of what the participant thinks the interviewer wants to know. Here the background of the survey is presented. Questions with free text entries are deliberately avoided to simplify the evaluation.

After finalizing the first draft, it is evaluated, and feedback is generated. Around fourteen friends, family, and colleagues participate in the test run. The structure is briefly explained below.

Question Group 1 – Which Mobility Type are you?

Fig. 3.1 shows the eight questions for identifying the mobility types according to Bartz. The participant does not answer all listed questions but only those that correspond to one's answers. Example: If the participant answers question one Q 1 with no, one gets Q 2 next. This is not the case for Q 3 and Q 3.1, as well as for Q 2.2 and Q 2.3. They serve to sharpen the respective types. Since the types of Bartz were created using cluster analysis, there can be uncertainties concerning the describing attributes. I.e., a person does not match 100 % with

all the described attributes, but the person-specific mobility characteristics still fit best into this type of cluster.

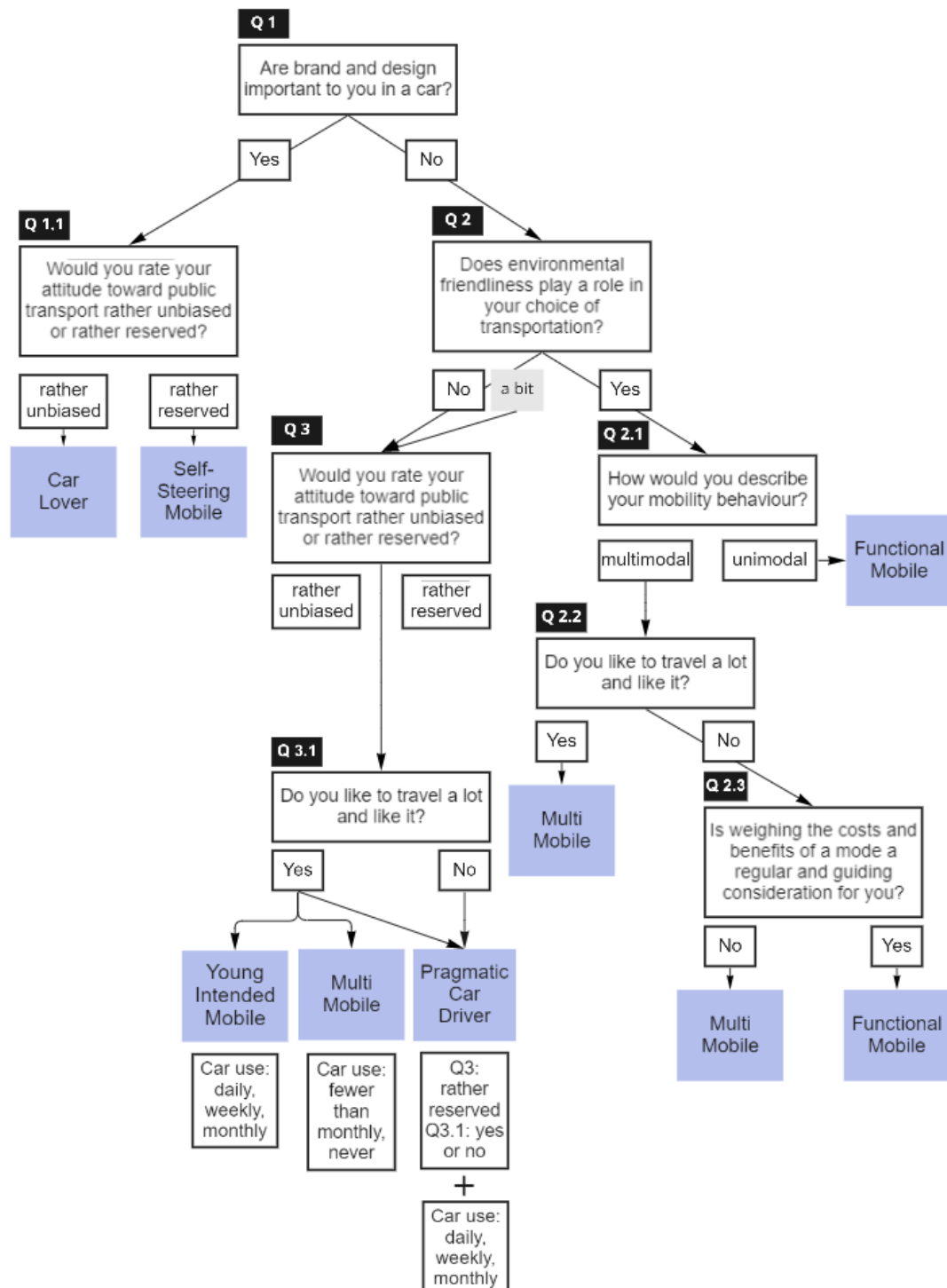


Fig. 3.1 Questions to identify the different mobility types in survey

Question Group 2 – mode ownership and use

To get to know the travel behavior of the defined types in more detail, the use of the different modes is queried. The MiD serves as an orientation for the question design and to create comparability with the analyzed MiD data. In addition, the ownership of modes, membership of MaaS-concepts, and number of cars are documented. Finally, the parking situation at the place of residence is recorded.

Question Group 3 – demographics and geographics

Demographic data can also be assigned to personas. Although, especially in Bartz's research, a uniqueness in this respect is not visible. Relevant is the place of residence. Is it urban and thus the access to different modes easier? Or is this excluded from the outset by a rural place of residence?

Question group 4 – time preferences and contact data

Suggested dates for the focus group sessions were provided to participants at the end of the survey. Three weekends at the end of June/beginning of July are proposed. Additionally, participants were asked about their preference for a weekday date.

Interview Guide

The interview with covers the following four topics in order to get an overall impression of their mobility and attitude towards mobility plans:

1. By way of introduction, a conversation is held about the person, his:her mobility behavior, and other relevant key points.
2. The mobility type mapped to him:her is discussed. Does he:she agree or are there differences?
3. Mobility concepts in the neighborhood are discussed, the topic is explained, and finally, different components are elaborated against the background of potential uses.
4. The mobility plans and their composition are detailed.

In preparation for the interviews, the table of Bartz's mobility types and a list of relevant components of a mobility concept from literature and experience are added to the interview guide (see Chapter 2.3.2, Tab. 2.7). Everyone, in the beginning, is encouraged to say what pops to their mind and ensured that there are no wrong answers. I tried to formulate open questions, a common rule in interview or discussion guidelines, also in order to minimize research bias (Dürrenberger & Behringer, 1999; Patton, 2015).

Introduction (20 minutes)

- Who are you and who am I?
 - Brief introduction of the research question and the topic of the interview

- Introductions on a more personal and thematically relevant level (both interviewer and interviewee):
Profession, place of work/residence, children, common modes of transportation, favorite mode, etc.
- Discussing the interviewees mapped mobility type

Primary/key topic (30 to 40 minutes)

- What do you understand by a mobility concept? Does your workplace offer mobility management?
- Which components would you need in a mobility concept?
 - Which modes/services are relevant to you?
- What volumes and amounts of modes/services would meet your needs?
 - Which modes/services would you subscribe to?

Final (5 minutes)

- Can you imagine a life/world without a car?
- Do you have feedback or anything to add?

3.3.2 Recruiting, Conducting, and Analyzing

Survey

The survey served as a hook for the qualitative approach. One could already familiarize oneself with the possible participants and their mobility types. At the same time, people were introduced to the topic. The survey was distributed among friends, family, colleagues, a book club, student chat groups, a cooperative housing community, and on the website *nebenan.de*. Nebenan.de is a neighborhood portal where neighbors can sign up to offer or look for local help.

The survey was active from June 1st to July 3rd, 2022. It served as an advance guard to the interviews. While the survey was still online, interview participants were already being contacted. The data generated from the survey was finally mapped with *R* to the mobility types and small index cards with the mobility behavior characteristics were created in preparation for the interviews to avoid duplications and to clarify important points and ambiguities from the survey.

Incomplete answers were excepted as complete if the participant answered all topic-relevant questions. Meaning that only the date questions regarding the focus group and interview appointments were disregarded. The Mapping process of the answers to the mobility type was conducted along the logic of Fig. 4.2. However, the crossover of questions Q 3 and Q 3.1 did not allow a clear assignment to the types. Therefore, the assignment of such participant's answers is explained below.

Those that said that the environment affects them a bit in their mode choice only got the Q 3 and Q 3.1. Therefore, YIM was mapped to those using a car at least once a month. Those that never use the car or fewer than monthly were mapped to MM. In addition, two participants were mapped to MM, who did not answer Q 3.1.

Interviews

Interviews were conducted from July 6th to July 26th. They were either held in person, via the online platform Zoom, or by telephone. The interviewees are labeled 1 to 15 in chronological order. One discussion was a double interview with two female participants. They were given the abbreviations 1.1 and 1.2. More details of the persons are given in chapter 4.3.. Car-free households are tagged with *CF* and cooperative residents are labeled with *coop*. Additionally, the MT is listed. The conversations lasted from a little over 30 minutes to one and a half hour.

Immediately after the interviews, the process was reflected, and weighted bullet points were noted for the following aspects, according to Dürrenberger and Behringer (1999):

- important topics and ideas
- differences to expectations or other interviews
- surprises
- changes to the process

All Interviews were audio recorded, except for one, number eleven. The software *transcribe* transcribed the audio files to text. However, the results were unsatisfactory, and chosen quotations had to be retouched. The transcribed audio files were imported into the software MAXQDA, and a color code was used to identify relevant topics. The program helped to get a strategic overview of the issues discussed with each person and to draw comparisons among them.

4 Results

This chapter presents the results, firstly, of the MiD findings, secondly, the survey results thirdly and finally, the qualitative evaluation of the interviews is highlighted.

4.1 MiD Data Analysis

After transport-relevant indicators related to trips, persons, and tours of the MTs are presented, activity-based factors are discussed. Figure Fig. 4.1 shows the shares of MiD and Bartz on the respective MTs. MM and FM are similar in size. The deficit in the CL and PCD share, can partially be explained by the overlapping mapping process. SSM and MM are assigned to persons who can also be defined as CLs. A surplus of MiDs SSMs and YIMs can be found in direct comparison to Bartz. On the other hand, in Bartz, the Chinese ethnicity dominates the CL cluster, and is therefore not so widespread in Germany. However, the same is true for YIMs and those also occur more frequently in MiD.



Fig. 4.1 Comparison: Mobility type distribution according to Bartz (2015) (light) and the MiD dataset (dark)

The absolute number of each MTs trips, persons, and tours recorded in MiD is shown in Fig. 4.2. Unassignable combinations is described as *Other*. They are not considered a mobility type. In total, there 36.312 people in 28.162 urban households which recorded 129.312 trips. These trips on the other hand include 44.194 tours.

SSMs are the largest MT group, with over six thousand people, almost 24 thousand routes, and around eight thousand tours. The smallest are the CLs, which are assigned only 600 people and a little over two thousand routes. Independently of the MTs, the Others represent the largest group, with almost nine thousand people and over 30 thousand trips. In addition, all tours are significantly lower than trips, with an overall average of 2,9 trips on tours, which means that tours are usually combined with an interim trip and, thus, another stopover.

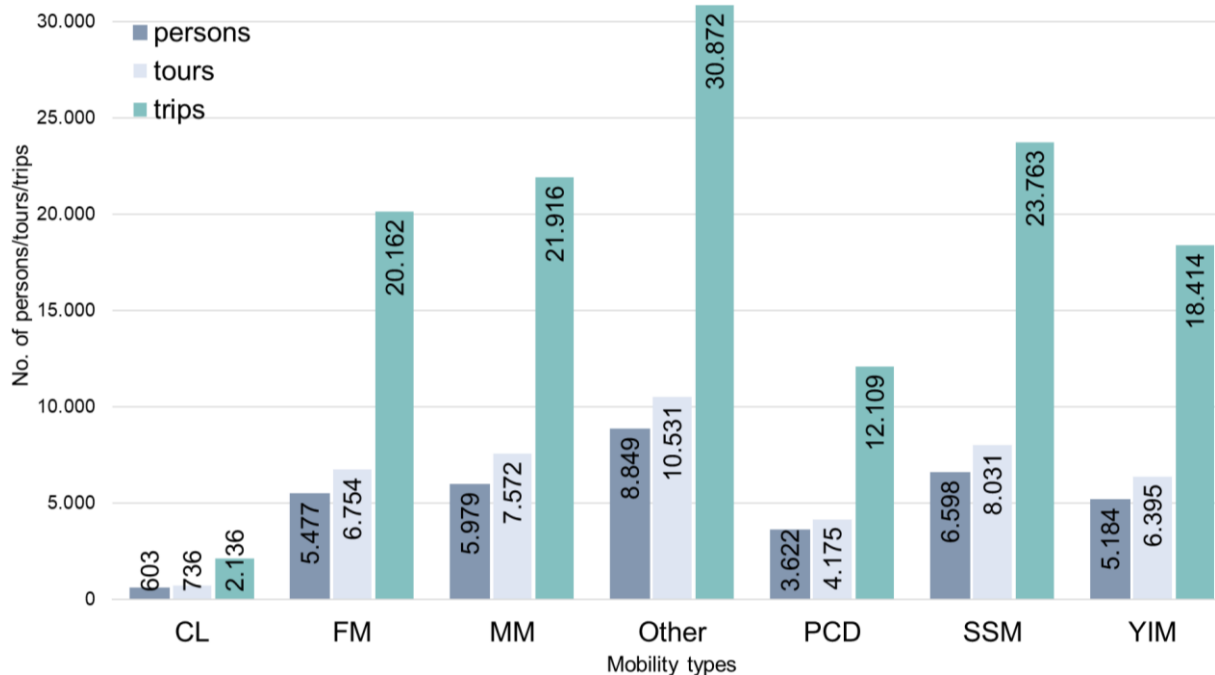


Fig. 4.2 Absolute number of trips, persons, and tours of mobility types according to MiD mapping process

The different modal splits of the MTs are shown in Fig. 4.3. They show recognizable differences, which indicates that attitudes also influence the use of a mode of transport. The three types that have some attachment to the car and have the most significant share of drivers. This is true for car passengers for CLs and PCDs, whereas for SSMs, this share is second to last; only FM has an even smaller passenger share. This and the low PuT share represent the predominant attribute of SSMs to control their own vehicle.

For FM, environmental transportation accounts for 76 % of trips. Their aversion to cars can be read out well here. Every second trip is made by bicycle, PuT or on foot among MMs. Although MTs live in urban areas, PuT accounts for a maximum share of 19 % among FM. PuT reaches the smallest share among SSMs, walking is the least common among CLs, and cycling is almost non-existent among PCDs.

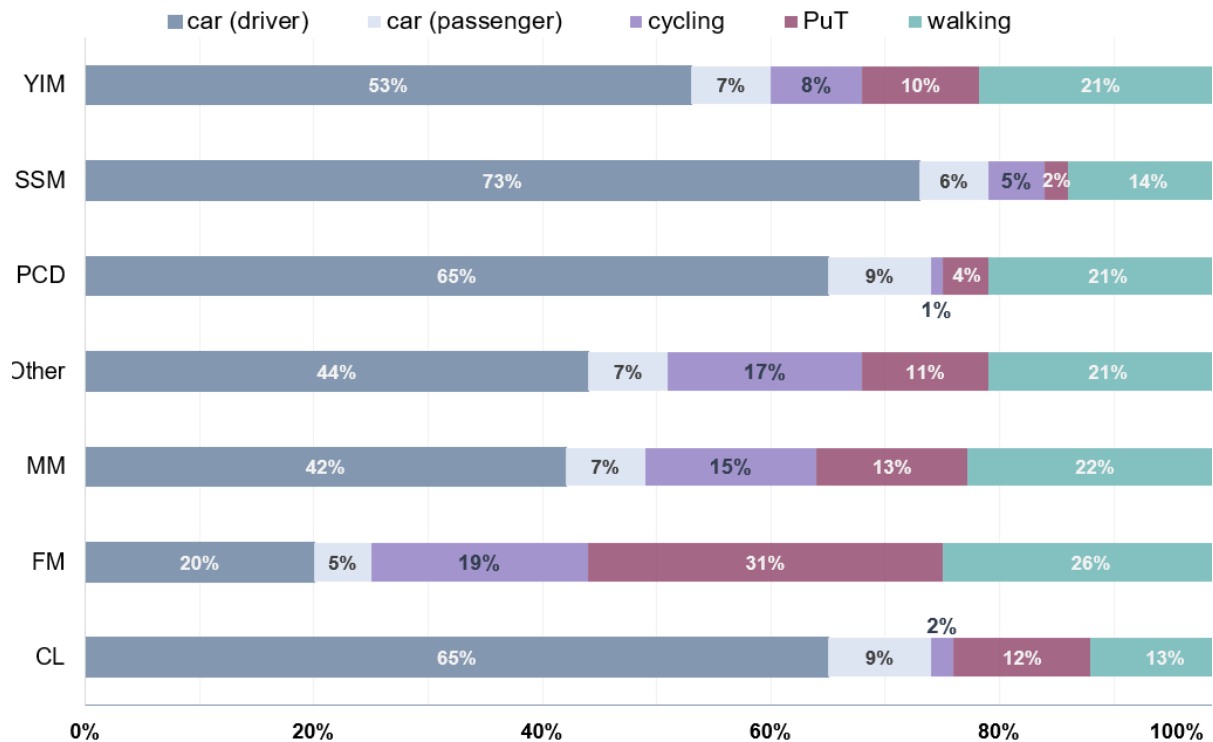


Fig. 4.3 Modal split per trip and mobility type of that person according to MiD mapping

MiD classifies individuals into uni- or multimodal transportation users based on their information. The persons are defined into the categories shown in Fig. 4.4 according to their weekly mode usage. The same types with the most prominent car share in the modal split also have the most unimodal car drivers. The share of car and public transport users is remarkable among CL (25 %), as well as the fact that every fourth SSM travels unimodally by bicycle. They are making it the largest unimodal cyclists' segment.

As can be seen from the name, MMs have the largest share of multimodal persons with 75 %, with the combination of car and bicycle being the most frequent. The FMs still have a share of 66 % of multimodal persons. Interestingly, the combination of car + bike is the rarest. On the other hand, Car +PuT and bike +PuT are the most common accounting for one in four. Whereas almost one in four MMs still uses cars exclusively, only one in fourteen FMs does so. The YIMs and Others are divided into a multimodal half, with the dominant combination's car + bike and car +PuT, and a unimodal half, where car use dominates. There is a small part of only public transport users.

