MASTER´S THESIS

M. Sc. Environmental Engineering

Evaluation of Mobility Stations in Offenburg

Assessment of Perception and Acceptance of an Integrated Multimodal Mobility Service and Potential Changes on Mobility Behavior

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Abstract

In recent years, more and more cities in Germany developed strategies to provide their citizens with sustainable and environmentally friendly transport solutions. Mobility Stations as locations where different modes of transport are connected on a physical level were implemented and should contribute to promote multimodality. The city of Offenburg started the planning process for their new integrated multimodal mobility service "Einfach mobil" (English: easy mobile) in 2012 and four Mobility Stations are now in the pilot phase. To evaluate the perception and acceptance of "Einfach mobil", as well as effects on mobility behavior, an online survey among users and non-users was conducted. Within the survey planning stage, five different target groups were identified: customers of the bikesharing provider *nextbike*, customers of the carsharing provider *Stadtmobil Südbaden*, citizens, commuters, and visitors. Emails sent by the respective mobility providers, postcards, information online and newspaper articles were used to invite people to take part in the survey. Incentives were offered to increase response rates. The responses given in the five different questionnaires provide insights on the awareness of "Einfach mobil" and its elements, the attitudes of participants towards the configuration of stations, mobility patterns, as well as actual and potential changes on mobility behavior and travel preferences. The physical presence in public space contribute to raising awareness of the service. The existing components of Mobility Stations play a central role and could be extended by additional components, like parking facilities for private bicycles, information desks, and lockers. Actual and potential changes in mobility behavior towards multimodality were revealed. Some users declared to use other mobility services more often. Non-users showed interest in using mobility services for daily private trips, leisure activities and shopping trips. Possible locations for an expansion of the network of Mobility Stations were identified. Based on the findings, the integrated multimodal mobility service can contribute to reduce car ownership.

Acknowledgments

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List of Abbreviations

Afög	Arbeitsfördergesellschaft
BBSR	Bundesinstitut für Bau-, Stadt- und Raumforschung
Bcs	Bundesverband CarSharing
BgA	Betrieb gewerblicher Art
CO_2	Carbon Dioxide
DB	Deutsche Bahn
EC	EuroCity
IC	InterCity
ICE	InterCityExpress
ICT	Information and communication technologies
IR	InterRegio
MIT	Motorized Individual Transport
PT	Public Transport
RP	Revealed Preference
SR	Stated Response
SrV	System repräsentativer Verkehrsbefragungen
StVO	Straßenverkehrsordnung
SWEG	Südwestdeutsche Verkehrs-Aktiengesellschaft
TBO	Technische Betriebe Offenburg
TGO	Tarifverbund Ortenau
UITP	International Association of Public Transport
ZOB	Zentraler Omnibus Bahnhof

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1 Introduction

By the year 2050, two thirds of the world's population will be living in cities (United Nations, 2014). This brings with it the challenges of increasing urbanization, more frequent traffic congestions and rising environmental pollution (Wulfhorst, Priester, & Miramontes, 2013). Therefore, strategies for sustainable mobility have to be developed. Mobility providers offer a multitude of new attractive alternatives to private car usage. Modes like carsharing and bikesharing complement public transport offers and contribute to more sustainable mobility (UITP, 2011). The concept of integrating these modes in terms of location, information, access, marketing and billing with the help of new information and communication technologies (ICT) facilitates and thereby encourages multimodal mobility (Miramontes, 2015). In recent years, these so called integrated multimodal mobility services were implemented in various cities in Germany (Luginger, 2016). One element of integrated multimodal mobility services is the implementation of Mobility Stations as locations where different modes of transport are physically connected (BBSR, 2015). Mobility Stations can potentially influence the daily mobility decisions of users. Moreover, they support the rising trend of using instead of owning for satisfying daily mobility needs.

1.1 Background

In 2012, the city of Offenburg decided to initiate a new strategy for more environmentally friendly mobility (Kassel, 2016b). As part of its mobility concept, the city introduced the new integrated multimodal service "Einfach mobil" (English: easy mobile). The first four Mobility Stations were successfully implemented within the period of June to October 2015. Registered users of "Einfach mobil" now have access to *Stadtmobil Südbaden* carsharing, *nextbike* bikesharing and private bike parking facilities. Furthermore, every Mobility Station is reachable by public transport (Kassel, 2016b). The project of creating a network of Mobility Stations within the city area of Offenburg is currently in the testing phase. After evaluating the operation of the first stations, the city will decide if more stations should be built (Stadt Offenburg, 2016j). Changes in travel behavior were analyzed with regards to car ownership. This was done in a GIS analysis where the catchment areas of the stations were modelled and the numbers of residents, employees and cars were calculated. Unfortunately, it was not possible to draw conclusions, because the service has just started operating and any potential effects are not yet apparent (Heller, 2016). At the moment, the analysis of Mobility Stations in Offenburg does not take into account the opinions and experiences of users and non-users. However, they may have different expectations of the effects of the new integrated multimodal service "Einfach mobil" and this information could be valuable for further development.

1.2 Goals

The aim of this master thesis is to evaluate the Mobility Stations in Offenburg and to derive recommendations for the implementation of additional stations. Based on an empirical study the perception and acceptance of the new integrated multimodal mobility service, the needs for mobility, and the (potential) change in mobility behavior of users and non-users will be analyzed. With this goal in mind the following objectives are defined:

- To analyze the perception and acceptance of the integrated multimodal mobility service in Offenburg by users and non-users;
- To investigate the potential changes in mobility behavior due to the integrated multimodal service;
- To deliver recommendations for the implementation of additional Mobility Stations.

An outlook will discuss possible future evaluation projects. Overall, this master thesis collects a data basis that reflects the individual effects of Mobility Stations on users and non-users. These results can be used for future development of the integrated multimodal mobility service in Offenburg.

1.3 Structure of the Document

In order to achieve the objectives mentioned above and to deliver recommendations for further Mobility Stations in Offenburg, both a theoretical and an empirical investigation were carried out. Chapter 2 contains results of the literature review on integrated multimodal mobility services. In order to get to know the area of investigation, the city of Offenburg and its new integrated multimodal service "Einfach mobil" is then presented in Chapter 3. The main steps of empirical investigations in the field of travel surveys were explored and are given in a theoretical investigation in Chapter 4. The whole process of planning and realizing the survey of users and non-users of the new service in Offenburg is presented in the methodology part of this thesis (Chapter 5). Chapter 6 presents the results of the survey. The answers collected in the questionnaires were used to create diagrams, which enable an easy comparison of the participants within the different target groups. In Chapter 7 recommendations for the implementation of additional Mobility Stations in Offenburg were derived based on the results. In the conclusion, the findings of the survey among users and non-users and the given recommendations are discussed. Furthermore, a brief outlook concerning future evaluation projects is given (Chapter 8).

2 Integrated Multimodal Mobility Services

So far, there is no explicit definition for the term *integrated multimodal mobility services*. According to Schnurr (2013), mobility services include all services that are based on material transportation or immaterial information services. Furthermore, they assist individuals in changing locations and include services that help users to organize their trips more conveniently. The different types of mobility services were identified (Schnurr, 2013) and are now presented in Table 2-1.

Table 2-1: Types of mobility services with explanations and examples. Source: own table, information based on (Schnurr, 2013).

MOBILITY SERVICE TYPE	EXPLANATION	EXAMPLE
Driver services	They release individuals from steering and owning a vehicle.	- Public transport - Taxi - Chauffeur services
Vehicle provision services	These services enable individuals to use a vehicle such as a bike or car without the need of owning it.	- Car rental - Carsharing - Public vehicle fleet - Public bicycle fleet
Information and assistance	Such services have the objective to make travel more convenient and even seamless. They provide data on schedules, locations etc., support the organization of trips and make purchase of tickets and access licenses easier. They can include several public and private transport modes and services and are most useful in urban areas with high proportions of mixed travel.	- Information centers - Traffic information - Mobility assistants - Mobility cards

Mobility Services include conventional "driver services", such as public transport or taxis, "vehicle provision services" such as car rental or carsharing, and "information and assistance services". Further criteria for categorizing mobility services are appropriation (private vs. public ownership), usage modus (individual vs. collective) and integration of different modes (monomodal vs. multimodal) (Schnurr, 2013).

2.1 Multimodality and Intermodality

Nowadays, people can choose between multiple modes of transport. Walking, driving a car, cycling, taking the bus or train, renting a carsharing or bikesharing vehicle, using carpooling offers or taxi – all these modes are not competing but rather complementing or coexisting (UITP, 2011). A balanced use of transport modes is necessary for distributing transport flows evenly among modes. Regarding the wide selection of possibilities, users have to decide, which means of transport to use for their trips. Depending on the purpose of trip, trip length, origin and destination, or time of day, they can be more or less appropriate. The decision is not only about single modes, but about the best mixture of modes. The mix of modes can help to save resources, time, and costs for individuals. The terms for this kind of flexible mobility behavior are multimodality and intermodality (Figure 2-1) (Schnurr, 2013).
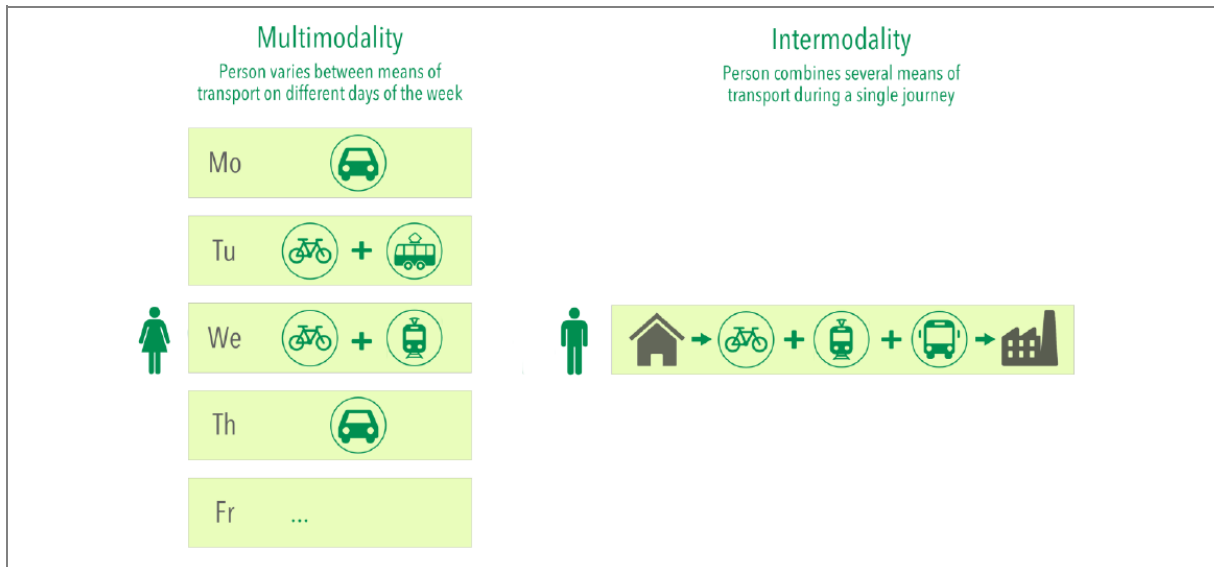
Figure 2-1: Description of multimodal and intermodal travel behavior. Source (Luginger, 2016).

Multimodality describes the utilization of different transport modes on different journeys, while intermodality is the utilization of different transport modes during a journey (Zumkeller, Manz, Last, & Chlond, 2005). Hence, intermodality can be seen as a subset of multimodality. The use of multiple transport modes in one journey (intermodality) or in one person's mobility patterns (multimodality) requires seamless transfers between modes and integrated mobility services, supported by intelligent transport systems (Schnurr, 2013).

2.2 Components of Integrated Multimodal Services

Public transport is the classic component, which should be included into new integrated multimodal mobility services. The different offers for local public transport (e.g. bus, light rail, train, subway) normally have fixed locations, timetables and routes. These characteristics enable a high degree of reliability but limit the flexibility of users. In order to increase this flexibility, new services like carsharing and bikesharing can be implemented as parts of integrated multimodal mobility services.

Carsharing

The "Bundesverband CarSharing" (English: German federal association for carsharing) (*bcs*) defines carsharing as the organized, joint use of vehicles (Bundesverband CarSharing, n.d.). Customers have to conclude an agreement with the carsharing provider and then receive an access medium (e.g. key, card, smartphone application) that allows them to use the vehicles of the carsharing fleet independently. The vehicles can be booked by telephone, smartphone application or via internet (Bundesverband CarSharing, n.d.). In case of station-based carsharing, vehicles are available at reserved parking spaces where users pick them up and bring them back. Another form of carsharing is the so called free-floating carsharing where the

vehicles are randomly distributed in a defined operational area. They can be located with the help of smartphone applications and after the trip they can be parked anywhere within the operating area of the provider (Bundesverband CarSharing, 2015). While station-based vehicles are bookable in advance, free-floating vehicles can only be booked spontaneously. In the case of free-floating carsharing, the return time has not to be determined in advance (Bundesverband CarSharing, n.d.). Beside vehicles with conventional drive systems, many providers also offer electrically-powered vehicles.

Bikesharing

Bicycle rental systems increase the quality of an integrated system consisting of public transport and carsharing and can contribute to more sustainable mobility behavior (Deutsches Institut für Urbanistik GmbH, 2016). Public bikesharing services can be part of an intermodal mobility chain through complementing bus and train especially for the "last mile" to the final destination (Deutsches Institut für Urbanistik GmbH, 2016). The reasons for implementing bikesharing services are often centered on goals of increasing the modal split of cycling, reducing congestion, improving air quality, and offering residents an active mobility option (ITDP, 2013). The services usually consist of a network of public bicycle rental stations, which are composed of docking spaces for the bicycles (ITDP, 2013). In addition to station based schemes, where the bicycles have to be returned to any station, there are also flexible schemes, which allow users to park the bicycles anywhere within a defined operating area (Greenfinder UG, n.d.). For many providers, users have to pre-register online or through a smartphone application. To rent a bicycle, the registered users accesses the bicycles through an application, via phone or card and the bicycle is then released from the docking station (ITDP, 2013). An additional component of bikesharing services is the provision of pedelecs, which include an assisting electric drive (Monheim, 2011).

Carpooling

Carpooling corresponds to ride sharing and means that (unrelated) individuals travel together in a single vehicle (BBSR, 2015). According to Randelhoff (2014), ridesharing is defined as the formation of a carpool with private vehicles for a trip that all participants have to make. The vehicle owner determines the destination, route and time of the trip (Randelhoff, 2014). Travel expenses usually are shared amongst all passengers without any commercial purpose. The organization and planning can be made on a private basis or online with the help of platforms (Randelhoff, 2014).

2.3 Integration of Components

The efficiency of multimodal mobility services depends on how well different modes are integrated. Only a sparse amount of literature that focuses on the levels of integration in the context of multimodal mobility services is currently available. A report written by Best and Heller (2016), the classification scheme developed by Luginger (2016) and a report on the project "Mobility as a Service" (Kamargianni, Matyas, Li, & Schäfer, 2015) were used to give an overview. In total eight tiers of integration were identified: physical, marketing, information, registration, trip planning, booking, access and billing integration.

- *Physical integration* is defined as the connection between two or more modes of transport at one immediate location. Connected services should be reachable without any barriers. Physical integration intends to shorten distances between connections and therefore facilitates the usage of other modes.

- Marketing of multimodal mobility services includes the promotion, distribution, and selling of products and services. Through marketing measures, the public becomes aware of the available services of the mobility providers. *Integrated marketing*, which includes advertisement for all integrated services, a strong brand identity and complementary offers can help to attract new customers.

- *Integrated information* in the context of multimodal mobility services involves the implementation of relevant information - like services available, pricing, timetables, registration, instructions for use - about the different services into one platform. This could be for example a website, app, physical timetable or information point.

- *Integrated registration* implies that people intending to use a multimodal mobility service only have to register once to be authorized for the usage of the different services provided by participating partners. In case of registration integration, a high level of cooperation amongst the providers is necessary.

- *Integration of trip planning* can be achieved with help of a platform (website, app, on-site terminal), which provides location information for all services. Users are then able to see all options for their trip at a glance.

- Once the trip planning is made and the best route and modes are chosen, *integrated booking* of all services can help to save time. A change of the platform (website, app, on-site terminal) would not be necessary.

- *Access integration* implies that two or more mobility providers agree that users can access their services via one card, app, or ticket. Integrated access further simplifies the usage of different services and is an important aspect with regards to the promotion of multimodal mobility behavior.

- The ability to pay all services used through one transaction or bill is defined as *billing integration*. Integrated billing requires one central institution for its processing.

2.4 Mobility Stations

Locations where different components of an integrated multimodal mobility service are physically connected, are often called Mobility Stations. At the moment, there is no uniform definition, but the "Bundesinstitut für Bau-, Stadt- und Raumforschung" (BBSR) (English: Federal Institute for Research on Building, Urban Affairs and Spatial Development) describes these stations as multimodal connection points where changing modes is easy and comfortable (BBSR, 2015).

Even if the concept of implementing Mobility Stations is relatively new and the results of early evaluation projects are missing, Randelhoff (2016) compared different scientific reports in order to learn about the impacts of Mobility Stations. According to the "Handbuch Mobilstationen" (English: manual for Mobility Stations) (Steinberg, Stocksmeier, & Scheer, 2015), Mobility Stations can help to reduce traffic and parking pressure in cities. They also support the shift of car usage towards more environmentally friendly means of transport and therefore contribute to a reduction of pollution and noise emissions (Steinberg, Stocksmeier, & Scheer, 2015). The manual also states that Mobility Stations would secure cost-effective and flexible mobility in urban and rural areas. Through implementation of such stations, a marketing effect for multimodal mobility services can be achieved (BBSR, 2015). Additionally, the providers could also experience positive impacts, if their services were included at Mobility Stations. The catchment areas of normal car / bikesharing stations can be expanded and additional services may attract new customers who contribute to an increase in demand (BBSR, 2015). Furthermore, Mobility Stations can act as social spots or meeting points for carpooling (Frensemeier, 2014). Mathias Kassel, head of the transport planning department in Offenburg, states that the implementation of Mobility Stations would contribute to the formation of a new mobility culture and an increase in the quality of urban life (Kassel, 2016b). In summary, existing literature assures only positive effects of Mobility Stations. However, an evaluation of the individual integrated multimodal mobility service with all its different characteristics is necessary to identify effects of these stations on mobility behavior of users and to prove the overall success of the service.

3 Integrated Multimodal Mobility Service in Offenburg

This chapter provides an overview of the area of investigation: the city of Offenburg. The transport means available and the development of the modal share are described in detail. Then, the new integrated multimodal mobility service "Einfach mobil" with its goals and characteristics is introduced. Actors involved and statistical data about the use of the new Mobility Stations provided by *nextbike* and *Stadtmobil Südbaden* were analyzed and are presented in Section 3.2.4. The levels of integration defined in Section 2.3 are transferred to the case of Offenburg in order to see, how components are integrated.

3.1 Introduction to Offenburg

Offenburg is a city in the state of Baden-Württemberg, Germany, with a total population of 60,000 people (Stadt Offenburg, 2016b). This city with an area of 78.38 km^2 is located 20 km southeast of Strasbourg within the Ortenau district (Stadt Offenburg, 2016k) (Figure 3-1). Offenburg is the biggest town in the regional center of the Middle-Baden economic region. With its 40,000 employees, 2,000 businesses and 25,000 commuters, the city is one of the leading hot spots in the regional economy and labor market (Stadt Offenburg, 2016r). The rate of unemployment in June 2016 was 3.5%, which lies above the average in the Ortenaukreis (3.3%), but below the average in the state of Baden-Württemberg (3.7%) (Stadt Offenburg, 2016r). As the center of an emerging tourism region, Offenburg is easily accessible. The city is situated on the highway A5 (Frankfurt - Basel) as well as on the federal roads B3 and B33. Along the Rhine Valley stretch, Offenburg is an important hub for *Deutsche Bahn* with its stops for ICE, EC, IC and IR. There is a rail connection to France and the famous "Schwarzwaldbahn" (English: Black Forest railway) starts in Offenburg. Three passenger airports in the vicinity provide access to international destinations. Coach bus services are available at the trade fair center in Offenburg (Stadt Offenburg, 2016g).

Figure 3-1: Satellite image of Germany with location of Offenburg. Map retrieved from Google Earth.

3.1.1 Transport in Offenburg

After a general introduction to the area of investigation, the different means of transport available in Offenburg (cycling, motorized individual transport, public transport, carsharing and bikesharing) are now presented in detail.

Cycling

Since 1979, the city has been developing five "Fahrradförderprogramme" (English: cycling support programs) (Stadt Offenburg, 2016e). The first program mainly included the construction of cycle paths, whereas the two following programs focused on the development of a continuous cycle network and the promotion of cycling (Stadt Offenburg, 2016e). In the fourth "Fahrradförderprogramm", the emphasis was mainly on the maintenance of the cycle paths, as well as on the positive marketing of cycling in Offenburg (Stadt Offenburg, 2016e). With the current program, the city reacted to the changes in the "Straßenverkehrsordnung" (English: road traffic regulations) (StVO). The population has to be specifically informed about what has changed in the regulatory framework for cycling (Stadt Offenburg, 2013b).

The high priority of cycling in Offenburg is reflected by the (cost-) intensive promotion, systematic public relation actions and numerous individual measures and activities (Stadt Offenburg, 2013a). Listed in "Fahrradförderprogramm V", the current status of the cycling network and facilities for private bicycles are presented below (Stadt Offenburg, 2013a).

- The length of the cycle network is 220 km, of which 100 km are dedicated cycle paths, which run parallel to roads or physically separated from roads. 50 km traffic calmed roads and 70 km rural roads are also integrated into the network. At various intersections, when bicycles share the road with cars, a marked area on the lane indicates where cyclists should preferably cycle and stop. In the last few years more and more traffic signals for cyclists at signalized intersections were installed.
- For 30 years the color green plays a major role in the promotion of cycling in Offenburg. All over the city, the lane markings for cycle paths are dyed in green. Those green markings represent the efforts for improving the cycle network and promoting cycling as an environmentally friendly mode of transport.
- The municipality provides over 3,000 free bike-parking spaces within public street space of which approximately 1,200 are roofed.
- Cyclists in Offenburg have many possibilities to get help and information. The services of the city include the "Scherbentelefon" (English: broken glass telephone) of the *TBO*, where citizens can call when they notice, that the cycle paths are messy. The "Luftstation" (English: air station) at the main train station can be used in case of a flat tire. Another service of the city is the so called "Neubürgerbegrüßungspaket" (English:

welcome package for new citizens). The city sends information about cycling to all people who move to Offenburg. Maps for cycle paths and cycle trips in the surroundings are also available as information for citizens.

- Since 2011, the city of Offenburg offers a free charging station for pedelecs, which is powered by solar energy.

- Every year, events to raise awareness for traffic safety of cyclists are hold.

- The *Technische Betriebe Offenburg* (English: technical services Offenburg), *TBO*, organize a free municipal bicycle rental service. They offer 28 bicycles (16 bicycles, two tandems, ten e-bikes) at the station "City-Parkhaus" (Stadt Offenburg, 2016f).

- 995 Bike+Ride spaces, as well as 130 rentable boxes for private bicycles are available at the main train station. The "RadHaus" (English: bicycle house), a fully-automated system that vertically stores bikes, is located at the east side of the main train station. It was opened in 2013, and now 120 private bicycles can be stored without being exposed to weather influences (Figure 3-2).

Figure 3-2: Facilities for private bike parking: "RadHaus" and rentable boxes. Source (Kassel, 2016c).

Motorized individual transport

The *TBO* is responsible for the maintenance of the public road network, which consists of 250 km streets and 60 km rural roads (Technische Betriebe Offenburg, n.d.). Providing parking spaces is a major task for the city. To reduce the number of parked cars in the streets, the city offers aboveground and underground parking garages with a capacity of about 1,600 parking spaces in total (Stadt Offenburg, 2016n). Table 3-1 lists the major parking garages with the numbers of parking spaces.

Table 3-1: Parking garages in Offenburg. Source: own table, information retrieved from (Stadt Offenburg, 2016n).

NAME	TYPE	PARKING SPACES
Tiefgarage Marktplatz	Underground car park	294
City-Parkhaus, Wasserstraße	Parking garage	380
Parkgarage Sparkasse	Parking garage	330
Parkhaus Karstadt	Parking garage	260
Parkhaus Alt Offenburg	Parking garage	200
Parkgarage Kino Forum	Parking garage	100

The on-street parking in the city center and in residential areas is divided into different zones, which are presented in Figure 3-3 (Stadt Offenburg, 2016c).
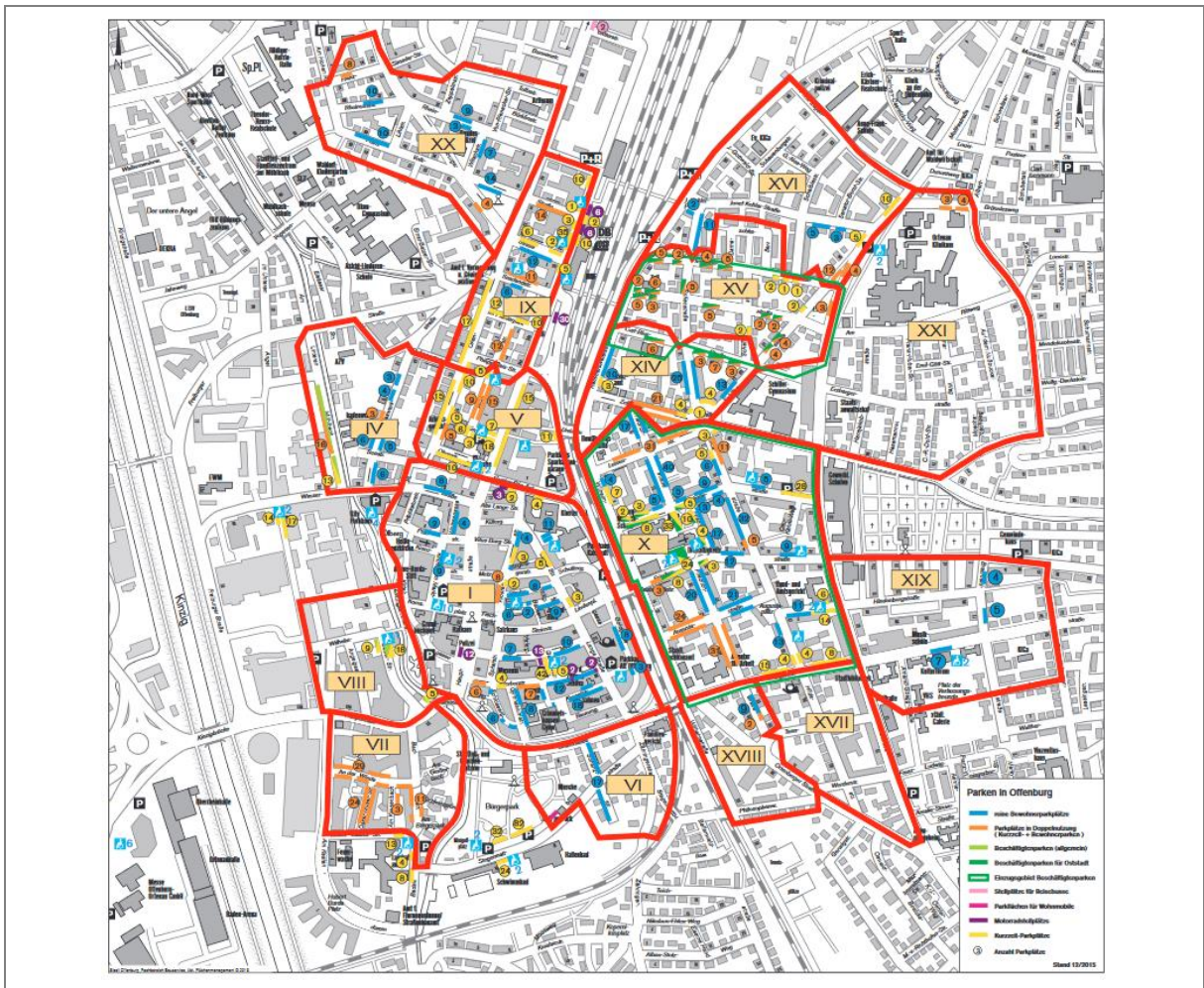
Figure 3-3: Map of zones for on-street parking in Offenburg. Source (Stadt Offenburg, 2016c).

The blue zones present the places, where only residents are allowed to park their cars. Zones for the mixed-use of residential parking and short-term parking are marked with orange. In the yellow zones only short-term parking is allowed. The bright green and dark green zones are reserved for employees. Parking spaces for busses, caravans and motorcycles are highlighted with different shades of purple. Another 144 parking spaces are provided by *DB BahnPark GmbH* at the main train station for Park+Ride (Stadt Offenburg, 2016m).

Public transport

Busses for the inner-city transport in Offenburg are called "Schlüsselbusse" (English: key busses) (Stadt Offenburg, 2016d). The eight "Schlüsselbus"-lines are operated by two different providers: *Südwestdeutsche Verkehrs-Aktiengesellschaft* (*SWEG*) and *SüdwestBus* (Tarifverbund Ortenau GmbH, 2016). These two companies are also responsible for the operation of the regional bus services, which connect the city with surrounding areas of the Ortenaukreis (Stadt Offenburg, 2016h). Both bus services are elements of the *Tarifverbund Ortenau GmbH* (*TGO*), the tariff association for local public transport in Offenburg (Stadt Offenburg, 2016o). All the different lines for public transport in Offenburg and its surroundings are presented in the route map in Figure 3-4.
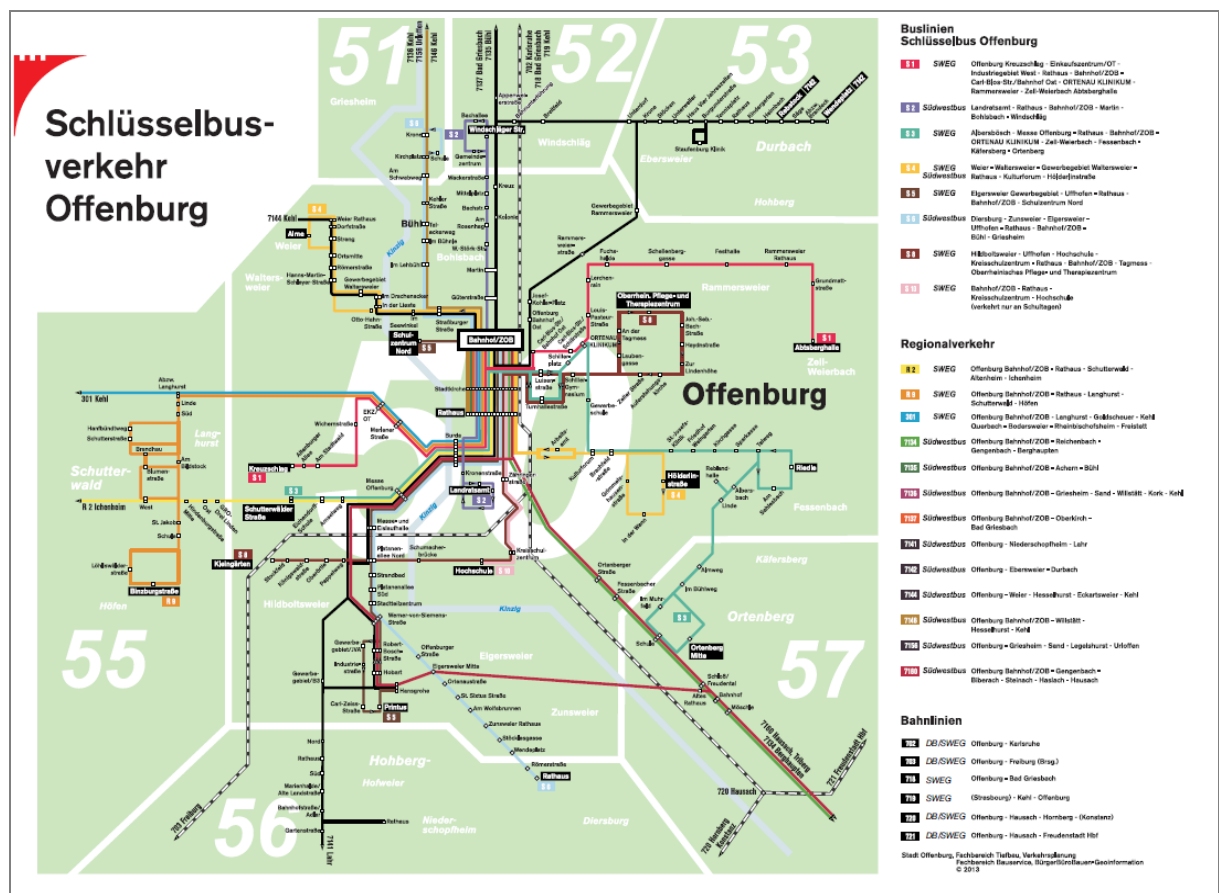
Figure 3-4: Network of (regional) bus lines for public transport in Offenburg. Source (Stadt Offenburg, 2016h).

SWEG provides six "Schlüsselbus"-lines and three regional bus lines; *SüdwestBus* provides two "Schlüsselbus"-lines and ten regional bus lines. Six railway lines, provided by *Deutsche Bahn* (*DB*) and *SWEG*, are available for regional and long-distance train services at the main train station and one other rail station, called "Kreisschulzentrum" (Stadt Offenburg, 2016h). Light rail transport is not offered in Offenburg.

Carsharing

Currently, two companies provide stationary carsharing services in Offenburg: *Flinkster* (Deutsche Bahn AG, 2011) and *Stadtmobil Südbaden* (Stadtmobil Südbaden AG, 2012b). *Flinkster*, the carsharing service of *Deutsche Bahn*, offers six cars at two stations (Deutsche Bahn AG, 2016). *Stadtmobil Südbaden* currently offers eight cars, which include four electric vehicles (Stadtmobil Südbaden AG, 2012a), at six stations (Stadt Offenburg, 2015d).

The major goal of *Stadtmobil Südbaden* is to provide sustainable mobility with their modern carsharing fleet (Stadtmobil Südbaden AG, 2012c). Low-pollutant and economical cars should help to reduce CO_2 emissions. Additionally, for more than two decades, *Stadtmobil Südbaden* has been promoting multimodal mobility to strengthen the use of environmentally friendly modes of transport, such as walking, cycling and public transport (Stadtmobil Südbaden AG, 2012c). To increase the attractiveness of multimodal mobility, this provider tries to place carsharing stations near public transport nodes and offers discounts on their fees to public transport seasonal ticket holders (Stadtmobil Südbaden AG, 2012c). In addition to the station-based carsharing services, there are three private carsharing mediators: *Nachbarschaftsauto*, *Autonetzer* and *Tamyca* (Online Experten Eins GmbH, 2013). This so called peer-to-peer carsharing is an approach to vehicle sharing, in which vehicle owners temporarily rent their personal automobiles to others in their surrounding area (Ballús-Arme, Shaheen, Clonts, & Weinzimmer, 2014). Traditional car rental is offered by *AVIS*, *Europcar* and *Buchbinder* (Online Experten Eins GmbH, 2013).

Bikesharing

In 2010, *nextbike* started its operation as the provider for bikesharing in Offenburg (Stadt Offenburg, 2016l). At the moment, *nextbike* offers in total 89 bikes at 17 stations, which includes one station for e-bikesharing (nextbike GmbH, n.d.-b). The one-way rental principle allows users to rent the bicycles at the different stations and return them at any other official *nextbike* station within the city area (nextbike GmbH, n.d.-a). The *TGO,* the tariff association for the local public transport in Offenburg, also coordinates the bikesharing project. Table 3-2 shows three different tariff offers for bikesharing of *nextbike* in Offenburg.

Table 3-2: Tariff offers for bikesharing in Offenburg. Source (Stadt Offenburg, 2016l).

Regular Tariff	"RadCard" Tariff (48 €/year)	"Einfach mobil"-card Tariff (39 €/year)
1 € (first 30 min)	0 € (first 30 min)	0 € (first 30 min)
9 € (24 h)	9 € (24 h)	9 € (24 h)

The regular tariff costs 1 € for 30 minutes with a maximum of 9 € per day. Users can buy a "RadCard", which costs 48 € per year, and then they can cycle for free for the first 30 minutes of each trip. After these 30 minutes, they pay 1 € for 30 minutes as in the regular tariff with a maximum rate of 9 € per day. "Einfach mobil"-card holders only pay 39 € per year and have the same conditions as "RadCard" owners (Stadt Offenburg, 2016l).

3.1.2 Development of Modal Share

In 1994, the modal share of walking was 22%, cycling 25% and motorized individual transport (MIT) amounted to almost half of the total (49%). The share of public transport (PT) only was 4% (Stadt Offenburg, 2009). On this basis, in 1996, within the framework of the "integrierten Verkehrskonzepts" (English: integrated transport concept), the city of Offenburg developed a new guideline, the "verkehrliche Leitbild" (English: mission statement for the city transport) (Stadt Offenburg, 2016p). The following three principles were stated.