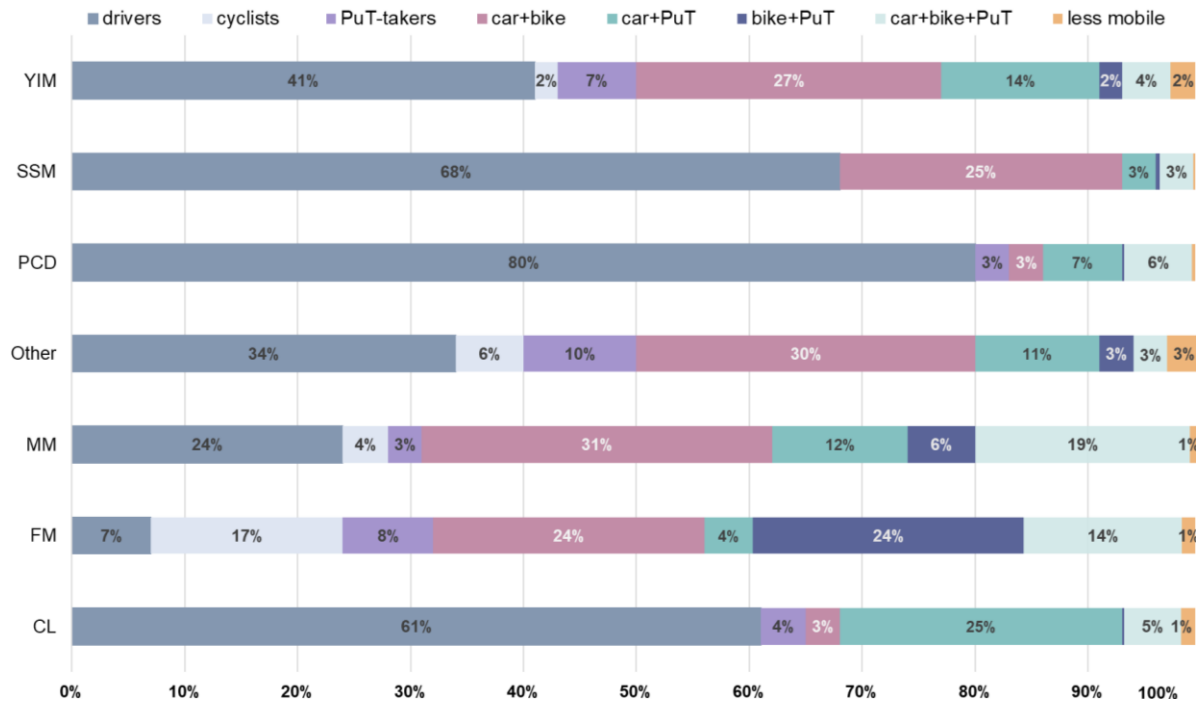


Fig. 4.4 Unimodal or multimodal travel behavior along the mobility types according to the MiD mapping process

From a gender perspective, the types are balanced with a variation of plus/minus 7 %. The largest percentage of men are CLs and SSMs (57 %), more women are found among the *Others* (52 %). The variables car ownership, economic status, children, and household size do not differ to the same extent as traffic behavior. It is worth noting that FMs have the largest share of non-car ownership, 27 %, compared to SSMs, with only one percent. Both these types have over 50 % households with high or very high economic status. Contrastingly, the FM and SSM households, lead with every third household having at least one child.

Activity-based Results

The following briefly examines the special features from an activity point of view. An illumination from each type and each activity documented by MiD (work, education, other, accompanying, shopping, and leisure) would go beyond the scope and lead to many repetitions. Therefore, either the results are reduced to a few representative types, or a type of analysis is omitted altogether. In addition, I mainly focus on the modes car and bicycle since I assume that the duration of the activities are most transferable to the respective sharing modes. Becker et al. (2017) found that in Switzerland, station-based CS is used more for leisure activities, shopping, accompanying, and transporting things. Free-floating is more practical when commuting to work, visits or as a transfer to the airport. To overview, recreational activities include sports and education, not at schools. *Other* errands include undefined purposes, personal errands, and seeing/meeting friends.

Fig. 4.5 thus shows an excerpt of the segments MM, FM and PCD for the activities work, leisure, shopping, and accompanying someone. The most significant difference is observable

between FM and PCD, while MM is more of a middle ground. SSMs are more like PCD, whereas CL and YIM are more in between MM and PCD.

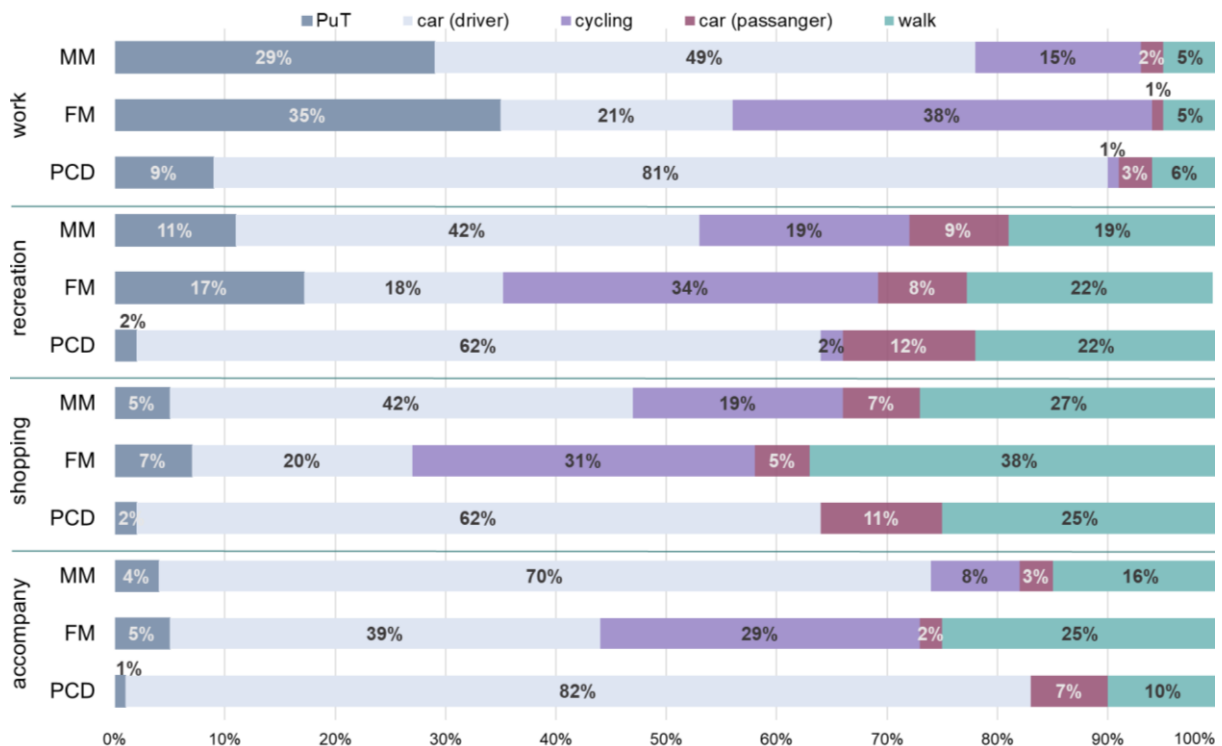


Fig. 4.5 Modal split mobility types over activity according to MiD mapping process

here are differences in mode choice concerning the activities. The most significant public transport shares are found on the way to work. PuT plays a subordinate role in shopping and accompanying people, as does being a car passenger. When accompanying people, the car plays the leading role in all clusters. Passengers are more likely to use the car for leisure or shopping.

On the other hand, the bicycle is most often used for leisure – at least one in four walks to go shopping. Individual modes have similarities across certain activities and segments, but the modal split considered for that particular type can vary widely. For example, 81 % of PCDs drive to work, while only 21 % of FMs and 49 % of MMs do so. Looking at the segments and activities, the mode choice is most similar for shopping and leisure.

In the following, I analyzed the activities according to segment, duration, and mode. However, it turned out that, especially for the categories work, shopping, leisure, and others, there are no considerable deviations in the duration over the respective modes and types. The deviations are to be considered between the modes themselves. And when the absolute number of tours is low. The chart on MTs, activities and duration is attached in the appendix. Therefore, Tab. 4.1 below shows the average and median duration of the respective activity for the modes car and bicycle aggregated for all types.

Tab. 4.1 Statistical characteristics of trip duration by activity and mode

	tour purpose	mean [h]	median [h]	standard deviation [h]	count
car (driver)	accompany	1,68	0,80	2,13	2.257
	other	2,55	1,83	2,27	4.330
	recreation	3,61	2,92	2,45	4.045
	shop	1,64	1,17	1,67	4.228
cycle	accompany	1,34	0,58	2,04	252
	other	1,86	1,33	1,78	1.012
	recreation	2,93	2,42	2,03	1.516
	shop	1,05	0,75	1,12	1.312

The values for cycling and driving show that most time is spent on recreational activities by car, over 3,5 hours on average. The median, though, tends to be a little under 3 hours. In terms of time, shopping and accompanying someone takes less than 2 hours and can also be completed within a reasonable hour. While with the car, both activities tend to last longer. This also applies to cycling. Other errands, on the other hand, take longer and thus come after recreation. Where one uses the bicycle in principle for under 2 hours, one needs the car longer for about 2,5 hours. Transferring this to sharing options and possible volumes, one to three hours for rented (cargo) bikes seems reasonable. With a sharing car, it would be between one and a half and four hours. Depending on the frequency of the individual activities, one can scale this up for a plan.

The following diagram shows the duration of shopping activities throughout the day. Walking is not considered. The graphs for work, other, education, and accompanying can be taken from the appendix. The latter two have very irregular patterns. Work starts in the morning and lasts from eight to ten hours. Other errands are also during the morning and afternoon rush hours.

Fig. 4.6 shows that for one to two hours, even in the morning between 9 and 10 o'clock, is often used for shopping by car as well as by bike. Also, the different lengths of the activities between cycling and driving are recognizable. In the case of PuT, no daily temporal accumulation can be recognized. The same applies as a passenger. The peak times in the morning and afternoon are shown, as well as a drop around midday and at night.

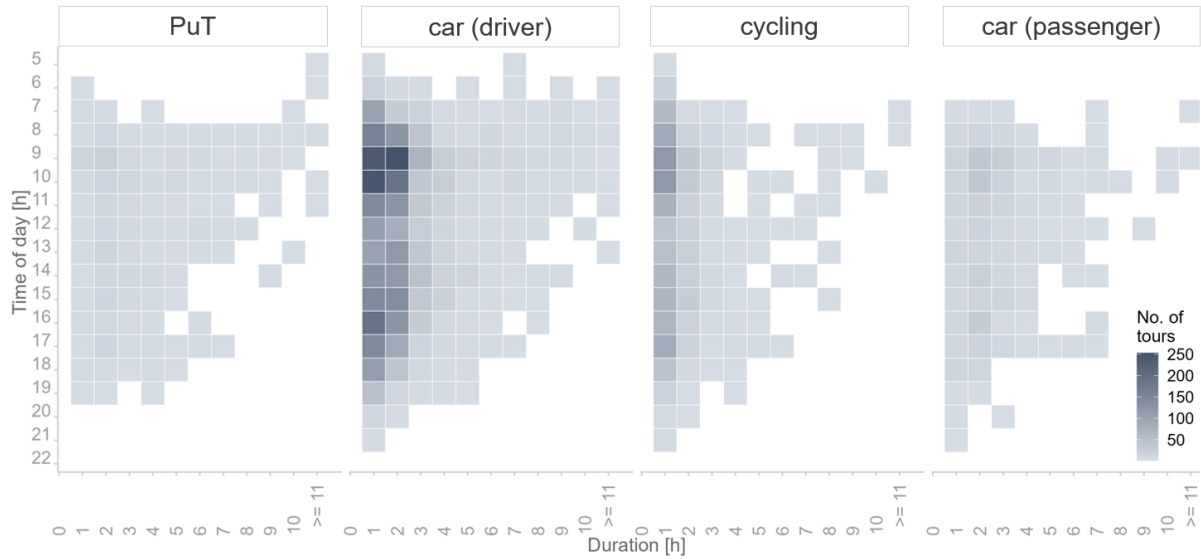


Fig. 4.6 Shopping durations over time of day and mode according to MiD dataset

In the free time one is rather longer on the move but it is less in the mornings and more in the afternoons/evenings. As a passenger, this is also slightly noticeable in the evenings. Which corresponds with the drivers. With the bicycle one can recognize a clear accumulation around 19 o'clock for a duration of approx. 3 hours.

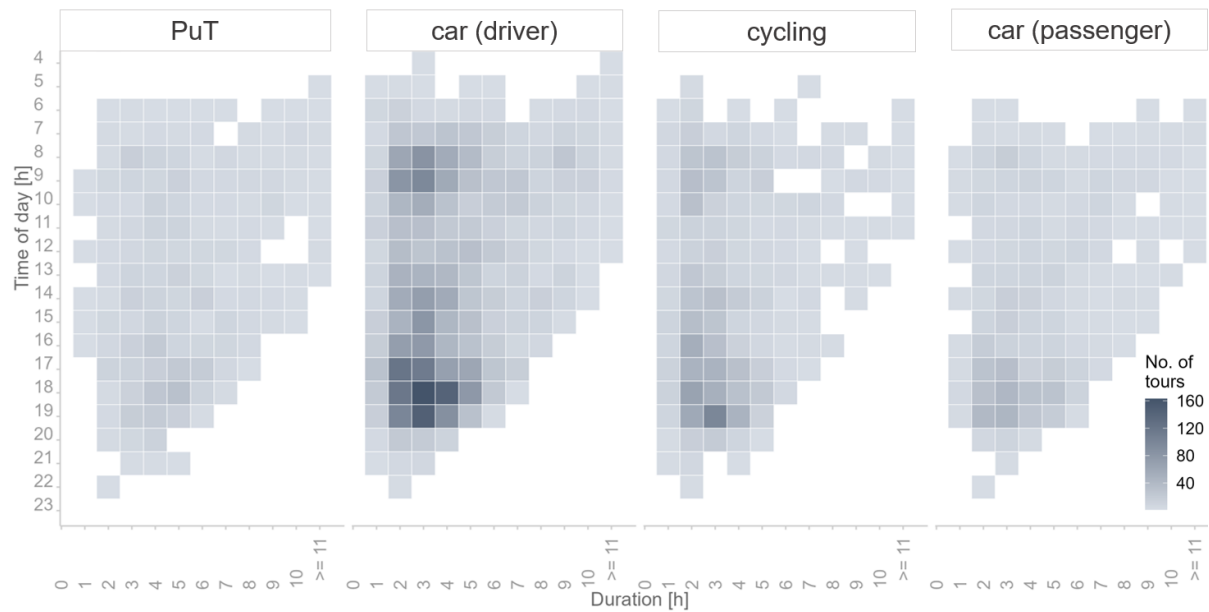


Fig. 4.7 Recreational activities duration over time of day and mode according to MiD dataset

The main conclusion to draw from this chapter is that while there are differences in the modes of transport used by MTs, no significant differences can be found in applying the modes for different activities and their durations. Especially against the background of the mobility plans, the activities can be broken down to their average/median. An accumulation of the different activities is not possible due to the data structure of MiD, i.e., a frequency of use over the week

or a month. The observation over the day gives a first indication of when accumulated demand can arise.

4.2 Survey Results

The survey is not a standardized questionnaire. The questions on mobility type are at the participant's discretion regarding how he: she assesses him: herself in these questions. As shown in chapter 4.3, some mapped types fit well. Others need to be adapted. The questions on mobility behavior provide more objective information here and thus allow the types to complement each other better. Nevertheless, this is a rather simple approach that is only intended to serve as a first segmentation. It does not claim to be correct or to replace Bartz's detailed statistical evaluation of clusters.

A total of 134 participants took part in the survey. Of these, 126 are complete responses, and eight are incomplete, i.e., the survey was terminated prematurely with insufficient responses. On average, it took four minutes to finish the survey. Around two-thirds are female. Twenty-five stated to be open to participating in a workshop/focus group session. Everyone was contacted and asked for an interview. Three never replied. No appointment could be found with the remaining seven. Sixteen people are interviewed, and the results are shown in the following chapter. Tab. 4.2 lists sociodemographic characteristics.

Tab. 4.2 Demo- and sociographic characteristics according to survey

residence	%	age group	%	sex	%
urban	67%	<18	0%	f	69%
suburban	31%	18-25	10%	m	31%
rural	2%	26-35	19%		
		36-50	30%		
		51-70	36%		
		>70	6%		

Almost no one mapped to PCD, as everyone stated they like traveling. This MT usually is more of a stay-at-home type and not highly active. However, the questions asked do not give a reference, so it is in the participants own assessment. CLs and MMs are the two most prominent groups. Together they sum up to over 60 %, which is way above Bartz's shares. However, as the interview process showed (see p. 40), the CL questions were too simple to differentiate between emotional and general attachment.

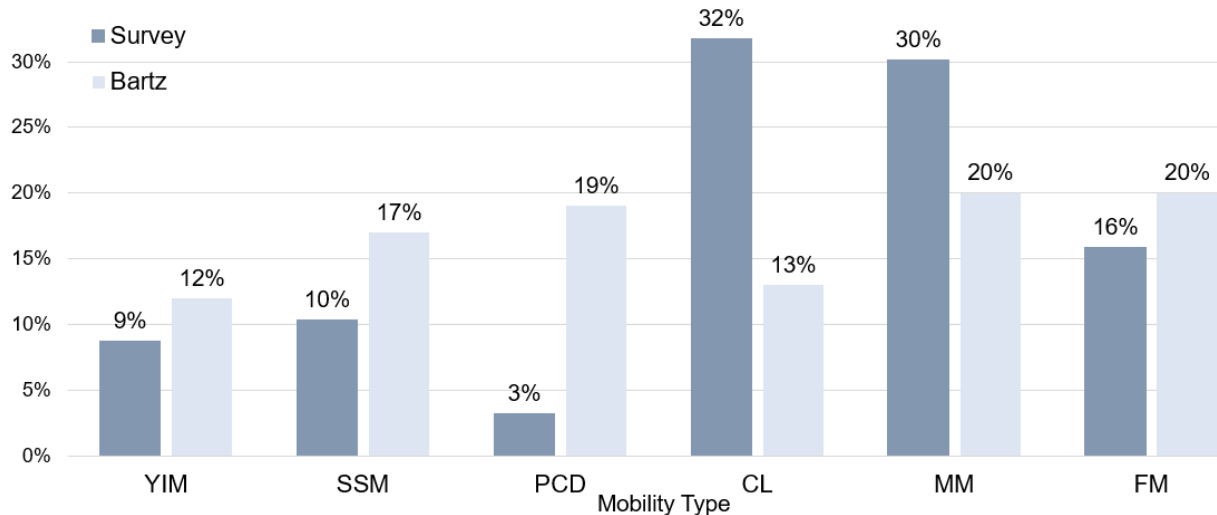


Fig. 4.8 Comparison: Mobility type distribution according to Bartz (2015) (light) and in survey (dark)

The table below gives an overview of the ownership of vehicles and the membership of sharing operators. Numbers in general need be seen with caution as absolute numbers are not high.