- "Transport planning aims to secure and improve the function and location of Offenburg as the major center in the region. This can only be achieved in coordination with other planning strategies for the well-being of the inhabitants, while preserving the environment, nature and resources."[1] (Stadt Offenburg, 2009)
- "In its entirety, the transport system in the city of Offenburg must continue to provide all population groups with adequate and secure opportunities for individual mobility, which can be carried out with as little physical, psychological and financial burdens as possible and with the greatest possible freedom in the choice of means of transport. It must also provide favorable conditions for commercial transport."[2] (Stadt Offenburg, 2009)

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[1] Translated from German: „Die Verkehrsplanung hat das Ziel, die Funktion und den Standort Offenburg als Oberzentrum in der Region zu sichern und zu verbessern. Dies kann nur in Abstimmung mit anderen Planungen zum Wohl der Einwohnerinnen und Einwohner und unter Schonung der Umwelt, der Natur und der Ressourcen erfolgen."

[2] Translated from German: „Das Verkehrssystem in der Stadt Offenburg muss in seiner Gesamtheit auch künftig allen Bevölkerungsgruppen angemessene und sichere Möglichkeiten für die individuelle Mobilität bieten, die mit möglichst geringen physischen, psychischen und finanziellen Belastungen und unter Sicherung einer größtmöglichen Freiheit bei der Wahl des Verkehrsmittels wahrgenommen werden können. Außerdem muss es dem Wirtschaftsverkehr günstige Bedingungen bieten."

- "The burdens caused by motorized traffic, such as noise, pollutants and separation effects, partly lead to severe disturbances in the living conditions of the population. Future transport has to be designed in a way to preserve spaces, to reduce the consumption of resources and should involve landscape and ecological conditions more intensively."[3] (Stadt Offenburg, 2009)

The goals of the guideline were to strengthen local public transport and to reduce private car usage. As displayed in Figure 3-5, target values for the modal split in 2010 were given (Stadt Offenburg, 2016p). The share of PT was intended to be increased to 10%, whereas the share of MIT should be decreased to 43%. The share of walking and cycling should remain constant (22% and 25%).
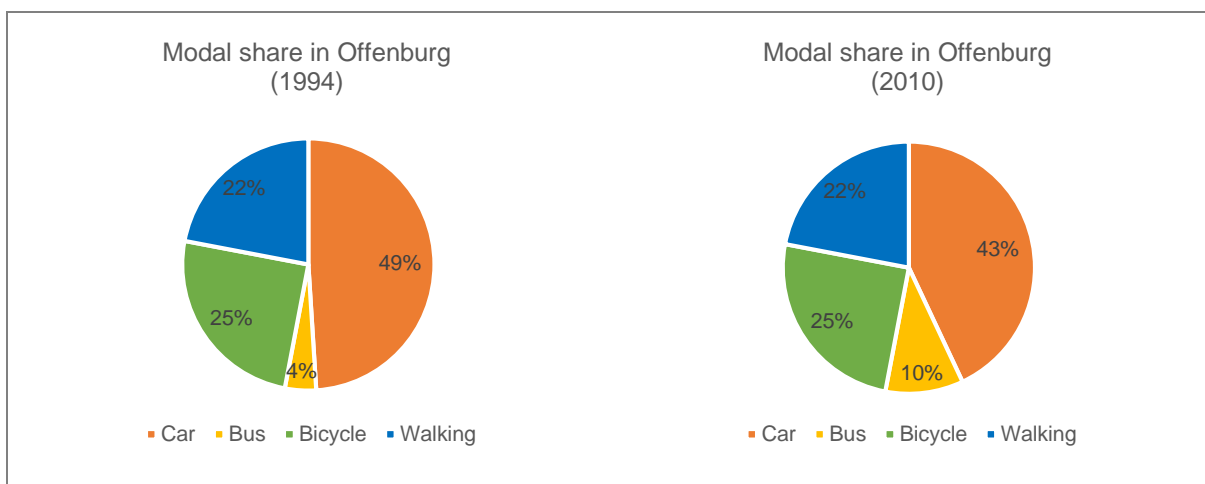
Figure 3-5: Modal share in Offenburg in 1994 and projected modal share for the year 2010. Source: own graphic, information retrieved from (Stadt Offenburg, 2016p).

In 2006, twelve years after developing the prognosis for the modal share in 2010, the predicted number of inhabitants in Offenburg was already surpassed. Therefore, the target values for the modal share had to be reassessed (Stadt Offenburg, 2016a). An analysis of the actual modal share in 2006 showed, that the share of MIT already decreased to 48%, whereas PT increased to 6%. The share of walking slightly decreased to 21% and the portion of cycling remained constant (Figure 3-6) (Stadt Offenburg, 2009).

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[3] „Die durch den motorisierten Verkehr verursachten Belastungen, wie zum Beispiel Lärm, Schadstoffe und Trennwirkungen, führen zum Teil - wie in anderen Städten auch - zu starken Beeinträchtigungen der Lebensbedingungen der Bevölkerung. Der künftige Gesamtverkehr soll flächenschonend gestaltet werden, zu einer Verringerung des Ressourcenverbrauchs führen sowie landschaftliche und ökologische Gegebenheiten verstärkt in die Abwägung einbeziehen."
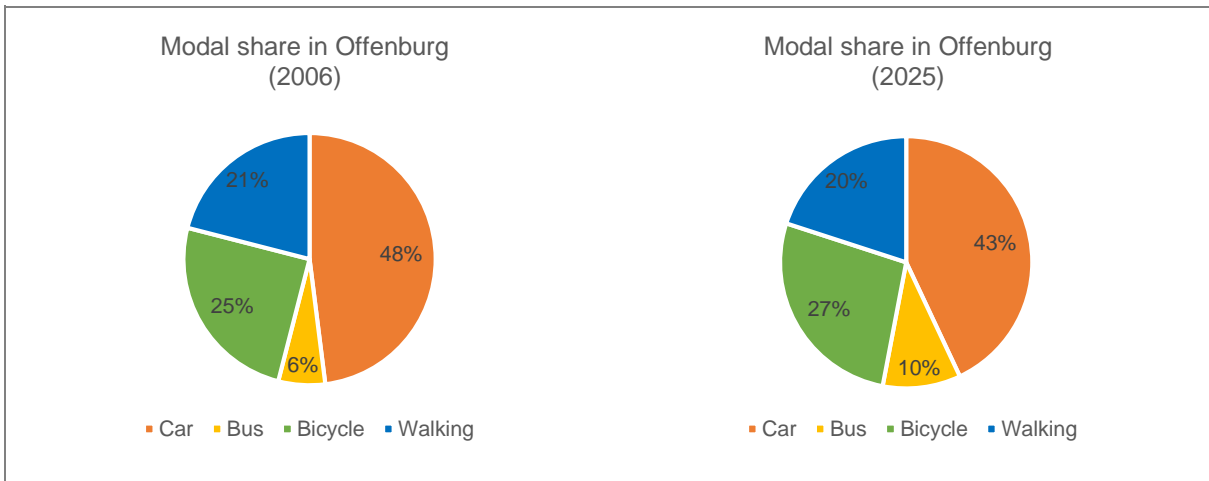
Figure 3-6: Modal share in Offenburg in 2006 and projected modal share for the year 2025. Source: own graphic, information retrieved from (Stadt Offenburg, 2009).

In 2009, the city decided to further strengthen environmentally friendly transport, also called "Umweltverbund" (bus, bicycle and walking). Within the scope of these decisions the city aimed to increase the shares of bus (up to 10%) and bicycle (up to 27%) and hence reduce car traffic (down to 43%). The share of walking should not fall below 20%. These goals should be reached until 2025 (Stadt Offenburg, 2016q). Adjustments of the target values for the modal share in 2025 were made in 2016 within the scope of the "strategischen Ziele 2016" (English: strategic goals 2016) (Stadt Offenburg, 2016). The municipal council decided to set the target value of cycling to 30% and to reduce the target value for public transport to 7%. Whether the measures help to increase the share of environmentally friendly modes of transport will emerge in 2018. In this year, an analysis of the current situation is planned in the context of the "System repräsentativer Verkehrsbefragungen" (English: system of representative travel surveys) (SrV), which will be conducted by the Technical University of Dresden (Kassel, 2016d).

3.2 Introduction to "Einfach mobil"

As part of its mobility management, the city of Offenburg developed a new integrated multimodal mobility service, called "Einfach mobil", to promote local public mobility and to strengthen the trend of borrowing instead of owning (Kassel, 2016b). The following sections give an overview of the goals and elements of the service with a special focus on the new Mobility Stations.

3.2.1 Goals and Implementation Process

In 2009, with the decision to further develop the "integrierte Verkehrskonzept", the city of Offenburg compiled a program of measures, which include a new mobility management for all modes of transport available (Stadt Offenburg, 2016i). The following presents the overall goals for this comprehensive mobility management strategy in Offenburg (Stadt Offenburg, 2016i).

- Make mobility more conscious (number and length of trips, choice of mode);
- Enable freedom of choice between transport modes;
- Set transport modes according to their respective strengths;
- Reduce burdens for environment and climate through promotion of environmentally friendly modes of transport;
- Make transport compatible with urban conditions;
- Set new mobility as trade mark for an open and modern city.

Within the scope of the "Klimaschutzkonzept" (English: climate protection concept) in 2012, the first approach for the planning of an integrated multimodal mobility service was elaborated (Stadt Offenburg, 2012). The brand "Einfach mobil" (English: easy mobile) should represent the new mobility culture in Offenburg (Kassel, 2016b). In order to develop the city as "Stadt der kurzen Wege" (English: city of short distances), the implementation of a network of Mobility Stations in Offenburg and its surroundings was decided (Stadt Offenburg, 2012). According to Kassel (2016b), the new Mobility Stations should help to promote sustainable local mobility while supporting shared mobility – using instead of owning – combined with electric mobility. In this context, the city of Offenburg also aims to reduce the number of cars per household, which would lead to savings in terms of space needed for parking and emissions (Kassel, 2016b).

The planning process for the integrated multimodal mobility service started in 2013 and the entire project is scheduled until 2030 (Kassel, 2016b). In December 2014, the "Gemeinderat" (English: municipal council) decided the realization of the first stage of expansion (Kassel, 2016b). The stations should be implemented in residential and commercial areas, at central points in the inner city, as well as in neighboring villages (Stadt Offenburg, 2016j). The first Mobility Station at the location "Messe" (English: trade fair) was implemented on June 23, 2015

and three more stations were opened by the end of October 2015. At the moment, all four stations are in the pilot phase and available to the public. After evaluating the operation of the first four stations, the city will decide if more stations should be developed (Kassel, 2016b).

3.2.2 Elements of "Einfach mobil"

The integrated multimodal mobility service "Einfach mobil" includes the provision of the Mobility Stations, the "Einfach mobil"-card and the project website "www.mobil-in-Offenburg.de". In the following, these elements are presented.

Mobility Stations

Mobility Stations should help to promote multimodal travel behavior by facilitating the change between transport modes (Kassel, 2016b). Therefore, all stations are accessible with public transport and have connection to carsharing of *Stadtmobil Südbaden*, bikesharing of *nextbike* and facilities for private bike parking (Stadt Offenburg, 2016j). The physical concentration of these means of transport at one location enables users to choose the most appropriate mode, depending on their trip purpose (Kassel, 2016b). According to Kassel (2016b), the promotion of alternative drive systems plays an important role in the process of implementing a new mobility culture in Offenburg. Therefore, various electric vehicles are offered at the new Mobility Stations. At the location "Messe", *nextbike* offers three pedelecs in addition to normal bikesharing (Stadt Offenburg, 2015c). Electric carsharing from *Stadtmobil Südbaden* and charging facilities are available at every Mobility Station (Stadtmobil Südbaden AG, 2012a). Additional coach bus services are available at the station "Messe" (Kassel, 2016b). Bikesharing and carsharing services, as well as public transport were already available in the immediate area of the locations "Bahnhof / ZOB", "Technisches Rathaus" and "Messe". Only for the implementation of the Mobility Station at "Kulturforum" in October 2015, the existing stations of *Stadtmobil Südbaden* and *nextbike* were relocated in order to create connections between these modes and public transport. The locations of Mobility Stations are shown in Figure 3-7 where also all other available stations for shared cars and bicycles are presented.
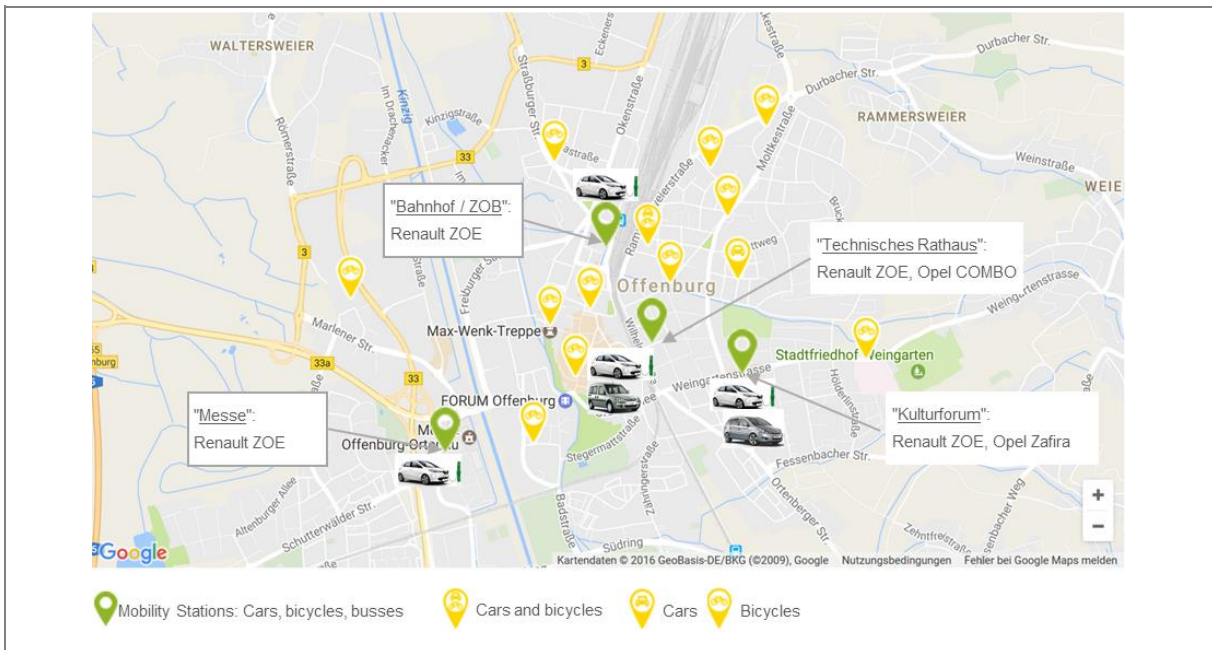
Figure 3-7: Location of Mobility Stations and other available stations for bikesharing and carsharing in Offenburg. Source (Stadt Offenburg, 2015d).

The existing bikesharing provider *nextbike* offers bicycles at the four Mobility Stations and at 12 other stations (Stadt Offenburg, 2015d). For carsharing in Offenburg, the local provider *Stadtmobil Südbaden* offers vehicles at the Mobility Stations and at another two stations, where the services are not physically integrated at one platform (Stadt Offenburg, 2015d).

"Einfach mobil"-card

As part of the new mobility service, Offenburg introduced the "Einfach mobil"-card, which facilitates the use of the offers at the Mobility Stations. Users are able to open the carsharing vehicles and the bicycles of the bikesharing service with their "Einfach mobil"-card (Stadt Offenburg, 2015c). The card also acts as key for private bicycle storage boxes (Kassel, 2016b). In the future, the "Einfach mobil"-card should be applicable for users of seasonal tickets for public transport (Kassel, 2016b).

"Einfach mobil"-website

Within the first stage of development of the integrated multimodal mobility service, the city of Offenburg established the website "www.mobil-in-offenburg.de" (English: mobile in Offenburg), which is the project website for "Einfach mobil" (Kassel, 2016b). The website provides information on how to use the mobility service, redirects to the registration forms of the providers of carsharing and bikesharing, and shows the location of the stations (Stadt Offenburg, 2015e).

Figure 3-8: Components of "Einfach mobil": "Einfach mobil"-card, project website www.mobil-in-Offenburg.de. Source (Stadt Offenburg, 2015e).

How to use "Einfach mobil"

If people decide to register for "Einfach mobil" on the project website, they have to pay a registration fee of 5 € for the receipt of the "Einfach mobil"-card (Stadt Offenburg, 2015a). With the membership of "Einfach mobil", users get 10% discount on the travel costs of every trip with a carsharing vehicle and 9 € discount on the annual subscription of *nextbike*´s "RadCard"-tariff (instead of 48 € they only pay 39 €) (Kassel, 2016a). After registering on the websites of the carsharing and bikesharing providers, users can start to book their trips. The booking of vehicles and bicycles has to be done via the websites or apps of the respective provider, because reservation is not possible at the "Einfach mobil"-website (Stadt Offenburg, 2015c). The billing for each service occurs separated by the providers themselves (Stadt Offenburg, 2015b).

Corporate design

For marketing and communication purposes the agency "fairkehr" developed the brand for the local public mobility in Offenburg (Kassel, 2016b). With the slogan "Einfach mobil" and the green coloring, the new brand sublimates all mobility services: the infrastructure elements of Mobility Stations, the sharing vehicles, the "Einfach mobil"-card, as well as bicycle infrastructure (Figure 3-10). Stops for the local public transport and the busses themselves should be branded with the "Einfach mobil"-logo and adjusted in terms of design (Kassel, 2016b). According to Kassel (2016b), a strong brand identity should help to raise awareness of citizens and visitors and to encourage them to use the offers of "Einfach mobil". While designing the logo, many different ideas played a role in the decision making process. For citizens of Offenburg, the logo (Figure 3-9) could indicate "Einfach mobil" in Offenburg. But the yellow circle could also represent the regions of the Ortenau or Oberrhein (Kassel, 2016d). This is a clear statement, that the new integrated multimodal mobility service should not only be seen in the context of local public mobility in Offenburg, but maybe in the future also as overall mobility concept in the regions.

Figure 3-9: Logo of „Einfach mobil". Source (Stadt Offenburg, 2015e).

Figure 3-10: Corporate design of "Einfach mobil": Infrastructure elements of Mobility Stations, carsharing vehicles and bikesharing bicycles, bicycle infrastructure. Source (Stadt Offenburg, 2015e)

3.2.3 Characteristics of Mobility Stations

This section highlights the locations and configurations of the new Mobility Stations.

Station location

According to Kassel (2016b) the choice of locations is based on a site concept, which has been developed by the city of Offenburg in corporation with potential service providers and experts. The following criteria have been determined to identify possible locations:

- Identification of existing carsharing and bikesharing stations with high demand;
- Integration and further development of existing offers for carsharing, bikesharing and public transport;
- Valorization of areas with low access to mobility services;
- Areas with high potential in terms of possible user groups;
- Areas with high acceptance regarding urban development and neighborhood;
- Land availability and accessibility (barrier-free and safe).

The first station "Messe" is located at the trade fair of Offenburg, one of the most important exhibition grounds in Baden-Württemberg (Messe Offenburg-Ortenau, 2011). Visitors of the trade fair and guests of the surrounding hotels prospectively should have the possibility to use mobility offers during their stay. The hotel "Mercure" is located in the immediate vicinity of the Mobility Station "Messe" and has already shown interest in offering the services of "Einfach mobil" to its customers. The stations "Technisches Rathaus" (English: technical town hall) and "Kulturforum" (English: forum for culture) were opened on 30 October, 2015 and are located in the quarter "Oststadt" (English: east city) (Kassel, 2016b). Due to high parking pressure in this quarter, which is also called "Gründerzeitviertel" (English: founder quarters), residents of those areas commonly are more affine in using sharing offers and more likely dispense with private cars. In addition to that, many service companies, whose employees could use carsharing vehicles for business trips, are located within these areas (Kassel, 2016b). As mentioned, more than 24,000 employees commute to the city every day. Most of them reach Offenburg at the central (bus) station and then have to continue their trip by bus to get into the commercial areas. Because of the lack of an efficient public transport offer supplying these areas, the third location was implemented at the central station, "Bahnhof – ZOB" (English: main train station, central bus station), in order to provide attractive alternatives for commuters (Kassel, 2016b).

Figure 3-11 displays the locations of the existing Mobility Stations (green color), which were implemented during the pilot phase at "Messe", "Technisches Rathaus", "Kulturforum", and "Bahnhof - ZOB". After the evaluation of the first stations, two more stations in residential areas and another one at the "Landratsamt" (English: rural district office) could be developed (blue color). At the moment, all Mobility Stations are located in Offenburg itself, but cooperation with

other cities and the surrounding areas is planned. To also sustain multimodal mobility beyond the city boundaries, Offenburg intends to pursue the network of Mobility Stations along major inter-city routes to Strasbourg/Kehl, Renchtal and Kinzigtal (Kassel, 2016b).
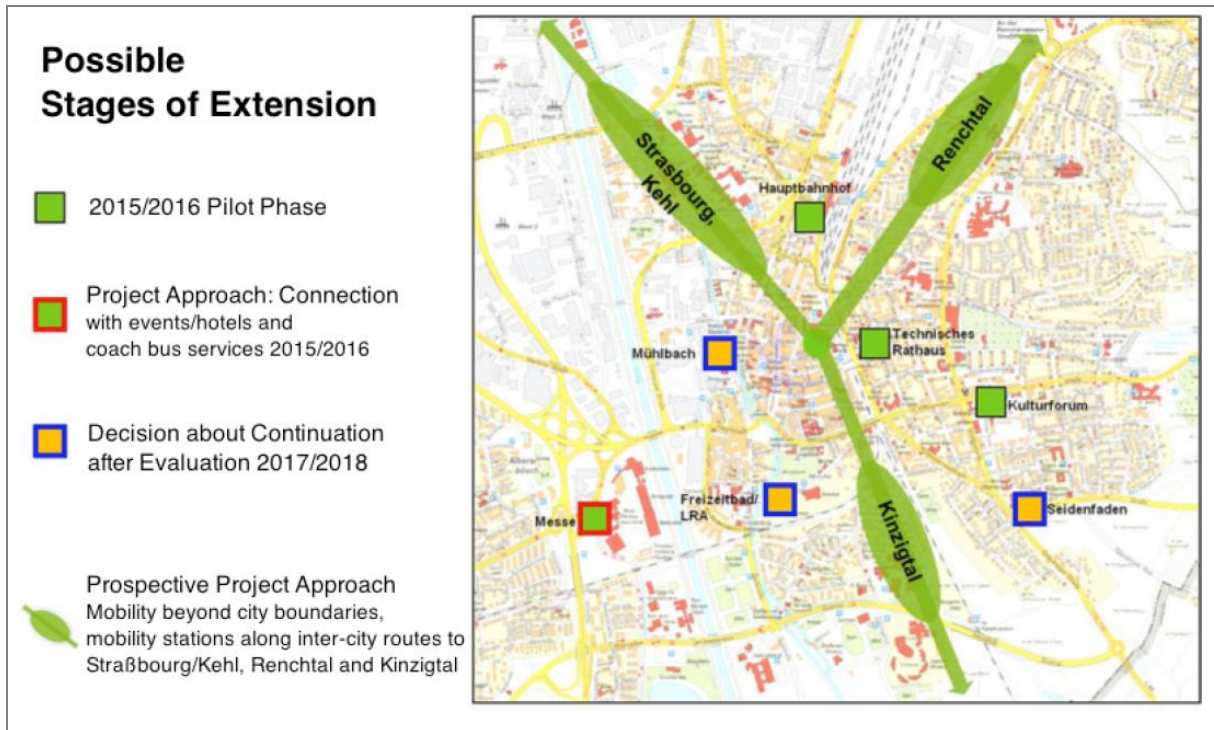
Figure 3-11: Planned development for Mobility Stations in Offenburg. Source (Kassel, 2016b)

Station configuration

A special feature of Offenburg's Mobility Stations is the modular design of the stations (Figure 3-12). The aim of the initiator, the city of Offenburg, was to create an easy, flexible and hence cost-efficient system, which can be changed and adjusted to the users´ and urban planning's demands (Kassel, 2016b). Thus, with little effort a station can be extended when the demand increases and on the other hand a station with lower utilization can be easily dismantled. Depending on the station, the following modules are possible:

- Parking spaces and charging facilities for (e-) carsharing vehicles;
- Parking spaces and charging facilities for shared bicycles and pedelecs;
- Parking spaces and charging facilities for cargo bicycles;
- Separate boxes to store pedelecs;
- Bicycle racks and boxes for private bicycles;
- Connection point for public transport with waiting area;
- Stop for coach busses;
- Stops for taxis;
- Common areas for users;
- Meeting point for carpooling.

Figure 3-12: Modular design of Mobility Stations. Source (andré stocker design, n.d.).

3.2.4 Actors Involved and Analysis of Statistical Data

Planning, construction, marketing and financing of the Mobility Stations is in the responsibility of the city of Offenburg (Kassel, 2016b). After their commissioning, the platforms were signed over into the fund assets of the *Technische Betriebe Offenburg* (*TBO*), a dependent subsidiary of the city of Offenburg. Thus, the operation and provision of the Mobility Stations occur through *TBO* as a "Betrieb gewerblicher Art" (English: commercial institution) (BgA) (Kassel, 2016b). Mobility providers use the platforms in order to provide their services. The future financing of Mobility Stations should be assured by awarding concessions for mobility providers and using the stations as advertising spaces (Kassel, 2016b). If necessary, the residual amount would be compensated with the help of the municipal budget (Kassel, 2016b). Within the pilot phase, the use of the Mobility Stations is exclusive for *nextbike* and *Stadtmobil Südbaden*.

Statistical data about the use of bikesharing and carsharing are available for all stations. *Nextbike* provides data for the years 2014 and 2015 and *Stadtmobil Südbaden* for the year 2015. For both services data are also available for January to September 2016. This facilitates the comparison of the different years with regards to changes due to the implementation of the Mobility Stations. Conclusions about potential effects of the Mobility Stations on the number of bookings and rentals can be drawn.

Nextbike

To evaluate the operation of the bikesharing offer of *nextbike*, the numbers of bicycle rentals per month in Offenburg were analyzed for the years 2014, 2015 and 2016 (January to September). The time variation curves for every Mobility Station are presented in Figure 3-13 and an overview is given in Figure 3-14 to compare the stations among each other.
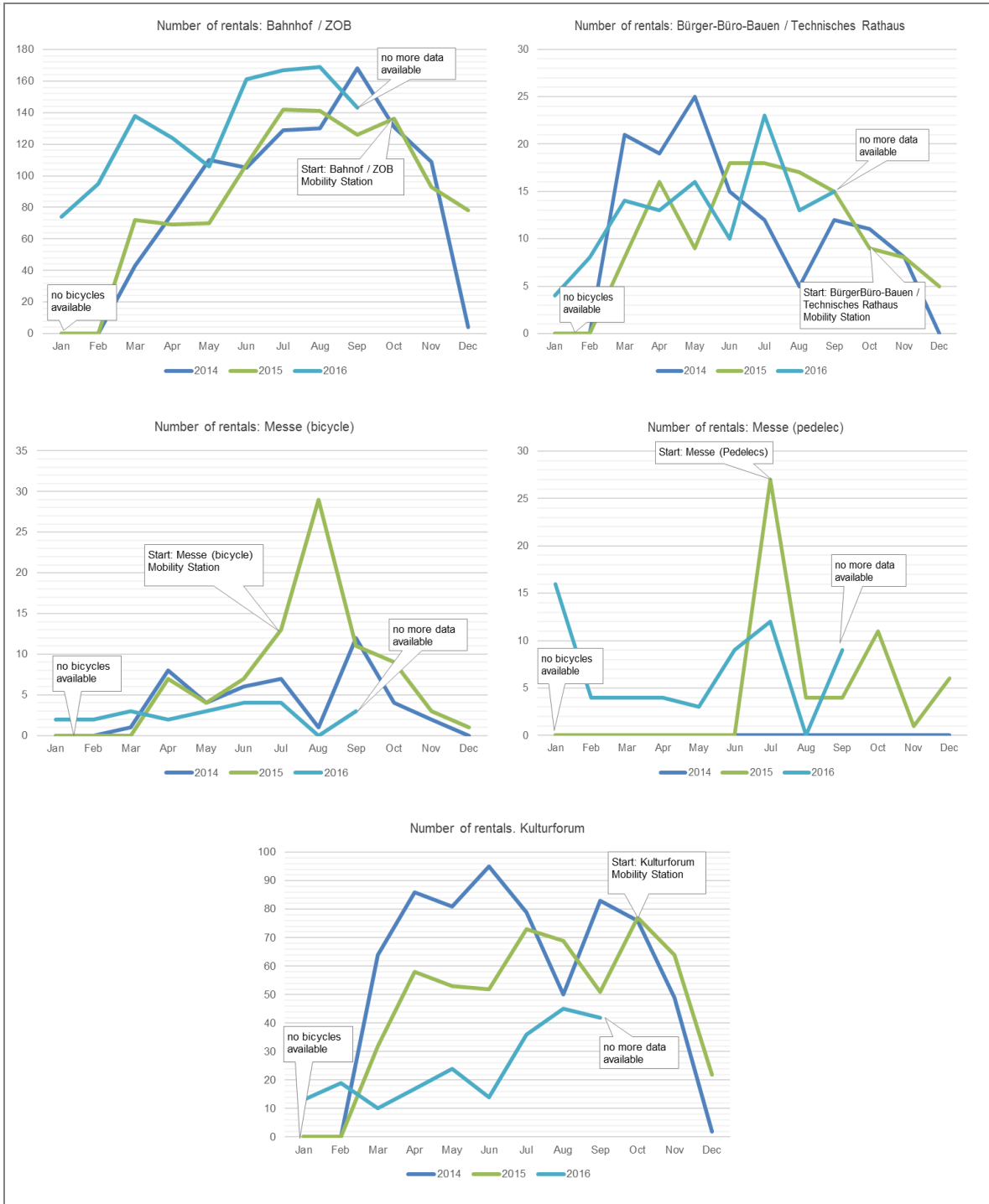
Figure 3-13: Number of bicycle rentals at the Mobility Stations for the years 2014, 2015 and 2016. Source: own graphics, statistical data provided by nextbike.

It is necessary to mention that there were no bikesharing bicycles available in January, February and December 2014, and in January and February of 2015. Due to the decrease of demand in the winter time, *nextbike* decided to remove the bicycles from the stations, to store and repair them (nextbike GmbH, n.d.-c). Within the period of December 2015 to February 2016, there was no so called "Winterbetrieb" (English: winter operation), which means that users had permanent access to the bikesharing services.

From February to September 2014 there was a steady increase in bicycle rentals at the location "Bahnhof / ZOB". A similar trend can be observed for the year 2015. The use of the station was generally higher in 2016, with a decline in rentals from April to May 2016. The station "Bürger-Büro-Bauen /Technisches Rathaus" recorded its highest number of rentals in the year 2014, with a negative trend in summer 2014 (June, July, August). This station was opened as Mobility Station in October 2015. A peak in the number of rental was reached in July 2016. Bicycle rentals at the location "Messe" significantly increased during August 2015. However, in 2016, the number of rentals dropped and in August 2016 nobody rented a bicycle or pedelecs at the location "Messe". Pedelecs at this location were available since the start of operation as Mobility Station in July 2015. The graphs for the station "Kulturforum" for the years 2014 and 2015 show similar trends. Due to the relocation of the station in October 2015, the number of rentals in 2016 decreased.
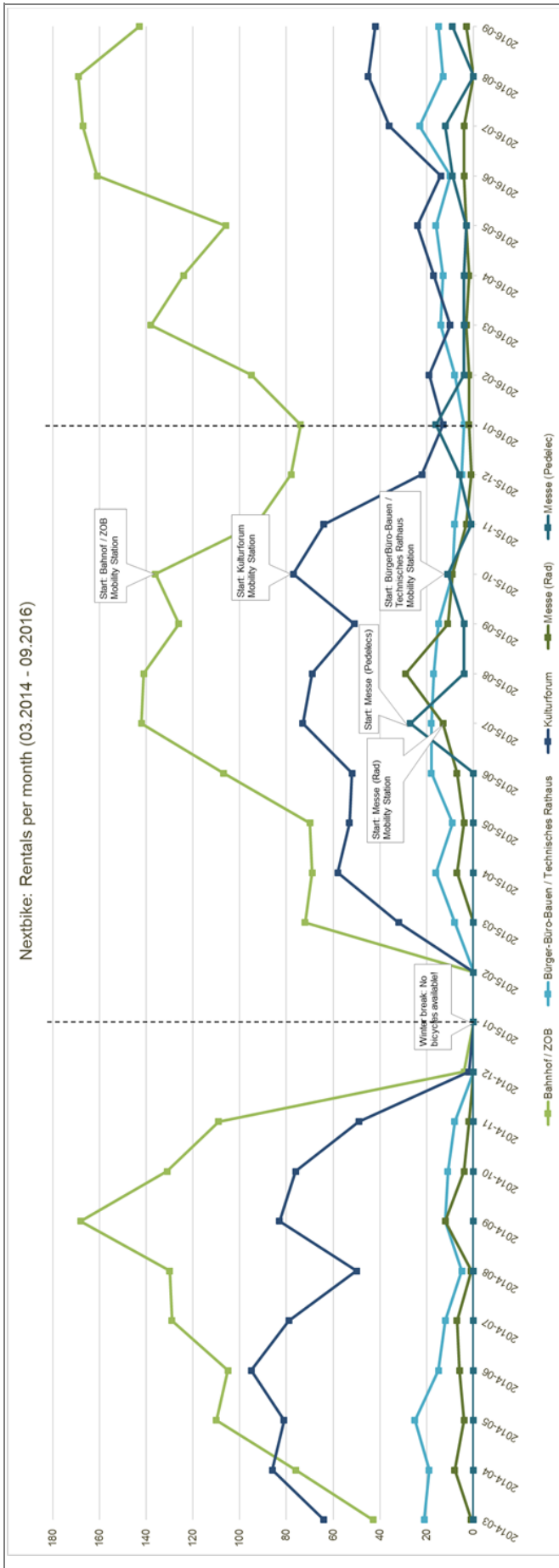
Figure 3-14: Overview: Number of bicycle rentals for the years 2014, 2015 and 2016. Source: own graphic, statistical data provided by nextbike.

With the help of the diagram presented in Figure 3-15 the change in the total numbers of bicycle rentals between 2014, 2015 and 2016 (January to September) were analyzed.
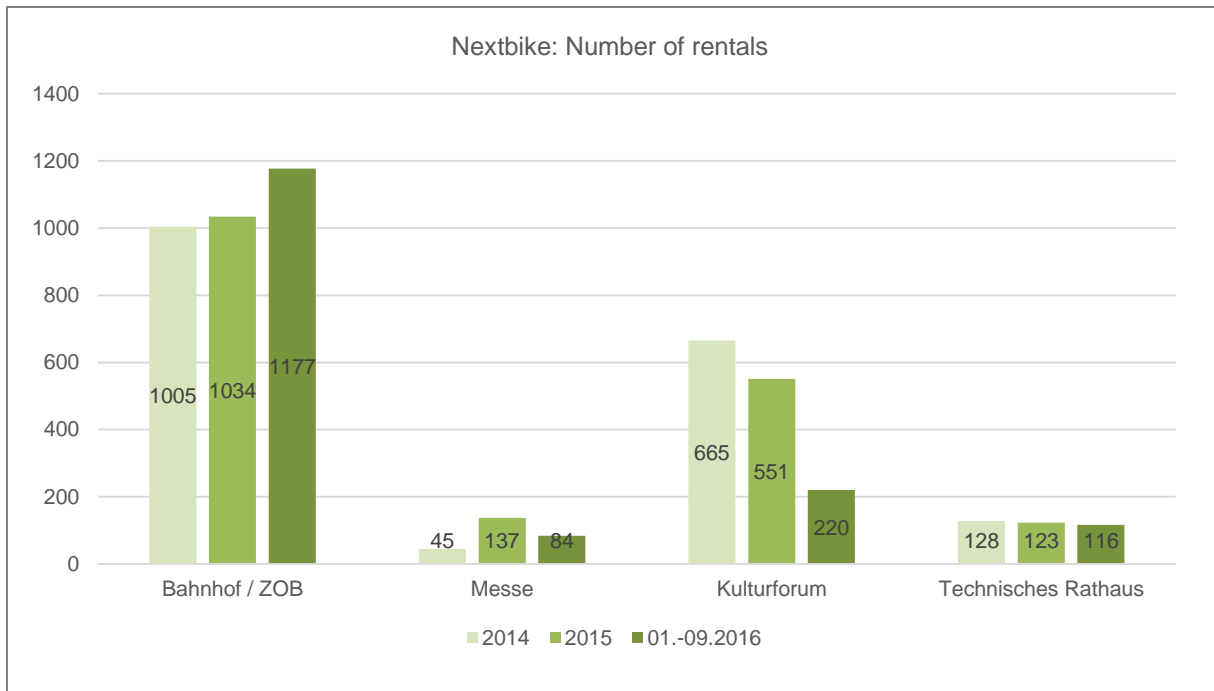
Figure 3-15: Number of rentals of bikesharing bicycles at Mobility Stations in Offenburg. Source: own graphic, statistical data provided by nextbike.

At the location "Bahnhof / ZOB", bicycles were rented most frequently. The perfect connection to public transport and regional / long distance trains plays an important role for the attractiveness of this location. Over the course of years, the number of rentals at this station increased to 1177 at the end of September 2016. In 2015, customers of *nextbike* rented bicycles / pedelecs 137 times at location "Messe". The use of the bikesharing service at "Technisches Rathaus" remained more or less the same. A decreasing trend in rentals can be observed at location "Kulturforum". According to Kassel (Kassel, 2016d) this is due to the relocation of the station in October 2015. Many users thought that the station would no longer exist, because they didn't get information from the provider and signposts were missing. In order to improve the situation, signs will be planned and installed in 2017 (Kassel, 2016d).