Tab. 4.3 Ownership/membership rates by survey participants

	car	company car	motor bike	bike	PuT-pass	CS	BS	ScS
CL (n=40)	68%	25%	13%	93%	48%	45%	23%	20%
FM (n=20)	15%	0%	0%	80%	55%	35%	20%	10%
MM (n=38)	37%	8%	11%	89%	66%	34%	18%	13%
SSM (n=13)	85%	31%	15%	85%	15%	31%	15%	31%
YIM (n=11)	82%	9%	0%	100%	36%	27%	18%	27%
PCD (n=4)	25%	75%	25%	100%	0%	0%	25%	0%
all (n=126)	52%	17%	10%	90%	48%	36%	20%	17%

Bicycle ownership is the highest among all types. As expected, the multimodal types MM and FM are ahead in transit pass ownership, and SSMs and PCD are at the lower end. The highest car ownership rate among the types have SSMs, YIMs, and CLs. This is the same for access to company cars, whereas PCDs have the highest rate here. In total more people are registered for BS than for scooter sharing (ScS). However, around one-third of SSMs and YIMs have ScS. BS memberships distribute more homogeneously among all types. The fewest people have a motorbike, followed by company cars and ScS.

Cars per household in Munich is estimated at 56 % (Belz et al., 2020), whereas in the whole of Germany it is at 87 % (Nobis & Kuhnimhof, 2019). The combination of private and company cars gives an average of 69 %, a well in between value. The survey explicitly asked about ownership. The number is, therefore, actually relatively high. CS memberships have 36 %, and according to MiD, it is at 21 % in Munich (Belz et al., 2020). Making it slightly more. Of the 36 % CS memberships, 50 % have no car. Now that the survey has been considered in its constituent parts, the interviews provide a qualitative supplement.

4.3 Findings and Impressions from the Interview Process

Findings from the interviews are presented next. In total, I spoke with sixteen people. Tab. 4.4 summarizes the relevant key data. About a third of them are male. As is also shown in the literature, more women tend to be involved in similar studies (Guidon et al., 2018; Matyas, 2020; Matyas & Kamargianni, 2018; Sochor et al., 2014), although none showed such a clear female surplus. A Free University of Berlin study also shows that men have an 11 % lower participation rate in online surveys (Ksiazek et al., 2020). Nevertheless, since this is a qualitative approach and women and other social groups have long been underrepresented in studies of all disciplines, this work can be seen as a complementary effort.

All interviewees live in the city of Munich. Seven in suburban areas and nine in central Munich. Five residents of a cooperative enriched the results through practical experience. In addition to three CS cars in the underground garage, their house has CBS, tenant tickets, and a volunteer mobility group that addresses residents' concerns. Further, some signed a waiver to own a car while living at this premises. The advantage here is the subway station in front of the door. Eleven of the respondents have access to a car in their household. Three even have two cars at their disposal. A total of five respondents state that they have a company car, and the same number of respondents live without a car. Three of them are in the cooperative. These are not only students but also families. As for the size of the HH, half of them live in a two-person HH. The other half is divided between single and four-person HH.

Younger interviewees are academics who also take the issue of sustainability into account. Sustainability also plays a greater role among the cooperative participants, as well as awareness of sharing and commitment in a community. Here especially participants who are interested in the topic of mobility or who have an open attitude towards surveys etc.. At the same time, people who do not necessarily bring a prerequisite and openness to the topic could be reached through family and friends. Economically viewed, the population is mixed. There are financially well-off households. Whereas cooperative housing also supports less financially well-off households. However, this was not asked in detail.

Tab. 4.4 Kye characteristics of interview partners

id	mobility type	place	participation origin	place of residence	car ownership (HH)	PuT-pass (subscription)	housing type	age group	household size
1.1/coop	CL	online	cooperative housing mailing list	suburban	1 (company car)		cooperative apartment	26 - 35	2
1.2	CL		bookclub mailing list	urban	1		apartment	51 - 70	1
2	(CL) CL/MM	online	bookclub mailing list	urban	2 (one e-car)		apartment	51 - 70	2
3	MM	Gern, Munich	family + friends	urban	2 (one company car)	yes	apartment	51 - 70	2
4	FM	online	student chat	suburban	1 (company car)	yes	apartment	26 - 35	2
5	(SSM) MM/FM	online	neighborhood portal	urban	1		apartment	> 70	1
6/CF	(CL) MM	online	neighborhood portal	urban		yes	apartment	51 - 70	4
7/coop/CF	MM	online	cooperative housing mailing list	suburban		yes	cooperative apartment	36 - 50	4
8	MM	Gern, Munich	family + friends	urban	2 (one company car)		apartment	51 - 70	2
9/coop/CF	FM	online	cooperative housing mailing list	suburban			cooperative apartment	36 - 50	2
10	(CL) CL/MM	Lehel, Munich	bookclub mailing list	urban	1,0	yes	apartment	51 - 70	2
11/coop/CF	MM	online	cooperative housing mailing list	suburban		yes	cooperative apartment	> 70	1
12	YIM	online	student chat	suburban	1	yes	shared apartment	18 - 25	2
13/coop	(CL) CL/MM	Riem, Munich	cooperative housing mailing list	suburban	1 (company car, e-car)		cooperative apartment	26 - 25	4
14	MM	Lehel, Munich	family + friends	urban	2		apartment	51 - 70	1
15/CF	YIM	online	student chat	urban			shared apartment	26 - 25	4

coop = living in cooperative housing, CF = car-free household

Mapped Mobility Types

The MTs assigned to the interviewees are briefly discussed. In ten out of sixteen cases, the participants approved the assignment via the survey. Furthermore, in five of the six other cases, the mapped type is CL. Here the respondent's expressed skepticism and justified their answer to question one of the survey. The following quotes provide information. I guess that one has problems being put into a category like this. At the same time, they are aware of the problem 'car' concerning the climate crisis and therefore do not want to be identified in this way.

Further, the question is, how do you objectively define an emotional attachment. Is the value that it is a nice car already such an attachment? At the same time, how honest are the people towards me? Most participants would also fit the MM profile, which is more common in Germany.

In the interviews, no one stood out as a particularly clear CL, so I would tend to map these guys more to MM. That can also be taken from Tab. 4.4 (p. 39). The type in parentheses is the one mapped by the survey, the ones behind are the types mapped during the interviews. It shows that question one is perhaps not delimiting enough to define the type sufficiently.

People do not like to be labeled. When talking about the Car Lover type, participants reacted reservedly or indignantly. The participants justified their statement in the survey by saying that they are not explicitly attached to a car but would not get into one type of car because it does not meet their expectations of a nice, good and high-quality car. Minimal criteria are placed on cars, which can perhaps be described as an emotional attachment for some. Nevertheless, it is open for discussion to what extent the first question, in combination with the second question of the survey, describes the accuracy of this type. Thus, none of the participants openly admitted an emotional attachment to their car, and some are willing to give it up. This shows that they might fit better into the cluster of YIM or MM.

1. *'But you know that Renault Kangoo car that looks like a hippo? They once made an advertisement with a hippo trying to copulate with the car. So, I would never buy a car like that, because it's a compromise of everything, it's supposed to be big, it's supposed to be cheap, it's supposed to be whatever. But that's the kind of car for me, I would never buy that. So that's what I have in mind when I say brand and design are important to me.'* 2/CL-MM
2. *'Yes, that you are a car lover, no one likes to hear. But it is simply true. The way you've described the type now, that's just the case. (...) If I heard them now, I would almost even see myself with one foot in the multi modals. (...) You're right, of course. The car is important to me. We've also talked about getting rid of it many times, but in the end never did. And that also has to do with the fact that the car is valuable to us, because we also pay for the parking space. And the feeling that it's there, when we are invited somewhere, that we can then say okay, I'll take it and if the weather is bad, just don't have to go by bike.'* 10/CL-MM

4.3.1 Relevant Components

This chapter analyzes the findings from the interviews. First, the types of mobility and the participant's state of mind are examined. The individual components are then examined. Finally, further aspects are discussed, also independently of the components. Here, the focus is on attitudes and needs for implementing mobility concepts and plans. For the sake of readability, the findings are first described in own words and then underlined with selected quotations. The quotes were translated from German into English and can be found in the appendix in the original.

Parking and Charging (Car+Bike)

Turning to the topic of parking and charging regarding the private modes car and bike, those who have a car use it mostly irregularly or once a week. The most frequently mentioned are trips to relatives, vacation homes, and holidays. Only two respondents use their car daily to get to work. These are also company cars.

Six people pay for a private **parking** space or own a private parking space. Five people use resident or on-street parking. Due to increasing densification in Munich, some increasingly consider parking difficult, even with a resident's permit. In some cases, private parking spaces are shared unofficially with friends and neighbors. A reciprocal occupancy for parking space is well received, meaning to book your parking space. However, participants see it more as their own parking space, which they give free when they are not there. One respondent finds the idea of booking a parking space at the workplace very appealing. Interestingly, a booking system can incentivize one to make trips by car that one would otherwise not make due to the lack of a parking spot.

3. *'They [guests] get my parking space because I put mine somewhere else days before.'* 14/MM
4. *'That's what I would do. Absolutely. Because (...) I often don't drive because I know that when I arrive, there's no parking space. If I could sort of book one in advance, I would do that.'* 8/MM

Charging only affects two participants, as they have an e-car. One of them is a company car, which was only purchased because of access to a personal charging station. The desire for more charging stations came not only from e-car owners but also from potential future buyers. However, it seems that it may also be necessary to consider a new regulation for their use.

5. *'What would be interesting in the future (...) is that the one car we have is an electric car and it is actually sometimes a bit tricky to charge. (...) So sometimes really, I drive in circles and can't find a charging station. That's never dramatic, because then I just wait a bit somewhere. Then I charge later. But if there were private charging stations that were installed somewhere, then people would say, "Yes, you can come, charge with your card, pay an additional €2 fee," that you can stand there and then it's good. There is something like that now, it is being considered, but I have not yet found it in Munich.'* 2/CL-MM
6. *'Parking lot with charging station (...). No, but it's a basic requirement for an e-vehicle. You don't want to have an e-car where I must then look somewhere in the neighborhood'*

in the evening to see where I can park (and charge) it. Then I can only park there for four hours, and at midnight I must move the car.' 3/MM

In most of the conversations (13), it became clear that there are not enough secure and weather-protected **bicycle parking** spaces in the house. These are then partly illegally placed in the basement compartment, or additional space for bike storage is rented. Also, the cooperative has an apparent deficit of parking spaces. A participant is also concerned about the 'under planning' in terms of additional areas for modes other than cars. She lives without a car and cannot park her electric scooter properly. A well-planned parking facility can nevertheless make the use of bicycles more convenient. Charging infrastructure outside the apartments was noted. There is also an exchange platform, e.g., bike parking in the cooperative. In principle, many are willing to pay for safe and secure parking, but the question is how much.

7. *'So, we are actually five people with us. So, everybody needs a bike here, even if they don't live here all the time. (...) But we only have three parking spaces. That's very little and it's the same for a lot of people, (...) what do you say when you deliberately under plan something? (...) So just at a house where we have marked, we permanently waive the parking space for the car, because we do not have a car and we commit ourselves to continue to have no car. So, I was pretty upset when I heard that we can't even put all our bikes in a proper rack. (...) So we have to put the UNU [electric scooter] somehow wrapped with tarpaulins, somewhere at a corner of the house, where the wind doesn't blow it over and it doesn't get in anyone's way.'* 7/coop/CF/MM
8. *'And then I would have to take the battery upstairs. And I have to be honest, I would rather charge my battery outside. I'd rather charge it in the garage or something. And maybe that's just a pipe dream, but when you hear so much about fire protection, you know so much and that something like that can explode, but you'd have to think about something.'* 4/FM
9. *'Before, we always had our bikes in the basement. That always meant unlocking the basement compartment, somehow pushing the bike out of the narrow thing, and then carrying it up the stairs and so on. Now the bike is in the garage, which is much easier. I unlock my lock, get on it and ride out of the garage. It's much faster. And because of the fact that the process is not so complicated, I think we also ride our bikes more as a family.'* 13/coop/CL-MM
10. *'I can imagine, but rent? Thank you, that makes my ears prick up. What do they want from me? Money? How much money? That would be a question of money. Well, it's outside the bike at the moment. And sometimes I put it in the yard but is unfortunately not under a roof. But this would be relevant to me.'* 8/MM

Carsharing, Carpooling and Cab Credits

Even though they do not (regularly) use **CS**, all participants agree that this is an essential part. Two of the participants living without a car use it within their household. Two use CS for regular leisure appointments and shopping. CS is a prerequisite for a car-free life for those who still have a car. Hurdles like price, not knowing how to use, and fearing that in case of emergency no car is available play the leading role. One cooperative household uses the CS offer in their underground car park. Otherwise, they rely on the previously used CS of another provider in the vicinity. Here, the reloading of the app and the associated registration process is perceived as a nuisance.

11. *'I have never used it before. The time it takes to download an app and enter my account data again bores me so much that I think, by the time I've done all that, I'll already have walked to where I want to go.'* 7/coop/CF

Experiences and worries revolve around the same issue: no car is left for one's use during vacation periods and weekends. A strategy that helps to buffer these peaks and to give security to the users seems indispensable. Demands are made on a differentiated fleet with minibuses and motorhomes. Participants who can imagine giving up their car are also aware that they will reduce their usual car use when switching to CS offers.

12. *'I think that's an exciting thing. So, I think, if there would be a suitable advertising slogan like 'With your plan 1000 vehicles'. Then I would probably be a bit more reassured than if it said your plan three vehicles.'* 7/coop/CF
13. *'Well, then it would just be like that. I think you just have to become a bit more pragmatical. If I say I have eight hours, then I just have the eight hours (car sharing).'* 8/MM

Carpooling is known to all and was used before. Tend to use it for more travel. They are more willing to take known people with them than strangers. Some had bad experiences with hitchhikers. The format of neighborhoods could be an advantage. Others said they do not think it is practical and explained from personal experience. Just one participant used to take a colleague with her once a month. This was coordinated on a personal level. In conclusion, there is probably a great need for expansion here, but it must be designed primarily from a social and personal perspective. Here, a platform with a profile for exchange could be helpful.

14. *'I find that problematic, because I don't know the people and I always think, either they talk to me, or they stink. (...) I would do that, here for example. Do you have to go somewhere? (...) Or in the immediate professional environment, colleagues, but not completely foreign people. (...) And where you can look at them beforehand. (...) I had also thought long and hard about whether I would take someone from Ukraine. And it was also stated on the website of this association that you can get to know each other. Yes, and I find that important.'* 14/MM
15. *'And with my cats, I don't want to ask someone else. If I would take someone with me. But yes, but now in Munich, too complicated to nudge that.'* 12/YIM

One issue from talking to a caregiver for the disabled has arisen is **cab credits**. In this way, the home residents are guaranteed a certain degree of independence through cab credits. In this way, they can participate in social life. I raised the issue with a couple of interviewees, but none of the three found it relevant in their cases.

16. *'And such offers would be but actually just for older people doctor's visits, or ... Actually, a good way to cover many trips by professionals who are used to traffic.'* 9/coop/CF/FM
17. *'I don't think anything of that at all, no, because I think that it would then ultimately lead to that, you might have less private cars, but then you have more cabs on the road. And ultimately, my ideal would be a car-free city. A car-free city center, yes. That's what I think. And then I wouldn't need cabs there either.'* 10/CL-MM

Cargo- and Bike-Sharing

Looking at the issue of bicycles, as described above, there are consistently too few bicycle parking spaces, I was repeatedly confronted with the desire for more space and infrastructure for cycling and the insecurity due to crowded streets as well as reckless drivers. In this context, driving safety training was introduced but rejected because it does not solve the problem of other reckless road users.

18. *'I don't think I would, because driving safety training doesn't solve the problem that everything is just way too crowded in the city here in Munich and that there are these endless road works.'* 5/MM-FM

Local **e-bike sharing** seems to have little benefit, at best for visitors. The older respondents also did not see an explicit need for e-bikes in the city. There was also increased talk about the expansion of free-floating services.

19. *'For guests, yes, of course. So, if I had it now, for example, an e-bike would be good for my dad. I would borrow it for him.'* 1.1/coop/CL

One participant discussed a topic in more detail, as it represents the current need for people to offer a concept similar to Swape Fiets. So that one can rent an e-bike on a monthly basis. For her, a new purchase would be expensive, and she would like to try commuting to work by e-bike first.

20. *'Well, I thought to myself, if there were the MVG bikes here with E-, I would have already tried them. But on the other hand, I've already had the experience with these bikes that they're just not good and that they're just standing around and that's why it's no fun and you don't really need it and they actually litter a bit the environment.'* 4/FM

On the other side, the renting of **cargo bike sharing** (CBS) (12) was mentioned by the majority of participants or was perceived positively. Experiences could be taken from the conversations of the cooperative residents. They are used here somewhat irregularly but are seen as helpful at times also potentially. In addition to the variety of cargo bikes, which are booked in an app, trailers can be rented without any cost. In the latter case, one interviewee pointed out that the trailer system is specific to bicycles and therefore does not always work. According to one resident, the cargo bikes are used more often than the trailers because of the motor.

21. *'I've never borrowed one before. So, because I'm still so strong that somehow with my backpack and my bike basket I can move my own bike quite well. We have three cats and there I have already considered, that if the times come when they have to go to the vet, then I will try to borrow such a cargo bike to then put these transport baskets purely. Since I would now rather not borrow a car, because that somehow ... but of course, it depends, so let it be winter and emergency.'* 7/coop/CF/MM

22. *'13: And I personally have never borrowed the trailers for the bike, but there are a handful of very intensive users of the trailers and they also use them, so they have a good utilization. And they are not just standing around, they are really used. But not by such a huge circle. Interviewer: The trailers, because they are free, just more likely, right? 13: Yeah, I would almost say the ones the bikes, the eBikes, they're used more, the utilization is almost higher. Advantage of the power system.'* 13/coop/CL-MM

23. *'It works. You realize with this thing that, if it was made exactly for this like for this [tenant] ticket or for these three tickets, then the function would be a little bit different. But since*

with the same app also bike trailers are lent or booked and yes other transport stuff around private biked, which you do not need so often, so there are two or three trailers that you can rent with it and child seats and saddlebags and so on. It works for all somehow but you have to read always text that says 'Yes, here the screw just got lost.' 9/coop/CF

Non-users saw the most use for shopping and bulky errands. An older participant said she once considered purchasing a cargo bike with seats for adults to take her husband around. That speaks for using multi-function CBS.

24. *'Yes, when I still had the J., I thought 'Why is there not something like for children, that you could also squat the old one in and take him to the English Garden?' Of course, he rejected that far from himself, how shit that would be, if he sat there. But I thought it would be a good thing, like a rickshaw. Then we could have done everything together because at some point he didn't ride his bike anymore after he fell down once.'* 14/MM

The following quotes show the positive attitude of two respondents. One respondent is now retrofitting CBS in the neighborhood and is curious to see how users in the neighborhood will level off.

25. *'We'll soon have a cargo bike, too. There is such a Munich association, which somehow sponsors it and they place it near us. I'm involved in the club, and I think the concept is good. So it's not one where you drive kids around, but actually to go shopping or to be able to transport larger things. I think that's good. The question is, will it be used or will it just stand around? I do not know. We'll have to see how it's accepted.'* 2/CL-MM
26. *'So what absolutely belongs to it is such a cargo bike, that if you have to transport larger things, you also have a possibility without having to fall back on the car.'* 8/MM

Now I would like to point out the other side, which sees no benefit in a cargo bike because it is not a car replacement for them, or one does not necessarily want to identify with the type 'cargo bike user'.