Customers of *nextbike* in Offenburg are divided into "RadCard" owners (TGO) and "Einfach mobil"-card owners. Table 3-3 gives and overview of the number of customers of *nextbike*, who use the bikesharing offer in Offenburg. In sum, the number of registered users increased from 185 (2015) to 210 (January to September 2016). Compared to 2015, the number of rentals of customers increased by 82%.

Table 3-3: User data of customers of nextbike *in Offenburg. Source: own graphic, statistical data provided by nextbike.*

	Customers in Offenburg		Number of trips	
Time	2015	01.-09.2016	2015	01.-09.2016
TGO	173	183	1040	1291
Einfach mobil	12	27	91	767
Sum	185	210	1131	2058

Stadtmobil Südbaden

In order to see potential impacts of the Mobility Stations on the use of carsharing in Offenburg, the bookings in 2015 were compared to the numbers available for the year 2016 (January to September). Figure 3-16 presents an overview created with statistical data, which was provided by *Stadtmobil Südbaden*.
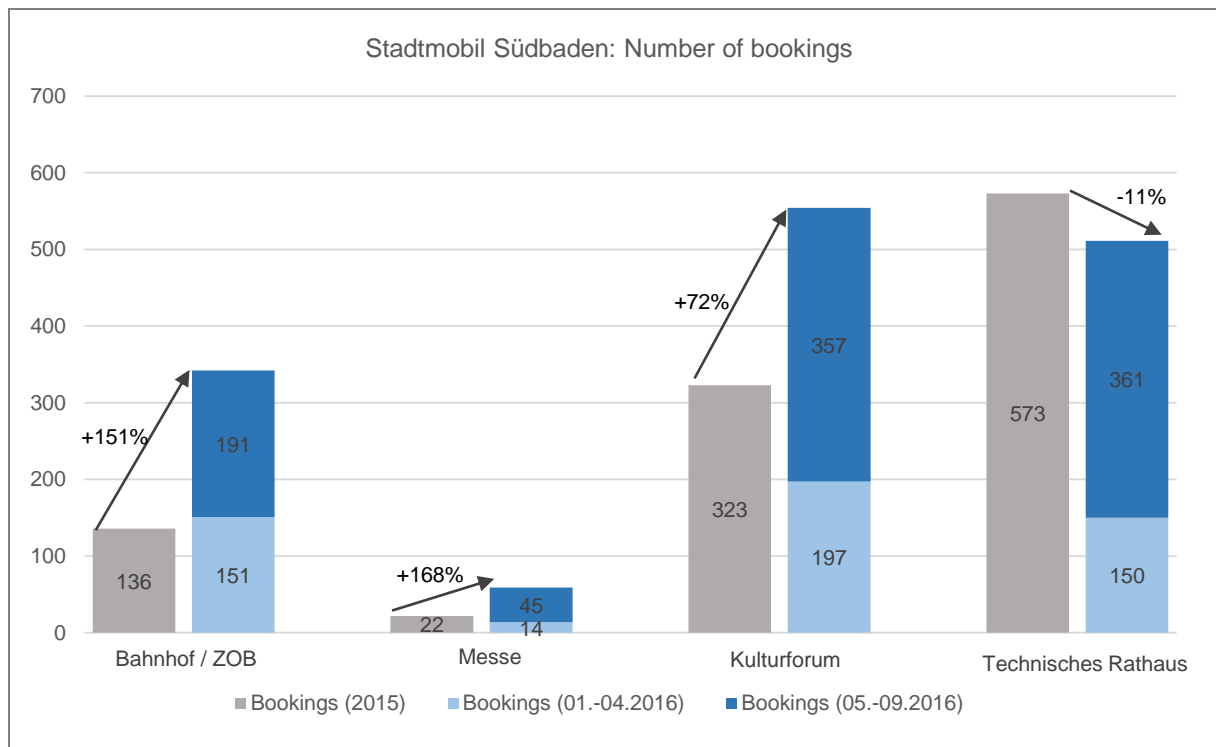
Figure 3-16: Number of bookings of carsharing vehicles at Mobility Stations in Offenburg. Source: own graphic, statistical data provided by Stadtmobil Südbaden.

Even if the numbers of bookings from October to December 2016 are missing, three out of four Mobility Stations already show a positive trend. At the Mobility Station "Bahnhof / ZOB", an increase of 151% compared to 2015 can be observed. The vehicle at location "Messe" has been offered since July 2015 and therefore, the 22 bookings were made within a period of six months (2015). However, there is already an increase in bookings (168%) within the first nine months of 2016. When implementing the Mobility Station at "Kulturforum", the existing station

of *Stadtmobil Südbaden* was relocated in order to create connections to the bikesharing station of *nextbike* and to public transport. In contrast to the users of the bikesharing service, customers of *Stadtmobil Südbaden* were informed about this relocation and had no problems to find the vehicles. The increase in the number of bookings at this station also underlines that the conversion of the station into a Mobility Stations presents an added value to users and the provider. "Technisches Rathaus" was the station with the highest number of bookings in 2015. Within the period of January to September 2016, the number of bookings decreased by 11%. One reason for the negative trend could be that the capacity (possible number of bookings) was reached. Kassel (Kassel, 2016d) explains the trend as follows. *Stadtmobil Südbaden* replaced one car (brand: Peugeot 107) by an electric vehicle (brand: Renault ZOE). According to the statistics and to Kassel (Kassel, 2016d) the "Peugeot 107" was booked very often, because it also was the cheapest vehicle of the carsharing fleet. In addition to this, the new electric vehicle posed many problems regarding compatibility with the charging facility and some users refused to use the vehicle.

Table 3-4 summarizes statistical data of customers, which use *Stadtmobil Südbaden* carsharing in Offenburg. The number of registered users slightly increased from 143 (2015) to 151 (January to September 2016). On basis of the received tables from the provider, only the number of bookings for all stations in Offenburg could be analyzed. Compared to 2015, the number of bookings of customers living in Offenburg decreased by 5%. In contrast, users from other origins booked vehicles at the stations in Offenburg more often (+188%).

Table 3-4: User data of customers of Stadtmobil Südbaden *in Offenburg. Source: own graphic, statistical data provided by Stadtmobil Südbaden.*

	Customers in Offenburg		Number of bookings (Mobility Stations + other stations)	
Time	2015	01.-09.2016	2015	01.-09.2016
Origin Offenburg	102	106	1714	1626
Other Origins	41	45	125	360
Sum	143	151	1839	1986

3.2.5 Levels of Integration

The new integrated multimodal mobility service, which was presented in the previous sections, is now examined with regards to the different levels of integration. Based on the findings in the report of Best and Heller (2016) and in the classification scheme developed by Luginger (2016), the components of "Einfach mobil" are integrated on the following levels.

Physical integration

During the pilot phase the following services are physically integrated at the four Mobility Stations:

- Parking facilities for private bicycles;
- Public transport stops (bus and/or train);
- (Electric) carsharing vehicles of *Stadtmobil Südbaden*;
- Shared bicycles and pedelecs from *nextbike*.

After the first evaluation of Mobility Stations the city will not only decide about implementing more stations, but also about integrating more modes and services (Kassel, 2016b). Therefore, the modular design of the Mobility Station enables an easy expansion.

Marketing integration

Brand Identity

The city of Offenburg established the new brand "Einfach mobil", which represents the mobility services involved (Kassel, 2016b). All services integrated within the new mobility concept are labeled with the logo and/or colored accordingly:

- Mobility Stations, bus stops and bicycle storage boxes;
- Carsharing vehicles of *Stadtmobil Südbaden* and *nextbike* bicycles;
- Bicycle infrastructure in Offenburg.

Complementary Offers

With the new "Einfach mobil"-card customers receive discounts for their trips with *nextbike* and *Stadtmobil Südbaden*. The card is not mandatory to book vehicles, but the following complementary tariff offers are exclusive for "Einfach mobil"-card owners.

- *nextbike* grants to all users with "Einfach mobil"-card 9 € discount the "RadCard"-tariff;
- Users of *Stadtmobil Südbaden* get 10% discount on the travel costs of every trip with a carsharing vehicle.

There are no discounts for bicycle storage boxes or public transport at the moment.

Information integration

The project website of "Einfach mobil" (www.mobil-in-Offenburg.de) informs about the carsharing and bikesharing offer. At the moment, it does not provide any information about bicycle storage or public transport. In the next stages of development, it is planned to implement a "Mobilitätszentrale" (English: mobility center), where information about busses and trains should be available on-site.

Registration integration

At the "Einfach mobil"-website it is only possible to register for "Einfach mobil" itself. However, the website redirects to the partner's websites of *nextbike* and *Stadtmobil Südbaden* for registering. It is not possible to rent a bicycle storage box, a parking place in the "RadHaus" or to purchase a public transport season ticket for public transport.

Trip planning integration

So far, "Einfach mobil" does not offer integrated trip planning at all.

Booking integration

It is not possible to book bicycle storage, bikesharing bicycles or public transport. There are no terminals available at the Mobility Stations. The "Einfach mobil"-website does not offer the possibility of booking cars directly. Users are redirected to the partner's websites instead. There is no smartphone application available so far.

Access integration

The "Einfach mobil"-card acts as key for carsharing vehicles and bikesharing bicycles, as well as for bicycle storage boxes. It is not yet possible yet to open the "RadHaus" at the central station. Currently the card does not include the use of public transport. There is no smartphone application available for "Einfach mobil" so far.

Billing integration

"Einfach mobil" does not offer integrated billing. Each service submits their claims separately.

4 Basic Steps for Empirical Investigations in Transport

The evaluation of new integrated multimodal mobility services calls for the collection of first-hand data. To analyze the perception and acceptance of these offers, it is particularly important to collect opinions and experiences of different groups of people. This chapter provides readers with basic information about developing and implementing a survey to collect quantitative and qualitative data about participants´ travel behavior. The following subsections describe the chronological steps in survey planning and execution, based on those defined by Richardson, Ampt and Meyburg (1995) (Figure 4-1).
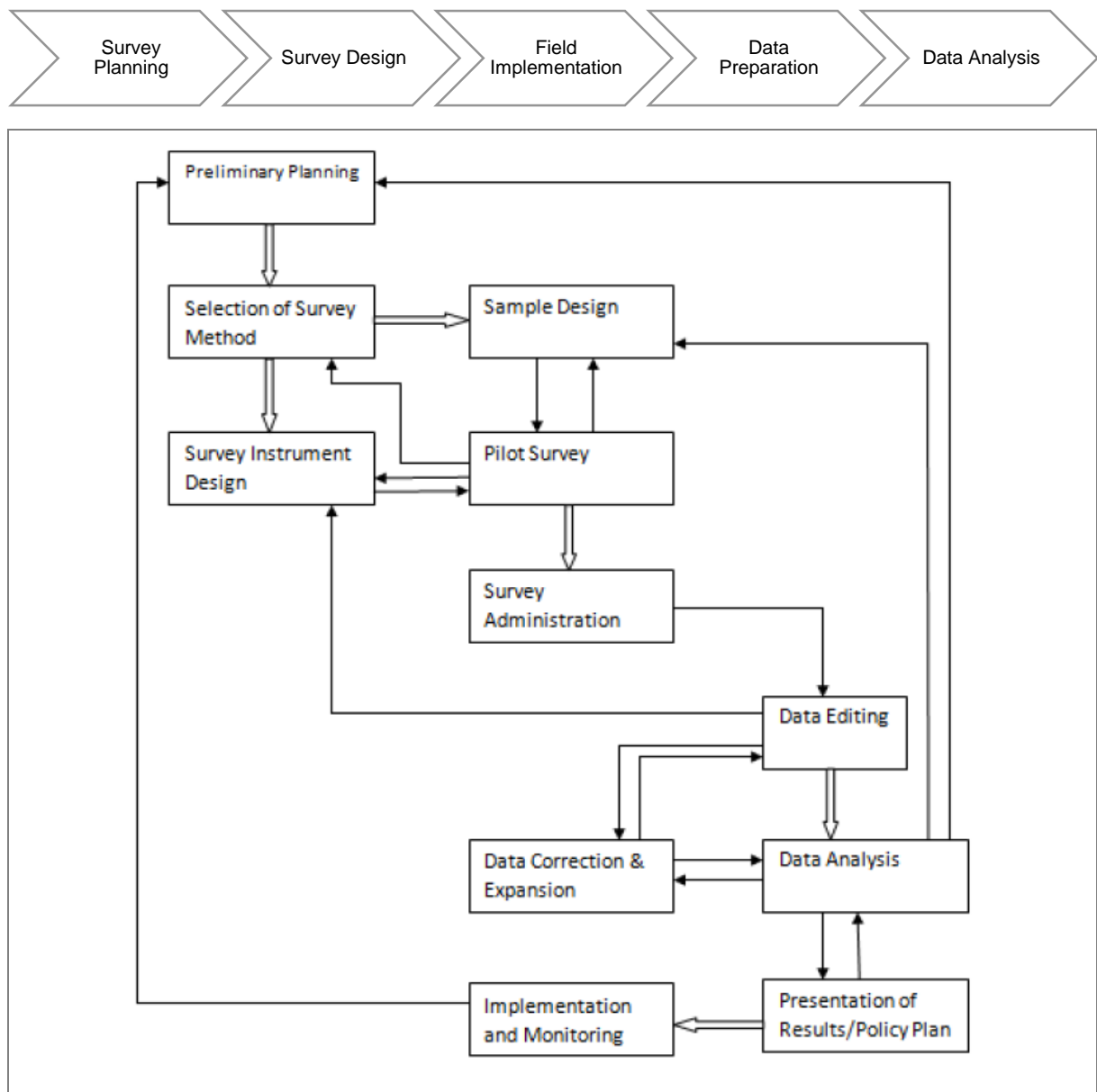
Figure 4-1: The transportation survey process. Source (Richardson, Ampt, & Meyburg, 1995).

4.1 Survey Planning Stage

| Definition of Study Objectives | Review of Existing Information | Determination of Survey Resources | Selection of Survey Techniques |
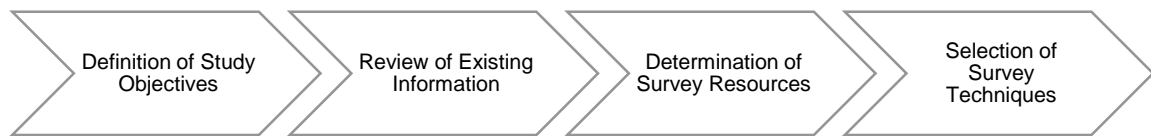
The first step before starting to plan a survey is to define the overall goals and objectives, which should be achieved with the help of data collection and analysis. All the following steps for survey planning are then performed with this central theme in mind. It is important to specify research questions that should be answered by the survey and how the information obtained can be used to assist the successful completion of the respective project. The review of existing information about the study area with its specific characteristics is essential to gaining an overview of the respective situation and ongoing research projects. A profound knowledge about the project background and state of the art is a prerequisite for a successful realization of the survey. Before starting with the collection of a new dataset, it is wise to check available sources of information in the investigated field, if appropriate, existing data sources can be used instead of the survey data (Travel Survey Methods Committee, 2014a). Even if they are not appropriate to work with, these other data sources may be of great assistance in the design of the survey. Another way in which an information review might provide assistance is in the revelation of methodological procedures which may be appropriate in the survey (Richardson, Ampt, & Meyburg, 1995). Many other researchers work in the field of empirical investigations and already have experiences with the planning and execution of surveys. By checking their reports, it is possible to learn from other´s mistakes and choose the most appropriate procedures.

Like in most scientific projects, also surveys have pre-defined resource constraints. During the planning stage of the survey, the researcher needs to have the following resources in mind: money, time and manpower (Richardson, Ampt, & Meyburg, 1995). The costs of a survey depend on various factors. Salaries for professional staff and consultants, travel costs for field staff, costs for services like designing and printing questionnaires, distribution of postcards, and costs for software and equipment, to name just few examples. The time needed to complete the survey should be planned by ensuring that there is enough time to perform the five steps of empirical investigations (Richardson, Ampt, & Meyburg, 1995). The personal requirements can be divided into professionals, administrative, computer support, field staff and consultants. "The task of selecting the appropriate survey method is crucial to the efficiency of the overall survey effort. The choice of the survey method will usually be the result of a compromise between the objectives of the survey and the resources available for the survey" (Richardson, Ampt, & Meyburg, 1995). The three main trade-offs in selection of the survey method are presented in Figure 4-2.
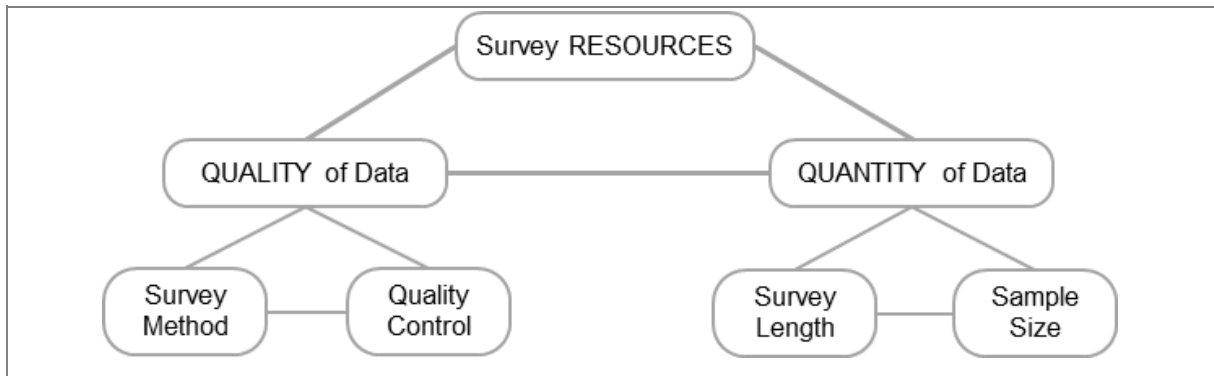
Figure 4-2: Trade-offs in selection of the survey method. Source: own graphic, information based on (Richardson, Ampt, & Meyburg, 1995).

Richardson, Ampt and Meyburg (1995) state, that a given budget (monetary, time or personnel) together with a defined degree of quality of data will automatically restrict the quantity of data which can be collected. On the other hand, within a given budget (monetary, time or personnel), a determination of quantity of data to be collected will immediately limit the quality of data obtained. So, the decision is between: lots of low quality data or limited amount of higher quality data. Traditional travel surveys focus on the collection of quantitative data by asking "what?", "who?", "when?", "where?", "how much?" or "how often?". The easiest and less resource intensive method to collect quantitative data from respondents is the use of self-completion questionnaires. The questions "why?" and "how?" are representative for qualitative data, which is helpful for gaining insights in mobility behavior of people and can be collected through personal interviews and focus-group discussion. Qualitative methods can be complements to quantitative survey methods and are often used at the same time as quantitative surveys. "Mixed method" approaches such as including open ended questions in questionnaires have the advantage of enabling both qualitative and quantitative analysis (Travel Survey Methods Committee, 2014b).

4.2 Survey Design Stage

Richardson, Ampt and Meyburg (1995) define the target population as the "complete group about which one would like to collect information". Units of the target population can be individuals, housing units, businesses, intersections, bus stops, airports, or a number of other options. In most cases, it is not possible to collect information about the complete group, therefore sampling strategies have to be developed. Sampling allows one to obtain a representative picture about the population, without studying the entire population. The sample population is a subset of the target population and contains at least one sampling unit. The

sampling frame is a base list or reference which properly identifies every sampling unit in the survey population (Richardson, Ampt, & Meyburg, 1995). If no adequate sampling frames can be found, it may be necessary to conduct a preliminary survey with a view to establishing a suitable sampling frame. Alternatively, the survey can be designed using a larger than required sampling frame and using filter questions at the beginning of each questionnaire (or interview) to eliminate non-relevant sampling units from the survey.

After selecting the most appropriate survey technique and the definition of the target population, the researcher has to design the survey instrument in the way that every question generates a useful outcome to reach the overall survey goals. Even though there are no fixed rules for designing the survey instrument, there are some basic principles, which must be followed (Richardson, Ampt, & Meyburg, 1995). The following refers to the design of questionnaires, which were already identified as effective methods for data collection. The use of a questionnaire requires a well-designed set of questions (Kockelmann, Bina, & Podgorski, 2005). Kockelmann, Bina and Podgorski (2005) also states, that "the questions [posed to the participants of the survey] should be evaluated for how effectively they can be analyzed, what information they will provide, and how the resulting information will be used." The stage of survey instrument design includes the following issues: length of the questionnaire, question content, definition of question types, question construction with format and wording, and question ordering.

The length of a questionnaire can be a key factor regarding the response rate and usability of received data. According to Kockelmann, Bina and Podgorski (2005), the acceptable questionnaire length can also depend on the perceived relevance or overall importance of a topic to a respondent. Generally, surveys with higher topicality can be longer. In order to collect only relevant information for the survey, the content of the different questions is based on the main aspects of investigation. Revealed Preference (RP) data is collected, if the survey wants to capture existing situations and current behavior of participants. For example, the actual travel mode, travel times, destinations, and so forth. The respondent is currently experiencing that behavior and is making choices based on his or her knowledge. Another type of data is based on Stated Responses (SR), in which hypothetical situations are presented to the respondents. In these cases, participants have to answer the questions without the experience of the real situations (Travel Survey Methods Committee, 2014a). In both cases, the format of the questions to be asked requires careful consideration. Two basic types for question format in self-completion questionnaires are closed-ended questions and open-ended questions. While in closed-ended questions, the participant is forced to choose a predefined answer, in open-ended questions he has the freedom of response.

The well thought-out ordering of questions in the questionnaire plays an important role for a smooth completion of the survey. One question ordering technique involves asking a screening question then asking a series of following questions that are chosen depending on the answer to the screening question (Richardson, Ampt, & Meyburg, 1995). This technique is called branching and can be used multiple times within the same survey (Kockelmann, Bina, & Podgorski, 2005). Another technique to vary question order is through skipping patterns, which omit questions that are inapplicable or inappropriate for a respondent based on her answers to previous questions (Kockelmann, Bina, & Podgorski, 2005). Other techniques include funneling and inverted funneling. Funneling is a method of organizing a group of questions with the most general first followed by increasingly more specific questions. This method is used to prevent bias and conditioning for later questions and allows a respondent to establish a frame of reference. Inverted funneling organizes specific questions first followed by increasingly more general questions. This provides a process for a respondent to work through his or her opinions before forming a general conclusion (Richardson, Ampt, & Meyburg, 1995).

4.3 Field Implementation

The survey planning stage and survey design stage are completed. Questionnaires are ready and the sample of respondents to whom they will be addressed is defined. Before starting the data collection, it is wise to test the survey with the help of a pilot survey. All surveys should be tested extensively before they are actually undertaken. Many survey researchers stress the necessity and importance of pretesting questionnaires, but this is the stage of the survey implementation process which is often neglected due to time and cost pressures. If possible, the Travel Survey Manual (Travel Survey Methods Committee, 2014a) recommend, that pilot surveys should be conducted in three steps: the office pretest, the questionnaire pretest, and the survey dry-run. In the first step, the office pretest, colleagues and other experts who are not directly involved in the survey design detect potential survey problems. This is helpful for identifying problems with the questionnaire and with specific questions. Survey questionnaires should also be tested on non-experts because they are often confusing to people without knowledge of the specific field and because the surveys often rely upon respondents' understanding of technical terms and expressions. The final step of the pretesting task is to complete the survey on a small number of respondents in an identical manner to the full survey effort. Ideally, the pretest should cover the whole range of survey tasks from sample selection to data analysis. This will ensure that all aspects of the survey are well planned and designed and will contribute to the overall study goals.

Finally, after many stages of planning and preparation, the actual part of data collection can start. A major problem with self-completion surveys is that very often, the response rate is quite low. In order to minimize this problem and to raise response rates, various actions before and during data collection are possible. At the beginning of each survey it is important to make the population and the individual target groups aware of the upcoming questionnaires. This can be done with the help of media publicity. Articles about the goals of the survey and invitations can be placed in local newspapers, internet, radio, or television. The content of the advertisements should include the period of time in which the survey will take place, the group of people who are invited to fill out the questionnaire and where people can find those questionnaires. A useful tool to increase response rates in surveys is to provide compensation to the participants in form of incentives (Richardson, Ampt, & Meyburg, 1995). The use of small payments, bonuses or gifts can be appropriate. In case there is a sponsor, who is willing to grant such incentives, this can be already posted in the advertisements for the survey. One effective tool to increase the number of participants in the ongoing survey is the use of reminder messages. This can be done via email, if addresses are available, or with help of flyers and postcards. Depending on the length of the survey period, more reminders can be sent.

4.4 Data Preparation and Analysis
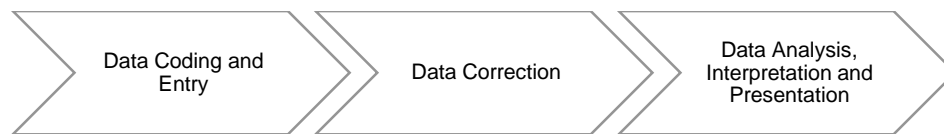
After the successful implementation of the survey and the collection of data, the task of transforming completed questionnaires into useable results comes next. This step is composed of several discrete tasks including coding, data entry, data correction, analysis, interpretation of results and preparation of reports (Richardson, Ampt, & Meyburg, 1995). Coding is the part of the survey in which responses of the participants are converted into codes that permit computer-based analysis (Stopher, 2012). Data entry is then the process of transferring these computer codes from the survey form or other intermediate medium to the computer. Nowadays, coding and data entry have become relatively minor issues, due to web-based surveys where these steps are executed automatically (Travel Survey Methods Committee, 2014a). However, one of the potential errors with such direct data entry, is the lack of a second record for verification of the entered data (Stopher, 2012). Ideally, data entry should, as far as possible, avoid the requirement to type in numbers, letters, or words, and should use closed-ended questions, in which the participants simply click on the appropriate response option (Stopher, 2012). The more typing that is required for the entry, the greater will be the potential for error in recording the information provided by the respondent. When a survey is conducted using paper forms and written entries, or audio recordings, the advantage

is that a record will exist that can be used to cross-check the entered data. Once the survey data have been entered, the results need to be systematically analyzed to identify data problems. According to the Online Travel Survey Manual (Travel Survey Methods Committee, 2014a), the following three editing and cleaning tasks can be conducted:

- Simple data cleaning to correct coding and data entry problems;
- Validation of survey responses;
- Application of analytical techniques to reduce non-response.

In a first step, it is important to verify the completeness of each record. Then, every response has to be checked in order to evaluate the internal consistency to the related question (Travel Survey Methods Committee, 2014a). If possible, the errors in the database should be corrected. In case the error involves more than coding and entry errors, the record will need to be marked as unusable and have to be excluded from the analysis database (Travel Survey Methods Committee, 2014a). When data repair is required, not only the final dataset but also the raw data without changes should be kept, so that any future analyst or researcher can establish the potential effects of the repairs, or even is able to employ a new set of rules to repair the raw data (Stopher, 2012). An important component of obtaining clean data is the use of various data correction and expansion techniques, which attempt to make the sample data more nearly representative of the population, which should be represented (Richardson, Ampt, & Meyburg, 1995). The data analysis stage includes exploratory analysis, which seeks to explore the contents of a dataset and to describe it through, e.g. response rates, arithmetic means and standard deviations. In addition, a more complex analysis, which aims to confirm statistical hypotheses and find causal relationships among the variables can be conducted (Richardson, Ampt, & Meyburg, 1995). Issues and methods involved in the presentation of results, the storage of data, and in the documentation of survey methods have to be addressed in order to complete the whole process of conducting a survey (Richardson, Ampt, & Meyburg, 1995).

5 Methodology

To assess the perception and acceptance of the new integrated multimodal service "Einfach mobil" in Offenburg, a survey among users and non-users was conducted. The previously defined steps for empirical investigations were taken as guideline for planning, designing and implementing the survey, as well as for preparing and analyzing the data obtained.

5.1 Survey Planning Stage

Within the survey planning stage, the study objectives were defined and existing information about the area of investigation were reviewed. Available resources for the survey within the framework of this master thesis were determined and the survey technique was selected accordingly.

5.1.1 Definition of Study Objectives

In Offenburg, the overall goal was to evaluate the operation of Mobility Stations and to derive recommendations for the implementation of additional stations. The new Mobility Stations in Offenburg were implemented as part of the integrated multimodal mobility service "Einfach mobil". One objective was to analyze the perception and acceptance of this service by the selected groups of persons. Potential changes in mobility behavior should be investigated. This survey is the first attempt to evaluate the "Einfach mobil" service in Offenburg using collected data.

5.1.2 Review of Existing Information

As already presented in detail in Chapter 3, background information about the city of Offenburg including general information about its population, transport system and modal share was collected from various sources. The department of transport planning of the city of Offenburg provides an extensive data basis with information about the new integrated multimodal mobility service "Einfach mobil" and the planning process, the implementation phase and the development of Mobility Stations. Two master theses are describing the new services and their levels of integration by conducting literature review and expert interviews (Luginger, 2016) (Krismanski, 2015). There is a GIS analysis available, which reports on the creation of the catchment areas of Mobility Stations in Offenburg and the calculation of residents and employees living within these catchment areas (Heller, 2016). The evaluation of the offer just started and data about user and non-user experiences are not yet available. For the creation of the questionnaires, the projects EVA-CS and EVA-MS of the Technical University of Munich were used as a reference.

5.1.3 Determination of Survey Resources

The implementation of a survey within the framework of a master thesis is very much dependent on the available resources time and money. Within the time period of three months, the survey planning stage, as well as the survey design and implementation stage had to be carried out in order to have enough time left for analysis of results and the preparation of the thesis. Regarding the limited time frame and the restrained budget, the method that seemed to be most appropriate for the survey was the development of an online survey. The main advantages of this method were the easiness of the distribution of questionnaires, as well as the fact that the answers could be automatically retrieved, which proved very useful within the limited time frame. Considering the limitation of costs of this thesis, a free survey tool was needed and found with the online-tool "Umfrage online" (Figure 5-1). The city of Offenburg took over the costs for printing questionnaires as well as for designing and printing postcards, which were distributed within the city area as invitation to the survey. Due to the fact that the survey was carried out within the framework of a master thesis, the professional and administrative tasks were handled by a small group of persons. The distribution of postcards was carried out by a group of seven young people who are employed at the city of Offenburg. Another apprentice handled the manual input of the small amount of paper questionnaires.
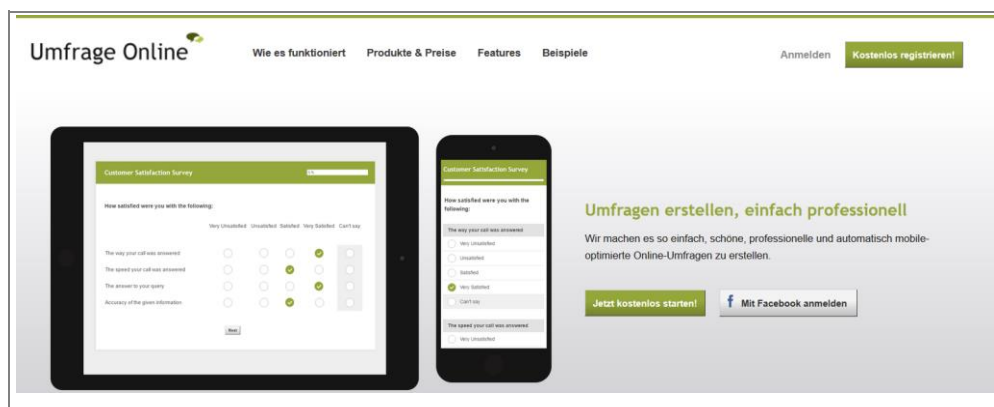
Figure 5-1: Website of the online survey tool "Umfrage online".

5.1.4 Selection of the Survey Technique

For the evaluation of Mobility Stations in Offenburg, questionnaires were chosen to be the most appropriate tool to collect people's opinions, expectations and experiences. The advantages of questionnaires in the case of Offenburg were low costs for the survey and the easy and fast way to address people. The online survey tool "Umfrage Online" was used to convert the questionnaires into online questionnaires. In the end, in total four online questionnaires were created and could be distributed with their own dedicated access links. For visitors and all people, who did not want to go online to fill out the questionnaires, printed versions were offered.

5.2 Survey Design Stage

The definition of the target population and the selection of the sampling procedures were part of the survey design stage. Furthermore, the survey instrument was designed on basis of the main aspects of investigation.

5.2.1 Definition of the Target Population

The evaluation of the Mobility Stations in Offenburg intents to find out the attitudes of the population of this city towards the new services. Accordingly, all citizens of the city of Offenburg were defined as the target population. A specification of this group was made by dividing the population into users and non-users of the new integrated multimodal mobility service in Offenburg.

Users

The first main target group in this evaluation includes two groups of people: customers of *nextbike* bikesharing and customers of *Stadtmobil Südbaden* carsharing in Offenburg. As users of the new integrated multimodal mobility service, they probably have a profound understanding of sustainable transport modes and new mobility sharing offers. Their experiences, whether good and bad, provide valuable insights in the utilization of the new Mobility Stations, the "Einfach mobil"-card and the project website. Both providers, *Stadtmobil Südbaden* and *nextbike*, offer their services at the four Mobility Stations.

Non-users

The second main target group to be addressed with the help of the survey are people who are not users of the new integrated multimodal mobility service in Offenburg. These non-users are represented by citizens, commuters and visitors. The aim of the non-user survey is to learn more about the reasons for not using the services and to give people an understanding of the new integrated multimodal mobility service.
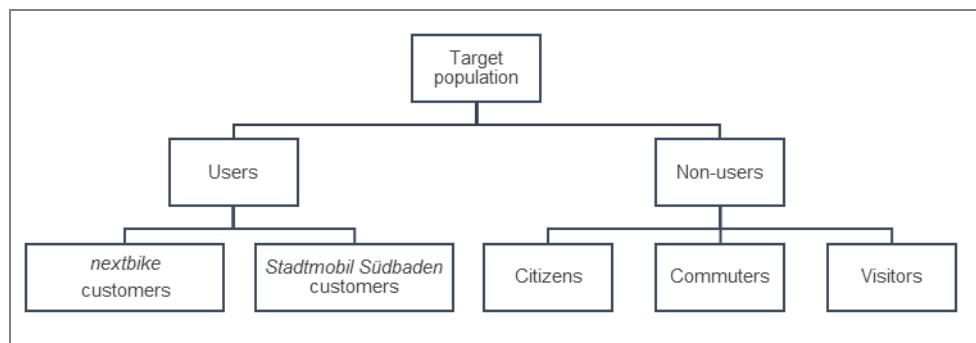
Figure 5-2: Overview target population for the user and non-user survey.

5.2.2 Sampling Procedures

For the survey in Offenburg, the target population was divided into the five following sampling populations: customers of the bikesharing service *nextbike*, customers of the carsharing service *Stadtmobil Südbade*n, citizens, commuters and visitors. The sampling frames for customers of carsharing and bikesharing were the mailing lists of the respective providers, which include all registered users within the city of Offenburg. In case of citizens, all interested persons in the city, who were not customers of either carsharing or bikesharing, formed the sampling frame. Commuters at selected local companies and at the main train station were identified as another sampling frame. The accommodations at the hotel "Mercure" were seen as the sampling frame for visitors.

5.2.3 Survey Instrument Design

The different questionnaires for the survey in Offenburg were created in order to collect information for the evaluation of the new Mobility Stations. Since it was the first survey with regards to the new integrated multimodal mobility service, the goal was to capture experiences and impressions of the different target groups. Regarding the length of the questionnaire, a time frame of 15 minutes for the completion of the online questionnaires was tried to adhere. The final versions for customers of carsharing and of bikesharing included a number of 40 questions. Both questionnaires for citizens and commuters consisted of 37 questions and the questionnaire for hotel guests included 14 questions. With help of the branching technique, an ordering of questions depending on previous answers of the participants was implemented to avoid to waste time and interest of the respondent. The content of questions reflected the main aspects of investigation, which are listed below.

Awareness and perception of "Einfach mobil"
- Do people know the new brand "Einfach mobil" and its different components (Mobility Stations, "Einfach mobil"-card, project website)? How did they become aware?
- Which marketing strategies were appropriate to attract attention?

Operation of Mobility Stations
- Which factors play a role for choosing a Mobility Station?
- What problems have they noticed while using the Mobility Stations, and what are their suggestions for improvement?
- Which components of Mobility Stations and intermodal connections are important?
- How important are different offers in the surrounding areas of Mobility Stations?
- Is there a need for more Mobility Stations in Offenburg? Should the network be extended into neighboring areas?

Mobility patterns and degree of multimodality

- Do Mobility Stations support multimodal mobility behavior?
- Do Mobility Stations play a role in attracting new customers to the individual offers?
- Do new mobility services influence mobility behavior? (i.e. car ownership)
- Which mobility services are most used and for what purposes?
- For which purposes would people use shared mobility offers?
- What factors prevent people from using shared mobility providers?
- Which aspects has to be changed so that people use the offers of "Einfach mobil"?