27. *'What should I do with it? I don't know why I would want to use that (...) No, what I would want to do by car..., the distance is too far for that. Okay, so if I go shopping, then I would simply be on the road for at least another hour. At least.'* 10/CL-MM
28. *'So, if you can borrow it, that you can say drive a crate of beer home or something. (...) Maybe. I'm more of a person who says, "cargo bike owners or users have a certain touch, and I don't necessarily want to put myself on the same level.'* 3/MM

Bike Service and Workshop

The people who would be happy to have a **bike service** (7) nearby and those who do not need it balance out. A **workshop** (6) is not rejected in principle but does not cause great emotion either. People with a job-bike (the company helps finance a bike leasing) do not need a bike inspection or service as this is included in their contract. The problem is that bike stores only accept bikes purchased from them for service/repairs. Indicating that independent low-threshold services could help. There are offers on public squares, where no appointment is needed, and people can stop by as they need it. In this context, one person mentioned she liked the bike-washing facility offered for some time.

Some participants, not only cooperative residents, have *Repair-Coffees* in the area or privately initiated bicycle-repair-workshops. No one has used this yet but found it reassuring to know that there is someone you can potentially ask. There is the camp that likes to do it themselves and the one who prefers to let someone else do it. There was always the question, what exactly does a repair service include, and that one can do small and simple things themselves. Here is room for definition. It is, however, well received that someone offers the service in the quarter once a year. One participant said she would instead use someone for her car than for her bike because she has a shop outside the door. Nevertheless, from this, you can deduce that the need has already been covered and exists. The wheel-repair stations of Munich came up in addition to the topic. Points where someone can pump air into the tire, tighten screws, etc. These were discovered by accident and were described as not sufficiently labeled. Something like this is easier to implement as a workshop and can be easily retrofitted.

29. *'But someone for the bike, I don't need. So I do that either way. So if I notice that a bike would have to be adjusted again or just times the circuit would have to be readjusted or brakes are checked.'* 3/MM
30. *'Maybe as a service, if I pay year 100 euros and then this fork service is in every two three years. I do. However, if I pay 300 euros every year for something like that so they could potentially do it every year, then it's not worth it to me. That's why, again, I think it's this cost-benefit calculation. Small simple things I can do myself and if, then I need the elaborate, but the elaborate is not included in such a plan mostly anyway.'* 13/coop/CL-MM
31. *'That's the thing between doing it myself and professionalism. That's what's always so difficult, but in the end you have the possibility to have things professionally repaired and to be able to do something yourself. I mean, that already exists.'* 4/FM
32. *'We have a repair coffee every Friday, every first Friday of the month. We already have something like that. As I said, the AB Association organizes it and I don't use it myself, but I would know that I could use it. But I am not that much of a frickler.'* 2/CL-MM

Tenant Tickets

Except for the residents of the cooperative, no one knew about tenant tickets. After I explained the concept to the participants, I received thoroughly positive feedback. There was skepticism about the implementation, but it was generally agreed that it is a good addition if it works well. Some were unaware that there are transferable PuT-passes. Others already do this within the family or household. The benefit was seen more by those who do not have their own PuT subscription.

33. *'Great idea. I think it's a great idea. We practice that, if we are not there or so, then we leave our tickets at home, then our children drive around with them or guests or whenever it is possible. I'm also often asked if I can lend out my IsarCard. I do that, too, because it's transferable.'* 10/CI-MM
34. *'So what would help me quite a bit, because I do travel very irregularly by public transport. If you had access to a, to a ticket.'* 8/MM
35. *'Yes, that depends (...). Interesting approach. Have to see if that works. It always depends on the heterogeneity of the people who are in the community. And how that then works in practice. But in principle, yes. Smart approach.'* 3/MM

Experience reports from the cooperatives show that the concept is well received and is being used, although current utilization in the survey period has declined sharply due to the 9 Eur³ ticket. Nevertheless, further tickets are being considered in addition to the three current tickets, depending on how demand after the 9 Eur ticket develops. In addition, it has become apparent that there were regular reservations, which should be prevented by limiting the number of bookings. They should be available for spontaneous/irregular trips and not replace their own ticket for regular appointments.

36. *'We've used it a couple of times too. (...) We used it more spontaneously, 'yes is free today, good, let's go to town'. Because we then needed two, we don't have a card, but we then needed two. And that's actually stopped now too. Unless it's spontaneous. If it is spontaneously free, then you are allowed to have two in parallel. Otherwise, only one booking is allowed. That means if you say 'we'll do something together', that's not possible.'* 13/coop/CL-MM
37. *'It travels through the house, in the sense that the previous tenant throws it into the mailbox of the next tenant. I.e. we don't have a central point of collection, where we put it and you pick it up, but we look in an app, 'who's next, aha he's next, I'll put it in his mailbox'. And if there is a gap of more than 24 hours, there is the so-called caretaker, who takes care of the ticket, who also takes care of it, if it gets lost or something, also that (...) the cover is intact and so on. And this caretaker then gets it into the box, if it is away for a longer time, the caretaker has to become active. If it's well booked, the caretaker doesn't have to do anything at all, because it's permanently marching back and forth in the house.'* 13/coop/CL-MM

Mobility Manager and Information

This section is about the **Mobility Manager**, a person who is responsible for the different services in the neighborhood and who is the contact person for residents and users. According to the reports of the cooperative, there is a voluntary mobility project group that takes care of mobility issues. Furthermore, some individuals act as an interface to the CS provider, and coordinators take care of the distribution of the tenant tickets. The idea of a responsible caretaker receives approval, although the question of implementation arises in some cases, mainly from cooperative residents. Of course, this person must be competent and available when needed. A contact person as a safety net for users should not be undervalued.

38. *'We have various project groups in the building for all kinds of things. And one of them is the mobility project group, which also takes care of the cargo bicycles, for example, or these bicycle trailers. And it is very good to know that there is an e-mail, for example. If you have questions, you can turn there and people really take charge of it. But of course, it's also the case that something like this is done on a voluntary basis and that can fluctuate. But until now you can not complain, if someone does something like that in his spare time, then everyone is grateful. But I could imagine that in larger houses, where a lot of families and people live, it would make sense if permanent people took care of it or if it was outsourced.'* 1.1/coop/CL
39. *'There is the brave C. who is always the link from our house community to, for example, 'Scouter' or just the companies that offer their vehicles or also something like that or just*

³ The 9-Eur-Ticket was an initiative of the German government in the months of June to August 2022 to dampen the effects of inflation and the energy crisis. The ticket could be used throughout Germany for local and regional public transport. (tagesschau.de (2022))

also provide the technology that is supposed to run so that one is able to borrow cargo bikes and cars. And he the patient/annoyed contact person for topics and questions.' 7/coop/CF/MM

Skepsis:

40. *'A bicycle is a completely different thing from a car and these tickets are something else again as well, which is just organization. Not much maintenance or anything, but just looking, somehow the person who wanted to have it really gets it. It's much more of an arrangement and so on. Electric cargo bikes and e-mobility, in general, is something between cars and bicycles, but I don't think they can be organized from a single source.'* 9/coop/CF
41. *'There's the neighbor who helps you to help yourself, supports you a bit, and that's a super low-threshold, great offer for people who don't do that much with their hands. But if you can already do relatively much yourself and do so, then he will not be able to help you much more. (...) And an electric motor he won't be either... that's just too complex. And there are also caretakers for the e-bikes downstairs. It's the case that they inflate the tires and maybe readjust the brakes a bit if they're worn out. But if there really is a defect or something, then the hotline and someone comes. (...) And there is also a person for each wheel who takes care that not everyone has all of them, but everyone has a single one. They then get the free hours in return.'* 13/coop/CL-MM
42. *'But when it comes to local, I don't need a mobility manager. I manage my own mobility.'* (/MM)

Positive:

43. *'Yeah, I'd rather talk than read through 1000 pages. Besides, we will otherwise really that our society goes to the dogs. When I think, with the paying already. When you don't have a cashier anymore, you just have this machine, when nobody talks to anybody anymore. So, I'll take that person. Also, because I'm too stupid to operate things.'* 14/MM
44. *'That's what I just said. It is quite clear that if I don't want to do it myself, then someone else has to do it. And I would find it excellent if someone was there to accompany the concept, to look after it, and to always know exactly where which car is and on which days no car is available or whatever.'* 10/CL-MM
45. *'So, the step now to say I do car sharing. It's much more difficult to take it than if I say, I know someone in my neighborhood, and he knows the ropes and I can just ask him, and he'll explain everything. Maybe he can also say, 'Look, have you ever thought about doing this and that instead of in the car or something?', that he has ideas that you wouldn't have thought of. (...) Your house actually sounds quite nice, and I could imagine that if you do it in an attractive place, there might be more exchange, that you meet among neighbors. That one can simultaneously promote the social aspect.'* 12/YIM
46. *'Yes. I think with me it's always at that moment. Where I have to do something. So if I have an e-car and then I get to the charging station, I've never connected a car there before. I would like to have someone to advise me, not a YouTube video or something else.'* 1.2/CL

Passive **information points** with info screens and information on departure times, points of interest, etc., are more likely to be regarded as unimportant in a familiar environment. People look at their cell phones, know the timetable by heart, or have it at the next bus/tram/subway stop. It gets more interesting when it is in unfamiliar places. Concerning new residential areas

or relocations, this can therefore be quite helpful. The cooperative does not have this, but it has pictograms that mark the different areas and guide to the CS cars.

47. *'I was also just thinking, but actually I always look at the apps. But sometimes it's like this, so if I now assume that I'm somewhere else and my hands are full right now and I don't have a smartwatch. Then maybe it wouldn't be bad if you leave the house. You're at the next main road and you see at the intersection, this is going and that's going. And what's going next, I think makes a fair bit of sense.'* 1.2/CL

Scooter and Kick-Scooters

Kick-Scooters are viewed negatively by all participants (16). Reference is made to the free-floating offers in the city. The arguments mentioned are the unadopted driving habits of the users, the noiselessness, the working conditions of the people charging them, and the environmental impact of disposal. Even if they were once used, they could be replaced by other offers like BS.

48. *'I would never in my life, would I take such a thing, because they annoy me so much. Even the people who are on it. I don't know. It's really. It's not just parking them, simply that attitude. When you hear that these things are being dumped in the rivers and the companies are refusing to dispose of them, I really get a total neck.'* 1.2/CL
49. *'I don't use them either. I've booked them twice. I think I'd rather take a bike here. If I don't have one and spontaneously needed one, then I would book an MVG bike or Call-a-Bike quite spontaneously.'* 1.1/coop/CL

Regular scooters are perceived somewhat better and find more application among the respondents. For one interviewee (living without a car), her electric scooter provides certain flexibility that would properly otherwise be provided by a car. One respondent describes (see below) the use case for people who are less able to walk. Compared to CS and CBS, it plays a minor role instead. But all these means of transport are developed for specific niches and have their *raison d'être*. However, not for everyone, it is visible.

50. *'Not at all on a daily basis. So that's also rather yes, somehow the weather has to fit.' (...)* *'Yes, exactly and precisely. It is simply this, this flexibility, which we appreciate. So in the meantime we have two batteries. That means that when both are charged, you don't have to worry about the range. It's like, "I'm going to come home again. Oh God, the battery is already relatively far down.'* 7/coop/CF/MM
51. *'There, too, I could imagine that rather. (...) So if you also think about these working conditions that are behind it, then you see that from a social point of view. I simply have to say that I would actually prefer it that way, because that would mean that there would also be charging devices or charging stations and that they would be charged there. That is, in principle, such an offer would be great. You just have to be able to drive them. (...) That's great. Honestly, I have an acquaintance who has the so-called shop window disease, which means he can't stand, or he can't walk. And he has real problems with his veins and arteries, and he always has pain in his legs when he walks longer. When we met, he couldn't walk more than ten steps at a time and these scooters are ideal for him, he rents them for the whole day, some device that is somewhere near him and he can ride it everywhere right up to the door. And I think that's very tempting. And even if you then drive back again with it...' 10/MM*

52. *'Whereby both have the problem that they don't stand as an alternative to the bicycle in the first place. Because when it rains, it rains on the things too. Public transport or car stands against it. So I just don't have the, how do I say, the event where it would be useful to me, when would it be more useful to me than a bicycle?'* 8/MM

Additional Topics

Two smaller topics that should be briefly discussed are parcel stations and showers at the workplace. **Parcel stations** represent today's consumption. Some of the respondents try to avoid deliveries. Others would find such stations convenient, as they are the ones where all the parcels from the neighbors are dropped off. An idea for in-house parcel stations was brought forth.

53. *'Nothing at all, I totally refuse, unless the children order something (...), no but I don't order anything at all.'* 14/MM
54. *'I don't know if they're that useful, to be honest. (...), I've never done that before. I don't know how it works, but it's probably a good thing once you get used to it. But of course, I'm a bit against ordering everything in life. I don't really want that.'* 8/MM
55. *'Yes, would certainly not be wrong. It would be best if every house had that, where you could throw that in. But I don't know because then everybody would have access or if that would be a problem again.'* 3/MM
56. *'What's missing everywhere today, for example, is to have boxes so that plans can be dropped off. We happen to live right next to the bell on the first floor. We should actually take one euro per package. Then I could make a beautiful vacation once a year or at least go out to eat or something. So what that's like in terms of traffic.'* 2/CL-MM

Lack of **showers and changing rooms** are mentioned as an obstacle to cycling to work. It is questionable whether the new installation will result in a behavioral change. For one interviewee, it was also about not having a pleasant travel route through the city after the aspect of showers.

57. *'Interviewer: Now, if there was an opportunity to shower at your place of work and there were lockers, would you ride your bike more often?'*
3: *I think so.*
Interviewer: That is, what is really the essential thing that is missing?'
3: *I would prefer to ride my bike especially in the summer. The only issue is also that, the connection from here to my workplace is rather mediocre. So, there's not really a good way. And always riding next to the cars. In 20 years, it may be different, the cars are electric and no more exhaust fumes, but only fine dust (...).'* 3/MM
58. *'I would also like to work out, but my job doesn't give me the opportunity to make myself fit for work again. We have no showers and no changing rooms. And in this respect, public transport is the ideal means of transport for me for a number of reasons.'* 10/CL - MM

On the other hand, there are participants who have access to showers but do not use them. On the one hand, this is about having a comfortable commute. You ride slower, do not sweat as much, and ultimately do not have to spend time showering. Further, it does not seem to be

expected and can cause an unpleasant sensation. Removal of the stigma through the companies' communication campaigns could help. The concept should be sufficiently dimensioned. If necessary, changing rooms and hairdryers should be placed separately from the showers so that everyone can get to the line for showering and no queues are created.

59. *'And if she doesn't drive on Friday, then I usually take it and bike to the office, if we have this collision, we only have one available, I don't borrow one downstairs either, because of course that costs again, but then I'm rather that I racing cycle. But there I have the problem that I arrive sweaty. Then it is rather the car the alternative I take. (...) We have a [shower], but nobody uses it yet and I don't know anyone who has used it so far, so I won't use it. (...) Well, I don't even know if it's worse. I just have it, because nobody uses it. And if a Mr. S. suddenly takes a shower, then everyone stands there and says 'what's happening with him again?'. 13/coop/CL-MM*
60. *As a sports teacher you have access and then there is also a shower and from therefore, I could do that. But as I said, I always drove in the morning rather quite relaxed that I didn't have to sweat so much and then I also arrived at school without having to take a shower.' 6/CF*
61. *'Nah, I wouldn't use that because that would then take so and so many more minutes before work. And then you also don't know, is the shower free right now or not?' 7/coop/CF/MM*

Other Aspects

Now that IMC's individual components were looked at, a more holistic look at the participants' attitudes is following. The topic of inclusion was already addressed and is not to be despised in order to create a resilient concept. Furthermore, the **price** plays an essential role in whether the concept is accepted. The price was repeatedly mentioned as the most crucial issue. It is a privileged situation not to think about costs. There is acceptance to pay for the bundling of services. However, not at any price. Price-sensitive campaigning and communicating differences in costs for private vehicles and other mobility services should be considered.

62. *'So, I would like to use something like that and I'm willing to pay for it. But I don't want to organize it in any way, I'm not up for it.' 10/CL-MM*
63. *'Of course, as a hedonist, I totally take advantage of everything that is service. And also, just thanks to a privileged situation, of course, I pay for that. Everything that I don't have to do myself, that I can pay for, that is in scope, I do it. I always don't understand when wealthier people save money because of such a ... So why? People have studied, they should do it, and then it's worth it and should be paid properly.' 14/MM*
64. *'That when you start now to rent something, then you think 'Ah it costs now so much it.'. You have to say that also don't have all the other costs. But it is, I think, psychologically always better, if you say, you just pay once and you then just retrieve it. I think then you use it more diversely than if you have to pay each time individually again, then you already start to think, 'Do I really need this now?'. 6/CF*
65. *'Yeah, I think it's great. So I would do it right away if there was. If someone would offer me that. Yes, again a question of price, of course, what am I willing [to pay]. Right now the 9 € ticket I would immediately use, for the rest my life.' 8/MM*

66. *'The price is decisive for me. (...) I'm wired as a human to say I want to avoid, if possible, getting into a situation somewhere where I'm overburdening myself financially with any contracts or fixed costs.'* 3/MM

In addition, **trial periods/subscriptions** were mentioned to get to know the system and the offers and later decide if it is necessary and helpful or to readjust. Trying out was referred not only to the topic plans but also to modes. This refers to testing new and unknown mobility products and borrowing children seats and other equipment. **Incentives** (e.g., free minutes) can also contribute to favored behavior with modes and services.

67. *'But I think then it would be important to first have some kind of trial month or something. I'll test it now and if it's something for me, then I'll become a real member, so that maybe you have a discounted one-month membership, for example.'* 12/YIM
68. *'And the nice thing was, at that time there was, that if you bring it back to the stations, you get credited ten minutes and so you could build up a credit.'* 13/coop/CL-MM

Mobility plans was an abstract topic for most, sometimes an annual ticket for public transport was already seen as a plan because you have access to bus, subway, and trams. Some of the people got involved in the mind game after the discussion about the components relevant for you and named the most important plan components. But there was also direct rejection of a prepaid flat because it is assumed to be more expensive and the guarantee of the presence of a means of transport in the plan is also not assured. In addition, and this also goes along with concerns from literature, a mobility plan may induce traffic because the credit wants to be used up (Guidon et al., 2018). There is also the camp that simply sees no need for a plan because they do not expect it to improve their mobility.