In addition to these topics, questions about the demographics of participants (gender, age, household members, access to private car / bicycles, education) were asked, in order to get statistical information about the respondents. Mainly revealed preference data about the current situation was collected, but also some questions to collect stated preference data were asked to gain insights into reactions of respondents on hypothetical situations. In order to keep the analysis of data as simple as possible, most of the questions were closed-ended questions. However, the participants had the possibility to add comments in some open-ended questions.
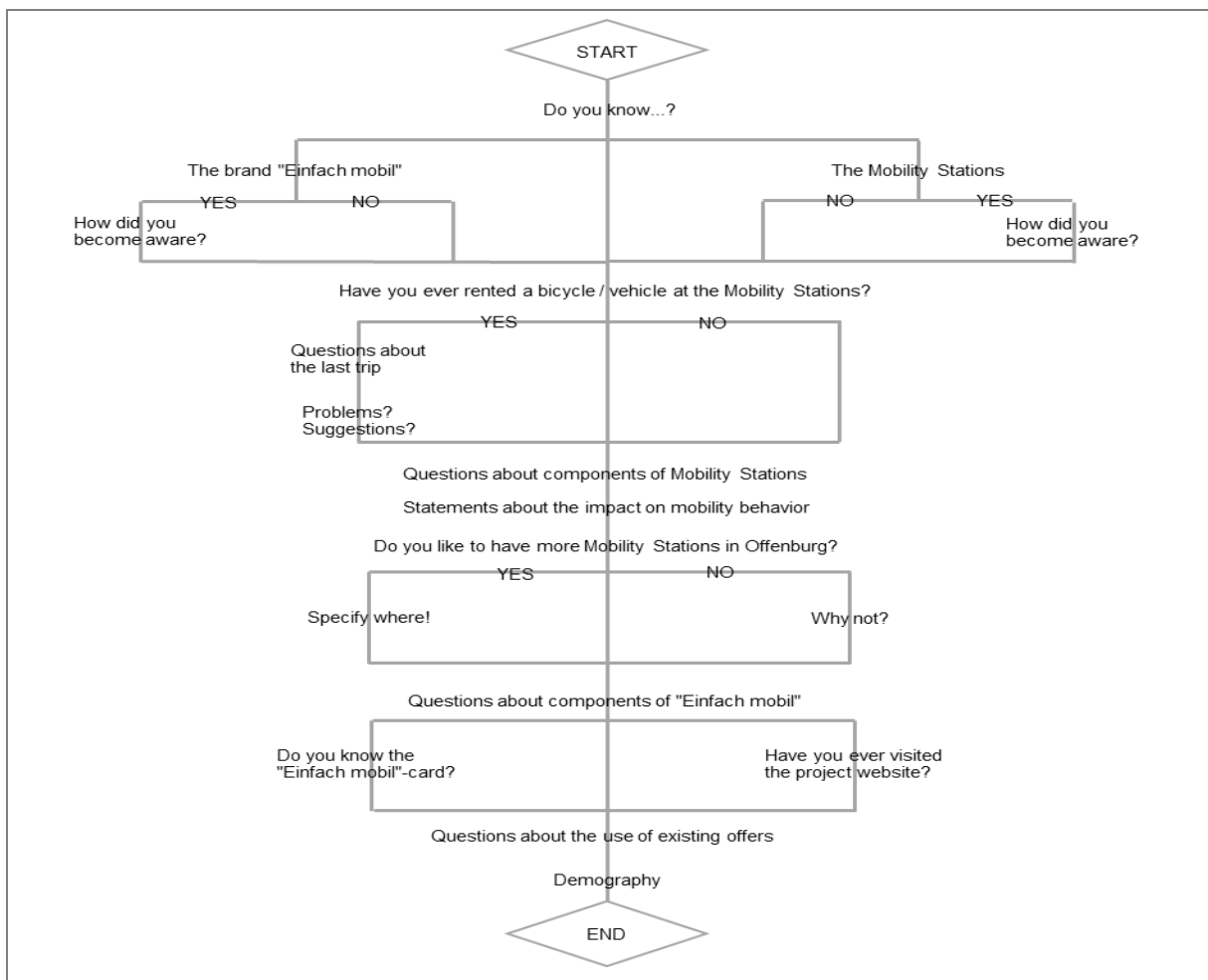
Figure 5-3: Flow chart: structure of questionnaires for customers of nextbike and Stadtmobil Südbaden.

Figure 5-3 presents the structure of the questionnaires for users of *nextbike* bikesharing and *Stadtmobil Südbaden* carsharing. Questions about the last trip were asked only in the user questionnaires. Main reasons for using the Mobility Stations and trip characteristics should be identified. One question also asked the participants, which mode of transport they would have used, if the sharing offer (carsharing / bikesharing) would not exist. For the user questionnaire, two versions of the same questionnaire were created with slightly different formulations for customers of the two different mobility services (*Stadtmobil Südbaden*, *nextbike*).

The structure of the questionnaires for citizens and commuters is shown in Figure 5-4.
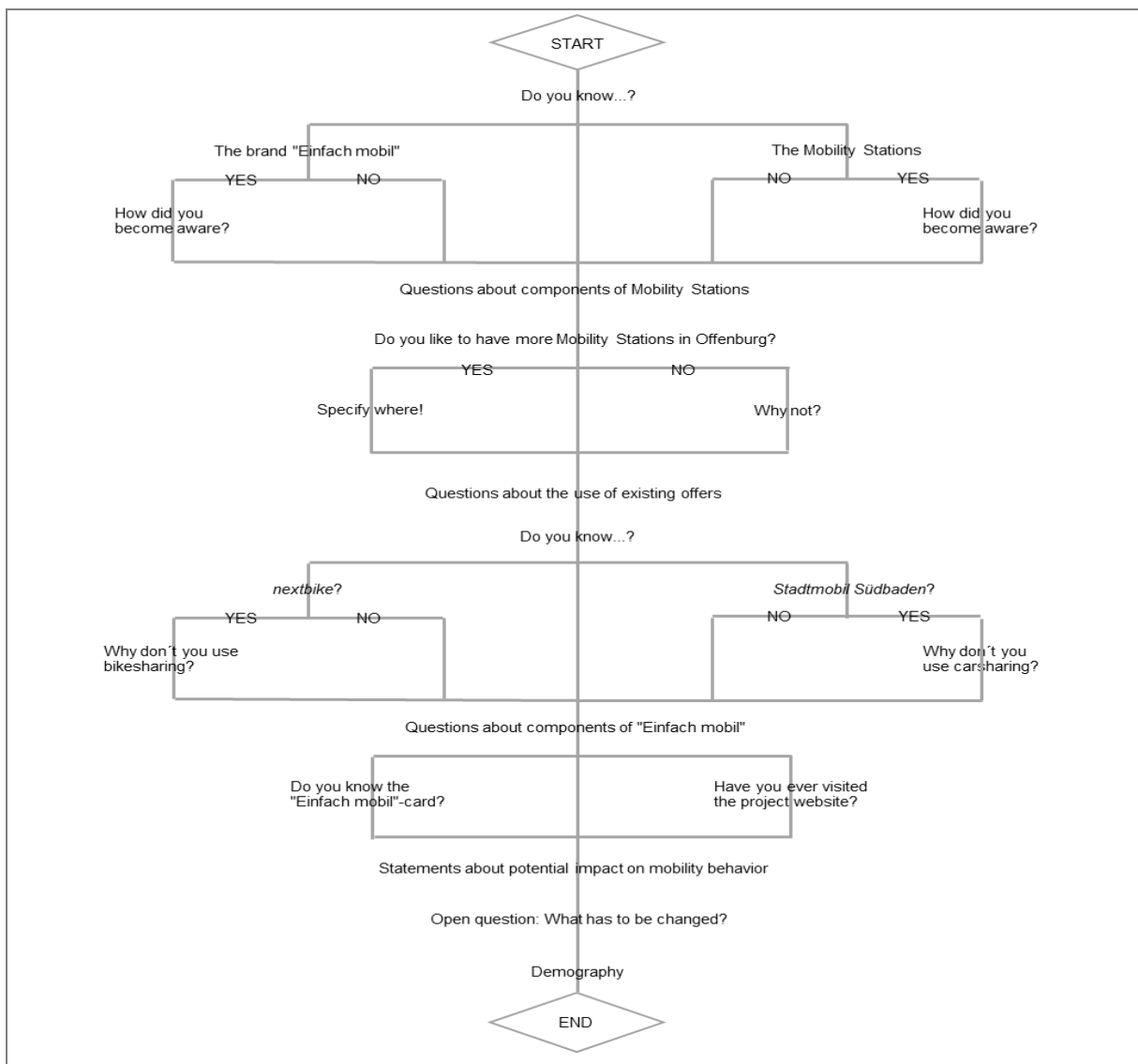
Figure 5-4: Flow chart: structure of questionnaires for citizens and commuters.

The non-user questionnaire for citizens and commuters was created on the basis of the user questionnaire. To make sure that only non-users actually fill out the questionnaires, a filter question was posted in the beginning. People, who indicated to be customers of *nextbike* or

Stadtmobil Südbaden, were asked to fill out the respective user questionnaires, which were sent by their providers. These people could quit the non-user survey without giving answers to the questions. Both groups (citizens and commuters) got similar questions, only the statements about potential changes on mobility behavior were adapted. Additionally, questions about providers *nextbike* and *Stadtmobil Südbaden* were added to the questionnaires, in order to identify the reasons why people do not use these services.

The non-user questionnaire for the guest of the "Mercure" hotel was created independently form the other questionnaires (Figure 5-5).
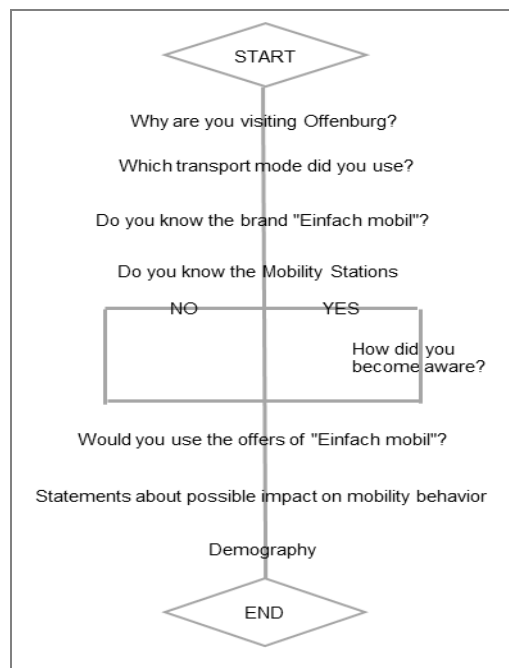
Figure 5-5: Flow chart: structure of questionnaire for visitors of the hotel "Mercure".

5.3 Field Implementation

As part of the field implementation, pre-tests as alternatives to a pilot survey were conducted. Then the collection of data from users and non-users of the new integrated multimodal mobility service started.

5.3.1 Pilot Survey

In the case of the Offenburg survey, instead of a whole pilot survey, only pre-tests of the questionnaires were conducted. By cooperating with experts in the field of integrated multimodal mobility services, the questionnaires were tested in terms of subject-specific questions. A small number of non-experts were asked to fill out the survey and to give feedback on comprehensibility and ease of use.

5.3.2 Data Collection

The following section presents the different approaches for data collection.

Users

Nextbike sent an email with the link to the user questionnaire to all customers in Offenburg who were registered for their newsletter. The provider *Stadtmobil Südbaden* sent two emails: one with the first invitation to fill out the questionnaire and a second one as a reminder for all people who did not yet participate. To increase the rate of respondents, the providers of the sharing services, *nextbike* and *Stadtmobil Südbaden* were asked to offer an incentive to all participants of the dedicated user questionnaires. *Stadtmobil Südbaden* offered a bonus of 5€ for every customer who completed the online questionnaire. *Nextbike* credited 240 minutes free cycling, if their customers filled out the questionnaire completely. For both groups, the last page of the online questionnaires was adopted and information about the incentives were posted (Figure 5-6).

*Figure 5-6: Last page of user survey (*nextbike *and* Stadtmobil Südbaden*) with information about incentives.*

Non-users

In order to reach a large number of citizens and commuters, in total 5000 postcards (Figure 5-7) with an invitation to the online survey were distributed within the city area. At the location "Bahnhof" the postcards were given to commuters. Twenty-nine selected companies received a letter with 30 postcards each and were asked to distribute them to their employees.

Figure 5-7: Front and back of the postcard as invitation for the survey.

The city of Offenburg posted an icon on the start page of their website. By clicking on that icon, the visitors were guided to another page, where they can choose between two buttons: citizen or commuter (Figure 5-8). These buttons guided them directly to the right questionnaire.
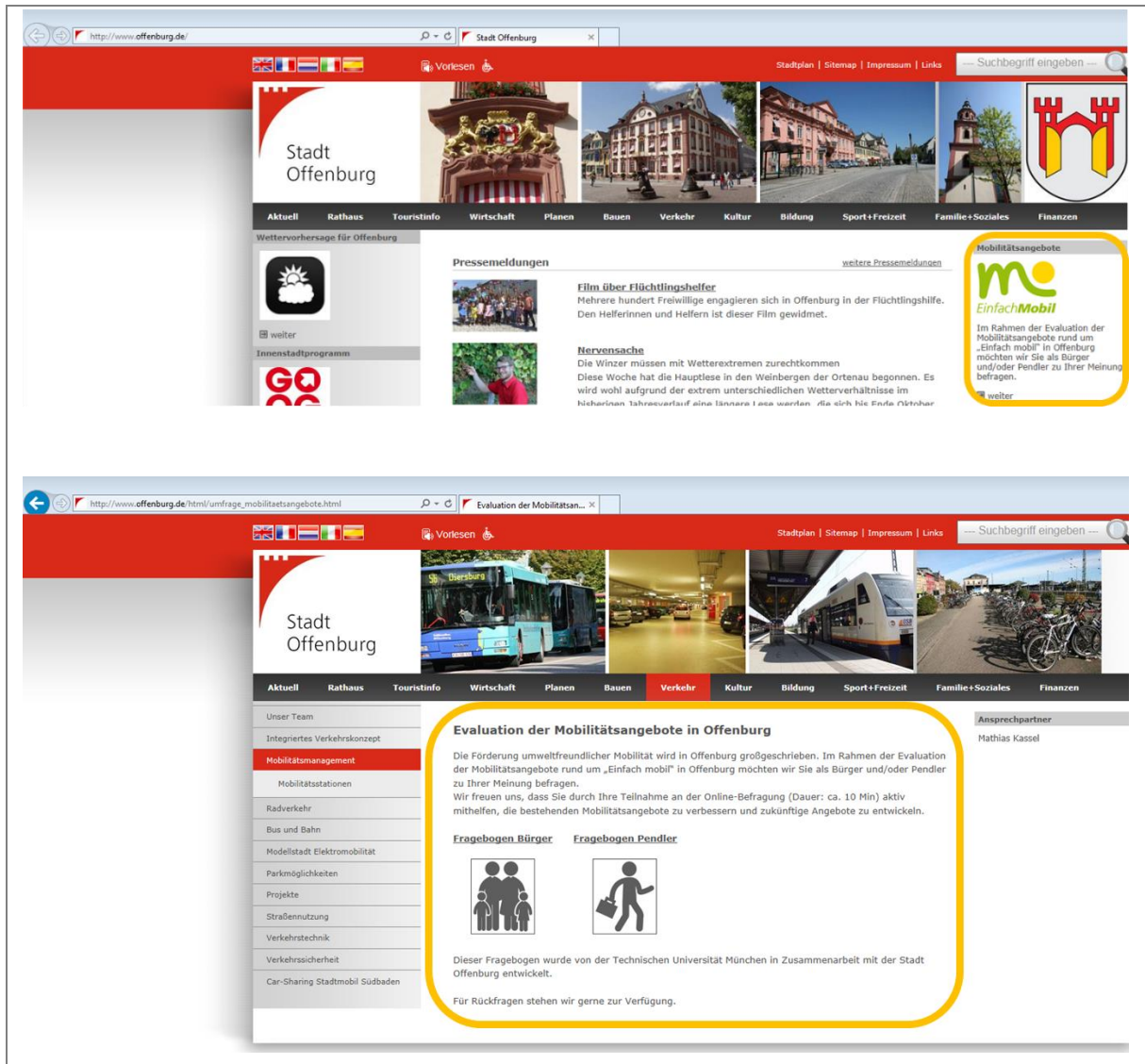
Figure 5-8: Information about the survey on the website of the city of Offenburg.

With the help of the local authorities in Offenburg, various steps for advertising and promoting the survey on the new service "Einfach mobil" were conducted. The local newspaper "Offenblatt" posted an article about the main goals before starting the survey for pre-publicity and for raising the level of awareness within the population. Another article during the first week of the survey included the link to the online questionnaires and an invitation for all citizens to take part in the survey. Thanks to the city of Offenburg, it was possible to offer incentives to the participants of the non-user questionnaires to increase the number of responses. For citizens and commuters, the city of Offenburg offered free "Einfach mobil"-cards. When finishing the online questionnaire, the people were directly guided to the project website

"www.mobil-in-Offenburg.de" where they had to register for the card. Those participants, who filled out printed questionnaires, got a voucher with which they could go to the "BürgerBüroBauen" to register for their card. The registration fee of 5€ was cancelled for all registrations during the period of the survey. The free "Einfach mobil"-cards were sent to the new users by employees of the "BürgerBüroBauen". Everyone got an extra letter with information including a list of steps for the use of the card and the registration for *nextbike* and *Stadtmobil Südbaden* (Figure 5-9).

Figure 5-9: Voucher for the "Einfach mobil"-card and letter of information for new customers of "Einfach mobil".

An overview of all steps in the field implementation stage is given in Figure 5-10 and Figure 5-11.
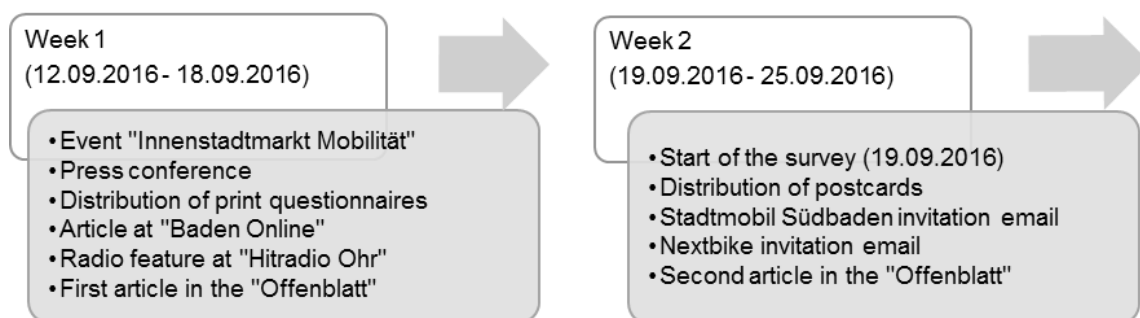
Figure 5-10: List of actions within the period of September 12 to 25, 2016.

The most important task before starting the survey was to make people aware of the evaluation project. The different target groups had to be informed about the questionnaires and the incentives. One week before the official start of the survey, the "Innenstadtmarkt Mobilität" took place where Mathias Kassel spread information. A press conference, a radio feature and two articles announced the upcoming survey. The print questionnaires were distributed to the hotel "Mercure" and the surrounding municipalities and the companies received the postcards. The survey started on September 19, 2016 and in this week the postcards were distributed in the city area. The providers, *nextbike* and *Stadtmobil Südbaden*, sent their emails with the invitation to the online questionnaires and another article in the "Offenblatt" invited the citizens.
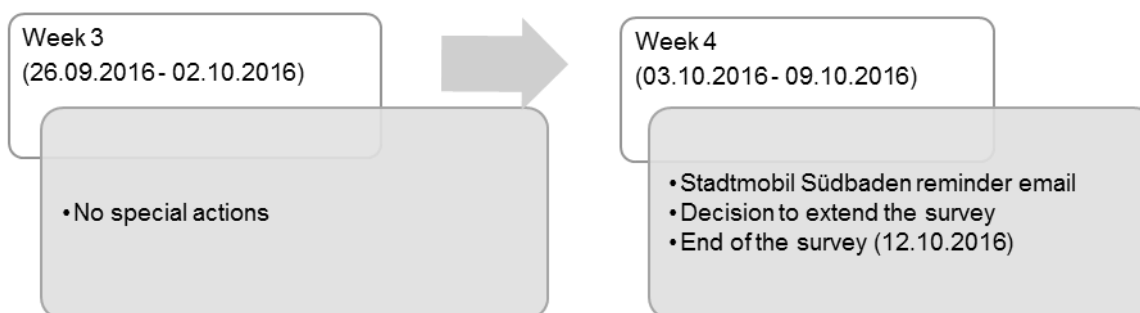
Figure 5-11: List of actions within the period of September 26 to October 09, 2016.

There were no actions within the period of September 26 to October 02, 2016. In order to increase the response rate in the user questionnaires, the providers of bikesharing and carsharing were asked to send reminders. *Stadtmobil Südbaden* sent another email on October 05, 2016, which should invite customers who did not yet participate. The survey among users and non-users of the new integrated multimodal mobility service was closed on October 12, 2016. All questionnaires, which were filled out by hand, were collected and returned to the department of transport planning in Offenburg.

5.4 Data Preparation and Analysis

The online-tool "Umfrage online" provided a first evaluation of the results in real time, while the survey was still open for participants. After the survey was closed, the questionnaires were examined with regards to accuracy of responses and completeness. With this first step of analysis, some questionnaires were identified to be complete, even if the tool listed them as "not finished". This error occurred, because some participants closed their browser without clicking on the button "Finish" on the last page of the online questionnaire. For the analysis, only completed questionnaires were used. The raw data was analyzed and visualized in diagrams with the help of Microsoft Excel. The potential locations of future Mobility Stations according to the responses of uses and non-users were created in the program ArcMap (Version 10.4). In this thesis, the results of the survey are presented in Chapter 6. The responses of the customers of *nextbike* were compared to those of *Stadtmobil Südbaden* in the section for the user survey. In the non-user survey, responses of citizens are compared to those of commuters. Responses of participants of the survey among visitors are presented in an extra section.

6 Results and Analysis

This chapter presents the results of the user and non-user survey. Diagrams, which were created on the basis of the received answers in the online and paper questionnaires, illustrate the individual responses and help to analyze the results. The user survey with a comparison of answers of *nextbike* and *Stadtmobil Südbaden* customers is given in Section 6.1. The results of the non-user survey are presented in Section 6.2, which includes a comparison among answers of citizens and commuters. Both chapters start with the analysis of the demographic composition of survey participants followed by the assessment of awareness of "Einfach mobil" and the four Mobility Stations. In the next section, answers to the questions about (additional) components of Mobility Stations are presented and the statements, which should indicate potential changes in mobility behavior, are reviewed. Then, the attitude of participants to a possible extension of the network of Mobility Stations is analyzed. The subsequent diagrams show answers to the questions about the "Einfach mobil"-card and the project website "www.mobil-in-Offenburg.de". In order to understand the travel behavior of participants, the use of existing offers is analyzed. In the user survey, additional questions about the last trip are utilized to identify trip characteristics. Even if the focus of the non-user survey lies on citizens and commuters, the answers given by guests of the hotel "Mercure" were analyzed and are presented separately in Section 6.3.

6.1 User Survey

The user survey took place from September 20 to October 12, 2016. Figure 6-1 presents the number of participants of the two providers: *nextbike* (bikesharing) and *Stadtmobil Südbaden* (carsharing). In total, 18 customers of *nextbike* and 63 customers of *Stadtmobil Südbaden* filled out the online questionnaires.
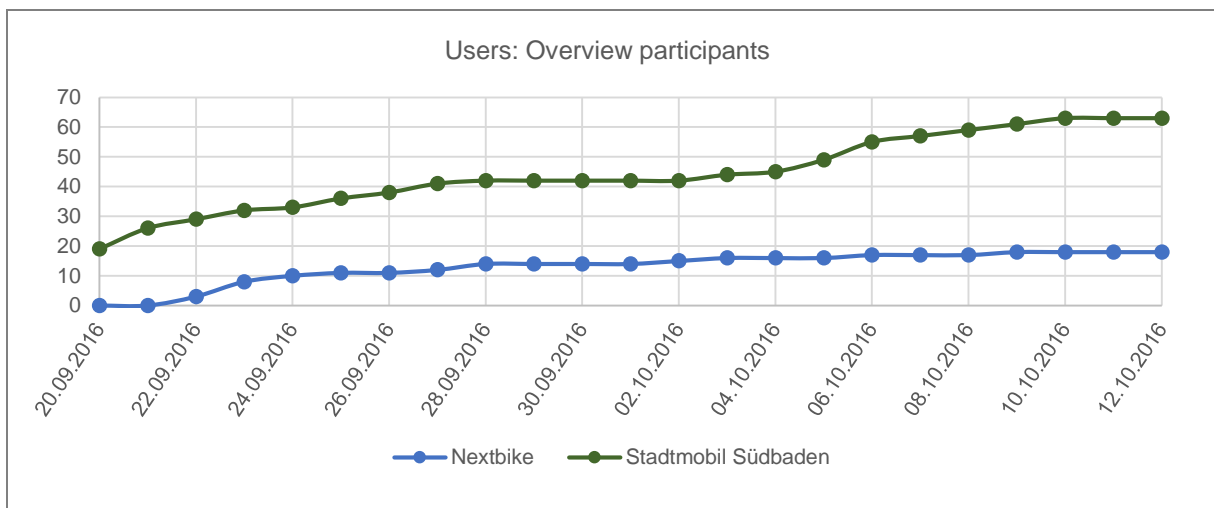
Figure 6-1: Number of participants of nextbike *and* Stadtmobil Südbaden *in the user-survey.*

The response rate of *nextbike* customers was relatively low (18%), therefore these results can only help to gain an overview of opinions and experiences, but are not representative for all customers of *nextbike* in Offenburg. In contrast, the response rate of *Stadtmobil Südbaden* customers was 47%, which means that almost half of the customers of *Stadtmobil Südbaden* in Offenburg participated. For the following analysis, only questionnaires, which were filled out completely were used (16 of *nextbike* and 61 of *Stadtmobil Südbaden*). Table 6-1 gives an overview of the sample sizes and the received response rates.

Table 6-1: Overview of user survey with response rates.

	Total	*Nextbike*	*Stadtmobil Südbaden*
Time frame		20.09.2016 - 12.10.2016	20.09.2016 - 12.10.2016
Days		23	23
Sample	235	100	135
Participants	81	18	63
Response rate	34%	18%	47%
Completed questionnaires	77	16	61

6.1.1 Demographic Composition of Survey Participants

Slightly more men (59%) took part in the user survey. The age of participants is well distributed, noticeable is that 46% of the Stadtmobil Südbaden customers are between 50 and 59 years old. About 68% of participants have a university degree. Almost all participants (97%) have a driver´s license. The average number of vehicles available per household is 0.9 for *nextbike* and 0.4 for *Stadtmobil Südbaden*. Sixty-six percent of *Stadtmobil Südbaden* participants stated that, beside the carsharing offer, they never have a car available. Almost 40% of *nextbike* participants and 23% of *Stadtmobil Südbaden* participants have public transport subscriptions and almost all (98.5%) have access to at least one bicycle.

Table 6-2: Demographics of the participants.

		Total	Nextbike	Stadtmobil Südbaden
Sample		77	16	61
Percentage of sample		100	21	79
Gender of participants (%)	Male	59	56	62
	Female	41	44	38
Age group of participants (%)	Under 18 years	6.25	12.5	0

	18 – 29 years	13.5	25	2
	30 – 39 years	15.25	12.5	18
	40 – 49 years	25.5	25	26
	50 – 59 years	35.5	25	46
	60 – 64 years	2.5	0	5
	65 – 74 years	1.5	0	3
	75 years and older	0	0	0
Participants with university degree (%)		67.5	63	72
Average number of household members per household		2.55	2.6	2.5
Average number of children per household (=persons under 18 years)		0.75	0.7	0.8
Participants with driver´s license (%)		97	94	100
Average number of vehicles available per household		0.65	0.9	0.4
Participants with car availability (%)	always	20.5	25	16
	sometimes	27.75	37.5	18
	never	51.75	37.5	66
Households with access to at least one bike (%)		98.5	100	97
Participants with public transport season ticket (%)		30.5	38	23

6.1.2 Awareness of "Einfach mobil"

In the first questions, both groups were asked, if they were aware of the new brand "Einfach mobil". If they answered with "yes", the next question was, how they became aware (Figure 6-2).
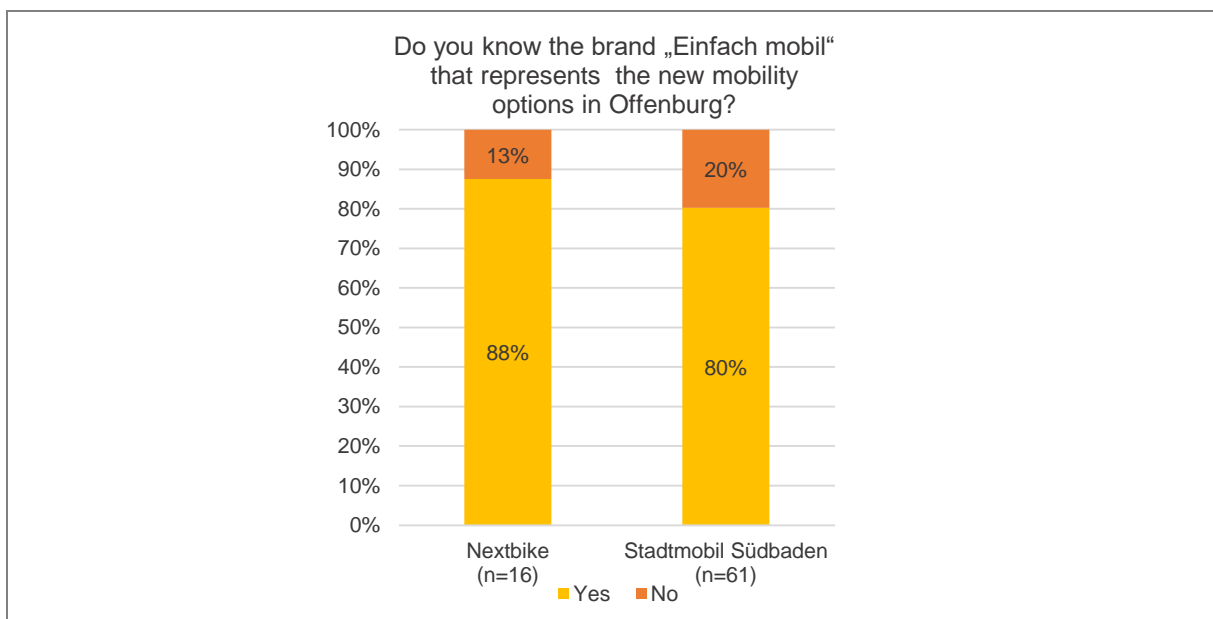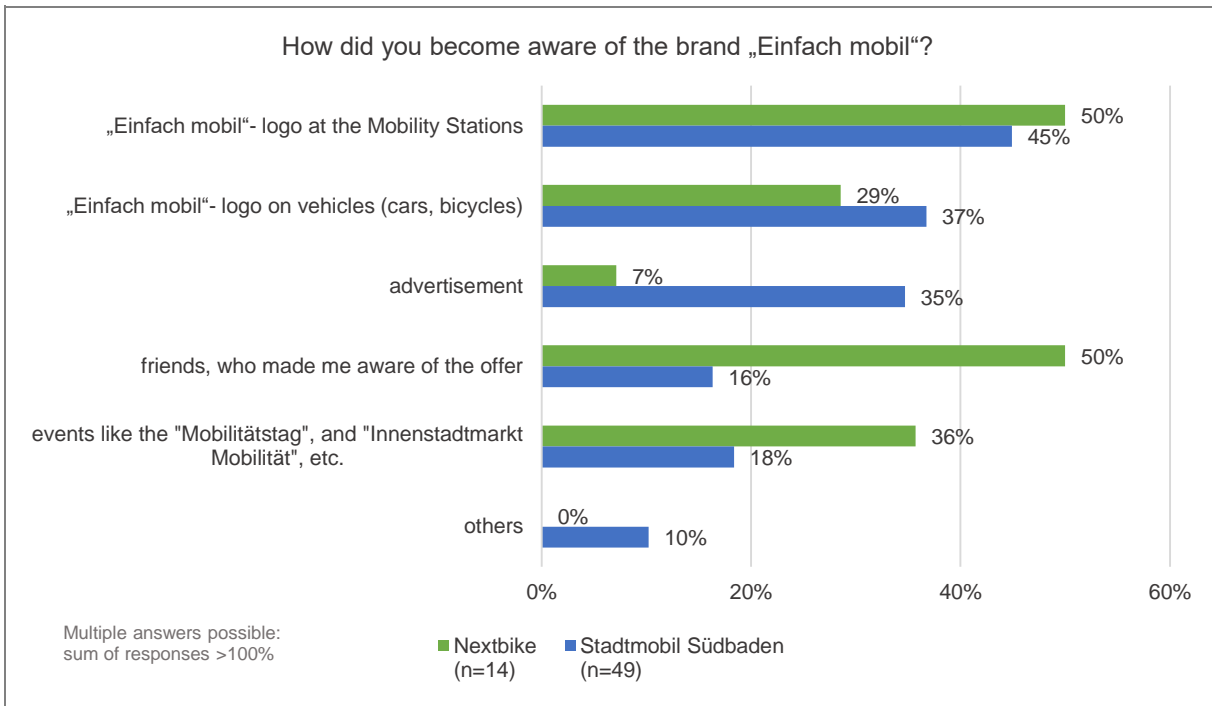
Figure 6-2: Questions about the awareness of the brand "Einfach mobil".

Almost 90% of *nextbike* users and 80% of *Stadtmobil Südbaden* users indicated that they were consciously aware of the brand "Einfach mobil" "that represents the new mobility options in Offenburg". For those participants, who were aware, the "Einfach mobil"-logo at the Mobility Stations and on vehicles was one reason for becoming aware. This highlights the importance of the strong brand identity of "Einfach mobil", which is visible in public space. Thirty-five percent of *Stadtmobil Südbaden* users learnt about the service "Einfach mobil" through advertisement, which was not further defined. Half of *nextbike* users also were made aware of the brand by friends. Some *Stadtmobil Südbaden* users didn't find the appropriate response option and picked "others". There they could define how they became aware. In most cases, these participants named the provider *Stadtmobil Südbaden* who made them aware of the brand "Einfach mobil".

6.1.3 Awareness of Mobility Stations

The following questions were related to the new Mobility Stations. Both user groups were asked, if they were aware of the Mobility Stations and if they answered with "yes", how they became aware (Figure 6-3).
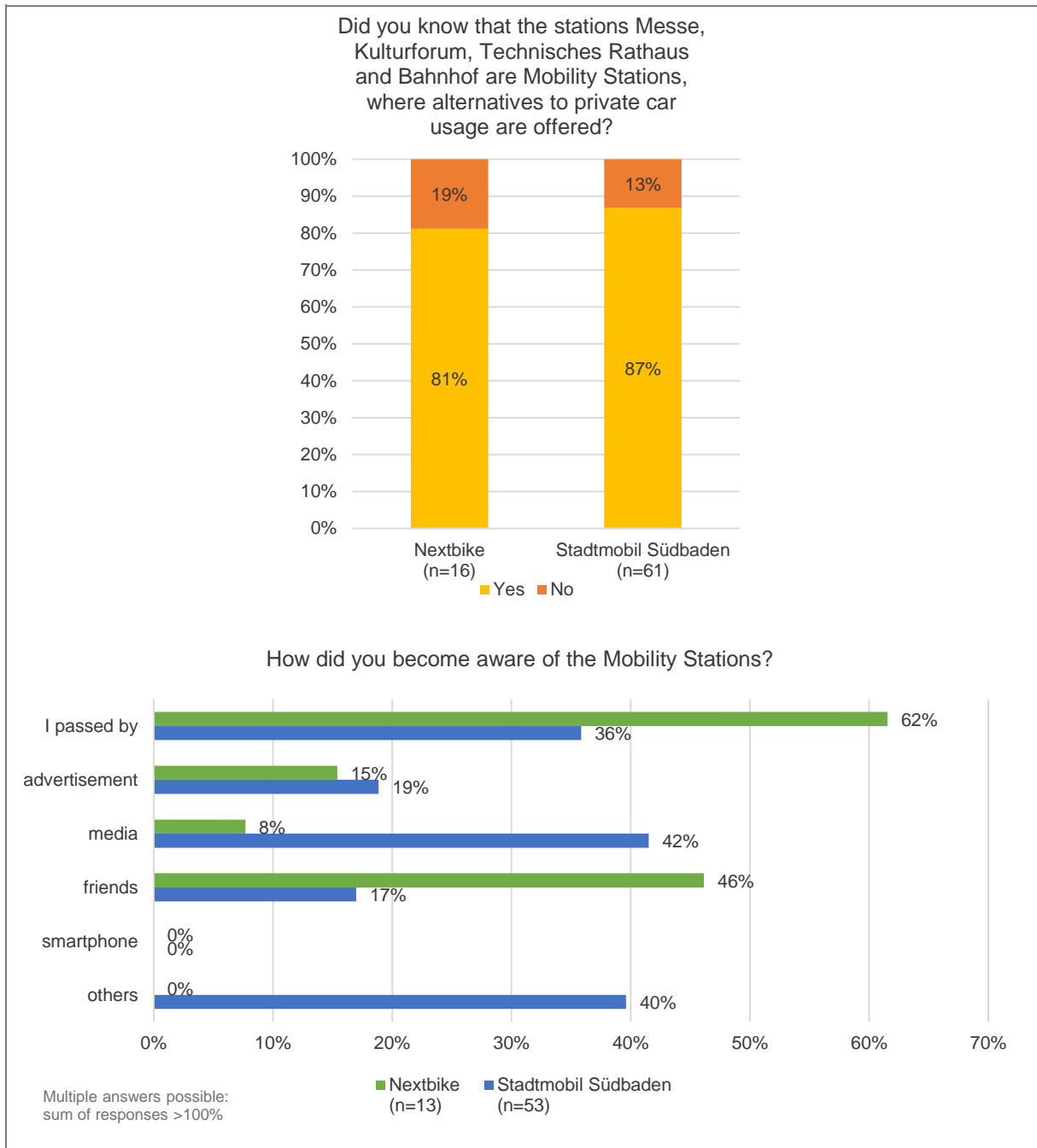
Figure 6-3: Questions about the awareness of the Mobility Stations in Offenburg.

Over 80% of both groups indicated that they were aware that "the stations Messe, Kulturforum, Technisches Rathaus and Bahnhof are Mobility Stations where alternatives to private car usage are offered." The majority of *nextbike* users learnt about the Mobility Stations by chance while walking past and 46% named friends as reason for their awareness. *Stadtmobil Südbaden* users named media (42%) and also passing by (36%). Again, *Stadtmobil Südbaden* users picked "others" (40%) and indicated that their provider made them aware of the Mobility Stations. These results make clear that users of the different providers, who offer vehicles at the Mobility Stations, are well informed and know that the four stations are part of the new brand "Einfach mobil".

6.1.4 Questions about the Last Trip

Questions about the last trip aimed to identify reasons for using the Mobility Stations, trip characteristics, the mode of transport replaced by the shared services and the mode of transport used to reach the station. The first three questions are presented in Figure 6-4. Participants were asked if they have ever rented a bicycle / vehicle of their provider at one of the Mobility Stations and if they can remember their last trip.
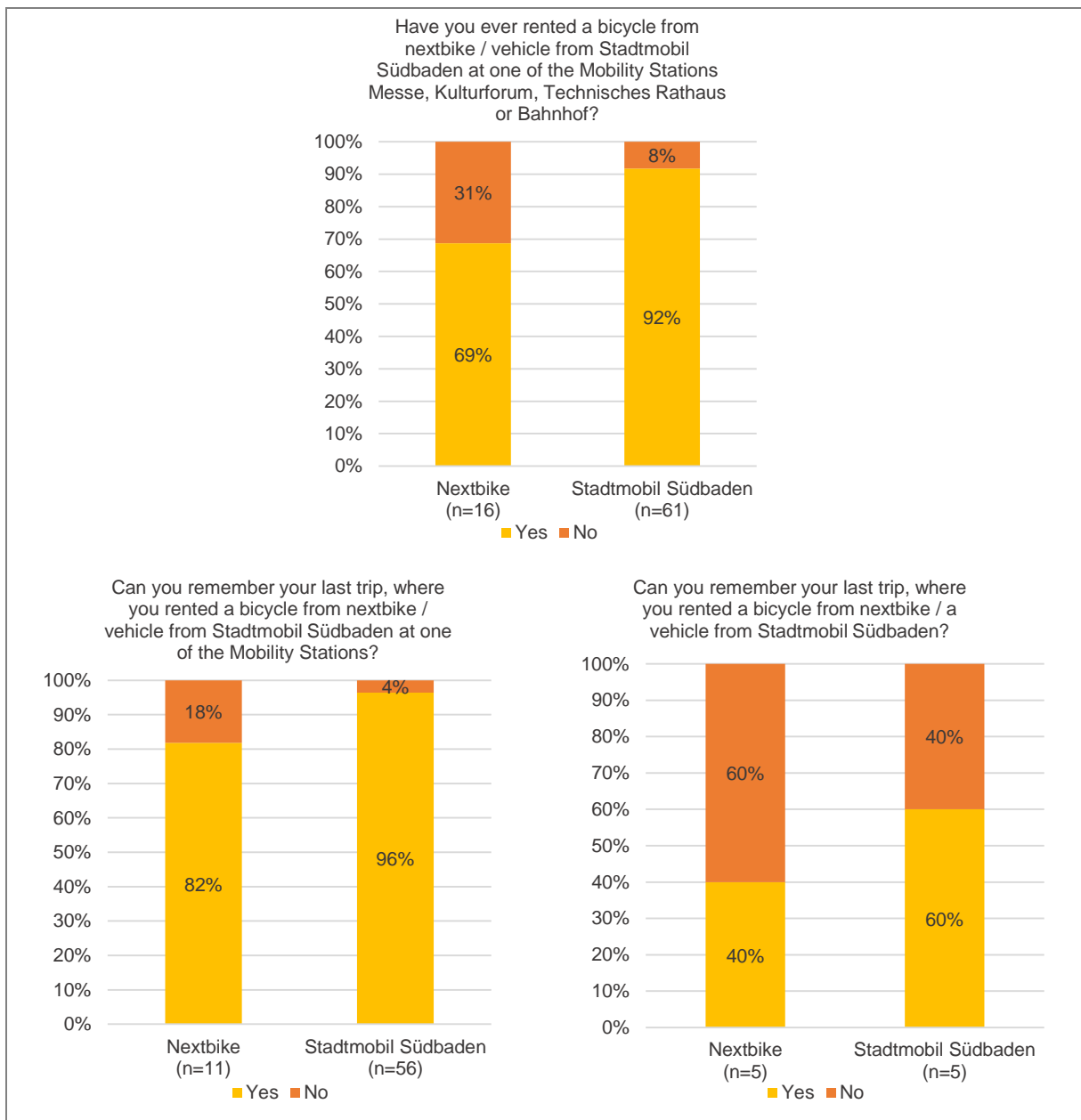
Figure 6-4: Questions about the last trip with the shared vehicles.

Almost all participants of *Stadtmobil Südbaden* (92%) and 69% or *nextbike* users have already rented a carsharing vehicle / a bikesharing bicycle at one of the Mobility Stations. These participants were asked, if they can remember their last trip "where they rented a bicycle from *nextbike* / vehicle from *Stadtmobil Südbaden* at one of the Mobility Stations". Only few participants (18% of *nextbike* users and 4% of *Stadtmobil Südbaden* users) could not remember their last trip. The participants, who indicated that they have never used the Mobility Stations, were asked in an additional question, if they could remember their last trip with the shared vehicles of *nextbike* or *Stadtmobil Südbaden* without mentioning the Mobility Stations.

Figure 6-5 displays the answers to the question at which of the four Mobility Stations the participants rented the shared vehicles of *nextbike* and *Stadtmobil Südbaden*.
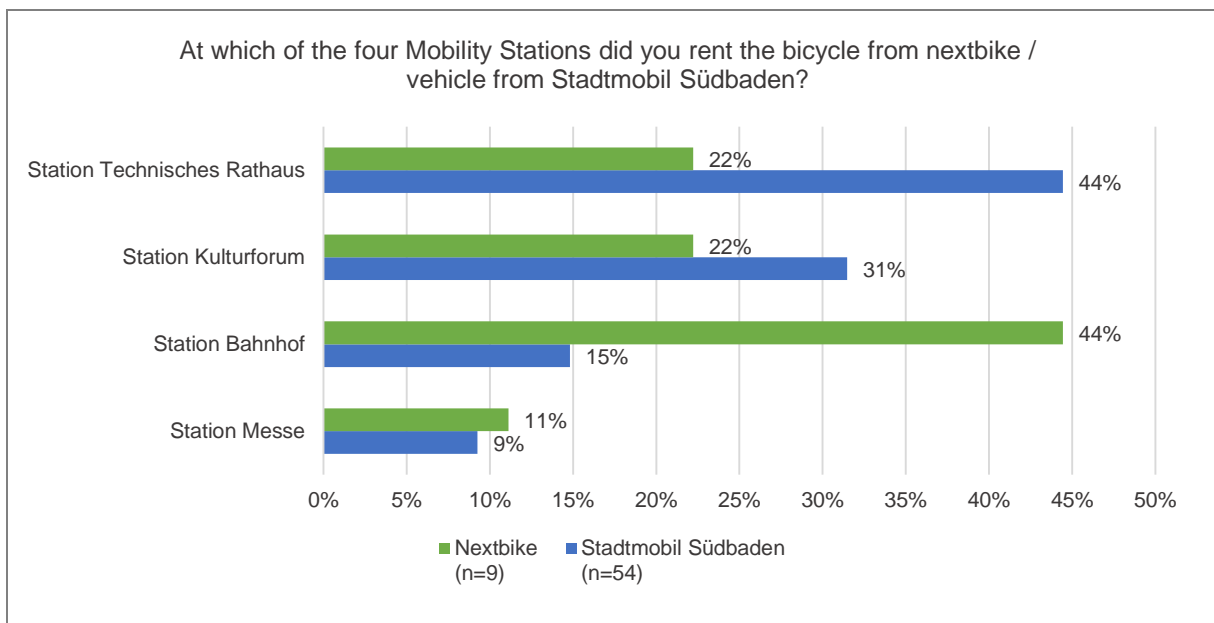
Figure 6-5: Mobility Station used for the last trip.

Forty-four percent of the *nextbike* users rented the bicycle for their last trip at the location "Bahnhof". The connection to regional and long distance train services could be a reason for the attractiveness of this station for users of the bikesharing service. People arrive with the trains and then pick a bicycle to reach their final destination in the city center. Almost half of the *Stadtmobil Südbaden* users (44%) booked their carsharing vehicle for the last trip at the station "Technisches Rathaus". One reason for the attractiveness of this station could lie in the availability of particular vehicles. Users can choose between one electric vehicle (brand: Renault ZOE) and one gasoline vehicle (brand: Opel Combo).

To analyze the reasons for renting the shared bicycles / vehicles at the respective Mobility Station, the question presented in Figure 6-6 was posed to the participants.
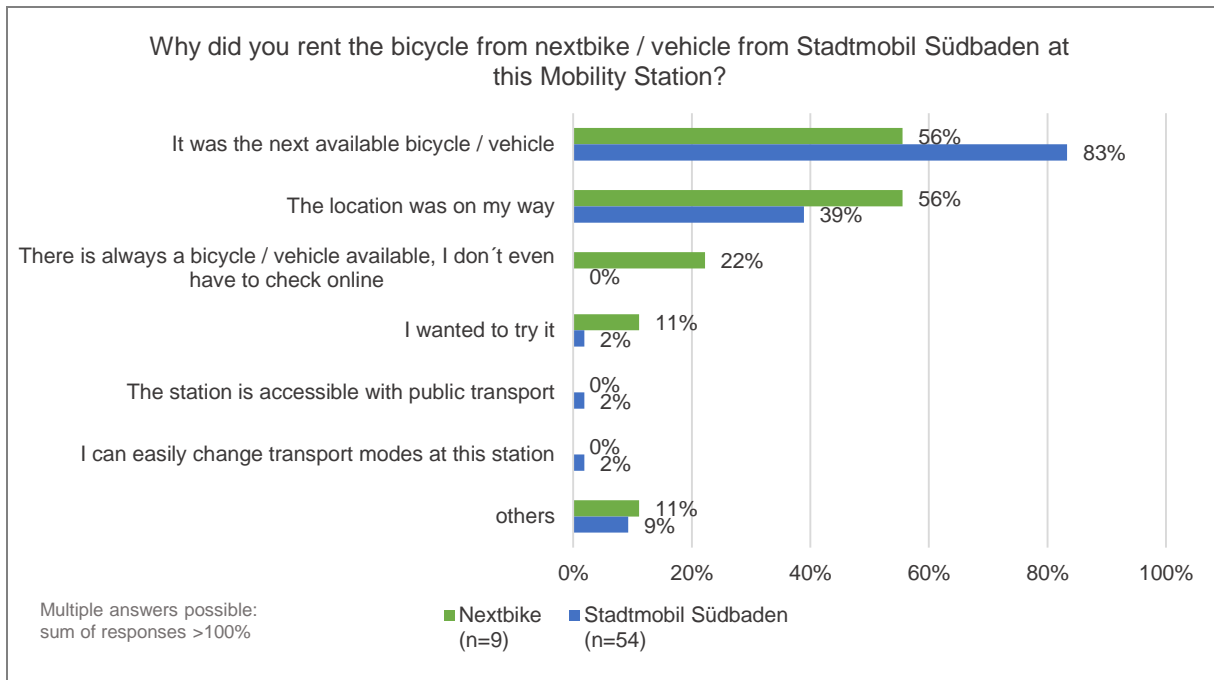
Figure 6-6: Reasons for renting the shared bicycles / vehicles at Mobility Stations.

The main reason users of *nextbike* and *Stadtmobil Südbaden* chose a Mobility Station, was the fact that the station offered the closest available bicycle / vehicle (56% for *nextbike* and 83% for *Stadtmobil Südbaden*). A large amount of participants (56% of *nextbike* and 39% of *Stadtmobil Südbaden*) also stated that the location is conveniently located along the way, which was the reason for choosing the respective Mobility Station. These answers indicate that the four new Mobility Stations are located in highly frequented and popular areas where people pass by and make use of the services. Four participants of *Stadtmobil Südbaden* choose the option "others" and defined that they chose the respective location, because only there their requested vehicle was available. The fact that the provider *Stadtmobil Südbaden* offers dedicated vehicles at every Mobility Stations proves these statements.

Users were asked, which mode they used to reach the station and which mode they would have used instead, if the bikesharing / carsharing offer would not exist (Figure 6-7). The predominant mode of transport to reach the Mobility Stations was walking for both *nextbike* and *Stadtmobil Südbaden* users. Participants of *Stadtmobil Südbaden* also used their private bicycles (46%). Intermodal connection that combines bikesharing, carsharing and public transport do not seem to play an important role at the moment. Only one participant of *nextbike* reached the Mobility Station by public transport and 2% of *Stadtmobil Südbaden* users used a shared bicycle of *nextbike*.
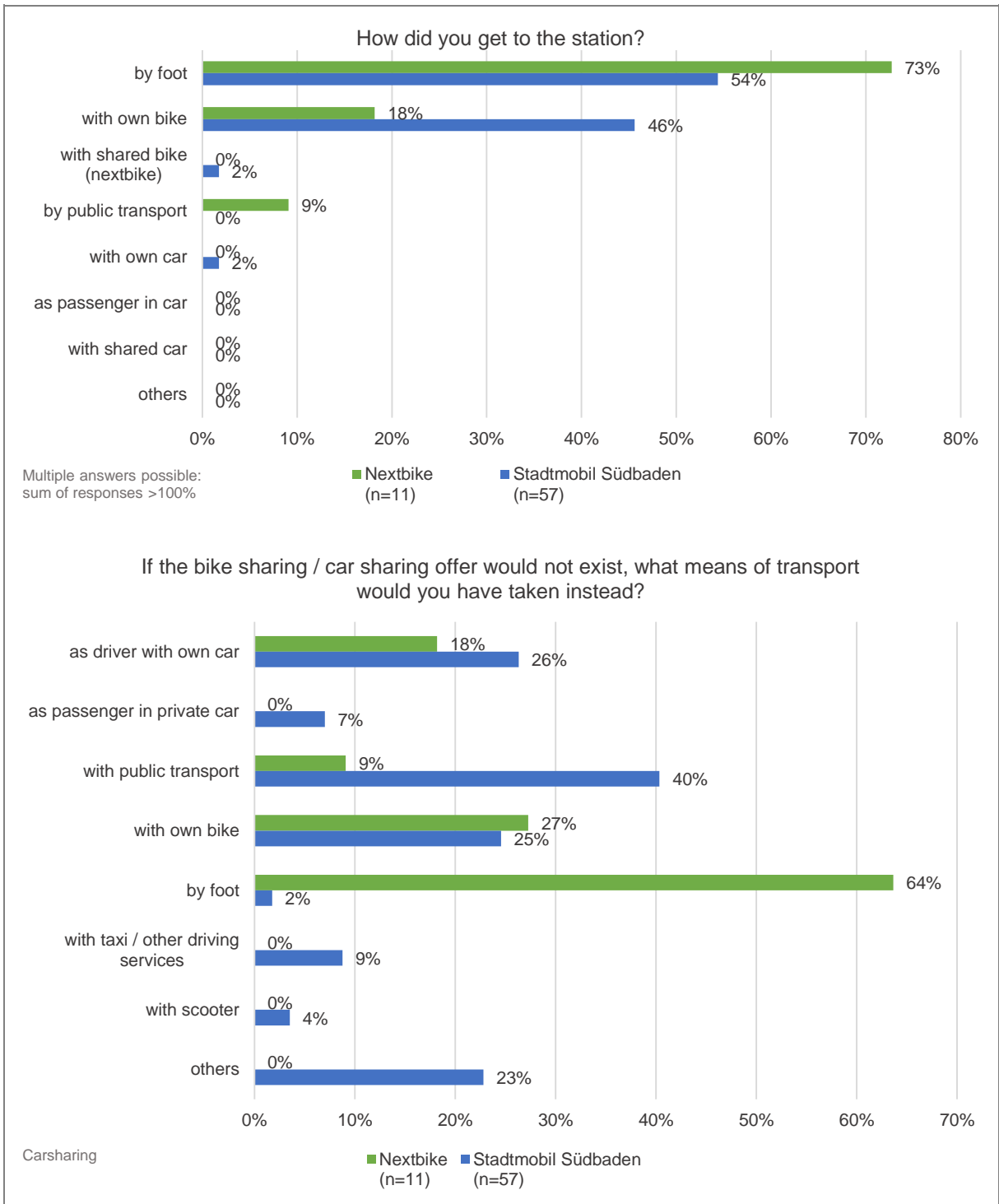
Figure 6-7: Mode of transport used a) to reach the Mobility Station and b) probably instead, if the bikesharing / carsharing services would not exist.

Answers to the question, what means of transport they would have taken instead, vary widely. Participants of *nextbike* would walk most likely (64%). Some would use their own bicycle (27%), drive their own car (18%) or use public transport (9%). Forty percent of *Stadtmobil Südbaden* users would use public transport, 26% would drive their own car and 25% their own bicycle.

Taxi or other driving services would be used by 9% of the *Stadtmobil Südbaden* users and only a small amount would walk (2%) or use a scooter (4%). The additional field "others" was used by 23% of *Stadtmobil Südbaden* users where they stated they would not make the trip, if the carsharing offer would not exist. The answers of the *Stadtmobil Südbaden* users to this question would imply that the carsharing service tends to generate more trips with cars. The assumption may be true, however, it should be noted that all these people forego to own a private car and therefore contribute to a reduction of the total number of vehicles within the city.

The following questions, presented in Figure 6-8, asked participants where (location, activity) they came from when they made their trip to the station and the purpose for their trip with the bicycles of *nextbike* and vehicles of *Stadtmobil Südbaden*.
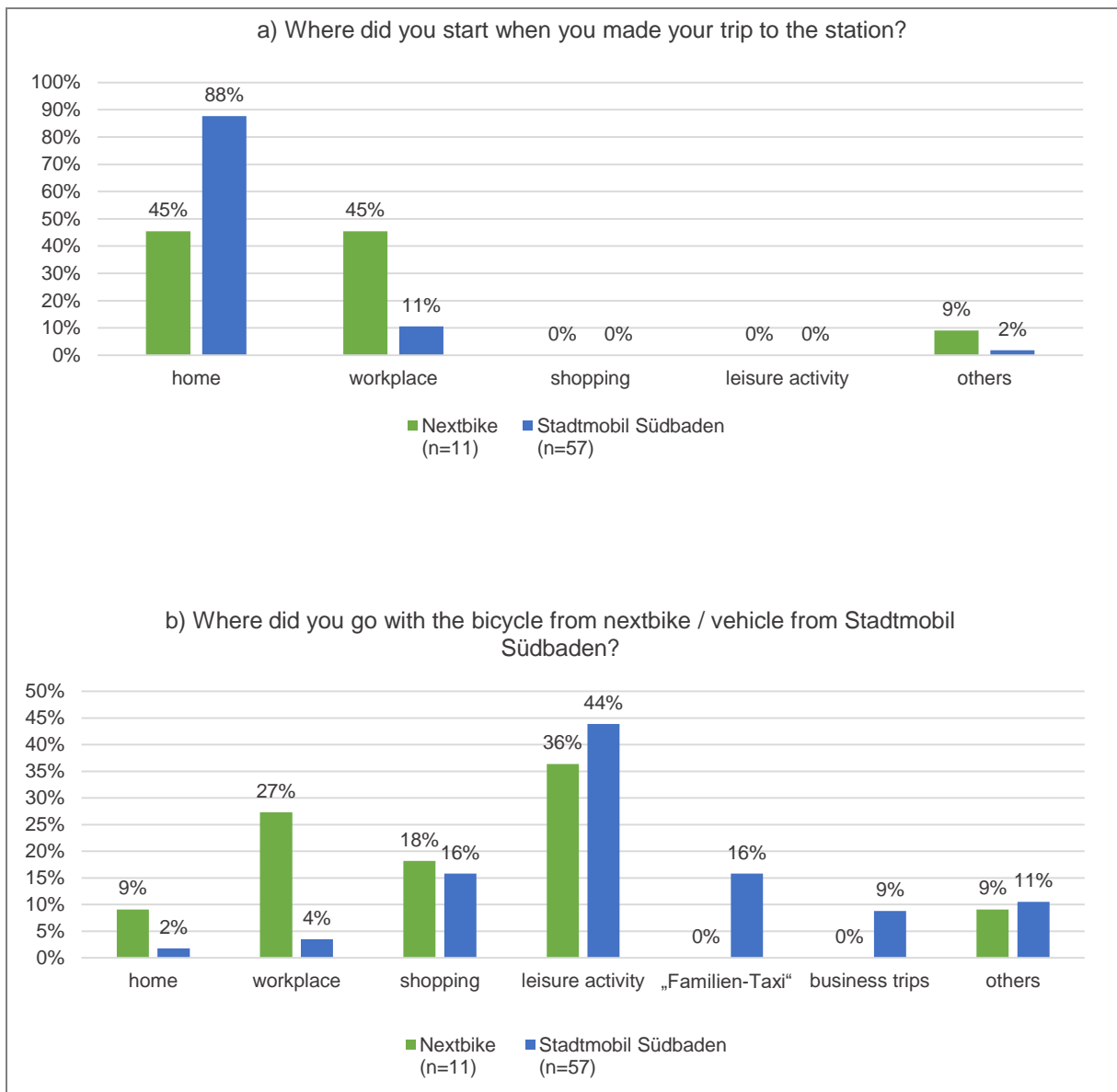
Figure 6-8: Starting location (a) and purpose of the trip (b).

Most users of *nextbike* came from home (45%) and from their workplaces (45%). The majority of *Stadtmobil Südbaden* users started at home (88%) and only 11% came from their workplaces. None of the participants in the user survey started from a shopping or leisure activity. The two mobility services were used for a variety of purposes. Users of the bikesharing provider *nextbike* used the shared bicycles for trips to their workplaces (27%), shopping trips (18%), trips for the purpose of leisure (36%) and trips to their homes (9%). Forty-four percent of *Stadtmobil Südbaden* users used the carsharing vehicle to reach a destination for the purpose of leisure. Shopping and "Familien-Taxi" (English: family taxi) was named by 16% of participants, respectively. A small amount of carsharing users used the vehicles for business trips (9%), trips to their workplaces (4%) and trips to their homes (2%).

On average, customers of *nextbike* traveled 3.5 minutes to reach the Mobility Station, users of *Stadtmobil Südbaden* traveled 5.5 minutes. The average travel time to the destination was 10.5 minutes for *nextbike* users and 40 minutes for *Stadtmobil Südbaden* users (Figure 6-9). These numbers indicate that the time effort to reach a Mobility Station is somehow correlated with the time, people travel with the shared vehicles.
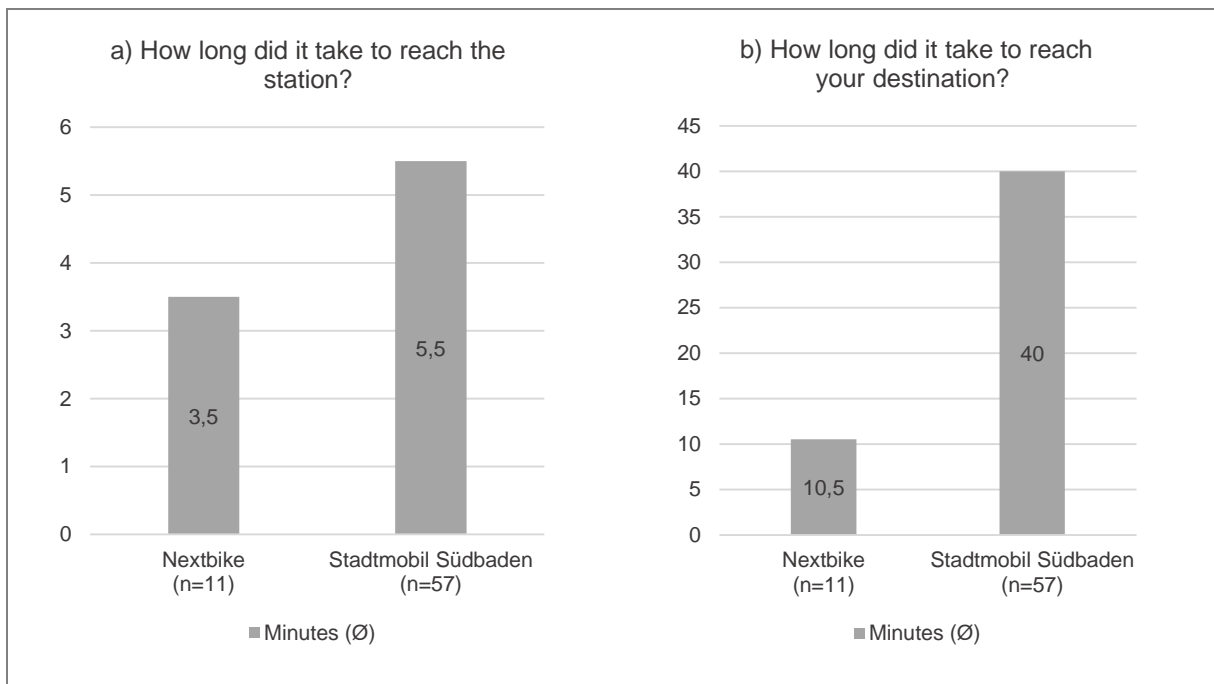
Figure 6-9: Travel time a) to reach the station and b) with the shared vehicle / bicycle.

After participants were asked about their last trip, they had the possibility to talk about problems that occurred while using the Mobility Stations. All customers of *nextbike* stated that they never had problems at the stations. In contrast, 25 *Stadtmobil Südbaden* users indicated that they already had problems while using the Mobility Stations. Figure 6-10 presents the problems named by the *Stadtmobil Südbaden* users in the open-ended question.
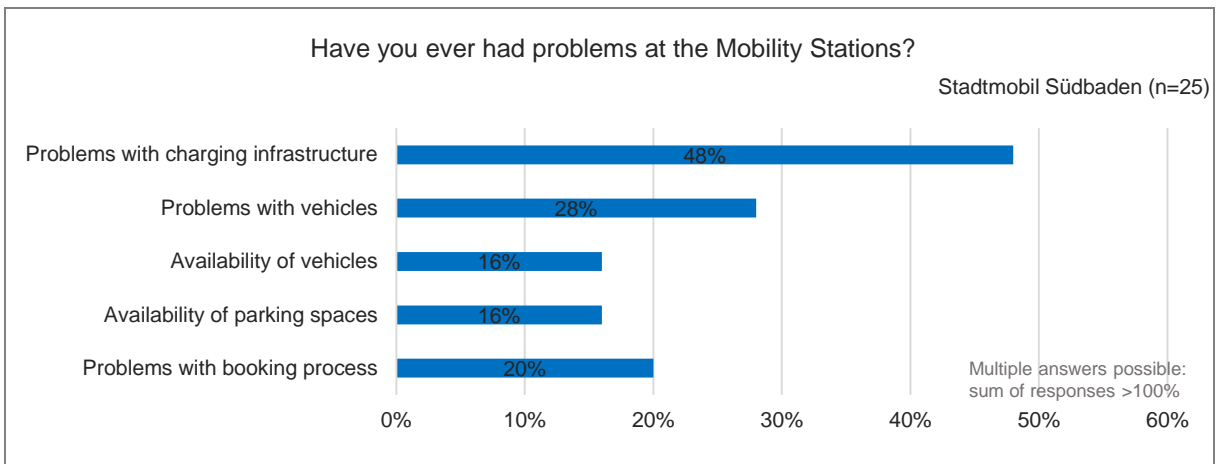
Figure 6-10: Problems at the Mobility Stations (Stadtmobil Südbaden customers).

Almost half of the participants (48%) stated that they had problems with the charging infrastructure for electric carsharing vehicles. Twenty-eight percent of responses included problems with vehicles. Problems regarding the availability of vehicles and parking spaces were named by 16% of respondents respectively. Another 20% of participants indicated problems with the booking process.

Among the customers of *Stadtmobil Südbaden*, almost half of all participants gave suggestions for the improvement of the service. The majority of responses was related to the carsharing service of *Stadtmobil Südbaden* (39%). Therefore, the responses were separated and are now presented in two diagrams in Figure 6-11.
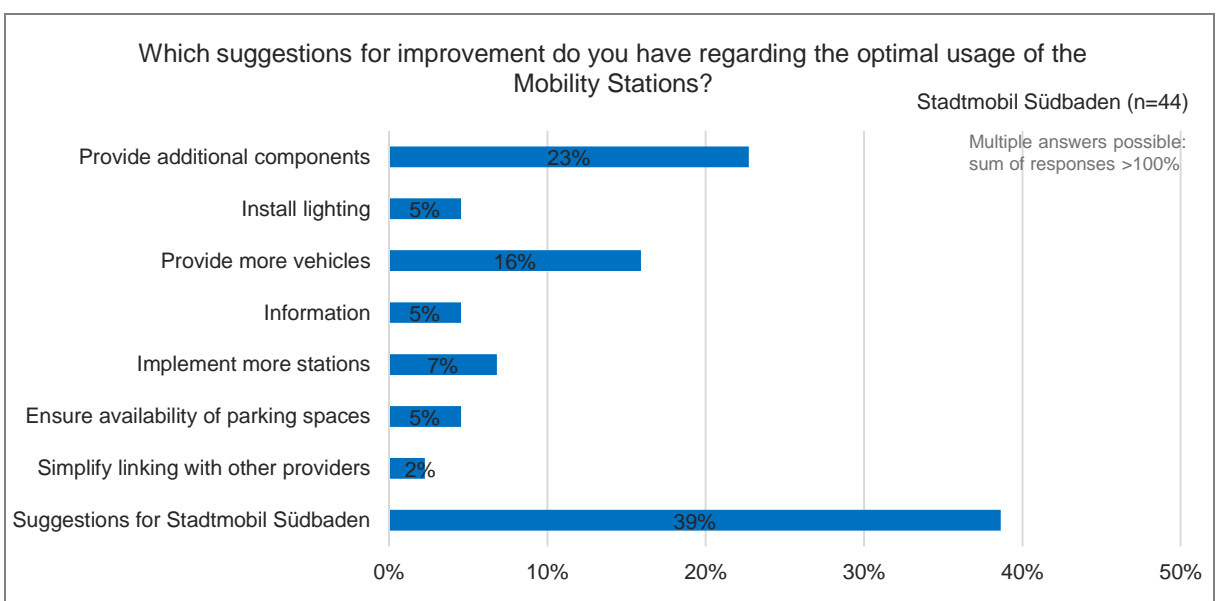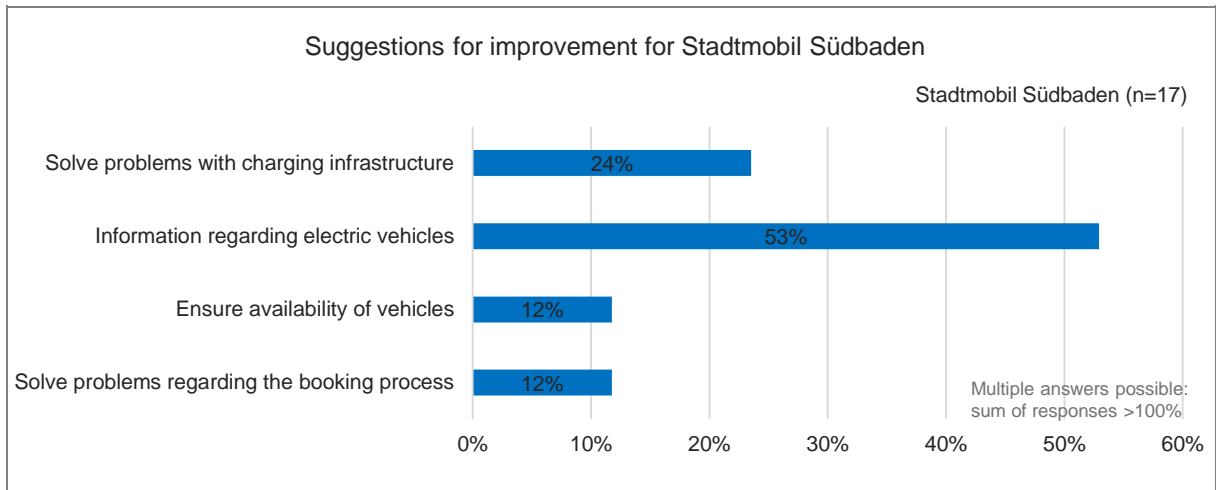
Figure 6-11: Suggestions for improvement of the Mobility Stations and for Stadtmobil Südbaden.

Many Stadtmobil Südbaden customers asked for additional components at Mobility Stations (23%). Sixteen percent wanted to have more vehicles and a wider choice of models. The extension of the network of stations was mentioned by 7%. Obviously, since the introduction of the Mobility Stations, there have been increasing problems with the electric cars and the charging facilities. In the open-ended question, users claimed that the provider should solve these problems (24%) and provide more information regarding the electric vehicles (53%). Some users mentioned problems regarding the booking process (12%). Another argument was the availability of vehicles (12%).

6.1.5   Components of Mobility Stations

In the following questions, the users were asked to state their opinions on the different (additional) components of Mobility Stations and within their immediate area. The components were presented and participants chose between the options: very important – rather important – rather unimportant – not important. The first diagram for every question presents the arithmetic mean of the answers for both groups and should help to gain an overview of the given answers (Figure 6-12). In the subsequent diagrams, the percentages for every answer is shown for *nextbike* and *Stadtmobil Südbaden* customers separately (Figure 6-13).

Figure 6-12: Importance of components of the Mobility Stations for users.
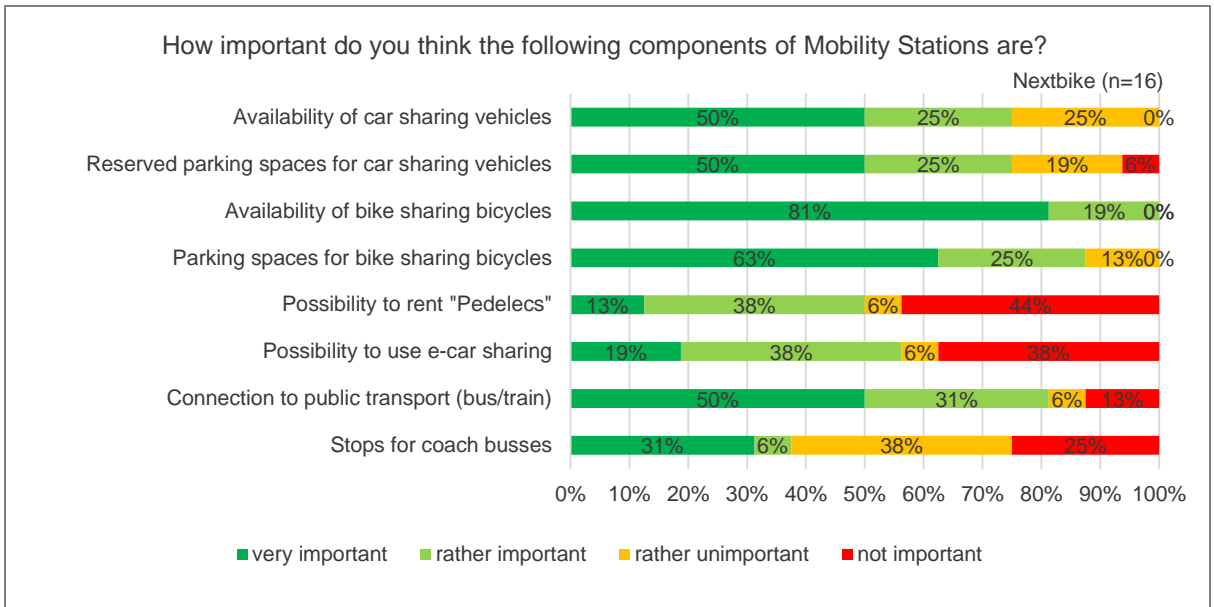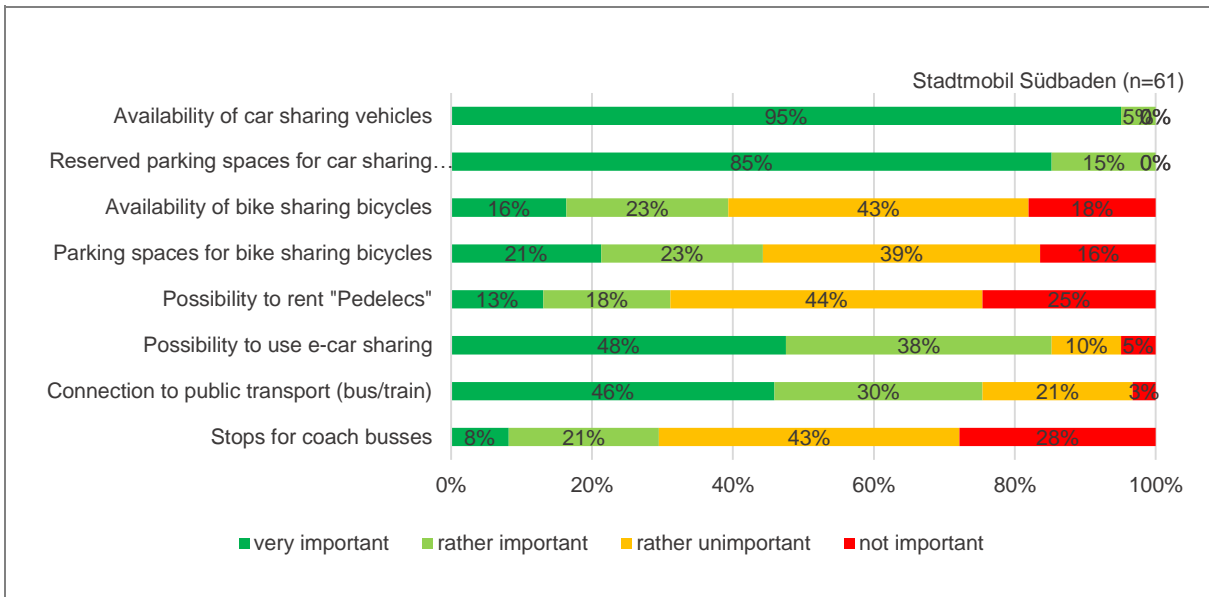
Figure 6-13: Importance of components of the Mobility Stations for nextbike / Stadtmobil Südbaden customers.