69. *'So, I usually don't particularly like plans like that. (...) Although I can foresee these regular things. Oh, I would have thought from the moment I then need more, it's more expensive, plus it's not guaranteed that I can then ad hoc really use that as I actually paid for it in my plan. Because when the car is gone, it's gone. Or if someone books it beforehand during the vacations and it's such and such a day, then it's gone, no matter which plan I pay for. So, this problem is especially with the cars totally blatant always during vacation times.'* 7/coop/CF/MM
70. *'It would make a change in usage patterns if I had two hours a week or ten hours a month. If I know I still have a budget and we haven't cycled yet, then I would just start cycling probably. (...) I would use it more because I have already paid if something like that was in it, but I would adapt. Currently, it is just something special, we take it and say, 'Hey today we ride the bike again.'* 13/coop/CL-MM

What became apparent in the interview process is that mobility is a matter of habit, as already described in chapter 2.1. Potential behavioral changes were precipitated by events such as giving up the car for reasons of age during the interviews. To start precisely at this moment, the mobility manager is essential, with competent information around personal mobility and consultation on alternatives. Similar to the consultation along a car purchase, there should be a more holistic consultation on mobility. At the same time, it is clear that some people are thinking about alternatives but have not yet informed themselves further because they do not know where and the effort is too great. The aim should therefore be to offer a low-threshold

information service. So, consciously building on mobility management and accompanying people personally. Certainly time-consuming, but a high demand can be derived from the interviews. This is also very much in line with the findings in Bremen, which see a comprehensive information and communication campaign as an essential contribution to the success of mobility concepts (Schreier & Karbaumer, 2021).

71. *'Well, I realize now just in our conversation that I don't even think about many things because I'm too lazy. Because it's very practical the way I have it right now. We want to become better as a society. And a little nudging can do a lot of good. (...) My life is full of other things. And if I'm told what to do, I'll probably go along with it. But to think for myself. I am already established professionally, so to speak. I can't move in another direction now, of course, I can, but probably with considerable losses. We are relying on you [young people]. I'll go along with it.'* 2/CL-MM

4.3.2 Final Mobility Plans

In principle, the people got involved in the mind game with the plans and could say at the end of the conversation which topics are relevant to them. I derived the individual plans from this and a detailed discussion about personal travel behavior. These can be found in the appendix. From the Individual plans, I defined the overarching plans.

Before continuing with the final plans, the topic of the volume of individual modes is examined. It has become clear that this is particularly relevant for car and cargo bike sharing. Other components are not necessary to break down into smaller units. The interviews do not show sufficient demand for electric bike sharing, so a pay-as-you-go option probably makes the most sense. For cargo bikes, the desired volumes can be determined between one and four hours. The majority find four hours the best. Less is more likely to be rejected in order not to have to rush. For car sharing, the majority is between eight and fifteen hours per month. People without a car seem to need less, and those with one - but considering giving it up - need more. The hours are based on the fact that one would have at least one full day a month to be on the road with a car, e.g., visiting family. A choice of ten or fifteen hours a month would be enough. As the end of the last chapter showed, there has to be a pay-as-you-go option. Some people do not want to be forced directly into such a financial construct but only pay for their needs. These components can be found in the plans as sub-selection of CS and CBS.

Briefly discussing the topic of parking, I distinguish between fixed and changing parking spaces. A fixed parking place does not mean that only 100% of the person with the plan is entitled to it. Because many have shown positive to release parking spaces over periods where they are not there but still have the main claim to the parking space. On the other hand, changing or bookable parking spaces are accessible to the person with the plan at certain times or days.

There is a base consisting of tenant tickets, bike service and parking, access to a workshop, and a responsible mobility manager. These components do not have to be broken down into smaller units and are well received by the majority of interviewees, or the need was visible.

In addition, I added a personal monthly public transport ticket. This is usually purchased when the use is openly visible, so you do not have a car or your daily commute with PuT to work/university. Since it is not directly part of the IMCs but still contributes significantly to mobility, it was added in a different color. Access to tenant tickets would be enough for those who are not regularly on the road.

The building kit from which the following four final plans are composed can be taken from the Tab. 4.5 below. In addition, individual ideas and needs that were not clustered are listed. They are further parts that can eventually be expanded and targeted.

Tab. 4.5 Building kit for mobility plans

Component	Base	Parking	CBS	CS	PuT	Other Individual Components
volumes (Parking, CBS, CS)	<ul style="list-style-type: none"> - tenant ticket - bike service - bike parking - workshop - mobility manager 	<ul style="list-style-type: none"> - fix - alternating - charging 	<ul style="list-style-type: none"> - pay-as-you-go - 4h 	<ul style="list-style-type: none"> - pay-as-you-go - 10h - 15h 	<ul style="list-style-type: none"> - monthly transit pass 	<ul style="list-style-type: none"> - DB offers - caravans/bus sharing - free-floating offers - taxi credits - e-bike renting - (kick) scooter offers - shuttle service - car pooling

As the first plan, I would like to introduce the 'pay-as-you-go' plan (Tab. 4.6). It consists of the base, has no parking, and one pays for CS and CBS only what is used. Interviewees see no need for a prepaid volume because they do not expect it to improve their mobility. Under certain circumstances, a discounted pay-as-you-go rate could be offered for a monthly fee. This plan probably resonates best with the FM, as they also very much internalized the cost-benefit aspect.

Tab. 4.6 'Pay-as-you-go' plan

	Base	CS	CBS
'pay-as-you-go' package	<ul style="list-style-type: none"> - tenant ticket - bike service - bike parking - workshop - mobility manager 	<ul style="list-style-type: none"> - pay-as-you-go 	<ul style="list-style-type: none"> - pay-as-you-go + monthly transit pass

Next comes the car owner plan (Tab. 4.7). It means you have a private car, mostly standing around because you go to work by public transport. Therefore, one usually has a fixed parking space requirement. Sometimes, however, one or the other commutes to work and can participate in an alternating parking space concept. Through the own car, there is no CS need. CBS, on the other hand, was positively received. Four hours would be enough, here. For those who do not want that, the pay-as-you-go option is sufficient. SSMs and PCDs would most likely go for this plan. Depending on their commute, they would probably be willing to use alternating parking schemes for a discounted price. However, since this plan addresses everyone with a

car, the YIM, MM and CL types are certainly represented as well. The last two types are surely found in the following plan as well.

Tab. 4.7 'Car-owner' plan

	Base	Parking	CBS
'car-owner' package	- tenant ticket	- fix	- 4h
	- bike service	- alternating	- pay-as-
	- bike parking	- charging	you-go
	- workshop		+ monthly
	- mobility manager		transit pass

As mentioned above, some respondents thought about giving up their own car or would be willing to give it up. From this group, I formed the 'getting-rid-of-car' plan (Tab. 4.8). Instead of the parking space, it includes a CS volume, which is selectable from 10 to 15 hours. Also, this group is willing to subscribe to a volume of 4 hours for CBS.

Tab. 4.8 'Getting-rid-of-car' plan

	Base	CS	CBS
'getting-rid-of-car' package	- tenant ticket	- 15h	- 4h
	- bike service	- 10h	
	- bike parking		+ monthly
	- workshop		transit pass
	- mobility manager		

Finally, the smallest plan (Tab. 4.9) consists of the base and the CBS for 4 hours. CBS was among the most popular components and has the most potential for use by the interviewees. Application can be found in principle with each type, least probably with the PCDs.

Tab. 4.9 'Cargo-bike' plan

	Base	CBS
'cargo-bike' package	- tenant ticket	- 4h
	- bike service	
	- bike parking	
	- workshop	+ monthly
	- mobility manager	transit pass

Classification of the results in relation to the MTs and other characteristics

The sample of qualitative interviews is too small to produce meaningful results. In addition, not every type is represented, which is not bad since the SSM and PCD tend to be a smaller percentage in the city and would be less likely to participate in a study like this one. Further, the survey was not detailed enough to define the types correctly. The largest group in the

survey is CL, but they also need the most explanation about their type (see Chapter 4.3). They all have a car, in some cases even two cars. However, they also tend to dispense with their own cars. Thus, the parking lot becomes superfluous, and the CS hours go up. The MMs are the second largest group and stand out due to the high approval of the bicycle service. They have a share of additional individual components. For FMs and YIMs, it is not easy to establish trends along the interviews.

Regardless of the MTs, it is noticeable that especially the cooperative residents have an aversion to plans. In addition, two participants find it challenging to think of an IMC and plans. Ideas are rather rejected than accepted with interest. They are satisfied with their mobility and see no need for adaptation. Price is not only an issue for FMs but also other types. This is probably due to the city of Munich, which has a very high cost of living (preis.de, 2022).

5 Discussion

The MiD data is not perfect for mapping the types, according to Bartz (2015). However, they give an indication and show differences in modal splits of MTs. This is also true for mode choice for various activities. Durations of the activities with the respective modes do not show significant deviations among the MTs. Considering the temporal distribution throughout the day, the situation is similar. Prominent is that SSM and PCD hardly use public transport and bicycles, regardless of the activity. The MTs may have an describe a persons the refusal/appraisal of a mode of transport and ultimately influence the combinations of mobility plans. The hours spent with one means of transport, however, can be extrapolated from the same durations. An observation over a longer period could provide information on how many activities per MT need to be covered by an MP.

The interviews show that attitudes, such as the rejection of bicycling due to crowded and polluted streets, run through several types. Before mobility becomes habitual, impressions and experiences shape it. A precise classification of the results from the interview process in relation to the MTs is not possible. However, they form an initial base.

It was shown that open questions could be overwhelming. Therefore, I have queried along the literature-known elements and afterward asked for further topics of interest to them. Preliminary information about the process or the topic could have helped to familiarize the interviewees. The particular topics could be queried more precisely and in more detail. Components like CS and CBS can be easily added with volume after the interview process. Then some components can and should be better defined - for example, the implementation of a bike service or a mobility manager. The MiD data allow at least a partial confirmation of the volumes by the interviewees, in the sense that the individual activities are, on average, all below the desired total volume. This applies to both cycling and driving.

A distinction must be made between those elements that are most relevant to the participants and those that are not negligible from an ideological point of view. The tenant ticket and the own public transport card had the highest value among the respondents. Several studies show that public transport is an essential component in such bundles (Guidon et al., 2018; Matyas & Kamargianni, 2018; Tsouros et al., 2021). Ideologically, the mobility manager is vital to stay connected with the people and their requirements. The stationary CS station, besides the CBS, is considered essential for participants. Especially for those who are considering giving up their car, a nearby car station is crucial in order to offer them more security. This is in line with the results of Bitter and Schnell (2021), which show that station-based CS is more likely to influence car ownership than the free-floating counterpart.

In order to make IMCs successful and reduce dependency on private cars, CS area must be able to cushion the demand highs, such as on weekends or school holidays. Uteng and Farstad (2020), for example, find that 65 % of CS is used for this purpose (Uteng & Farstad, 2020).

Attractive weekend offers with sufficient security can positively influence the decision to give up one's own car.

A few more limitations of this study are briefly addressed. The interviews were conducted with a small sample of participants and can only be considered a qualitative collection of ideas and needs. In addition, only residents of the city of Munich were questioned, so the results are not necessarily transferable to other locations. The testimonials of the cooperative residents made a valuable contribution. The results are thus a mixture of requirements and suggestions for improvement. The results are an early insight into user-oriented planning of IMCs and associated mobility plans, which should be adjusted and sharpened with further research as presented after summarizing the main aspects in the following chapter.

6 Conclusion and Recommendations

Regarding the objectives, initial approaches to determining needs could be obtained from the MiD data. These should be further explored. From the interviews, a lot of knowledge and user-oriented information was gained. The listed paragraphs contain the most important findings from this work. There are other valuable insights that provide a user-oriented perspective on IMCs.

- The evaluation of the MiD data (chapter 4.1) indicates that the mapped mobility types have differences in mode choice. The duration of activities (shopping, errands, leisure, and accompanying) do not show significant deviations concerning the mobility types. The aggregated results provide a baseline for further development of the volumes of the individual modes in the plan and scaling of the offers throughout the day.
- Concluding from the interviews a high degree of agreement for the CS, CBS, tenant ticket, mobility manager, bike service, and workshop can be drawn. Information points are considered unimportant in one's own neighborhood, but useful for unfamiliar areas. Components such as carpooling are known but have little application. Not knowing the other person is the biggest obstacle. Cab credit could lead to more inclusion if necessary. However, this needs to be investigated further.
- Other aspects mentioned are: Long-distance (rail) offers, integrating free-floating systems, bus sharing, shuttle services, (kick) scooters, and electric bike renting. Nevertheless, these should still be discussed with a larger number of people, to draw relevant conclusions.
- Trial periods can be helpful to introduce people to the concept and the plans. The interviews show that there is also a reluctance to pay in advance for certain components. Therefore, it makes sense to offer services without a plan.
- From the comparison of the individually composed plans, four final mobility plans emerged (see chapter 4.3.2):
 1. 'pay-as-you-go' plan,
 2. 'car owner' plan,
 3. 'getting-rid-of-car' plan,
 4. 'cargo-bike' plan.

Each plan includes a base: tenant ticket, bike parking/service, workshop, and mobility manager. They differ in the composition and volume of the components parking, car sharing, and cargo bike sharing. Those ready to give up the car receive a volume of 10 to 15 hours of car sharing. Finally, some would only book cargo bike sharing in volume. Results indicate that a volume of around four hours per month could be sufficient for occasional and regular use.

The interview process shows that people are often not actively and sufficiently informed about new mobility offers. That they thought about it before but not really came to a conclusion about

it. The neighborhood level is an excellent opportunity to create low-threshold offers. Additionally, there needs to be a personal level where one can collectively evolve. Diversification in modes, funds, stakeholders, and users allows for a more integrated, robust view into an uncertain future.

6.1 Recommended Future Work

As the limitations indicate, this research is a small user-oriented effort that further specialized approaches should complement.

- First and foremost, international settings should be studied to ensure transferability to other cities and neighborhoods. Here, one can investigate how the synergies of mix-used neighborhoods can be used for robust integrated mobility concepts.
- Under certain circumstances, interviews or focus groups with more subjects would allow for better comparability of the mobility type's demands. This qualitative approach should, nevertheless, be supplemented with quantitative approaches. Here, verifying and investigating the plan composition by stated-preference approaches would be appropriate. An activity approach over the period of one month to verify the aggregated volume/hours for CS and CBS with the MOP data could be beneficial.
- In addition, some components need to be defined more precisely in terms of their configuration and implementation. Expert interviews would be suitable for this purpose.
- Notably, a deeper investigation of the impact of such concepts and plans on emissions is essential concerning the climate crisis. Even if positive effects on car ownership can already be observed (chapter 2.3.3), the potential induction of traffic by plans has to be explored.
- In complement to classical engineering research, political and legal aspects should be further studied and pave the way for a simplified implementation of more sustainable mobility options. Field trials should be scientifically accompanied to document technical data and the process of bringing together diverse stakeholders.

One would always like to cover all aspects and topics in one's work. But where would we get there? This work has focused on the qualitative investigation of people's demands on integrated mobility concepts, and four preliminary plans could be identified from the interviews. This research represents a first and valuable starting point for further research.

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List of Abbreviations

BS Bike Sharing
CBS Cargo Bike Sharing
CL Car Lover
CS Car Sharing
FM Functional Mobile
HH Household
IMC Integrated Mobility Concept
MaaS Mobility as a Service
MiD Mobilität in Deutschland/Mobility in Germany
MM Multi Mobile
MOP Mobilitätspanel/German Mobility Panel Survey
MT Mobility Type
PC Pragmatic Car Driver
PuT Public Transport
ScS Scooter Sharing
TPB Theory of Planned Behavior
TRB Theory of Repeated Behavior
WTP Willingness-To-Pay
YIM Young Intended Mobile

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Appendix A: MiD Activity Graphs

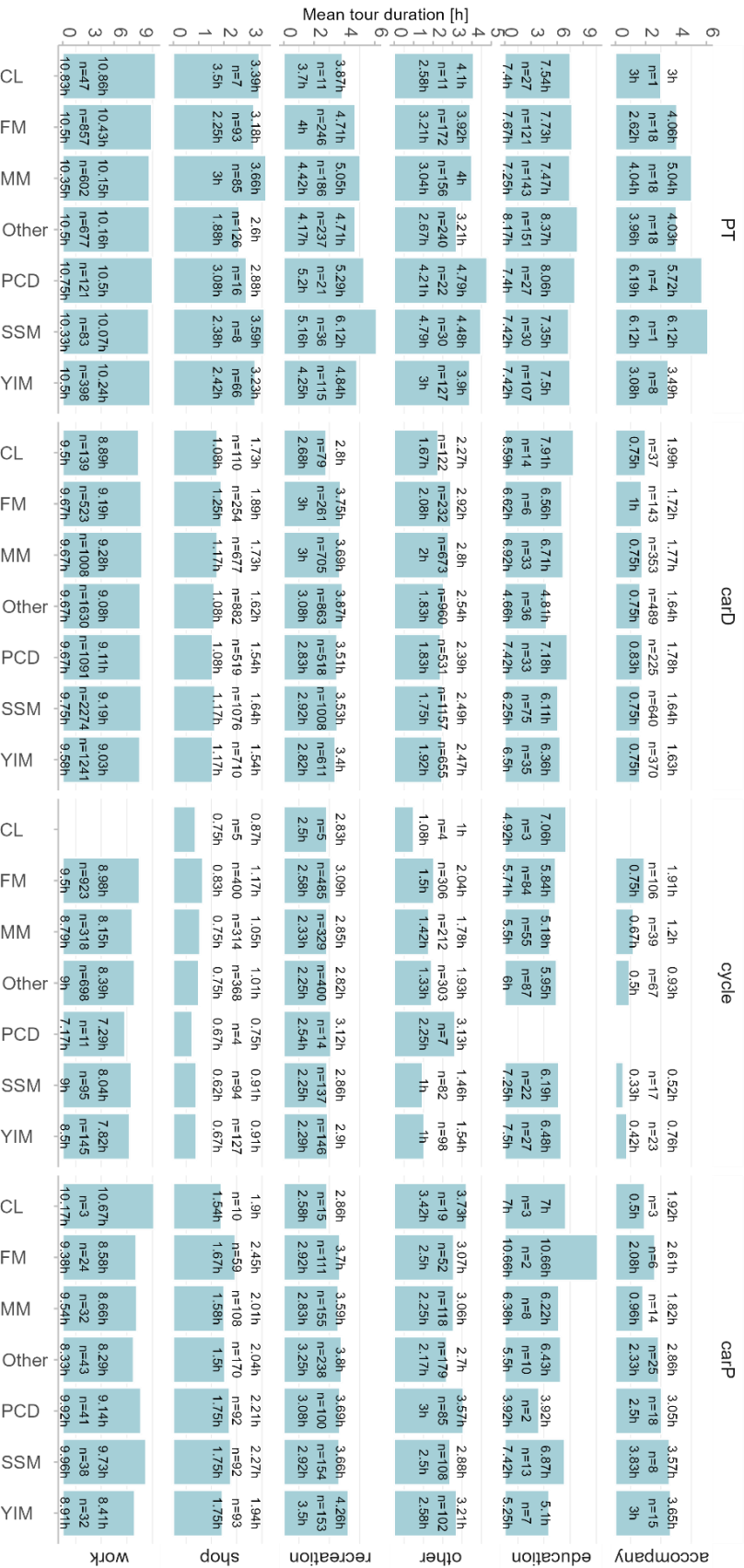


Fig. A.1. Mean duration of activities according to MiD mobility types with respective modes
1. mean, 2. count, 3. median