As expected, the majority of *nextbike* users rated components related to the use of bikesharing as very important (*availability of bikesharing bicycles (81%), parking spaces for bikesharing bicycles (63%)*). Similarly, *Stadtmobil Südbaden* users rated components related to the use of carsharing (*availability of carsharing vehicles (95%), reserved parking spaces for carsharing vehicles (85%), possibility to use electric carsharing (48%))* as very important. Additionally, 50% of the bikesharing users and 46% of the carsharing users confirmed the importance of the connection to public transport. The use of coach bus services was rated rather unimportant by 38% (*nextbike*) and 43% (*Stadtmobil Südbaden*). The possibility to rent pedelecs at the Mobility Station was not important for 44% of the *nextbike* users and 25% of the *Stadtmobil Südbaden* users.

The modular design of the Mobility Stations in Offenburg allows a high flexibility in the configuration of stations. In order to understand the needs for additional components of Mobility Stations, the users of *nextbike* and *Stadtmobil Südbaden* were asked, how they would rate them in terms of importance (Figure 6-14 and Figure 6-15).
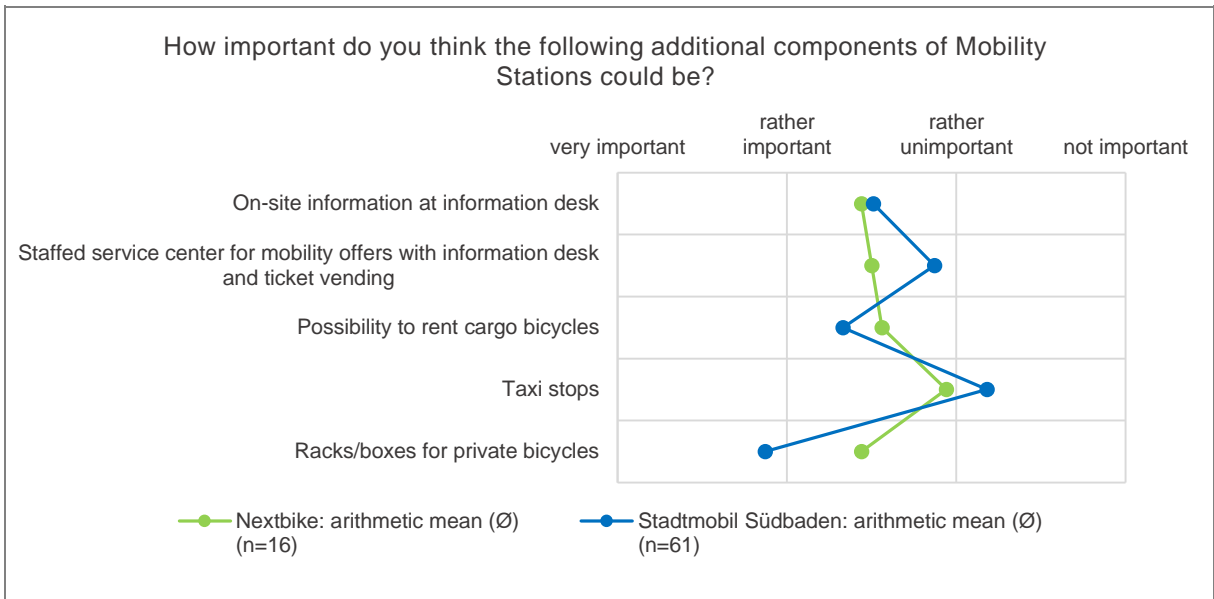
Figure 6-14: Importance of additional components of the Mobility Stations for users.
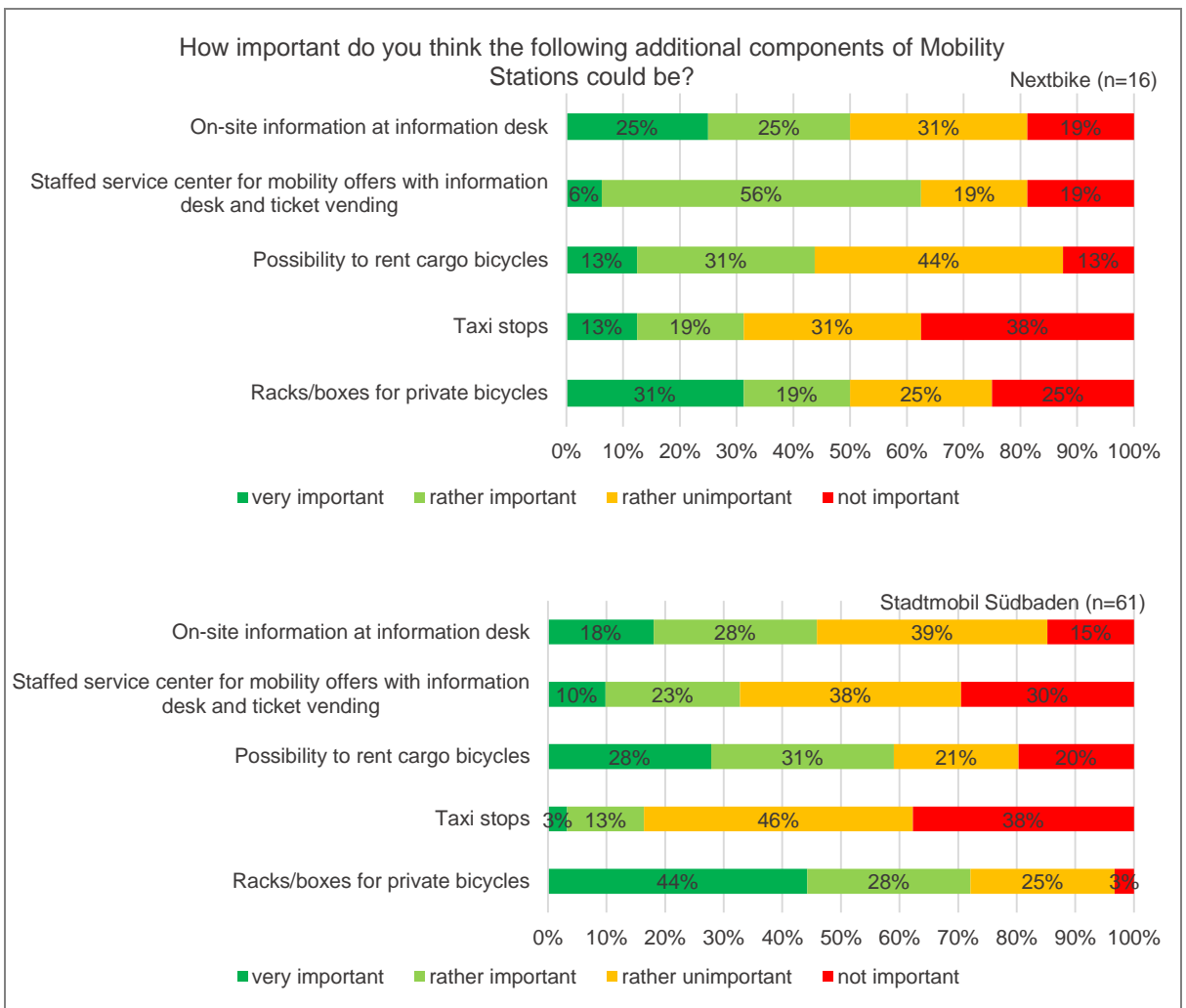
Figure 6-15: Importance of additional components of the Mobility Stations for nextbike / Stadtmobil Südbaden customers.

At the moment, there is no on-site information provided at the Mobility Stations. Therefore, a possible extension could be an (unstaffed) information desk. This component would be very / rather important for 50% of *nextbike* users and 46% of *Stadtmobil Südbaden* users. A staffed service center, like the planned "Mobilitätszentrale" (English: mobility center), with information and ticket vending was rated rather important by 56% of *nextbike* users and in contrast, rather unimportant by 38% of *Stadtmobil Südbaden* users. The possibility to rent cargo bicycles was ranked rather unimportant by 44% of *nextbike* users but very / rather important by 59% of *Stadtmobil Südbaden* users. Facilities for private bike parking (racks / boxes) were rated very / rather important by 50% of *nextbike* users and 72% of *Stadtmobil Südbaden* users. Thirty-eight percent of participants in both groups ranked taxi stops as unimportant.

Offers in the surrounding area can also play a role for increasing the attractiveness of Mobility Stations. The following question aimed to find out how important components nearby theses stations are (Figure 6-16 and Figure 6-17).
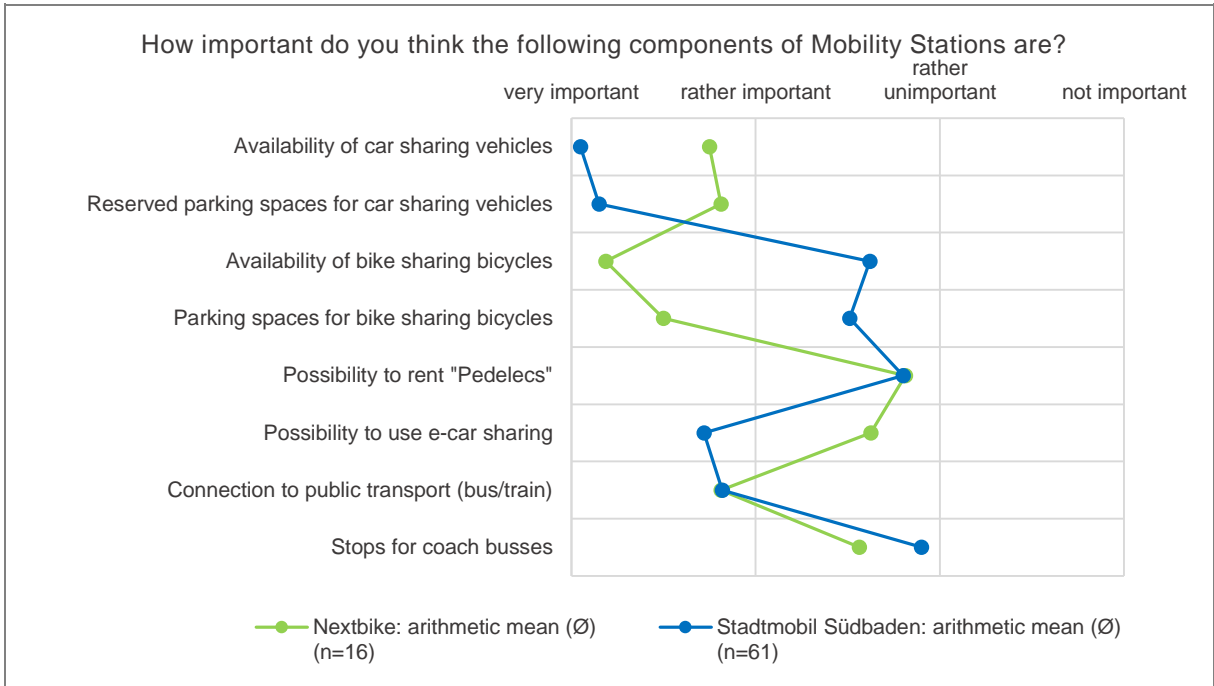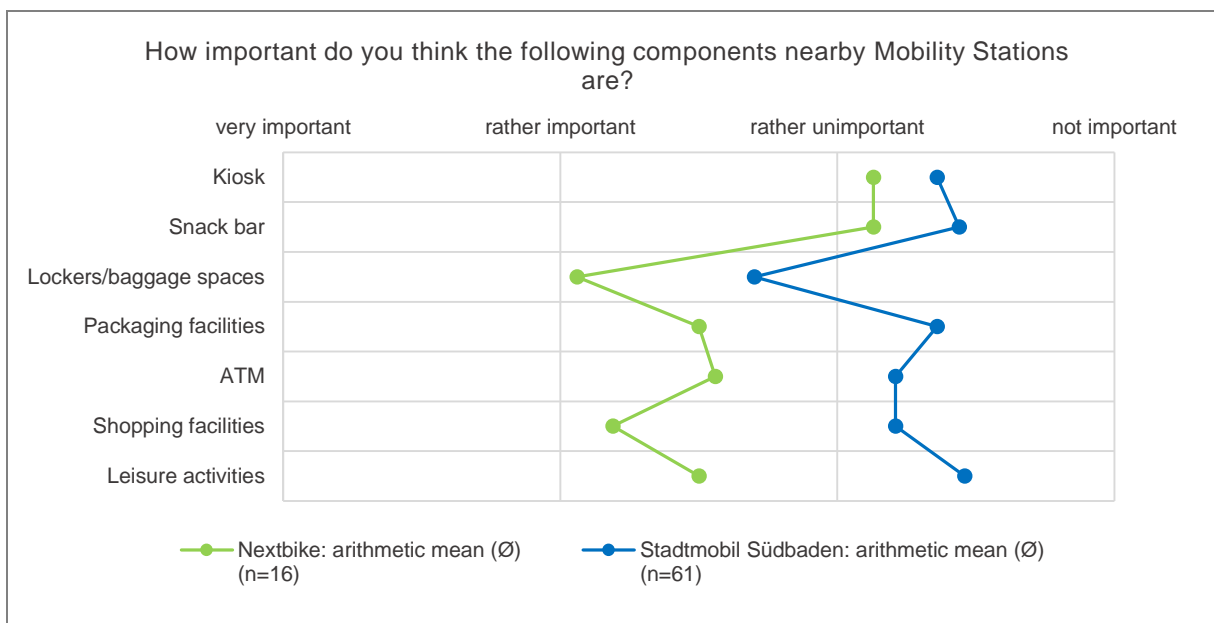

Figure 6-16: Importance of components nearby Mobility Stations for users.
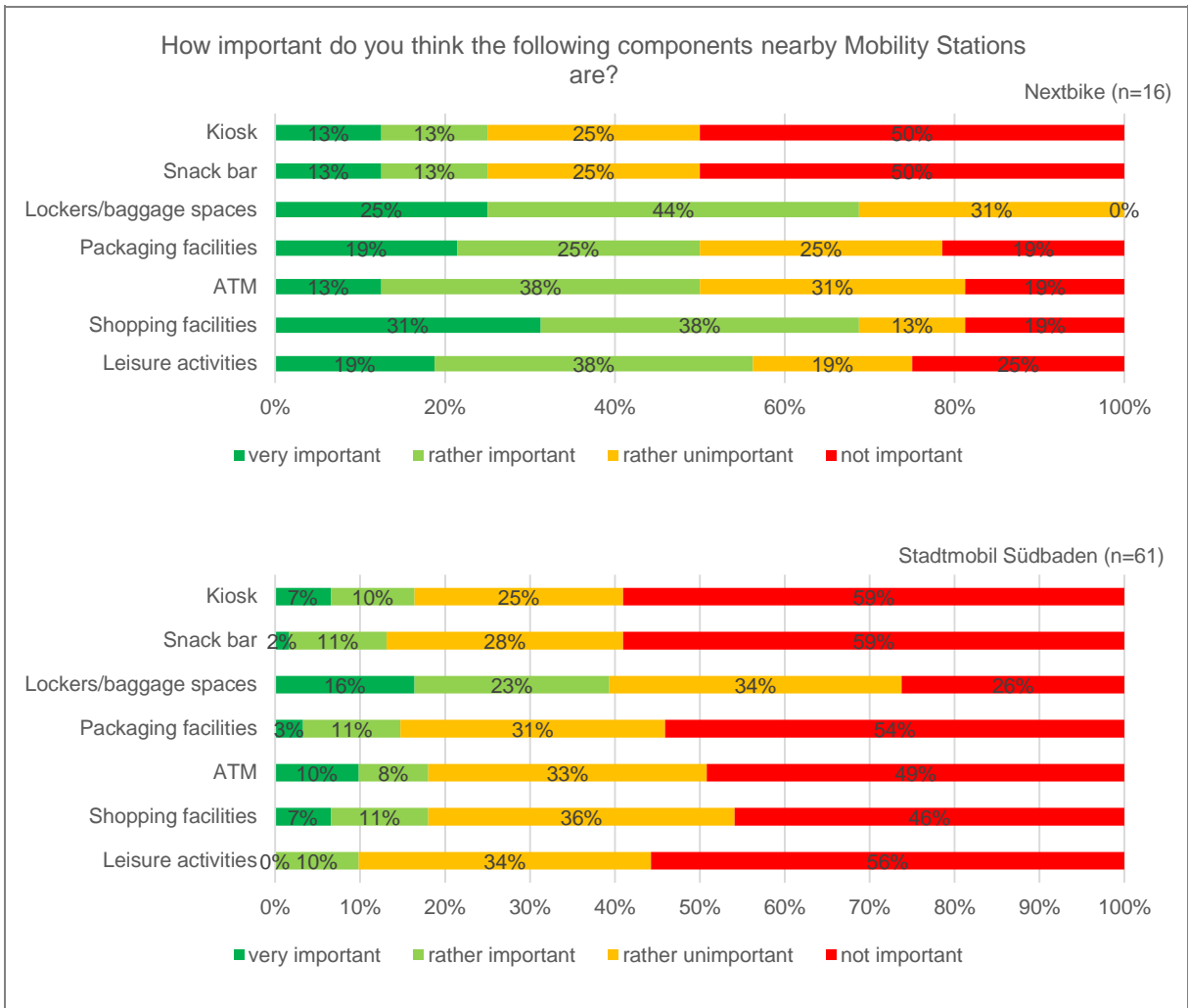
Figure 6-17: Importance of components of the Mobility Stations for nextbike / Stadtmobil Südbaden users.

Mostly, a kiosk or snack bar, packaging facilities or an ATM seem to be unimportant for users of the Mobility Stations. Whereas, lockers and baggage spaces were rated very / rather important by users of *nextbike* (69%) and users of *Stadtmobil Südbaden* (39%). Bikesharing users rated leisure activities nearby Mobility Stations as very / rather important (57%), but only 10% of the carsharing customers rated them with rather important.

6.1.6 Influences of Mobility Stations on Mobility Behavior

Important questions with regards to the use of integrated multimodal mobility services are, if and how they have influence on mobility behavior in the short and long term. To analyze the potential changes, statements were made and the participants had to decide, whether they totally agree – rather agree – rather do not agree – totally agree. The first statements (Figure 6-18 and Figure 6-19) were presented to all participants who stated that they have already used the Mobility Stations.

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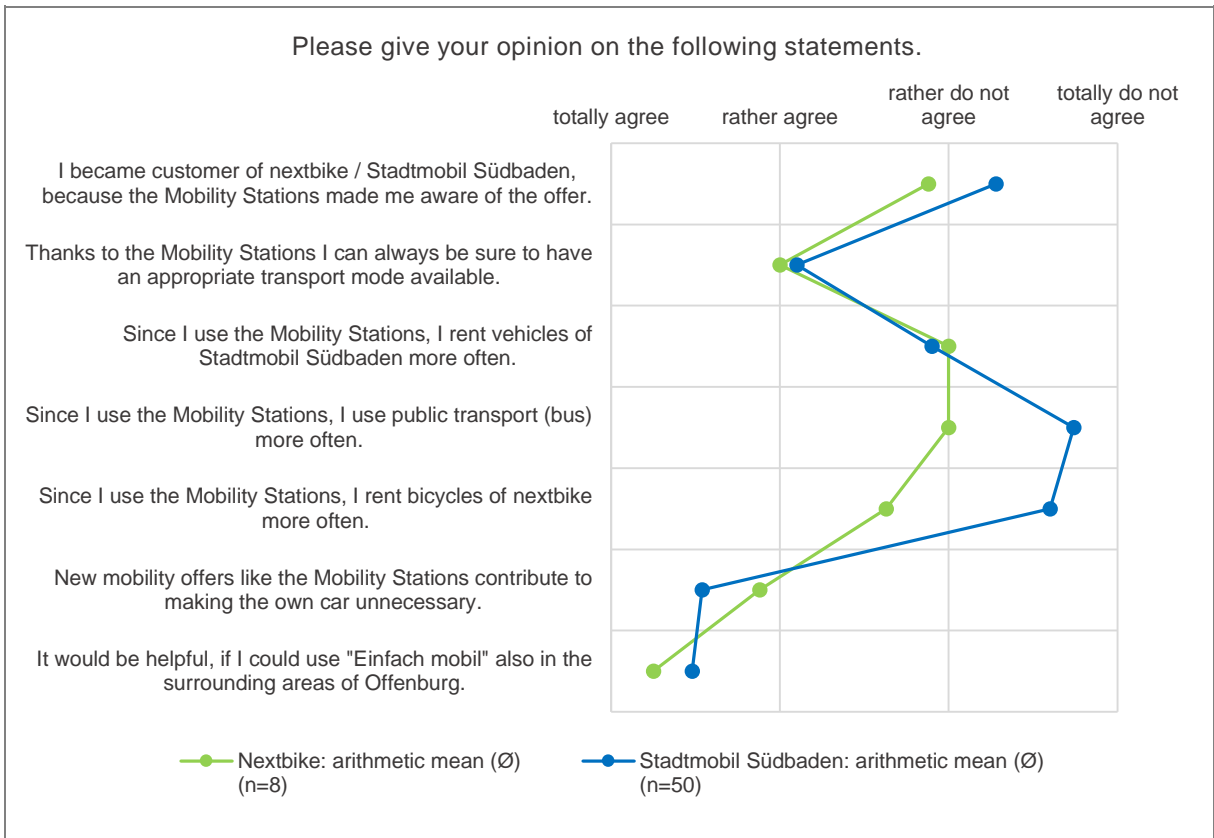
Figure 6-18: Statements about the influences of Mobility Stations on mobility behavior of users.
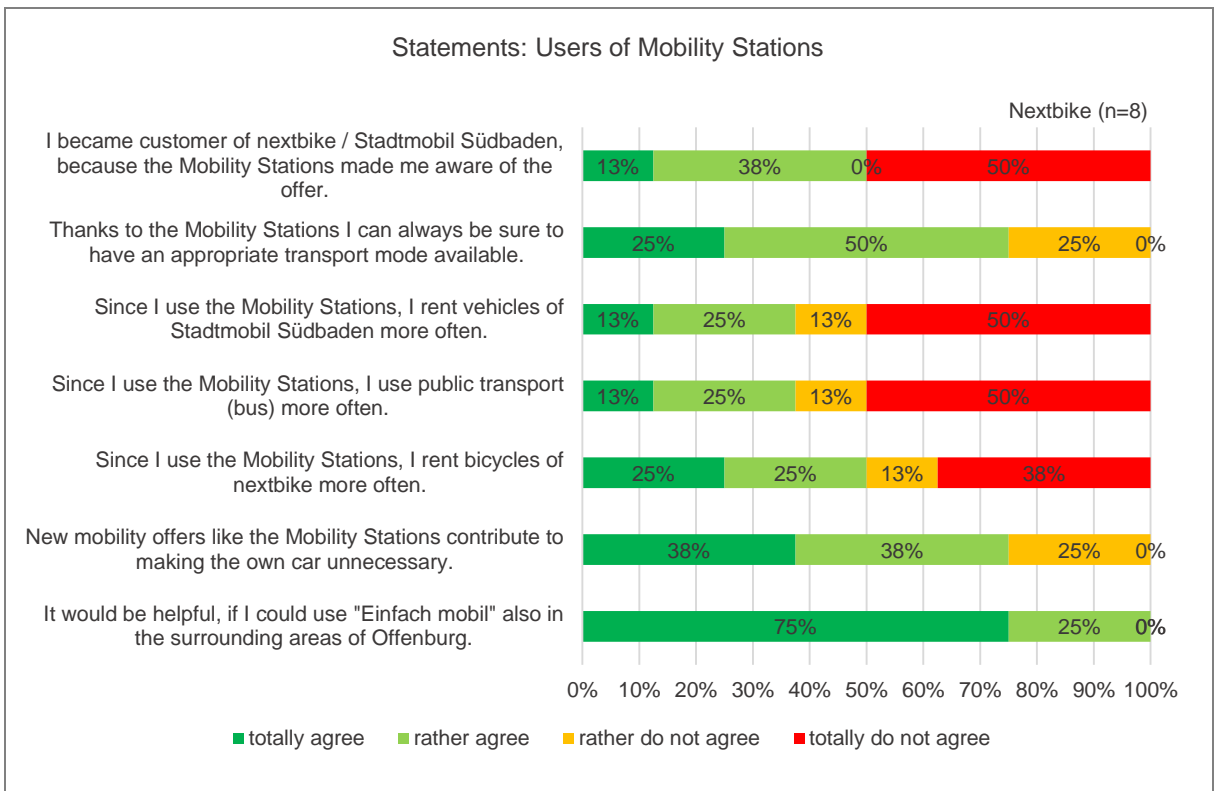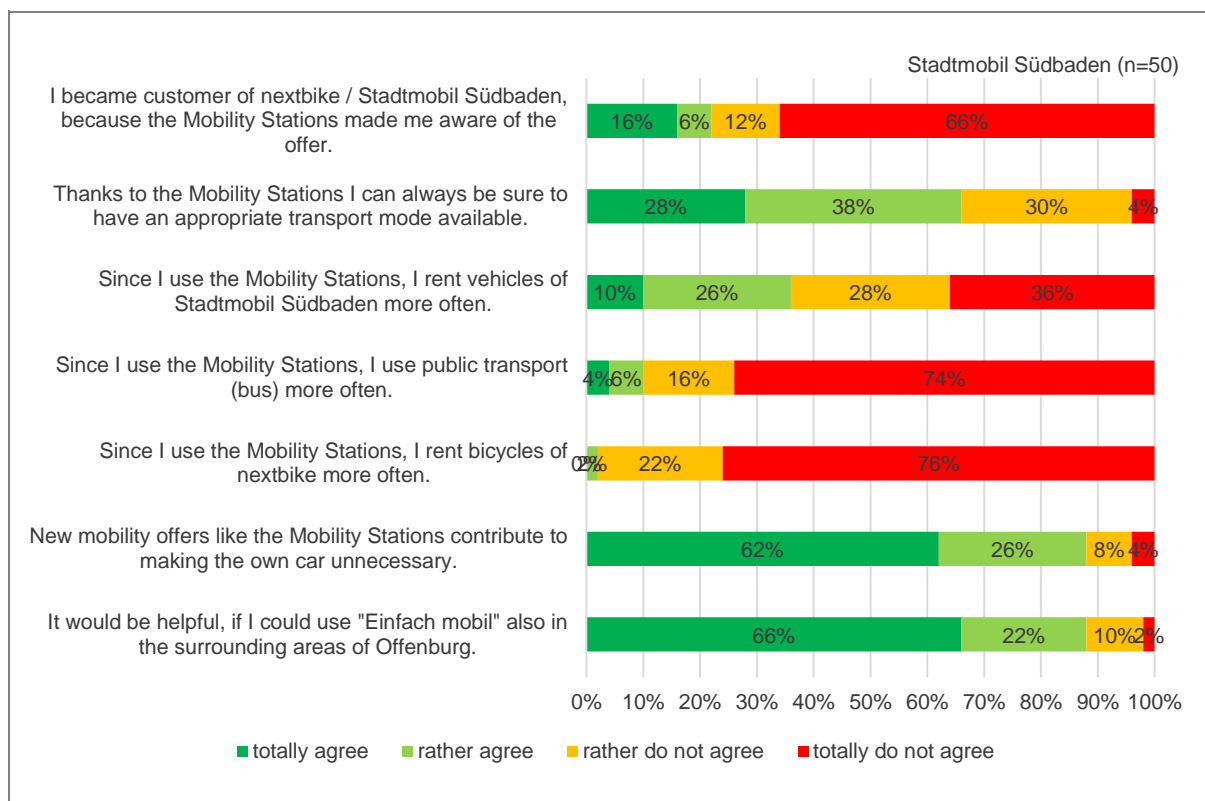
Figure 6-19: Statements about the influences of Mobility Stations on mobility behavior of nextbike */* Stadtmobil Südbaden *users.*

The first statement wanted to find out, if the Mobility Stations had influence on the decision of people to become customers of the bikesharing provider *nextbike* or the carsharing provider *Stadtmobil Südbaden*. Half of *nextbike* users stated that the Mobility Stations had an influence. A small but significant portion of *Stadtmobil Südbaden* users totally agreed and showed that the stations had induced them to join the provider (16%). A large amount of participants totally or rather agreed that "thanks to the Mobility Stations, they can always be sure to have an appropriate transport mode available" (75% of *nextbike* users and 66% of *Stadtmobil Südbaden* users). The following statements aimed to find out, if respondents use (other) mobility services more often, since they use the Mobility Station:

- 50% of *nextbike* users totally / rather agreed that they use bicycles of *nextbike* more often;
- 36% of *Stadtmobil Südbaden* users totally / rather agreed that they use vehicles of *Stadtmobil Südbaden* more often;
- 38% of *nextbike* users and only 10% of *Stadtmobil Südbaden* users indicate that they use public transport more often;
- 38% of *nextbike* users totally / rather agreed that they use the carsharing services of *Stadtmobil Südbaden* more often;
- 98% of *Stadtmobil Südbaden* users rather or totally did not agree that they use bikesharing of *nextbike* more often since they use the Mobility Stations.

About 76% of *nextbike* users and almost 90% of *Stadtmobil Südbaden* users thought that such offers contribute to make private cars unnecessary. Additionally, all users of *nextbike* and almost 90% of *Stadtmobil Südbaden* agreed that "it would be helpful, if they could use "Einfach mobil" also in the surrounding areas of Offenburg.

Even if some of the participants have never used the Mobility Stations, they probably changed their mobility behavior due to the usage of the bikesharing / carsharing services. Figure 6-20 and Figure 6-21 present the statements for participants who have never used the stations before.
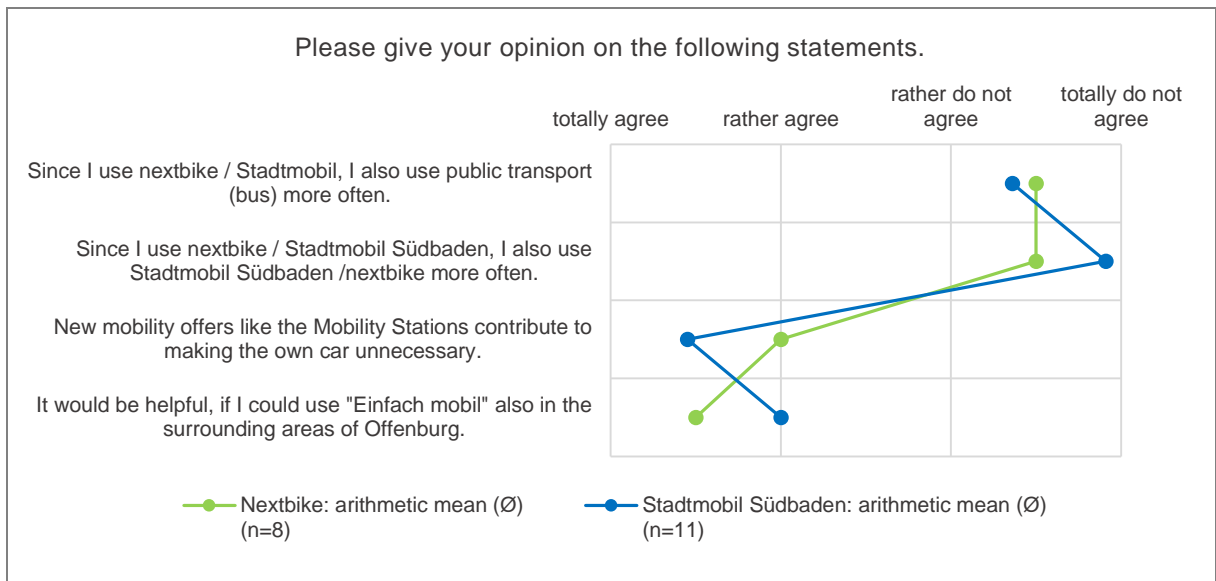
Figure 6-20: Statements about the influences of new mobility services on mobility behavior of users.
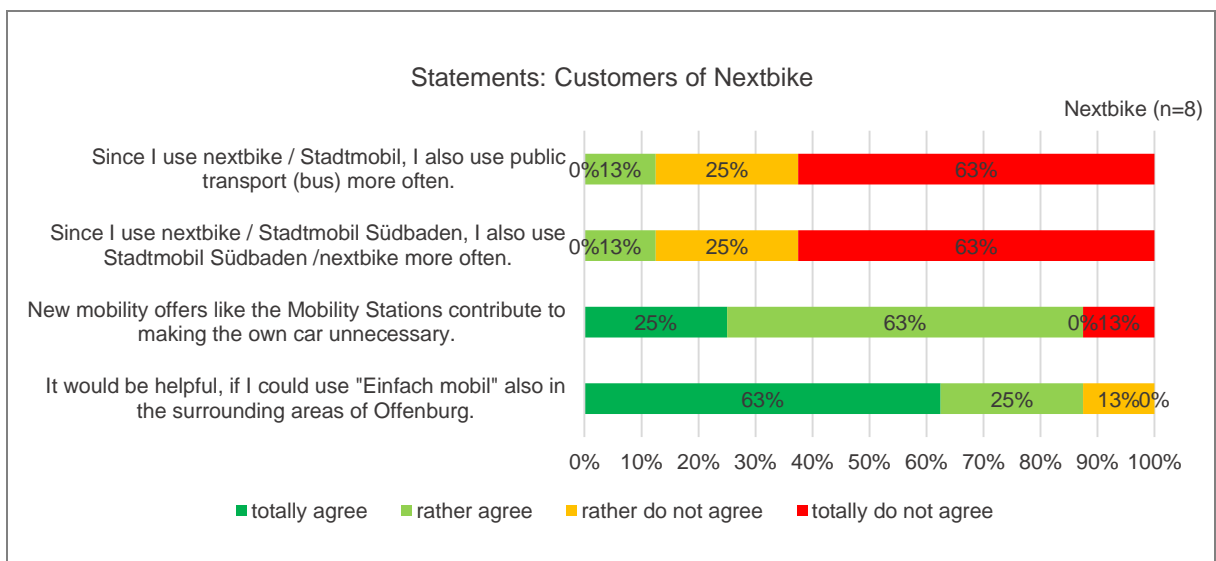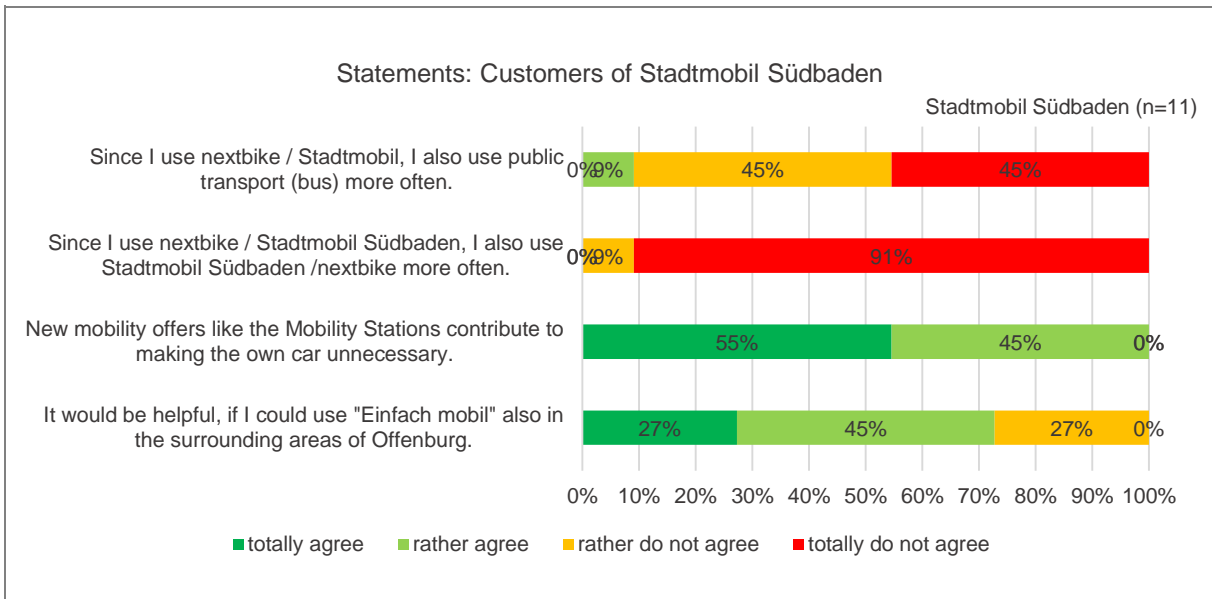
Figure 6-21: Statements about the influences of mobility services on mobility behavior of nextbike */* Stadtmobil Südbaden *users.*

Only a small amount of *nextbike* users (13%) and *Stadtmobil Südbaden* users (9%) confirmed that they use more public transport since they use the sharing service. Thirteen percent of *nextbike* users also use *Stadtmobil Südbaden* more often, since they have been customers of the bikesharing service. Unfortunately, none of the *Stadtmobil Südbaden* users agreed that "since they use *Stadtmobil Südbaden*, they also use *nextbike* more often". About 88% of *nextbike* users and all *Stadtmobil Südbaden* users thought that such offers contribute to make private cars unnecessary. Additionally, 88% of *nextbike* users and 72% of *Stadtmobil Südbaden* agreed that "it would be helpful, if they could use "Einfach mobil" also in the surrounding areas of Offenburg.