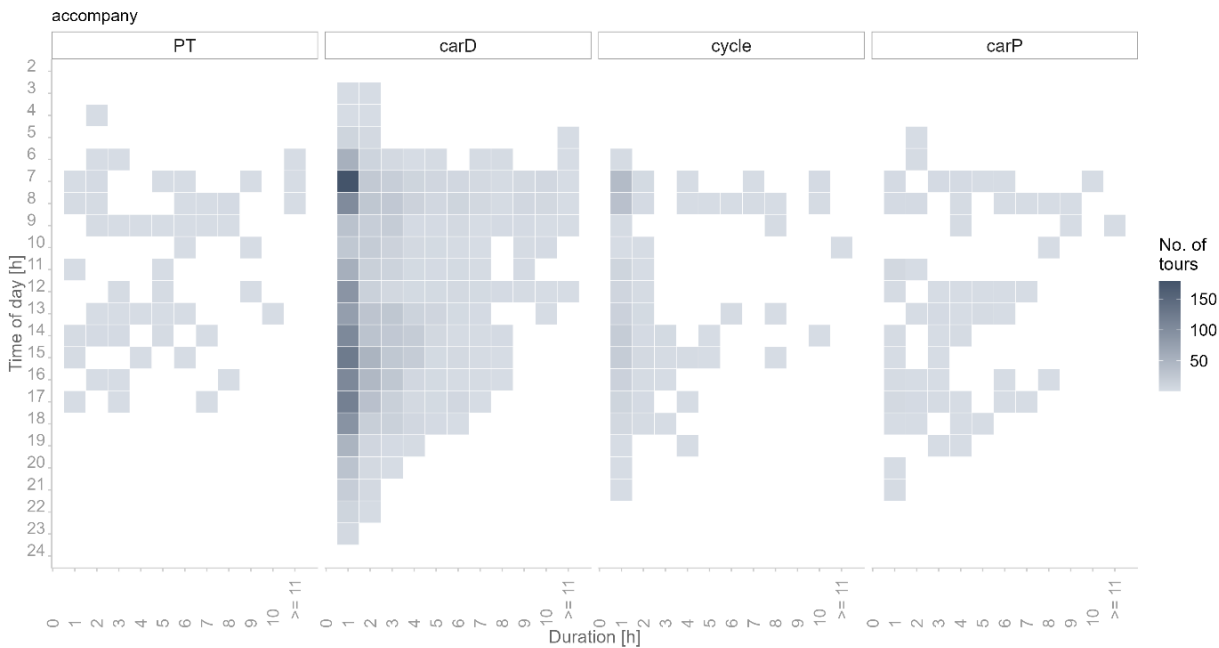


Fig. A.2. Accompanying durations over time of day and mode according to MiD dataset

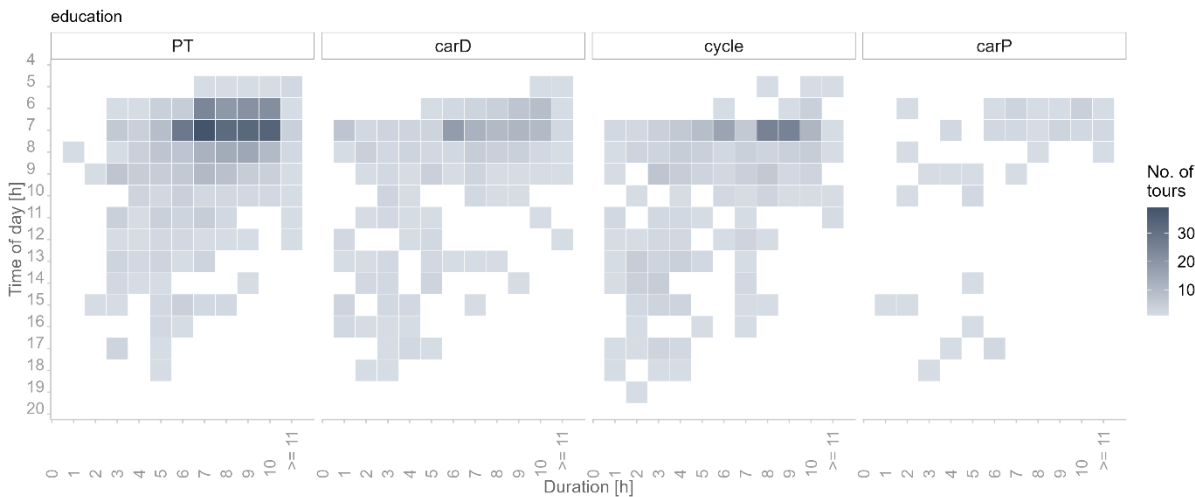


Fig. A.2. Education activities durations over time of day and mode according to MiD dataset

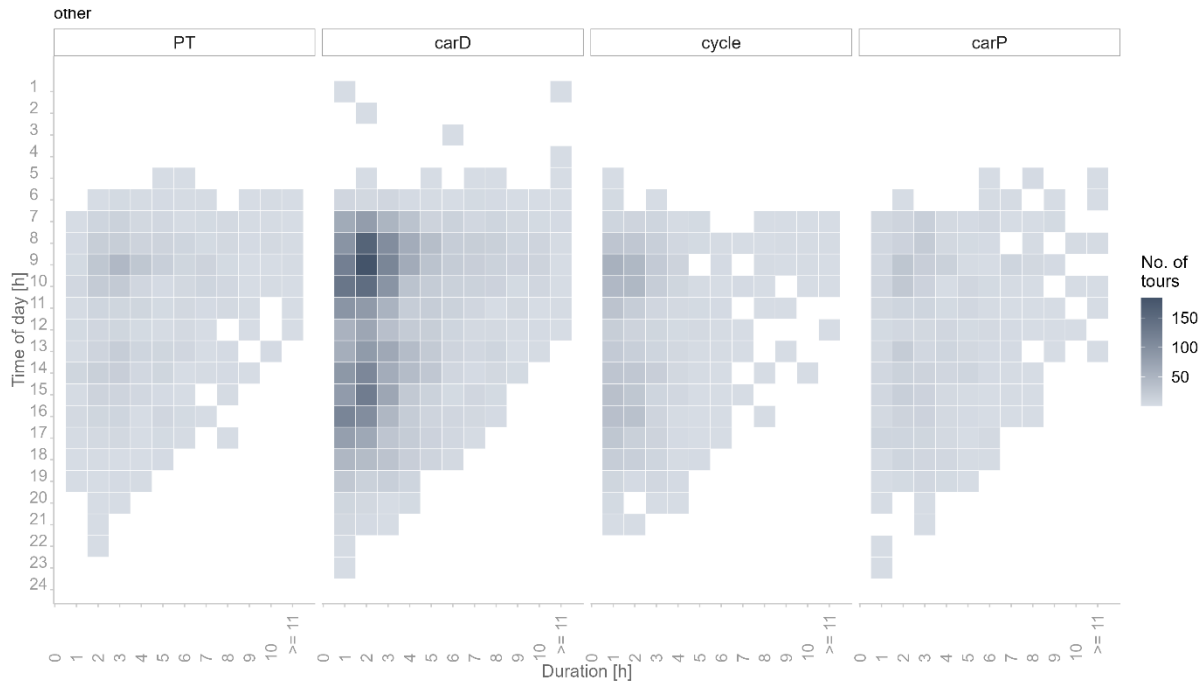


Fig. A.4. Other activities durations over time of day and mode according to MiD dataset

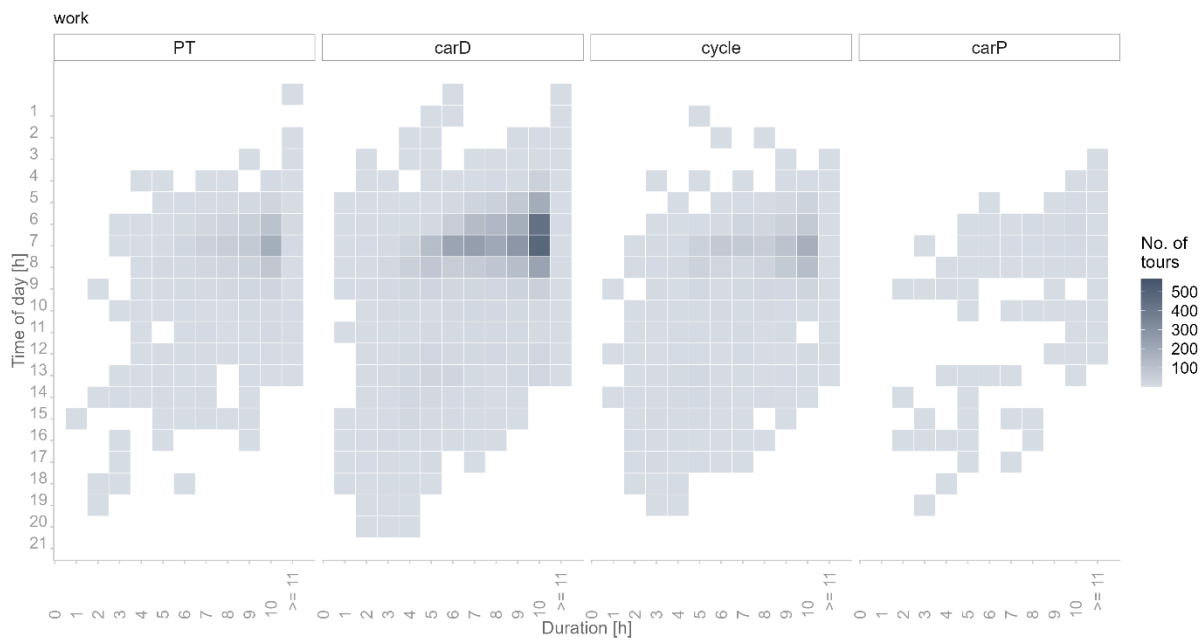


Fig. A.5. work activities durations over time of day and mode according to MiD dataset

Appendix B: Survey

Dear participants,

My name is Ida and I am currently writing my master's thesis at the Professorship of Travel Behavior at the Technical University of Munich. My thesis is also accompanied by my work at Urban Standards, which develop and implement integrated mobility concepts for neighborhoods.

In the course of my research I would like to find out how a mobility concept can be designed for different mobility types and how these different needs can be covered by mobility plans. This survey aims to find out your mobility type. Are you a Practical Car Driver or a Functional Mobile?

The survey is the basis for a further qualitative research approach in focus groups. Here I want to work out the requirements of the different mobility types for a mobility concept. The aim is to find out which modes, i.e. means of transport, and which usage contingents are right for you. What kind of mobility plan do you need so that your mobility needs are adequately met?

Participation in the survey is voluntary and does not mean that you are required to attend the workshops. In the course of the survey you will be asked if you can imagine participating in a small workshop. If yes, you will receive further information. The survey is anonymous up to this point and your data will not be published in a personalized way, only used in aggregated form. You can find the privacy policy at the bottom left.

It takes about 5 to 10 minutes to complete the survey. If you would like to be a part of this qualitative approach to determining different demands for mobility concepts and packages, I would greatly appreciate it.

Thank you for your participation!

Navigation On each page you will find a NEXT button at the bottom right, at the bottom of the page, to go to the next question. Please do not use your browser's back button while answering the questionnaire. If you want to go to a previous page, you can use the BACK button at the bottom left of all survey pages.

Section A: Which mobility type are you?

A1. Are brand and design important to you in a car?

☐ Yes ☐ No

A2. Would you rate your attitude toward public transportation as rather unbiased or rather reserved?

☐ rather unbiased ☐ rather reserved

A3. Does environmental friendliness play a role in your choice of transportation?

☐ Yes ☐ Somewhat ☐ No

A4. How would you describe your mobility behavior?

Unimodal: You predominantly use the same means of transport in everyday life.
Multimodal: You use changing means of transport over the course of a week. Example: On Monday you go to work by car, on Tuesday by bike.
The image below illustrates the difference between uni- and multimodal travel behaviour.

☐ unimodal ☐ multimodal

A5. Do you travel a lot and like it?

☐ Yes ☐ No

A6. Is weighing the costs and benefits of a mode a regular and guiding consideration for you?

☐ Yes ☐ No

A7.	Would you rate your attitude toward public transportation as rather unbiased or rather reserved?		
		rather unbiased	<input type="checkbox"/>
		rather reserved	<input type="checkbox"/>
A8.	Doe you travel a lot and like it?		
		Yes	<input type="checkbox"/>
		No	<input type="checkbox"/>
Section B: Mode ownership and use			
B1.	How often do you use these modes?		
		daily or almost daily	1-3 days per week
		less than monthly	1-3 days per month
		never	never
	Bicycle/E-Bike	<input type="checkbox"/>	<input type="checkbox"/>
	Car	<input type="checkbox"/>	<input type="checkbox"/>
	Public Transport	<input type="checkbox"/>	<input type="checkbox"/>
	Motorcycle/Scooter	<input type="checkbox"/>	<input type="checkbox"/>
	Walking	<input type="checkbox"/>	<input type="checkbox"/>
B2.	Which of these modes do you own or have a memberships/subscription to?		
		Car (private)	<input type="checkbox"/>
		Car (company)	<input type="checkbox"/>
		Motorcycle/Scooter	<input type="checkbox"/>
		Bicycle/E-Bike	<input type="checkbox"/>
		Annual Transit Pass Ticket	<input type="checkbox"/>
		Carssharing	<input type="checkbox"/>
		Bikesharing	<input type="checkbox"/>
		E-Scootersharing	<input type="checkbox"/>
B3.	How many cars do you own or have access to in your household?		

Section D: Possible dates for the workshops	
<p>D1. Can you imagine participating in a small workshop/focus group session?</p> <p><u>What is it about?</u> Working out requirements of your mobility type for a mobility concept and packages.</p> <p><u>When?</u> End of June to mid-July; approx. 1 to 1.5 h online or on site in Munich (near Hbf).</p> <p><u>Who?</u> About 3 people with the same or similar mobility type.</p> <p>If you answer yes here, you will be given suggested dates in the following few questions. This does not mean that you have to participate, but you will allow me to invite you for a workshop. Therefore you will be asked for your email at the end. For this reason, this survey is now no longer anonymous. Nevertheless, your data will not be published in a personalized way and will only be used in aggregated form.</p> <p>Yes <input type="checkbox"/> No <input type="checkbox"/></p>	<p>D4.</p> <p>On which of the following dates would it generally be possible for you to participate in a workshop of approx. 1 to 1.5 h?</p> <p>Saturday, 2nd of July</p> <p>Morning <input type="checkbox"/> Afternoon <input type="checkbox"/></p>
<p>D2.</p> <p>On which of the following dates would it generally be possible for you to participate in a workshop of approx. 1 to 1.5 h?</p> <p>Saturday, 25th of June</p> <p>Morning <input type="checkbox"/> Afternoon <input type="checkbox"/></p>	<p>D5.</p> <p>On which of the following dates would it generally be possible for you to participate in a workshop of approx. 1 to 1.5 h?</p> <p>Sunday, 3rd of July</p> <p>Morning <input type="checkbox"/> Afternoon <input type="checkbox"/></p>
<p>D3.</p> <p>On which of the following dates would it generally be possible for you to participate in a workshop of approx. 1 to 1.5 h?</p> <p>Sunday, 26th of June</p> <p>Morning <input type="checkbox"/> Afternoon <input type="checkbox"/></p>	<p>D6.</p> <p>On which of the following dates would it generally be possible for you to participate in a workshop of approx. 1 to 1.5 h?</p> <p>Saturday, 9th of July</p> <p>Morning <input type="checkbox"/> Afternoon <input type="checkbox"/></p>
	<p>D7.</p> <p>On which of the following dates would it generally be possible for you to participate in a workshop of approx. 1 to 1.5 h?</p> <p>Sunday, 10th of July</p> <p>Morning <input type="checkbox"/> Afternoon <input type="checkbox"/></p>

D8.

Would you prefer a weekday evening participation from, say, 6 to 7 p.m.?

Yes

No

D9.

If yes, which days of the week would generally work best?
(Anticipated between mid-June and mid-July)

Monday

Tuesday

Wednesday

Thursday

Friday

D10.

Would you prefer an online participation or an on-site workshop in Munich (near Baupthnhof)?
(If you have no preferences in this regard, you can select both answers.)

online

on-site

D11.

E-mail address, to get in contact for the small workshops.

D12.

Your name:
(First and/or last name, so I can personally address you, when contacting you via mail.)

D13.

You want to know your mobility type? Then leave me your name and e-mail so that I can contact you after this survey.

If not, just click the Next button (bottom right).

If you provide your email, your answers will no longer be stored anonymously. Your data will not be personalized published and will only be used in aggregated form.

Name

E-Mail

Thank you for participating in my survey!

If you are willing to participate in a small workshop as well, I will contact you privately with date suggestions via mail as soon as I have received enough responses and I can form small groups.

If you would like to know your mobility type, you will receive an email from me afterwards.

If you have any questions or suggestions, please feel free to email me:
ida.bachmaier@tum.de.

Thank you very much, Ida Bachmaier.