6.1.7 Demand for More Mobility Stations

The following question was posed to find out, if there is a general demand for additional Mobility Stations in Offenburg (Figure 6-22). If participants said "Yes", they were asked to specify their answer and state where they think stations are necessary through writing the postal code, quarter or district, station or intersection. In case the participants said "No", they were asked to state why they don't want to have additional stations.
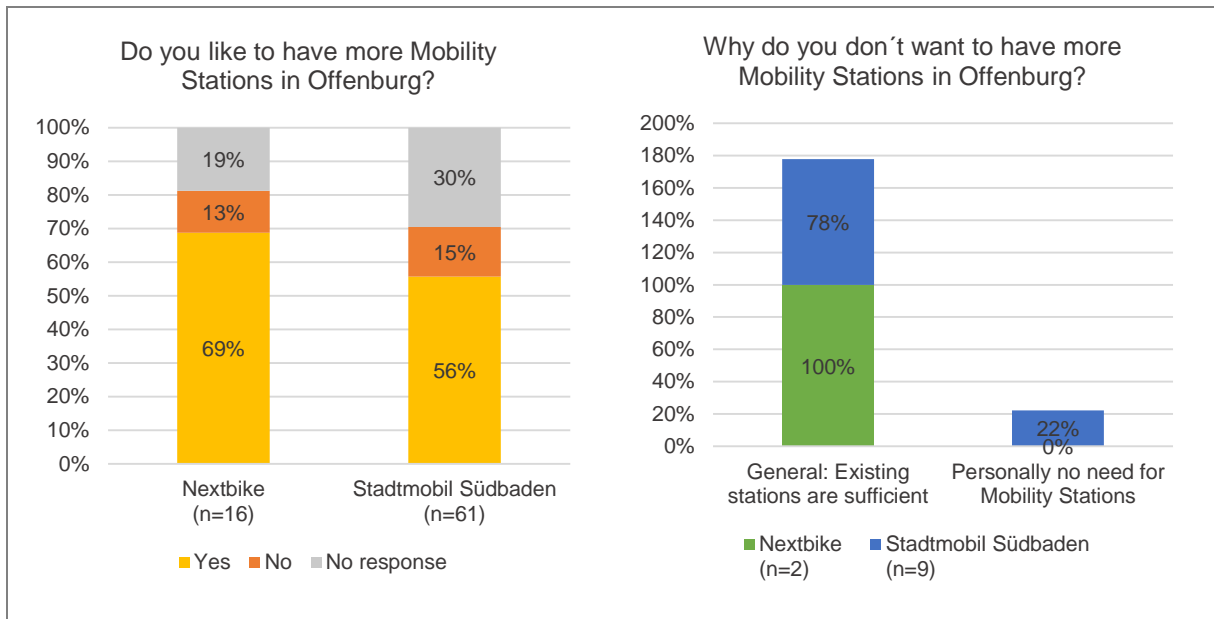
Figure 6-22: Demand for additional Mobility Stations in Offenburg.

The majority of *nextbike* users (69%) and *Stadtmobil Südbaden* users (56%) wanted more Mobility Stations in Offenburg. In contrast, 13% (*nextbike* users) and 15% (*Stadtmobil Südbaden* users) disagreed to further extend the network of stations. The rest (19% of *nextbike* users and 30% of *Stadtmobil Südbaden* users) were undecided. The preferable locations for more Mobility Stations, according to bikesharing and carsharing users, are presented in Figure 6-23 and Figure 6-24.
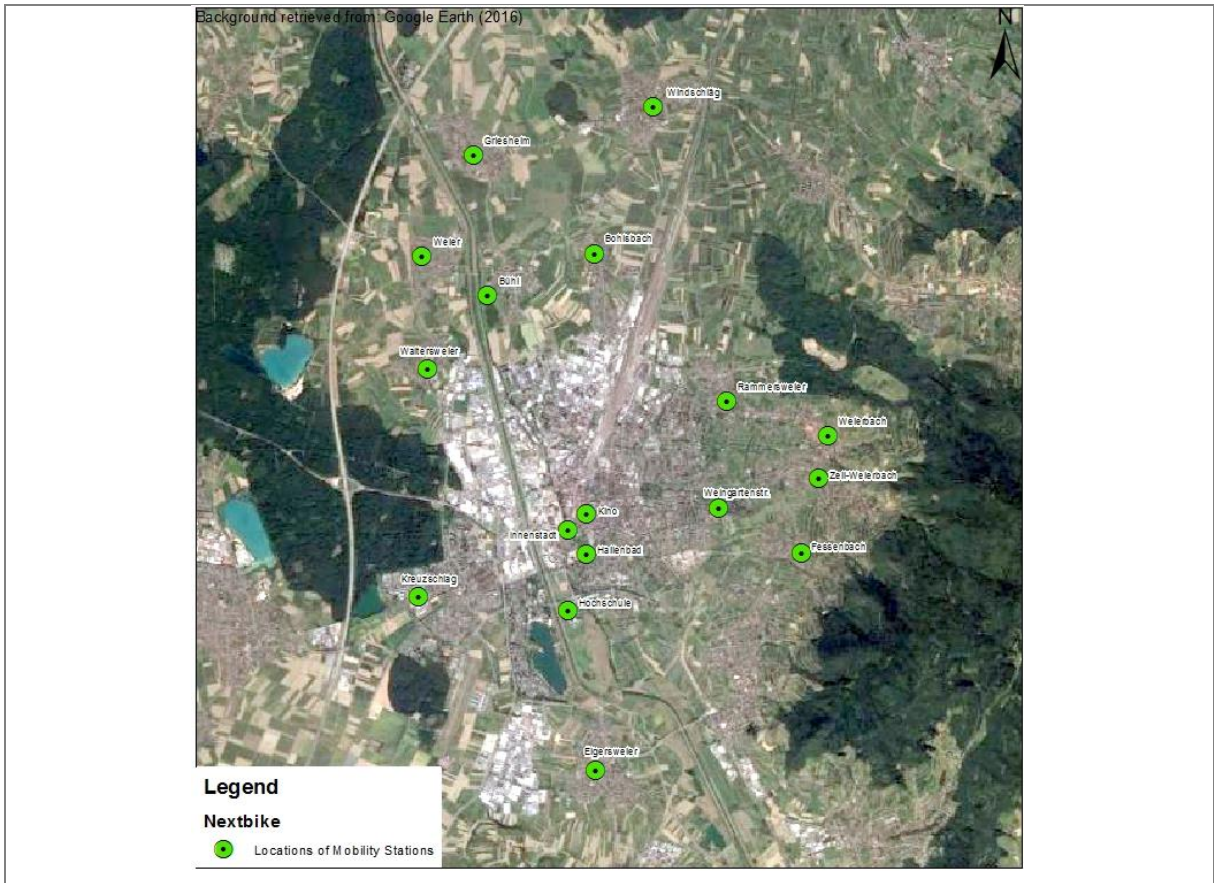
Figure 6-23: Locations of Mobility Stations according to nextbike customers.
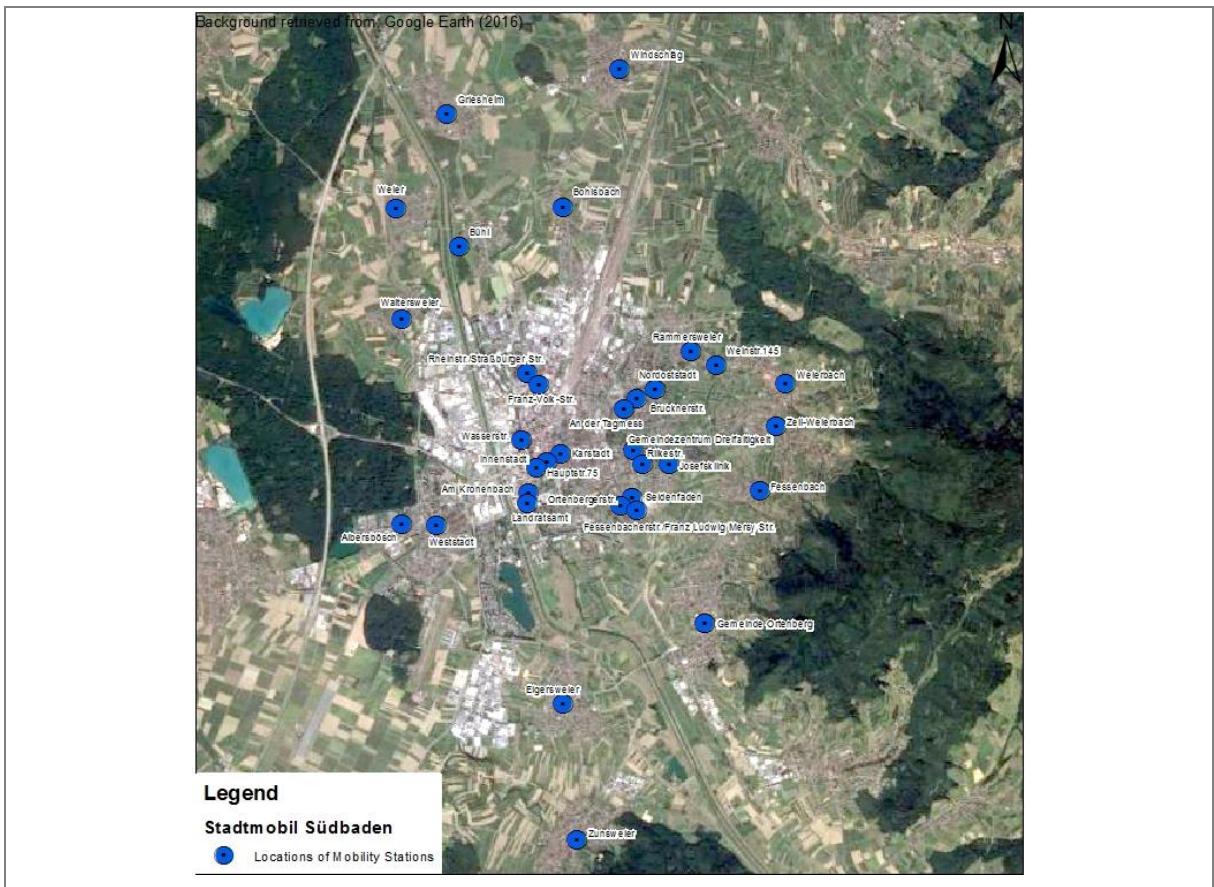
Figure 6-24: Locations of Mobility Stations according to Stadtmobil Südbaden customers.

Two customers of *nextbike* and seven of *Stadtmobil Südbaden* found that there is no need for more stations, because the existing stations are sufficient. Another two customers stated that they personally have no need for Mobility Stations.

6.1.8 Components of "Einfach mobil"

The brand "Einfach mobil" not only represents the four new Mobility Stations in Offenburg, but also the "Einfach mobil"-card and the project website "Mobil-in-Offenburg". In order to ask participants of the user survey about their awareness of these additional services, the following questions were asked (Figure 6-25).
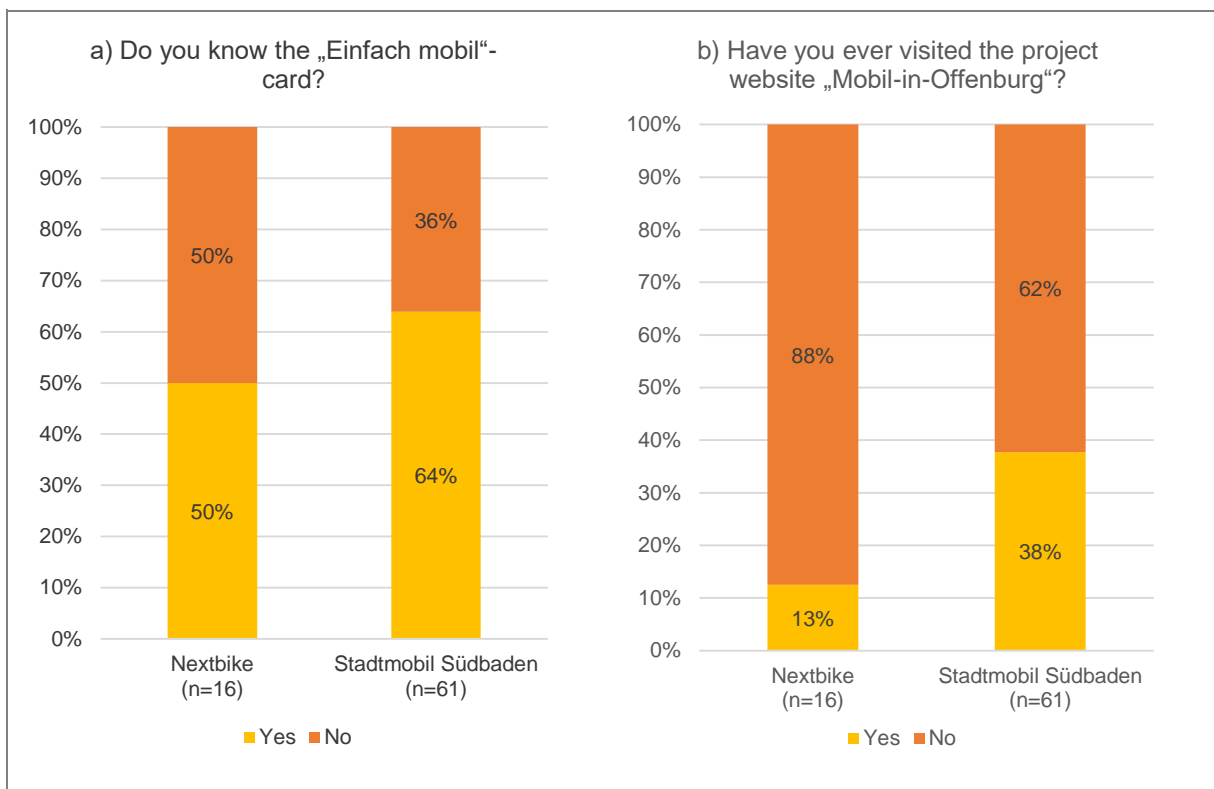
Figure 6-25: Awareness of additional components of "Einfach mobil": a) "Einfach mobil"-card, b) project website.

Half of the *nextbike* users and 64% of *Stadtmobil Südbaden* users already knew the "Einfach mobil"-card. A significantly smaller share of participants (13% of *nextbike* users and 38% of *Stadtmobil Südbaden* users) has visited the project website "www.Mobil-in-Offenburg.de".

In the following diagrams (additional) components of the "Einfach mobil"-card were presented and participants could rate them in terms of importance. In the analysis, the results of the two user groups were presented together, because the answers of *nextbike* users and *Stadtmobil Südbaden* users did not vary significantly (Figure 6-26).
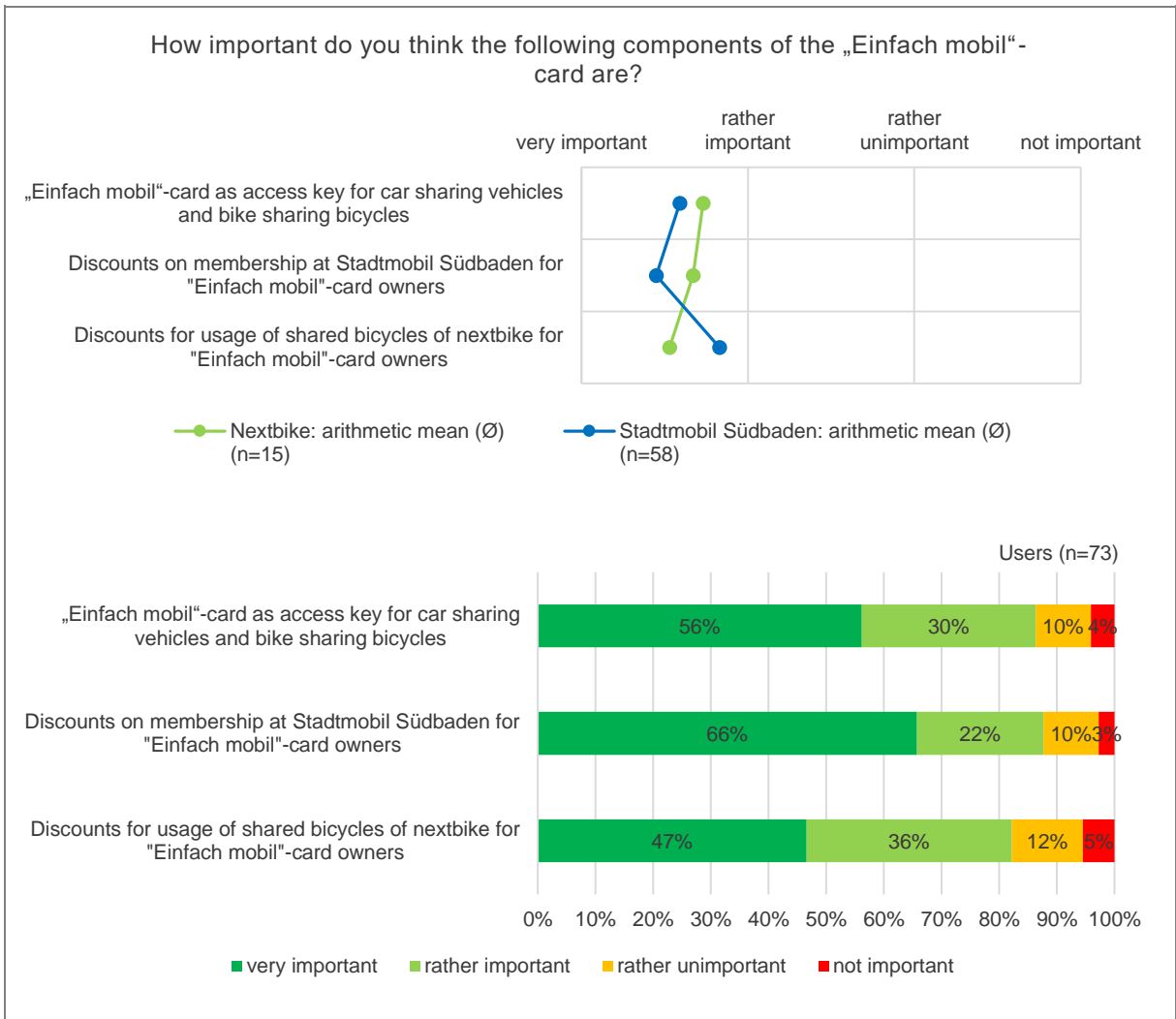
Figure 6-26: Importance of existing components of the "Einfach mobil"-card.
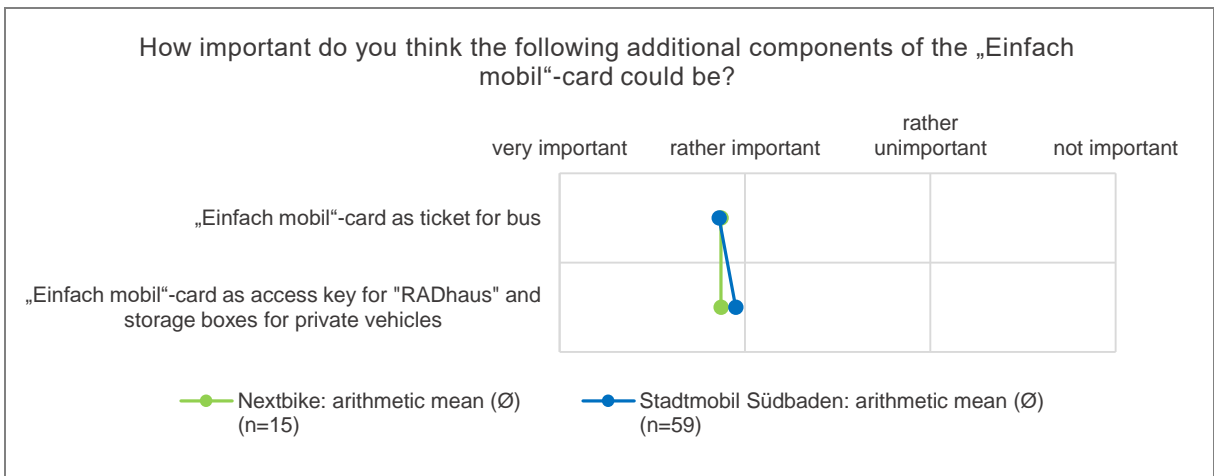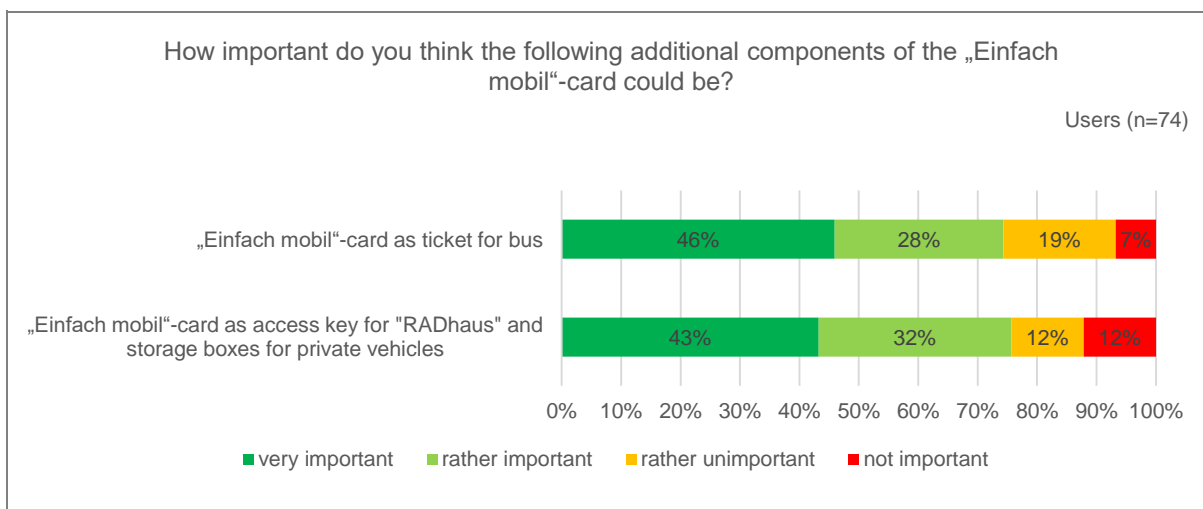
Figure 6-27: Importance of additional components of the "Einfach mobil"-card.

Overall, it is noticeable that the users of bikesharing and carsharing generally rated the different (additional) components of the "Einfach mobil"-card as important. The use of the card as access key for bikesharing bicycles and carsharing vehicles was rated as very important by 56% of the participants. Complementary offers for *nextbike* were rated as very important by 47% and discounts for *Stadtmobil Südbaden* customers by 66% of the participants. One possible extension of the "Einfach mobil"-card could be the use as a ticket for public transport. Seventy-four percent of all participants rated this additional component as very / rather important. The card as access key for the "RadHaus" and for the rentable boxes for private bicycles was rated as very / rather important by 75% of the users.

Two users of *Stadtmobil Südbaden* took the chance and wrote about problems at the project website. One complained that there is no information on how to link an existing account of *Stadtmobil Südbaden* with the "Einfach mobil"-card. The other user was wondering, why the website does not allow registration for the respective provider.

6.1.9 Use of Existing Offers

Information about the use of other mobility offers in Offenburg can help to analyze the actual mobility behavior of the bikesharing and carsharing users. The question listed all offers available for individual mobility in Offenburg and participants were asked to choose how often they use the different offers: several times a week – once a week – once a month – more seldom – never. Results are given in Figure 6-28 and Figure 6-29.
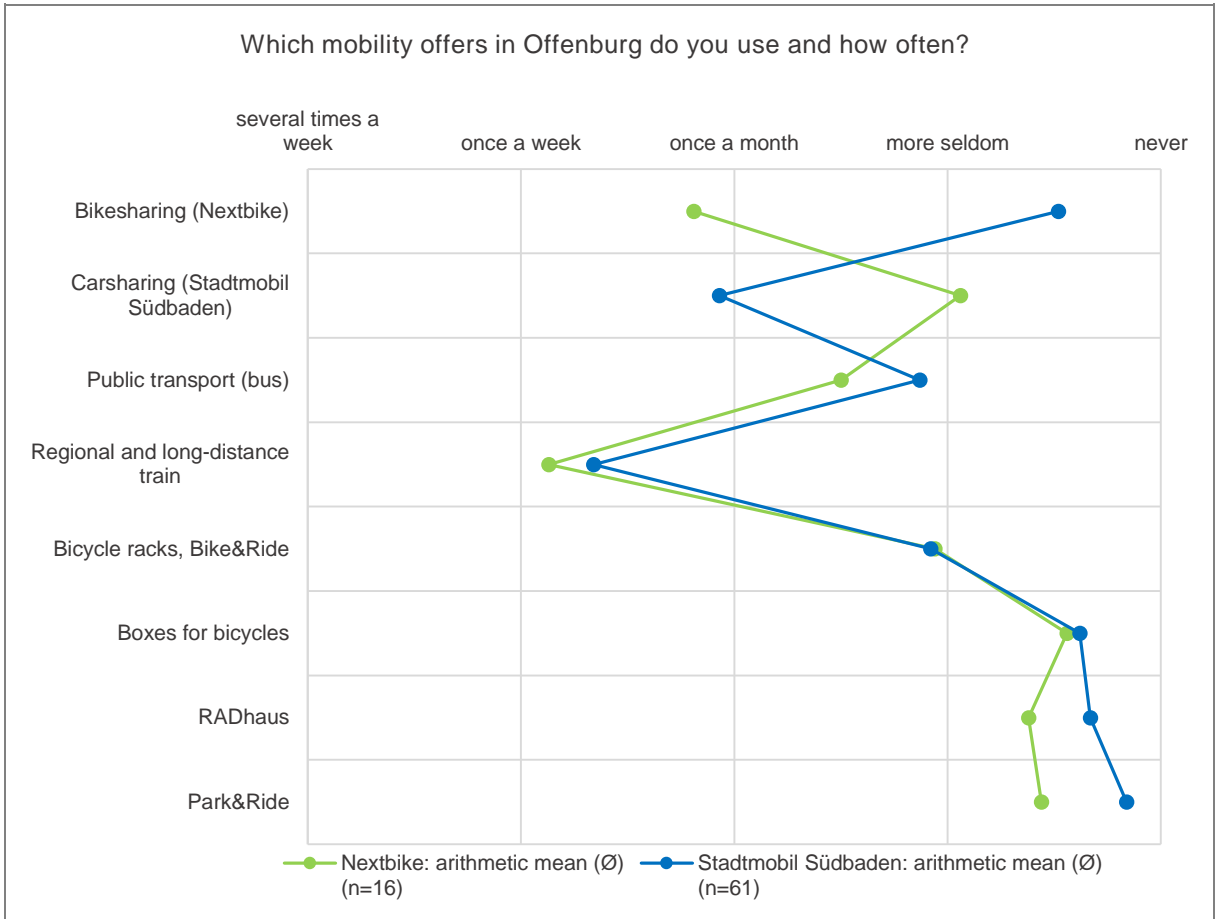
Figure 6-28: Use of existing mobility offers of users of the mobility service "Einfach mobil".
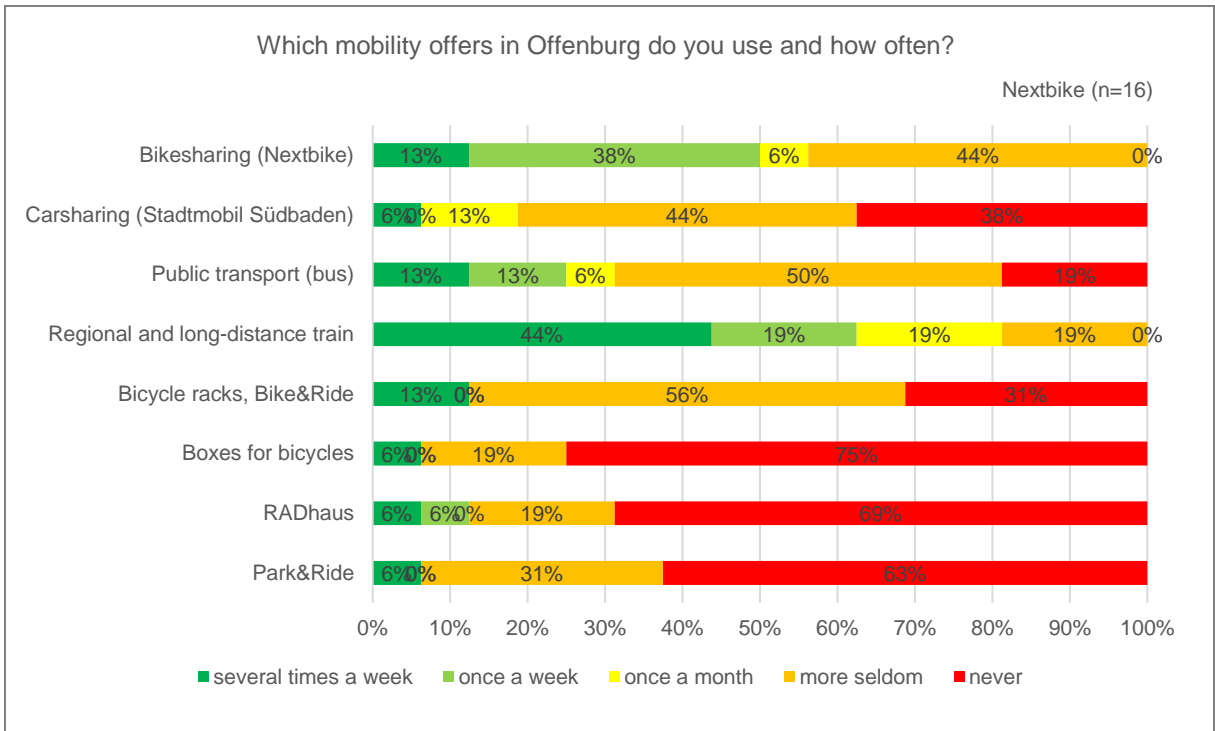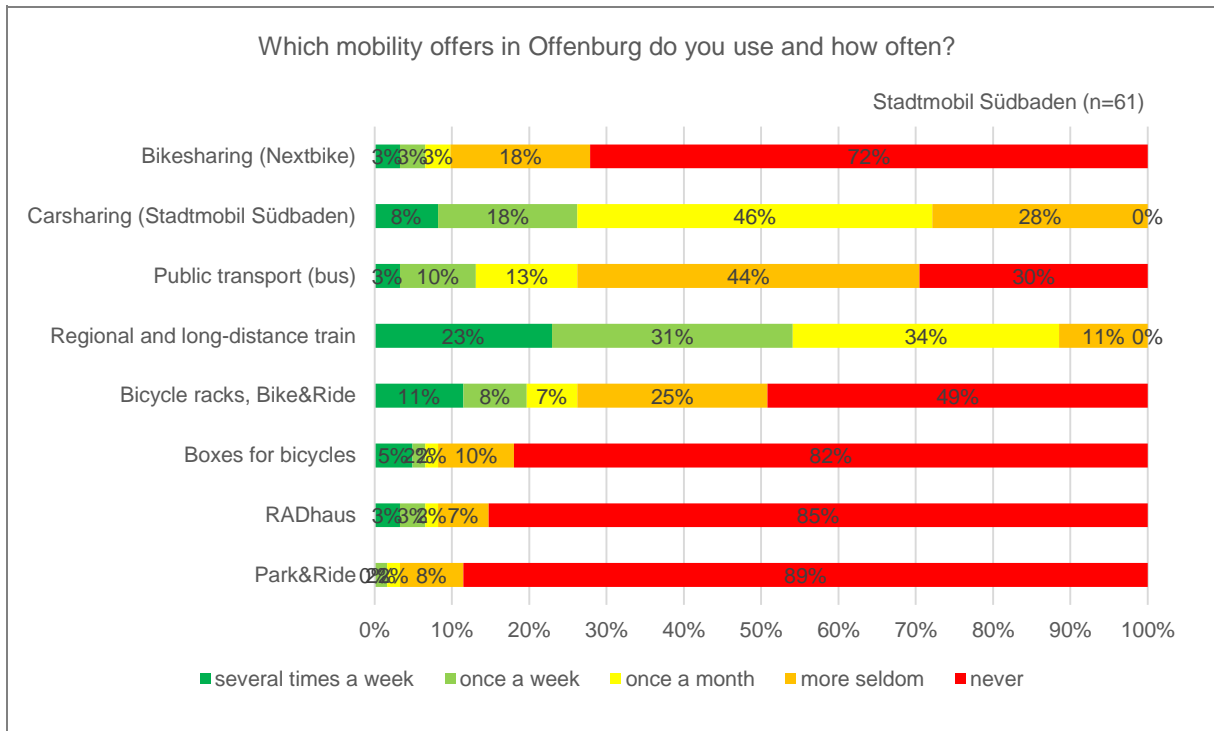
Figure 6-29: Use of existing mobility offers of nextbike *users /* Stadtmobil Südbaden *users.*

In the following, the results for the frequency of use of other mobility options are given:

- 51% of *nextbike* users use the bikesharing service at least once a week. In contrast, 72% of *Stadtmobil Südbaden* users never use bikesharing of *nextbike*;

- 19% of *nextbike* users use carsharing of *Stadtmobil Südbaden* at least once a month. Twenty-six percent of *Stadtmobil Südbaden* users use carsharing several times a week, but 46% use this service only once a month;

- 50% of *nextbike* users and 44% of *Stadtmobil Südbaden* users use public transport seldom, but regional and long-distance train services are used at least once a week by 63% of *nextbike* users and 54% of *Stadtmobil Südbaden* users;

- 13% of *nextbike* users and 11% of *Stadtmobil Südbaden* users use bicycle racks for private bicycles and Bike+Ride several times a week;

- The majority of participants never use rentable boxes for private bicycles, the "RadHaus" and facilities for Park+Ride.

6.2 Non-user Survey

The non-user survey took place from September 15 to October 26, 2016. Figure 6-30 presents the number of participants of the two population groups: citizens and commuters. In total, 174 citizens and 135 commuters filled out the online questionnaires.
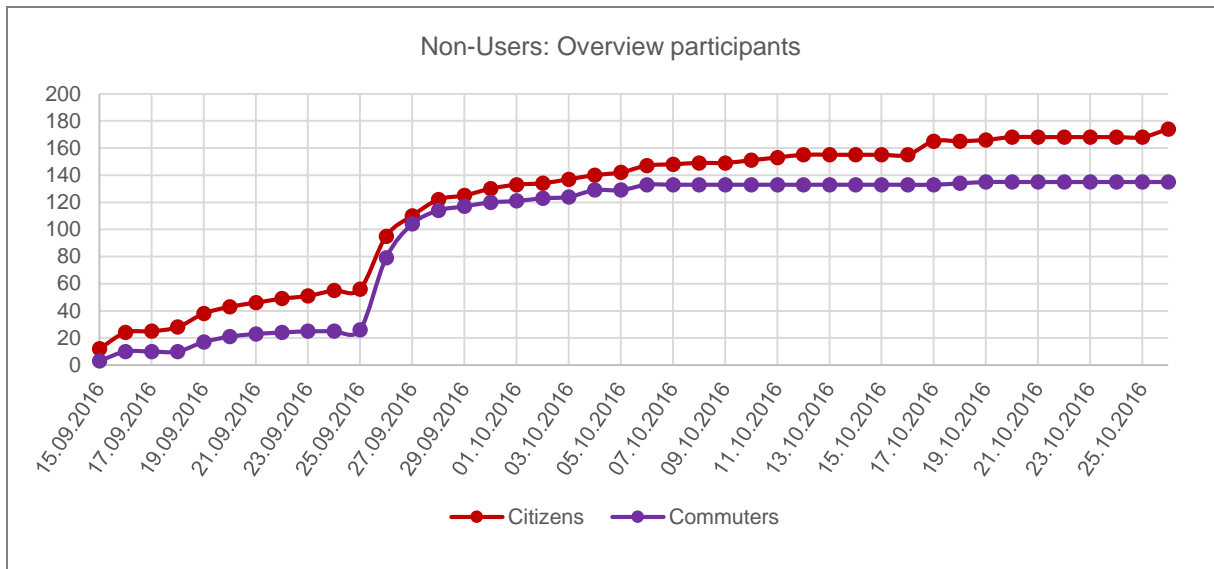
Figure 6-30: Number of participants (citizens and commuters) in the non-user survey.