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Appendix C: Original Quotations

Mobility types

1. *„Aber kennst du dieses Renault Kangoo Auto, der so aussieht wie ein Nilpferd? Die haben mal eine Werbung damit gemacht, dass ein Nilpferd versucht das Auto zu begatten. Also so ein Auto würde ich mir nie kaufen, weil das ist ein Kompromiss aus allem, es soll groß sein, es soll billig sein, es soll was weiß ich was sein. Aber das ist für mich so ein Auto, das würde ich mir nie kaufen.“ (2/CL-MM)*
2. *„Ja das man Car Lover ist, hört niemand gerne. Aber es stimmt einfach. Also, so wie du den Typus jetzt beschrieben hast, so ist es einfach. (...) Wenn ich sie jetzt gehört habe, würde ich mich fast sogar mit einem Bein bei den Multi Modalen sehen. (...) Du hast natürlich schon recht. Das Auto ist mir wichtig. Wir haben auch schon oft darüber gesprochen, es abzuschaffen und es aber letztendlich nie getan. Und das hat auch damit zu tun, dass das Auto wichtig ist, weil wir zahlen ja immerhin auch für den Stellplatz. Und das Gefühl, dass es da ist, dass wenn wir in Gauting oder keine Ahnung wo sonst wo eingeladen sind, dass wir dann sagen können, okay, ich fahr dahin und wenn das Wetter schlecht ist, eben nicht mit dem Fahrrad.“ (10/CL-MM)*

Parking

3. *„Die kriegen meinen Parkplatz von mir, weil ich mich Tage vorher schon woanders hinstelle.“ (14/MM)*
4. *„Das würde ich machen. Absolut. Weil, (...) Ich fahre ja oft nicht mit dem Auto, weil ich dann weiß, wenn ich komme, gibt's keinen Parkplatz. Wenn ich mir quasi im Vorfeld einen buchen könnte, würde ich das machen.“ (8/MM)*

Charging

5. *„Wobei jetzt in Zukunft irgendwo interessant wäre, es gibt schon so, dass ein Auto, das wir haben, ist ein E-Auto und es ist tatsächlich manchmal so ein bisschen knifflig zu laden, weil es gibt also manchmal wirklich, fahre ich im Kreis und finde keine Ladestation. Das ist nie dramatisch, weil man dann warte ich halt ein bisschen irgendwo. Dann lade ich später. Aber wenn es da so private Ladestationen gäbe, die irgendwo installiert sind, dann sagen die Leute „Ja kannst kommen, lädst mit deiner Karte auf, zahlst noch einen Obolus von 2 €“, dass du da stehen darfst und dann ist gut. So was gibt es jetzt, ist angedacht, aber habe ich jetzt bei uns in München noch nicht so gefunden.“ (2/CL-MM)*
6. *„Parkplatz mit Ladesäule. (...). Nein, aber ist ja eine Grundvoraussetzung für ein E-Auto. Man will ja kein E-Auto haben, wo ich dann abends irgendwo in der Nachbarschaft schauen muss, wo ich das hinstellen kann. Dann darf ich nur vier Stunden dort parken, dann muss ich um Mitternacht das Auto wegfahren.“ (3/MM)*

Bicycle parking

7. *„Also wir sind ja eigentlich fünf Personen bei uns. Also jeder braucht ein Fahrrad hier, auch wenn er nicht ständig wohnt. Chiara braucht ein Fahrrad hier, auch wenn sie nicht ständig wohnt. Aber wir haben nur drei Parkplätze. Das ist sehr wenig und es gibt wahn-sinnig vielen. So, also das ist unter, unter und wie sagt man da, wenn man bewusst was unter plant? (...) Also gerade bei einem Haus, wo wir angekreuzt haben, wir verzichten dauerhaft auf den Stellplatz für den PKW, weil wir kein Auto haben, und wir verpflichten uns auch weiterhin kein Auto zu haben. Dar war ich dann schon ziemlich sauer, als ich gehört habe, dass wir jetzt nicht mal all unsere Fahrräder in einen ordentlichen Ständer stellen können. (...) Also müssen wir die UNU irgendwie dann mit Planen umwickelt und irgendwo an eine Ecke des Hauses stellen, wo der Wind sie nicht umweht und sie keinem im Weg steht.“ (7/coop/CF/MM)*
8. *„Und dann müsste ich halt den Akku mitnehmen nach oben. Und da muss ich ehrlich sagen, ich würde meinen Akku lieber draußen laden. Lieber in der Garage oder so. Und das ist vielleicht auch nur ein Hirngespinnst, aber wenn man so viel von Brandschutz hört,*

dann weiß man so viel und dass sowas explodieren kann, aber irgendwas müsste man sich da auch überlegen.' (4/FM)

9. *„Vorher hatten wir unsere Fahrräder immer im Keller. Das heißt immer Kellerabteil auf-sperren, Fahrrad irgendwie raushieven aus dem engen Ding und dann Treppe hochtra-gen und so weiter. Das heißt, jetzt steht das Fahrrad, das ist viel niederschwelliger. Ich schließ mein Schloss auf, steig drauf und fahr los aus der Garage raus. Es geht viel schneller. Und dadurch, dass der Prozess nicht so kompliziert ist, fahren wir glaube ich auch mehr Fahrrad als Familie.'* (13/coop/CL-MM)
10. *„Kann ich mir vorstellen, aber Miete? Danke, da werde ich schon hellhörig. Was wollen die von mir haben? Geld? Wie viel Geld? Das wäre schon eine Geldfrage. Gut, es steht draußen. Das Fahrrad im Moment. Und manchmal stelle ich es in den Hof, aber es steht leider nicht unterdacht. Was mir aber schon recht wäre.'* (8/MM)

Car sharing

11. *„Habe ich noch nie benutzt. Also schon der Zeitaufwand wieder irgendeine App runter-zuladen, wieder meine Kontodaten einzugeben, langweilt mich so sehr, dass ich mir denke, bis ich das alles hab, bin ich schon dahin gelaufen wo ich hin will.'* 7/coop/CF/MM
12. *„Das finde ich eine spannende Sache. Also, ich glaube, gäbe es so einen passenden Werbeslogan mit ‚Dein Paket 1000 Fahrzeuge.', dann wäre ich wahrscheinlich auch schon etwas beruhigter, als wenn da steht ein Paket drei Fahrzeuge.'* (7/coop/CF/MM)
13. *Also ich glaube, da ist man, muss man einfach auch ein bisschen pragmatischer werden. Wenn ich sage, ich habe acht Stunden, dann habe ich halt die acht Stunden.* (8/MM)

Carpooling

14. *„(...) Das finde ich problematisch, weil ich die Leute nicht kenne und immer denke, also entweder die quatschen mich voll, sie stinken. (...) Das würde ich machen, hier zum Beispiel. Müsst ihr irgendwo hin? (...) Oder im näheren beruflichen Umfeld, Kollegen, aber so ganz fremd nicht. (...) Und wo man die vorher angucken kann. (...) Das mit der Ukraine, das hatte ich mir ja auch länglich überlegt, ob ich da jemanden nehm. Und da war ja auch gestanden auf der Webseite von dieser Vereinigung, dass man sich kennen-lernen kann. Ja, und das finde ich wichtig.'* (14/MM)
15. *„Und mit meinen Katzen möchte ich nicht jemand anders fragen. Wenn würde ich jemand mitnehmen? Aber ja, aber jetzt in München. Zu kompliziert, dass mal anzusto-ßen.'* (12/YIM)

Cab credits

16. *„Und solche Angebote wären doch eigentlich eben auch gerade für ältere Leute Arztbe-suche, oder ... Eigentlich eine gute Möglichkeit, um ganz viele Fahrten abzudecken von ja eigentlich Profis, die den Verkehr gewöhnt sind.'* (9/coop/CF/FM)
17. *Halte ich gar nichts von, nein, weil ich glaube, dass das es würde, dann letztendlich dazu führen. Dann hat man vielleicht weniger Privatautos, aber dafür hast du dann mehr Taxen auf der Straße. Und letztendlich wäre meine Idealvorstellung ja eine autofreie Stadt. Eine autofreie Innenstadt, ja. Also das finde ich schon. Und dann bräuchte ich da auch keine Taxis.'* (10/CL-MM)

Safety training

18. *„Würde ich glaube ich nicht, weil das Fahrsicherheitstraining löst ja nicht das Problem, dass es einfach in der Stadt hier in München alles viel zu voll ist und dass es diese un-endlich vielen Baustellen gibt.'* (5/MM-FM)

E-Bike sharing

19. *„Für Gäste ja klar. Also wenn ich's jetzt hätte und jetzt zum Beispiel mein Papa zum Beispiel kommt der wäre für ein E-Bike gut. Für ihn würde ich mir es ausleihen.'* (1.1/coop/CL)

20. *„Also, ich habe mir gedacht, wenn es hier die MVG-Räder gäbe mit E-, hätte ich die schon mal ausprobiert. Aber auf der anderen Seite habe ich jetzt auch schon mit diesen Rädern die Erfahrung gemacht, dass sie einfach nicht gut sind und dass sie nur rumstehen und dass es deshalb keinen Spaß macht und man es eigentlich nicht braucht, und sie eigentlich die Umwelt ein bisschen vermüllen.“ (4/FM)*

Cargo bike sharing

21. *„Ich noch nie ausgeliehen. Also weil ich noch so kräftig bin, dass ich jetzt irgendwie mit meinem Rucksack und meinem Fahrradkorb, kann ich mein eigenes Fahrrad ganz gut bewegen. Denn wir haben drei Katzen und da habe ich schon überlegt, wenn die mal zum Tierarzt müssen, dann werde ich versuchen so ein Lastenrad zu leihen um dann da diese Transport Körbe rein zu stellen. Da würde ich jetzt eher nicht ein Auto leihen, weil mir das irgendwie.. Aber kommt natürlich auch darauf an, also lass es Winter sein und Notfall..“ (7/ccop/CF/MM)*
22. *„Und die Hänger fürs Fahrrad habe ich persönlich noch nie geliehen, aber es gibt so eine Handvoll sehr intensive Nutzer von den Anhängern und die nutzen die dann auch, dass die eine gute Auslastungen haben. Und die stehen da nicht nur rum, sie werden wirklich genutzt. Aber nicht von so einem riesengroßen Kreis.
I: Die Anhänger, weil sie kostenlos sind, einfach mehr wahrscheinlich, oder?
J: Ja, ich würde fast sagen, die die Fahrräder, die E-bike, die werden mehr genutzt, die Auslastung ist fast höher. Vorteil des Antriebs.“ (13/coop/CL-MM)*
23. *„Es funktioniert. Du merkst bei dem Ding, dass, wäre es genau für diese Sache und für diese Karte oder für diese drei Karten gemacht, dann wären die Funktion ein bisschen anders. Aber nachdem mit der gleichen App auch Fahrradanhänger verliehen bzw. gebucht werden und ja Transport-Geschichten oder rund ums private Rad, was man nicht so häufig braucht. Es gibt also zwei oder drei Anhänger, die man damit noch ausleihen kann und Kindersitz und Satteltaschen und so weiter. Es funktioniert für alle so irgendwie und du musst dann halt immer Text lesen, was da drinsteht 'Ja, hier die Schraube gerade verloren'. Okay.“ (9/coop/CF/FM)*
24. *„Ja, als ich den J. noch hatte, dachte ich 'Warum gibt es nicht so wie für Kinder, dass man auch die Alten reinhocken könnte und ihn mitnehmen könnte in den Englischen Garten?' Er hat das natürlich weit von sich gewiesen, wie scheiße das denn wäre, wenn er dasäße. Aber ich fand das, ich habe damals gedacht, es wäre eine gute Sache, wie so eine Rikscha, (...) Dann hätten wir zusammen alles machen können, weil er dann irgendwann nicht mehr Fahrrad gefahren, nachdem er einmal gestürzt ist.“ (14/MM)*
25. *„Wir haben jetzt demnächst auch ein Lastenrad. Da gibt es so eine Münchner Verein, der es irgendwie sponsert und die stellen das bei uns hin. Ich bin da im Verein engagiert, den das Konzept und das finde, ich schon gut. Also das ist jetzt keins, wo man Kindern rumfährt, sondern tatsächlich zum Einkaufen gehen oder um größere Sachen auch mal transportieren zu können. Das finde ich gut. Die Frage ist halt, wird es genutzt oder steht es dann immer nur rum? Weiß ich nicht. Muss man mal gucken, wie das angenommen wird.“ (2/CL-MM)*
26. *„Also was unbedingt dazugehört ist so ein Lastenrad, dass wenn man mal größere Sachen transportieren muss, man da auch ne Möglichkeit hat, ohne gleich aufs Auto zurückgreifen zu müssen.“ (8/MM)*
27. *„Was soll ich damit? Ich wüsste nicht, wozu ich das (...) Nee, das, was ich mit dem Auto ..., also dafür ist mir die Strecke auch zu weit. Okay, also wenn ich da zum Einkaufen müsste, dann wäre ich einfach noch mindestens eine Stunde länger unterwegs. Mindestens.“ (10/CL-MM)*
28. *„Ich bin eher jemand der sagt, „Lastenfahrradbesitzer oder User haben einen bestimmten Touch und ich will mich nicht unbedingt mit dem auf eine Stufe stellen.“ (3/MM)*

Workshop and bike service

29. *„Aber so einer der das Fahrrad, brauche ich nicht. Also das mach ich so oder so. Also wenn ich merke, dass ein Fahrrad wieder eingestellt werden müsste oder einfach mal die Schaltung neu justiert werden müsste oder Bremsen überprüft werden.“ (3/MM)*
30. *„Vielleicht als Dienstleistung, wenn ich Jahr 100 Euro zahle und dann ist dieser Gabelservice alle zwei drei Jahre drin. Mache ich. Wenn ich allerdings jedes Jahr 300 € für so was zahl, damit die das potenziell jedes Jahr machen könnten, dann ist es mir das nicht wert. Deswegen ist es auch wieder glaube ich, diese Kosten-Nutzen-Rechnung. Kleine einfache Sachen kann ich selber machen und wenn, dann brauche ich das Aufwändige, aber das Aufwändige ist in so einem Paket meistens eh nicht enthalten.“ (13/coop/CL- MM)*
31. *„Das ist dieses Ding zwischen Ich mach das selbst und Professionalität. Das ist was immer so schwierig ist, aber im Endeffekt, dass man dann die Möglichkeit hat, Sachen professionell reparieren zu lassen und halt auch selbst was machen zu können. Ich meine das gibt es ja schon.“ (4/FM)*
32. *„Wir haben einen Repair-Kaffee jeden Freitag, jeden ersten Freitag im Monat. Wir haben so was schon. Wie gesagt, als das organisiert der Ackermann-Bogen-Verein und ich nutze es selber nicht, aber ich wüsste, dass ich es nutzen kann. Aber ich bin nicht so ein Frickler.“ (2/CL-MM)*

Tenant tickets

33. *„Super Idee. Super Idee finde ich eine ganz tolle Idee. Wir praktizieren das ja, wenn wir nicht da sind oder so, dann lassen wir unsere IsarCard zu Hause, dann fahren unsere Kinder damit rum oder Gäste oder wann immer es geht. Also ich werde auch häufiger gefragt, ob ich hier meine IsarCard verleihen kann. Das mache ich auch dafür ist sie ja übertragbar.“ (10/CL-MM)*
34. *„Also was mir ja ganz helfen würde, da ich ja sehr unregelmäßig mit dem ÖPNV fahre. Wenn man einen Zugriff hätte auf eine, auf eine Karte, auf eine.“ (8/MM)*
35. *„Interessanter Ansatz. Muss man schauen, ob das funktioniert. Es hängt immer von der Heterogenität der Leute ab, die in der Gemeinschaft sind. Und wie das dann in der Praxis funktioniert. Aber prinzipiell ja. Smarter Ansatz.“ (3/MM)*
36. *„Wir haben es auch schon ein paar Mal benutzt. (...) Wir haben es eher spontan genutzt. 'Ja ist frei heute, gut, lass uns in die Stadt fahren'. Weil wir dann zwei gebraucht haben, wir haben keine Karte, sondern wir haben dann zwei gebraucht. Und das ist auch jetzt eigentlich unterbunden. Außer es ist spontan. Wenn's spontan frei ist, dann darfst du auch zwei parallel haben. Sonst ist halt nur eine Buchung erlaubt. Das heißt, wenn man sagt 'wir machen jetzt zu zweit was', geht auch wieder nicht.“ (13/coop/CL- MM)*
37. *„Das wandert durchs Haus, indem der Vermieter es dem nächsten in Briefkasten schmeißt. D.h. wir haben keine zentrale Anlaufstelle, wo wir es hinlegen, und da holst du es dir, sondern es wird in einer App geschaut, 'wer ist als nächstes dran, aha der ist als nächstes dran, ich packs dem in Briefkasten'. Und wenn da ein Gap von mehr als 24h ist, das gibt es den so genannten Kümmerer, der, der sich um das Ticket kümmert, der kümmert sich auch darum, falls es mal verloren geht oder so was, auch dass (...) die Hülle heil ist und so weiter. Und dieser Kümmerer kriegts dann in den Kasten, wenn's mal länger weg ist muss der Kümmerer aktiv werden. Wenn es gut ausgebucht ist, braucht der Kümmerer überhaupt nichts tun, weil das im Haus permanent hin und her marschiert.“ (13/coop/CL- MM)*

Mobility manager

38. *„Wir haben ja im Haus verschiedene Projektgruppen für alles Mögliche. Und eine von denen ist die Mobilitätsprojektgruppe, die sich auch zum Beispiel um die Lasten-Fahrräder kümmert oder diese Fahrradanhänge. Und es ist sehr sehr gut zu wissen, dass es dann zum Beispiel eine E-Mail gibt. Wenn man Fragen hat, kann man sich dort hinwenden und dass sich wirklich Personen drum kümmern. Es ist natürlich aber auch so, dass*

sowas auf freiwilliger Basis gemacht wird und das kann durchaus schwanken. Wobei bis jetzt kann man sich jetzt nicht beschweren, wenn jemand so was überhaupt macht in seiner Freizeit, dann ist jeder dankbar. Aber ich könnte mir vorstellen, dass in größeren, also in den Häusern, wo sehr sehr viele Familien und Menschen leben, dass es sinnvoll wäre, wenn wirklich auch fest Personen sich drum kümmern oder halt man das extern vergibt oder so.' (1.1/coop/CL)

39. 'Da gibt es den tapferen C. der immer wieder das Verbindungsglied ist von unserer Hausgemeinschaft zu zum Beispiel Scooter oder eben den Firmen, die da ihre Fahrzeuge oder auch so was anbieten oder eben auch die Technik bereitstellen, die laufen soll, damit man in der Lage ist Lastenfahräder und Autos auszuleihen. Genau. Und der ist geduldiger/ genervter Ansprechpartner für Themen und Fragen.' (7/coop/CF/MM)
40. 'Fahrrad ist halt ein ganz andres Ding wie ein Auto und diese Tickets sind noch mal was anderes, was einfach nur Organisation ist. Gar nicht viel Wartung oder so, sondern einfach nur gucken, irgendwie kriegt wirklich der, der es haben wollte das dann. Es ist viel mehr Absprache und so. Die elektrischen Lastenräder und überhaupt die E-Mobilität ist nochmal so was zwischen Auto und Fahrrad, aber ich glaube eben, aus einer Hand geht es gar nicht zu organisieren.' (9/coop/CF/FM)
41. 'Da gibt es diesen Nachbarn, der gibt einem Hilfe zur Selbsthilfe, unterstützt ein bisschen und das ist super niederschwellig. Ein tolles Angebot für Leute, die handwerklich nicht ganz so viel machen. Aber wenn du eh schon relativ viel selbst machen kannst und machst, dann wird er dir wenig weiterhelfen können (...) ein Elektroantrieb wird er auch nicht ... Das ist einfach zu komplex. Und es gibt auch Kümmerner für die e-Bikes Und da ist es auch so, dass die halt die Reifen aufpumpen, dass die vielleicht die Bremse dann ein bisschen nachstellen, wenn die abgenutzt ist. Aber wenn wirklich ein Defekt ist oder irgendwas ist, dann Hotline und da kommt jemand. (...) Und da gibt es auch für jedes Rad eine Person, die sich kümmert, nicht einfach einer für all, sondern jeder hat ein einzelnes und die kriegen dann als Gegenleistung ein paar Freistunden.' (13/coop/CL-MM)
42. 'Aber wenn es ums Lokale geht, dann brauche ich da keinen Mobilitätmanager. Ich manage meine Mobilität selbst.' (2/CL-MM)
43. 'Ja, ich red lieber, als dass ich mir 1000 Seiten durchlese. Außerdem, wir werden sonst wirklich, dass unsere Gesellschaft geht vor die Hunde. Wenn ich denke, mit dem Bezahlen schon. Wenn du nicht mehr eine Kassiererin hast, sondern nur noch dieser Automat, wenn niemand mehr mit jemandem redet. Also ich werde die Person nehmen. Auch weil ich zu blöd bin das zu bedienen.' (14/MM)
44. 'Das habe ich ja gerade gesagt. Es ist ja ganz klar, Wenn ich selbst nicht tätig werden will, dann muss das jemand anderes es tun. Und ich fände das hervorragend, wenn jemand da wäre, der das Konzept also begleitet, betreut und immer genau Bescheid weiß, wo welches Auto ist und an welchen Tagen grad kein Auto zur Verfügung steht oder sonst was.' (10/CL-MM)
45. 'Ja, ich denke auch so, so der Schritt jetzt zu sagen ich mach Carsharing. Ist doch deutlich schwieriger den zu nehmen, als wenn ich sage, ich kenn da den aus meiner Nachbarschaft und der weiß da Bescheid und den kann ich einfach mal fragen und der erklärt dann alles. Vielleicht kann er dann auch sagen guck mal, hast du schon mal überlegt, das und das könntest du auch machen statt im Auto oder so, dass der da noch Ideen hat, auf die du gar nicht gekommen wärst.' (12/YIM)
46. 'Ja. Ich glaube, bei mir ist es immer in dem Moment. Wo ich das machen muss. Also wenn ich jetzt ein E-Auto hab und dann komme ich an die Ladesäule, hab noch nie vorher ein Auto da angeschlossen. Da hätte ich dann halt gern jemand der mich berät und nicht irgendwie YouTube Video oder sonst was. Ich weiß nicht welche.' (1.2/CL)

Information point

47. *„Ich hab auch grad gedacht, aber eigentlich schaue ich auch immer in die Apps. Aber manchmal ist es ja so, also wenn ich jetzt davon ausgehe, dass ich woanders bin und ich habe die Hände gerade voll und keine Smartwatch. Dann wäre es vielleicht gar nicht schlecht, wenn du das Haus verlässt. An der nächsten Hauptstraße bist und da an der Kreuzung siehst, da fährt das und das. Also, was als nächstes fährt, finde ich schon ein wenig sinnvoll.“ (1.2/CL)*

Kick-Scooters

48. *„Ich würde das nie im Leben, würde ich so ein Ding nehmen, weil die mich so ärgern. Auch die Leute, die da draufstehen. Ich weiß nicht. Es ist wirklich. Es liegt nicht nur am Abstellen, einfach diese Haltung. Und wenn du hörst, dass da in den Flüssen die Dinger versenkt werden und die Firmen sich weigern, die zu entsorgen, da krieg ich echt einen totalen Hals.“ (1.2/CL)*
49. *„Was, wovon ich jetzt nicht so überzeugt bin, sind diese komischen Roller und ich finde das ist echt Sondermüll fahrender Sondermüll, der da rumsteht, überall und kreuz und quer in der Gegend rumsteht.“ (2/CL-MM)*

Scooters

50. *„Täglich überhaupt nicht. Also das ist auch eher ja, irgendwie muss ja auch das Wetter passen. (...) Ja, genau und genau. Es ist halt einfach dieses, dieses Flexible, was wir da dran schätzen. Also mittlerweile haben wir zwei Akkus. Das bedeutet, wenn beide aufgeladen sind, dann muss man sich auch nicht über die Reichweite so Sorgen machen. So nach dem Motto komm ich auch wieder heim. Oh Gott, der Akku ist ja schon relativ weit unten.“ (7/coop/CF/MM)*
51. *„Auch da, das könnte ich mir schon eher vorstellen. (...) Also, wenn man auch über diese Arbeitsverhältnisse nachdenkt, die dahinterstehen, dann sieht man das aus dem sozialen Gesichtspunkt her mitberücksichtigt [bei Kick-Scootern]. Da muss ich einfach sagen, wäre mir so eigentlich lieber, weil das würde bedeuten, dann hat man da auch ein Ladegerät oder Ladesäulen und da werden die aufgeladen. Das heißt, grundsätzlich wäre so ein Angebot auch toll. Nur fahren muss man halt konsumieren. (...) Das ist doch super. Ehrlich, ich habe einen Bekannten, der der hat, die sogenannte Schaufenster Krankheit, das heißt er kann nicht stehen bzw. der kann nicht laufen. Und er hat also, der hat mit den mit Venen und mit den Arterien echte Probleme und er hat immer Schmerzen in den Beinen, wenn er länger geht. Der kann jetzt, als wir uns getroffen haben, nicht mehr als zehn Schritte am Stück gehen und für den sind diese Roller optimal, der mietet sich die dann den ganzen Tag, irgendein Gerät, was bei ihm dann irgendwie in der Nähe steht und kann damit ja überall bis vor die Tür fahren. Und also ich finde das schon, das ist schon sehr verlockend. Und auch wenn man dann damit wieder zurückfahren...“ (10/CL-MM)*
52. *„Auch da, das könnte ich mir schon eher vorstellen. (...) Also, wenn man auch über diese Arbeitsverhältnisse nachdenkt, die dahinterstehen, dann sieht man das aus dem sozialen Gesichtspunkt her mitberücksichtigt [bei Kick-Scootern]. Da muss ich einfach sagen, wäre mir so eigentlich lieber, weil das würde bedeuten, dann hat man da auch eine Ladegeräte oder Ladesäulen und da werden die aufgeladen. Das heißt, grundsätzlich wäre so ein Angebot auch toll. Nur fahren muss man halt konsumieren.“ (10/CL-MM)*

Parcel Stations

53. *„Überhaupt nix, lehn ich total ab, außer die Kinder bestellen etwas '(...)', nein aber ich bestell überhaupt nix.“ (14/MM)*
54. *„Zu viel bringen weiß ich nicht. Ehrlich gesagt. Also ich weiß auch so, das habe ich noch nie gemacht. Keine Ahnung, wie das funktioniert, aber wahrscheinlich ist es durchaus eine feine Sache, wenn man sich mal dran gewöhnt hat. Aber ich bin natürlich schon grundsätzlich so ein bisschen gegen, dagegen alles zu bestellen im Leben. Ich möchte das eigentlich eher nicht.“ (8/MM)*

55. *„Ja wäre sicher nicht verkehrt. Am besten wäre, wenn jedes Haus, das hätte, wo man das reinschmeißen könnte. Aber ich weiß ja nicht, weil dann alle Zugang haben dazu oder ob das dann wieder ein Problem darstellt.“ (3/MM)*
56. *„Was heute zum Beispiel überall fehlt, ist, dass man so Pakete Boxen hat, dass die Pakete abgegeben werden können. Wir wohnen zufällig direkt neben der Klingel im Erdgeschoss. Wir sollten eigentlich pro Paket immer so einen Euro nehmen. Dann kann ich schön Urlaub machen im Jahr einmal oder wenigstens essen gehen oder so. Also was da so an Verkehr ist.“ (2/CL-MM)*

Showers and changing rooms

57. *Interviewerin: Wenn es jetzt die Möglichkeit geben würde, an deinem Arbeitsort zu duschen und Schließfächer geben würde, würdest du dann öfters mit dem Fahrrad fahren?*
3: *Ich glaube schon.*
Interviewer: Das heißt, das ist wirklich das Wesentliche, was fehlt?
3: *Das, wenn ich hätte, würde ich lieber gerne mit dem Fahrrad fahren vor allem im Sommer. Das einzige Thema ist auch das, die Verbindung von hier zum Ostbahnhof eher mäßig ist. Also da gibt es nicht wirklich einen guten Weg. Und immer neben den Autos herfahren. In 20 Jahren mag das anders sein, und elektrisch sind und keine Abgase mehr, aber nur noch Feinstaub (...).“ (3/MM)*
58. *„Also ich würde mich auch sehr gerne auspowern, aber mir bietet einfach meine Arbeit nicht die Möglichkeit, mich dann entsprechend auch nicht wieder arbeitsfähig zu machen. Also ich. Wir haben keine Duschen und keine Umkleidekabinen. Und insofern ist Öffentlichkeit aus mehreren Gründen für mich das ideale Verkehrsmittel.“ (10/CL-MM)*
59. *„Und wenn sie am Freitag nicht fährt, dann nehme ich das meistens und fahr damit ins Büro, wenn wir diese Kollision haben, wir haben nur eins zur Verfügung, leih ich mir unten auch keins, weil das kostet natürlich wieder, sondern bin dann eher, dass ich Rennradfahrer. Aber da habe ich das Problem, dass ich verschwitzt ankomme. Dann ist es doch eher das Auto die Alternative, die ich nehme. (...) Wir haben eine [Dusche], aber die nutzt keiner bisher und ich kenne niemanden der die bisher genutzt hat und deswegen werde ich die nicht nutzen. (...) Na ich weiß gar nicht, ob die schlechter ist. Ich habe es einfach, weil die niemand nutzt. Und wenn da ein Herr S. dann plötzlich mal duscht, dann stehen da alle und 'was ist jetzt mit dem malwieder los?'“ (13/coop/CL- MM)*
60. *„Als Sportlehrerin hat man Zugang und dann ist da auch eine Dusche und von daher kann könnte ich das auch machen. Aber wie gesagt, ich bin immer morgens eher so ganz gemächlich gefahren, dass ich nicht so viel schwitzen musste und bin dann so in der Schule auch angekommen, ohne dass ich duschen musste.“ (6/CF/MM)*
61. *„Nee, würde ich nicht nutzen, weil. Das würde dann noch mal so und so viele Minuten länger dauern vor der Arbeit. Dann weiß man auch nicht, ist die Dusche gerade frei oder nicht?“ (7/coop/CF)*

Price

62. *„Also ich möchte so was nutzen und bin bereit, dafür zu bezahlen. Aber ich möchte das nicht irgendwie organisieren, oder, da habe ich kein Bock drauf.“ (10/CL-MM)*
63. *„Alles, was Service und Dienstleistung ist, nehme ich als Hedonist natürlich total in Anspruch. Und auch eben dank privilegierter Situationen zahle ich das natürlich auch. Alles, was ich nicht selber machen muss, wofür ich bezahlen kann, was in einem Rahmen steht, und dann mache ich das. Das verstehe ich immer nicht, wenn wohlhabendere Menschen wegen so einem? sparen. Also wieso? Die Leute haben dann studiert, die sollen das machen und dann ist es das wert, dann wird das auch ordentlich bezahlt.“ (14)*
64. *„Also ich finde den Gedanken jetzt spannend. Ich glaube aber, dass so also ich glaube, einfach, dass da jetzt vom Mensch her, dass dann plötzlich drei auf einmal diese Karten haben möchten, und dann ist es nicht verfügbar oder einer legt es dann nicht zurück oder*

wie auch immer. Dass es dann an dieser menschlichen Komponente scheitert (...) Ja, warum nicht? Also, das ist auf jeden Fall. Wenn es gut gelöst ist, wäre es auf jeden Fall einen Versuch wert.' (6/CF/MM)

65. *„Ja, finde ich super. Also würde ich sofort machen, wenn es gäbe. Wenn mir das jemand anbieten würde. Ja auch wieder eine Preisfrage natürlich, was bin ich bereit [zu zahlen]. Gerade bis 9 € Ticket würde ich sofort machen, für den Rest meines Lebens.'* (8/MM)

66. *„Für mich ist der Preis der wichtigste. (...) Das habe ich als Mensch so gestrickt, dass ich sage, ich will vermeiden, möglichst irgendwo in eine Situation zu kommen, wo ich mich finanziell zu sehr mit irgendwelchen Verträgen, Fixkosten zu sehr belaste.'* (3/MM)

Trial subscriptions

67. *„Aber ich denke, dann wäre es wichtig, dass man erst mal so eine Art Probe Monat oder sowas hat. Ich teste das jetzt mal und wenn's was für mich ist, dann werde ich richtiges Mitglied, das man vielleicht so zum Beispiel eine verbilligte ein Monat Mitgliedschaft hat.'* (12/YIM)

68. *„Und das Schöne war, damals gab's immer noch geht, dass man, wenn man zwei Stationen zurückbringt, kriegt man zehn Minuten gutgeschrieben und wenn man mit konnte, man sich ein Guthaben aufbauen.'* (13/coop/CL-MM)

Mobility plans

69. *„Also ich mag immer so Pakete eigentlich nicht. (...) Obwohl ich diese regelmäßigen Sachen absehen kann. Oh, hätte ich den Gedanken ab dem Moment, wo ich dann mehr brauche, ist es teurer, plus es ist ja nicht gewährleistet, dass ich dann ad hoc das wirklich so nutzen kann, wie ich es eigentlich in meinem Paket bezahlt habe. Weil wenn das Auto weg ist, ist es weg. Oder wenn jemand vorher schon das bucht in den Ferien und es ist der und der Tag, dann ist es weg, ganz egal welches Paket ich bezahl. Also dieses Problem ist speziell bei den Autos total eklatant immer während diesen Ferien.'* (7/coop/CF/MM)

70. *„Es würde eine Änderung im Nutzungsverhalten bewirken, wenn ich pro Woche zwei Stunden oder pro Monat zehn Stunden hätte. Wenn ich weiß, ich habe noch ein Budget und wir sind noch nicht geradelt, dann würde ich halt losfahren, wahrscheinlich. (...) Ich würde es mehr nutzen, weil die schon gezahlt haben, wenn so was drin wäre, aber ich würde mich umstellen. Aktuell ist es halt was Besonderes, dass wir das nehmen und sagen 'Hey heute fahren wir mal wieder mit dem Rad.'* (13/coop/CL-MM)

71. *„Naja, ich merke jetzt allein schon in unserem Gespräch, dass ich über viele Sachen gar nicht nachdenke, weil ich zu faul bin. Weil es sehr praktische so wie ich es jetzt gerade habe. Wir wollen ja besser werden als Gesellschaft. Und da tut so ein kleines Nudging auch ganz gut. (...) Ja, wir machen ja auch mit. Mein Leben ist voll mit anderen Sachen. Und wenn ich es vorgekauft kriege, mache ich da wahrscheinlich schon auch mit. Aber selber mitdenken. Also ich bin ja schon sozusagen beruflich etabliert. Ich kann ja jetzt nicht mehr mich in eine andere, kann ich natürlich schon, aber mit erheblichen Einbußen wahrscheinlich, in eine andere Richtung bewegen. Wir verlassen uns auf euch. Ich mach dann mit.'* (2/CL-MM)

Appendix D: Individual Mobility Plans Interviewees

Below are the individual-derived mobility plans. Red stands for parts of public transport, green for everything to do with bicycles, blue for everything to do with cars, and purple for further components. Dotted boxes are the volumes related to the mode above. An arrow inside the packets indicates those who may be willing to change their behavior if certain elements are present.



Fig. D.1. Individual mobility plans of participants (1.1 – 4)

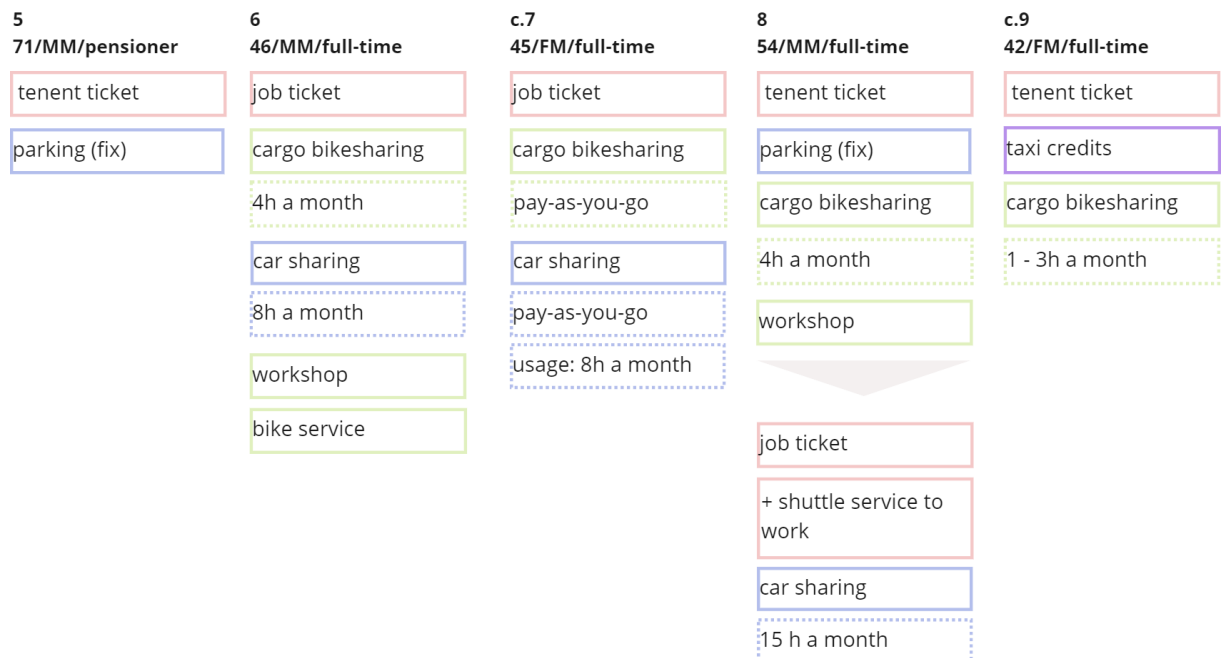


Fig. D.2. Individual mobility plans of participants (5-9)

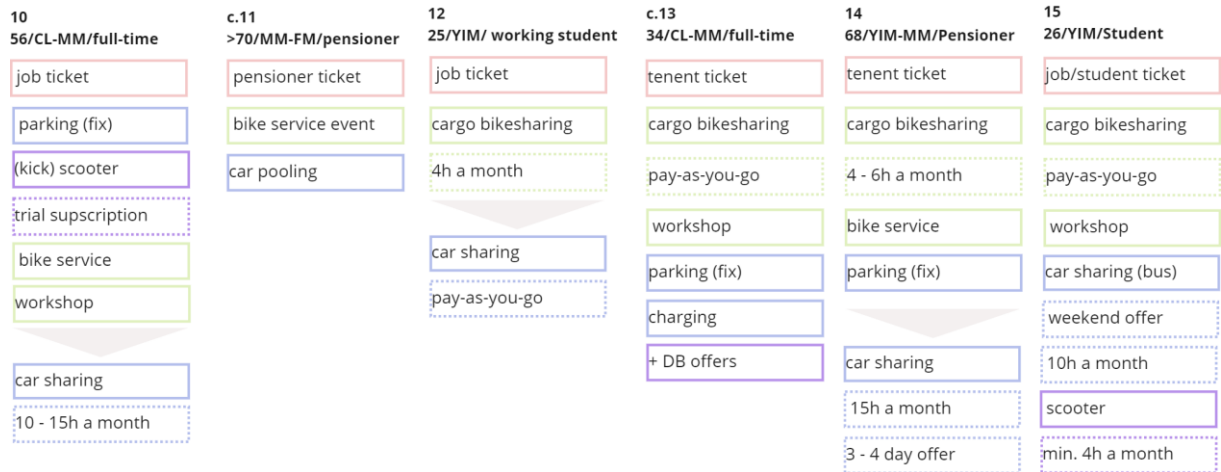


Fig. D.3. Individual mobility plans of participants (10-15)

Declaration concerning the Master's Thesis

I hereby confirm that the presented thesis work has been done independently and using only the sources and resources as are listed. This thesis has not previously been submitted elsewhere for purposes of assessment.

Munich, September 19th, 2022

Ida Bachmaier