Table 6-3 gives an overview of the sample sizes and the received response rates. Regarding the large amount of postcards, which were distributed within the city area, the response rate of citizens was rather low (4%). However, 152 citizens and 111 commuters completely filled out the questionnaires.

Table 6-3: Overview of the non-user survey with response rates.

	Total	Citizens	Commuters
Time frame		15.09.2016 - 26.10.2016	15.09.2016 - 26.10.2016
Days		42	42
Sample (Postcards)	5000	4130	870
Participants	309	174	135
Response rate	6%	4%	16%
Completed questionnaires	263	152	111
Customers of *Nextbike / Stadtmobil Südbaden*	32	21	11
Questionnaires for analysis	231	131	100

Among the participants, 21 citizens and 11 commuters indicated that they are already users of the bikesharing service of *nextbike* or of the carsharing service of *Stadtmobil Südbaden*. These people were asked to fill out the respective user surveys, which were sent by their providers and could quit the non-user survey without giving answers to the questions (Figure 6-31). In the end 131 (citizens) and 100 (commuters) questionnaires were used for the following analysis.

Figure 6-31: Identification of customers of nextbike / Stadtmobil Südbaden and reference to user survey.

6.2.1 Demographic Composition of Survey Participants

Slightly more women (53.5%) took part in the non-user survey. Only one participant (commuter) is under 18 years old and 30.5% of all participants are between 40 and 49 years old. About 55% of participants have a university degree. Almost all participants (95.5%) have a driver´s license. The average number of vehicles available per household is 1.4 for citizens and 1.8 for commuters. Sixty-five percent of the citizens and 81% of the commuters said that they always have a car available. Only 17% of the citizens but almost 50% of the commuters have seasonal subscriptions for public transport and almost all participants (95.5%) have access to at least one bicycle.

Table 6-4: Demographics of participants in the non-user survey.

		Total	**Citizens**	**Commuters**
Sample		231	131	100
Percentage of sample		100	57	43
Gender of respondents (%)	Male	46.5	52	41
	Female	53.5	48	59
Age group of respondents (%)	Under 18 years	0.5	0	1
	18 – 29 years	15	13	17
	30 – 39 years	18.5	24	13
	40 – 49 years	30.5	29	32
	50 – 59 years	26	22	30
	60 – 64 years	6.5	8	5
	65 – 74 years	2	2	2
	75 years and older	1	2	0
Respondents with university degree (%)		55	63	47
Average number of household members per household		2.65	2.6	2.7
Average number of children per household (=persons under 18 years)		0.55	0.6	0.5
Respondents with driver´s license (%)		95.5	95	96
Average number of vehicles available per household		1.6	1.4	1.8
Respondents with car availability (%)	always	73	65	81
	sometimes	18	24	12
	no	9	11	7
Households with access to at least one bike (%)		95.5	98	93
Respondents with public transport season ticket (%)		31.5	17	46

6.2.2 Awareness of "Einfach mobil"

In the first questions of the non-user questionnaire both groups were asked, if they were aware of the new brand "Einfach mobil" and if they answered with "yes", how they became aware (Figure 6-32).
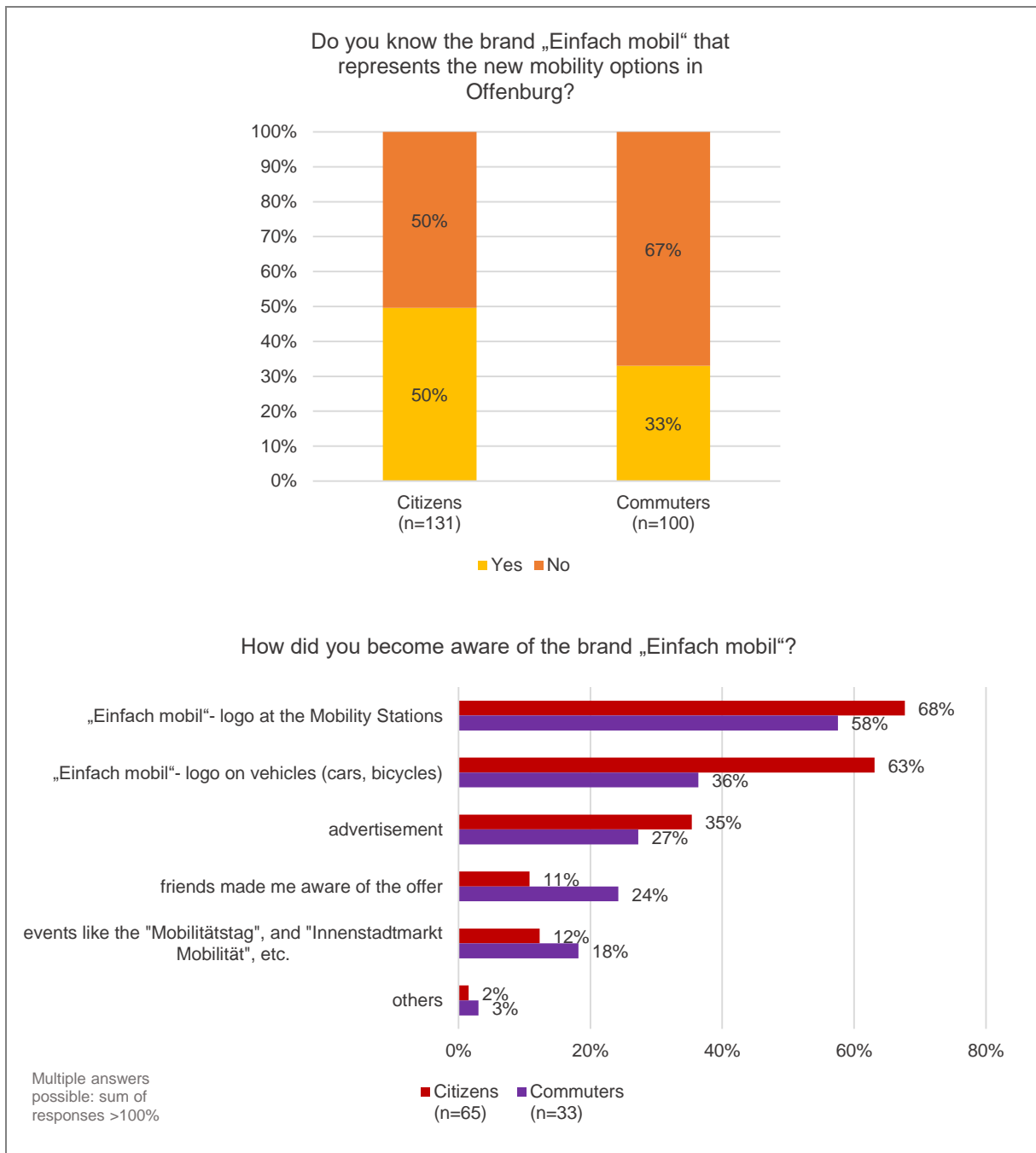
Figure 6-32: Questions about the awareness of the brand "Einfach mobil".

Half of the citizens and 33% of commuters indicated that they were consciously aware of the brand "Einfach mobil" "that represents the new mobility options in Offenburg". For those non-users who were aware, the "Einfach mobil"-logo at the Mobility Stations (68% of citizens and 58% of commuters) and on vehicles (63% of citizens and 36% of commuters) was one reason

for becoming aware. Again, this highlights the importance of the strong brand identity of "Einfach mobil" and the visibility of the logo in public space. Thirty-five percent of the citizens and 27% of the commuters learnt about the service "Einfach mobil" through advertisement, which was not further defined. Some citizens (11%) and commuters (24%) stated that friends made them aware of the offer. Events like the "Mobilitätstag" (English: mobility day) and the "Innenstadtmarkt Mobilität" (English: city center market for mobility) were named by 12% of the citizens and 18% of the commuters as reason for their awareness of "Einfach mobil".

6.2.3 Awareness of Mobility Stations

The following questions were related to the new Mobility Stations. Both groups were asked, if they were aware of the Mobility Stations and if they answered with "yes", how they became aware (Figure 6-33).
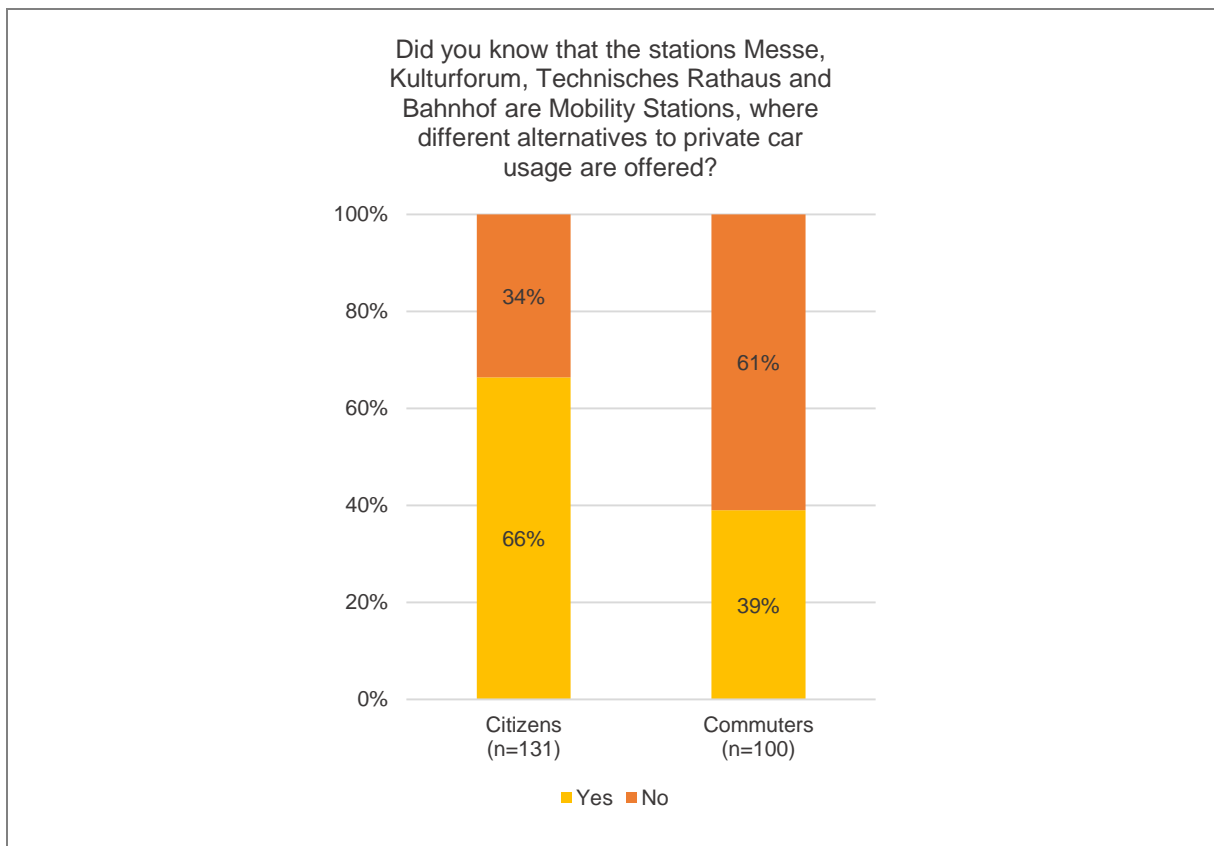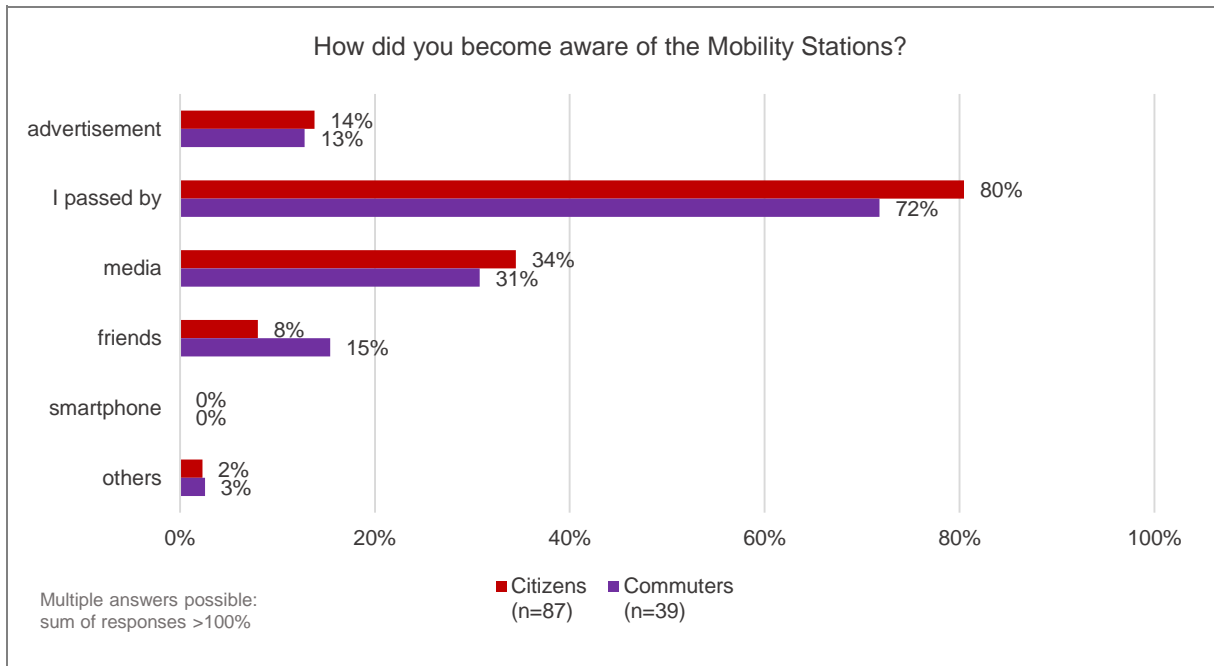
Figure 6-33: Questions about the awareness of the Mobility Stations in Offenburg.

Almost 70% of citizens and 39% of commuters indicated that they were aware that "the stations Messe, Kulturforum, Technisches Rathaus and Bahnhof are Mobility Stations where alternatives to private car usage are offered." A great majority of citizens (80%) and commuters (72%) learnt about the Mobility Stations by chance while walking past. The second most named reason for the awareness of participants was media (34% of citizens and 31% of commuters). Fourteen percent of citizens and 13% of commuters stated that they became aware of the Mobility Stations through advertisement. While analyzing the responses of this question, it became clear that the two possible response options "advertisement" and "media" needed more specification in order to highlight differences. A share of 8% of citizens and 15% of commuters became aware of the stations through friends.

In order to get an impression on how non-users basically find the idea of setting up such stations, the question in Figure 6-34 was posed. Almost all participants in the nun-user survey (93% of citizens and 94% of commuters) thought that implementing Mobility Stations in Offenburg is a good idea.
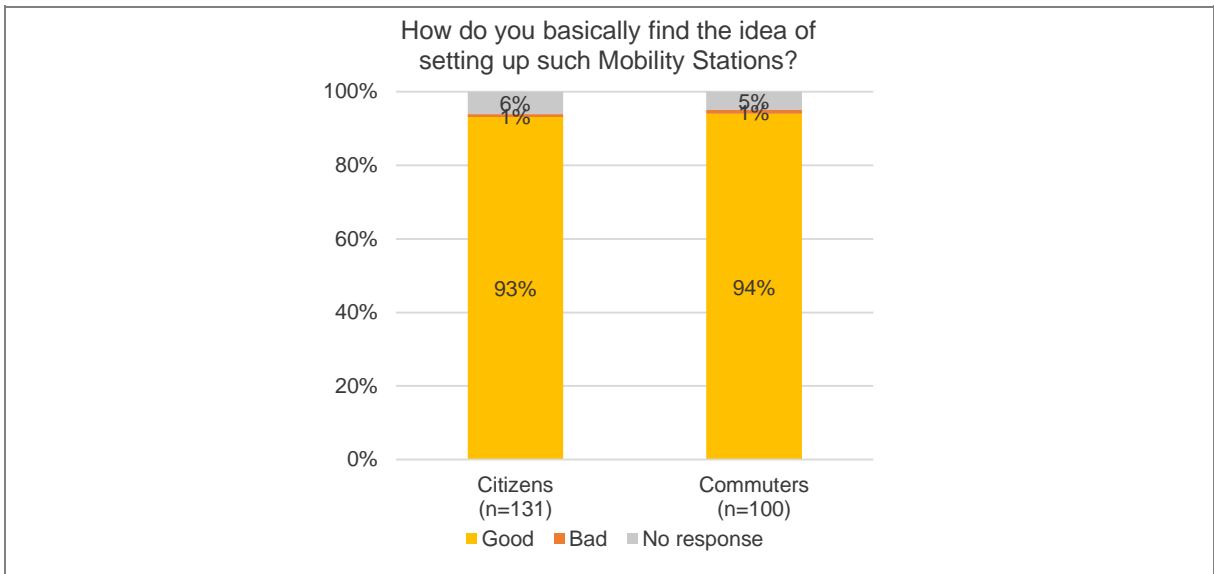
Figure 6-34: General question about the attitude of non-users on the implementation of Mobility Stations.

6.2.4 Components of Mobility Stations

In the following questions, the non-users were asked to state their opinions on the different (additional) components of Mobility Stations and within their immediate area. The components were presented and participants chose between the options: very important – rather important – rather unimportant – not important. The first diagram for every question presents the arithmetic mean of both groups and should help to gaining an overview of the given answers, whereas the second diagram shows the percentages for every response option. The answers of citizens and commuters regarding the importance of existing components of Mobility Stations vary slightly. Therefore, in addition to the comparison of arithmetic means (Figure 6-35), extra diagrams for each group were generated (Figure 6-36).
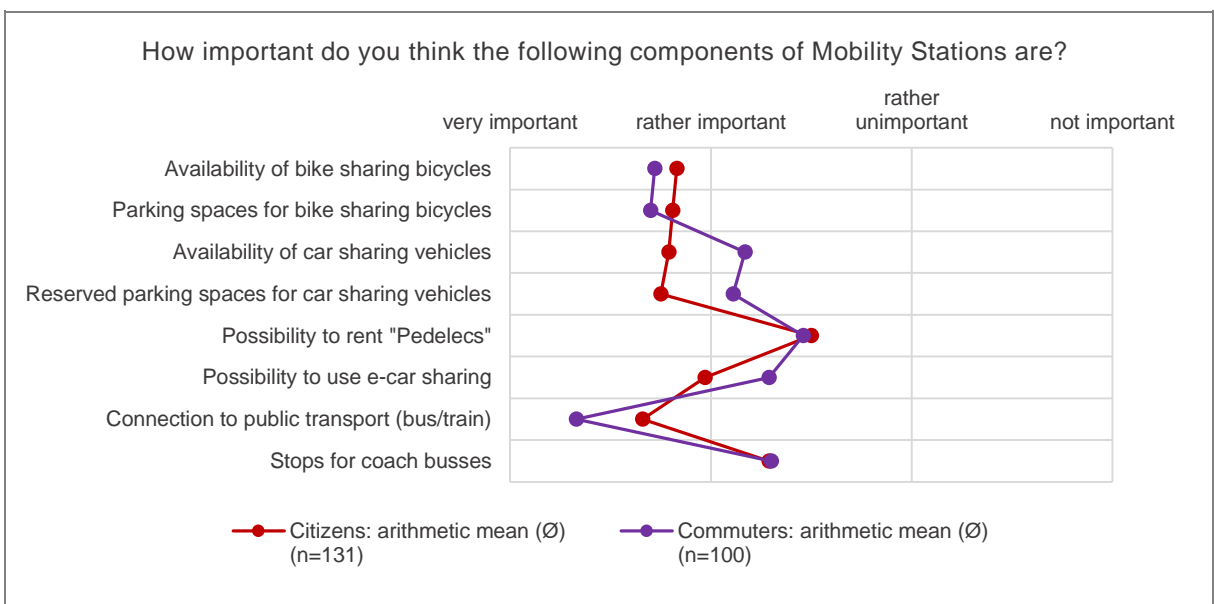
Figure 6-35: Importance of components of the Mobility Stations for non-users.
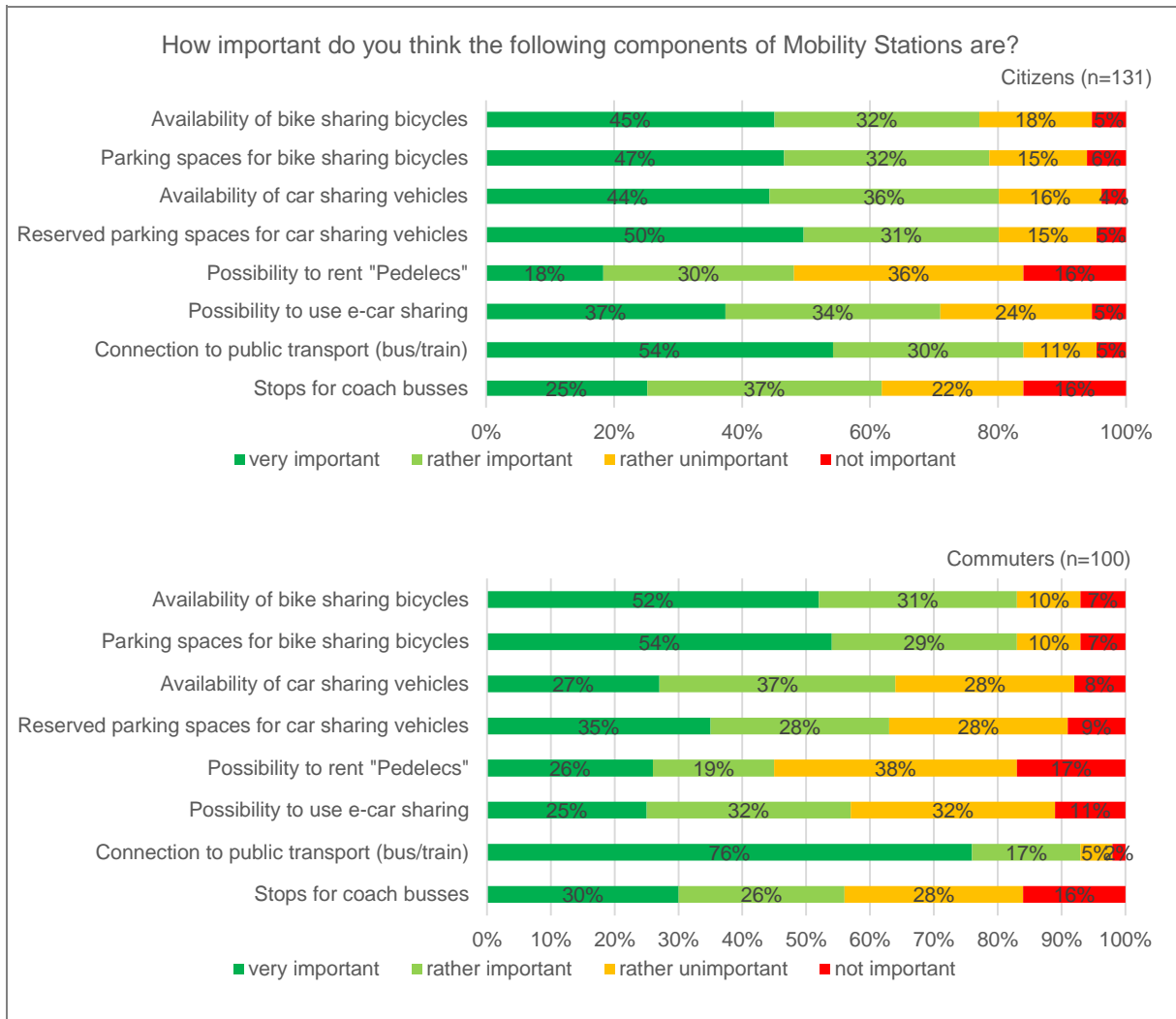
Figure 6-36: Importance of components of the Mobility Stations for citizens and commuters.

The availability of sharing services, like bikesharing and carsharing, as well as parking facilities for the respective vehicles were important for the majority of non-users. A high share of participants confirmed the importance of the connection to public transport (84% of citizens and 92% of commuters). The use of coach bus services was rated very / rather important by 62% (citizens) and 56% (commuters). The possibility to rent pedelecs at the Mobility Station was rather unimportant for 36% of the citizens and 38% of the commuters.

The modular design of the Mobility Stations in Offenburg allows a high flexibility in the configuration of stations. In order to understand the needs for additional components of Mobility Stations, the non-users were asked how they would rate "an on-site information desk", "a staffed service center for mobility offers with information desk and ticket vending", "the possibility to rent cargo bicycles", "taxi stops" and "racks / boxes for private bicycles" in terms of importance (Figure 6-37).
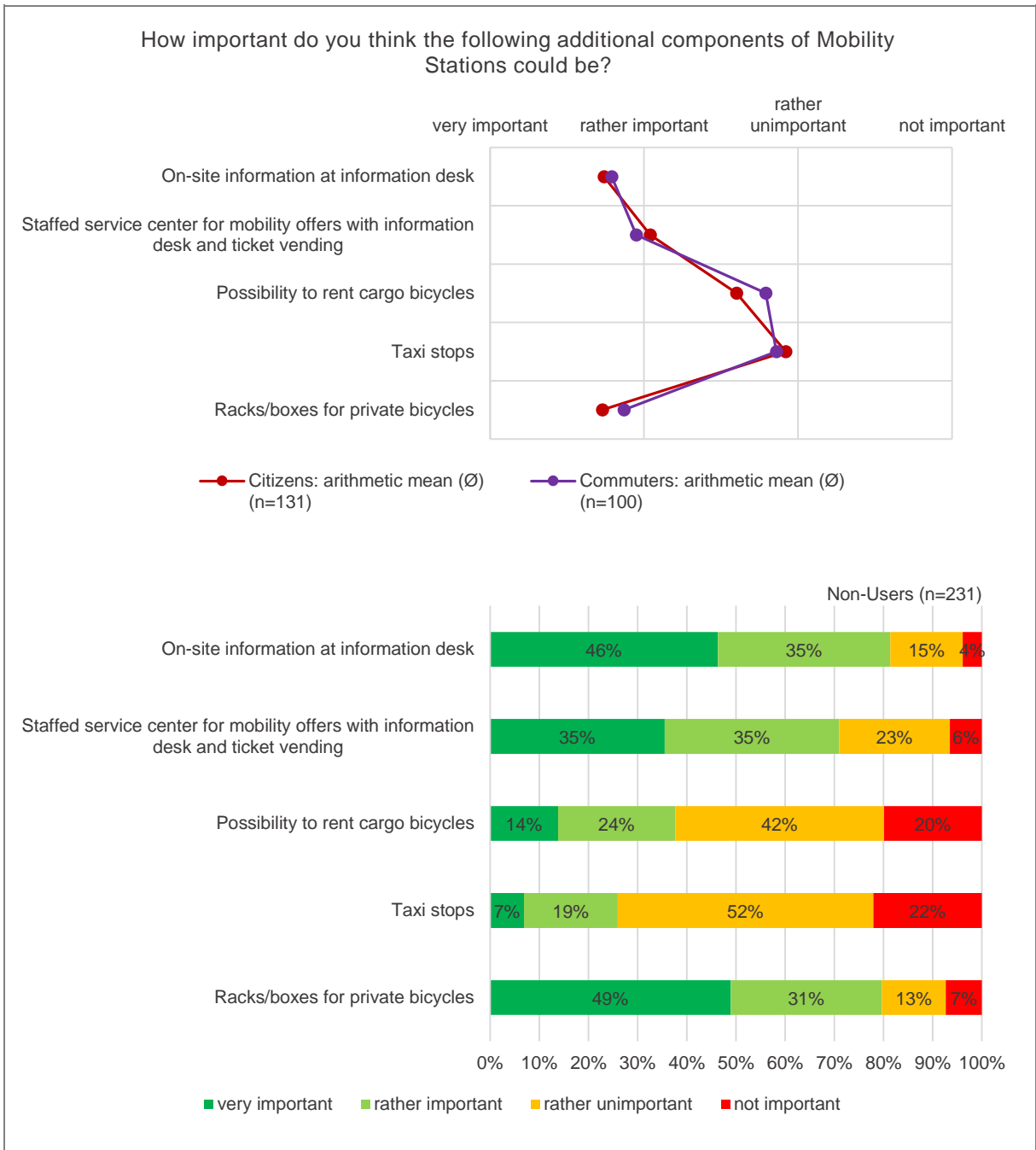
Figure 6-37: Importance of additional components of the Mobility Stations for non-users.

On-site information at an information desk would be very / rather important for 81% of the non-users. A slightly lower share rated the staffed service center as important (70%). The possibility to rent cargo bicycles was ranked rather unimportant by 42% of the citizens and commuters. Facilities for private bike parking (racks / boxes) were rated very / rather important by 80% of the non-users. Seventy-four percent of participants in both groups ranked taxi stops as (rather) unimportant.

Offers in the surrounding area can also play a role for increasing the attractiveness of Mobility Stations. The following question aims to find out how important components nearby theses stations are (Figure 6-38).
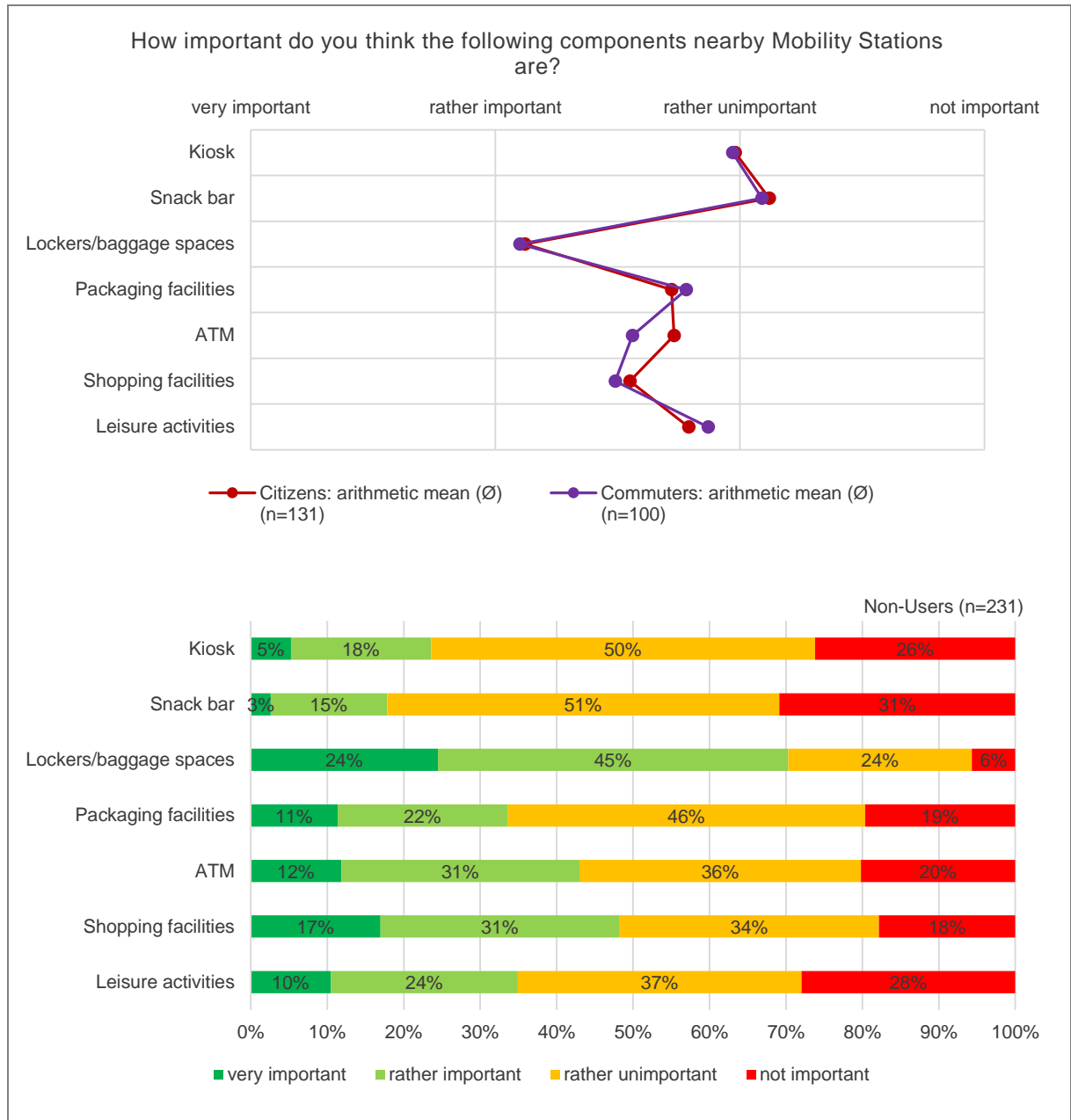
Figure 6-38: Importance of components nearby the Mobility Stations for non-users.

Mostly, a kiosk or snack bar seem to be unimportant for non-users. Whereas lockers and baggage spaces were rated very / rather important by 69% of commuters and citizens. The number of non-users, who consider the following components as very / rather important, is smaller but not negligible: packaging facilities (33%), ATM (43%), leisure activities (34%). Almost half of the participants would rate shopping facilities nearby Mobility Stations as very / rather important.

6.2.5 Demand for More Mobility Stations

The following question was posed to find out, if there is a general demand for additional Mobility Stations in Offenburg (Figure 6-39). If participants of the non-user survey said "Yes", they were asked to specify their answer and to state where they think that stations are necessary through writing the postal code, quarter or district, station or intersection. In case the participants said "No", they were asked to state why they don't want to have additional stations.
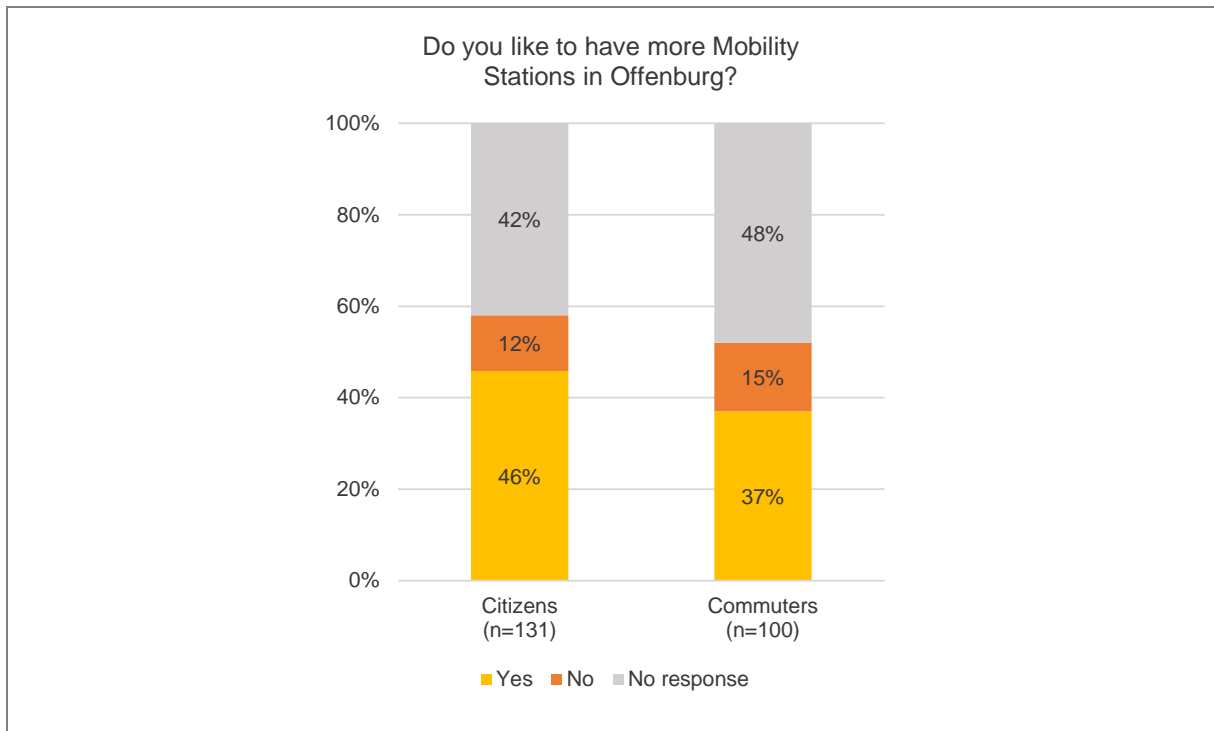
Figure 6-39: Demand for more Mobility Stations in Offenburg for non-users.

Almost half of the citizens and 37% of commuters wanted more Mobility Stations in Offenburg. In contrast, 12% (citizens) and 15% (commuters) disagreed to further extend the network of stations. A large share (42% of citizens and 48% of commuters) was undecided. Fifteen citizens and twelve commuters defined the reasons why they don't want to have more Mobility Stations (Figure 6-40).
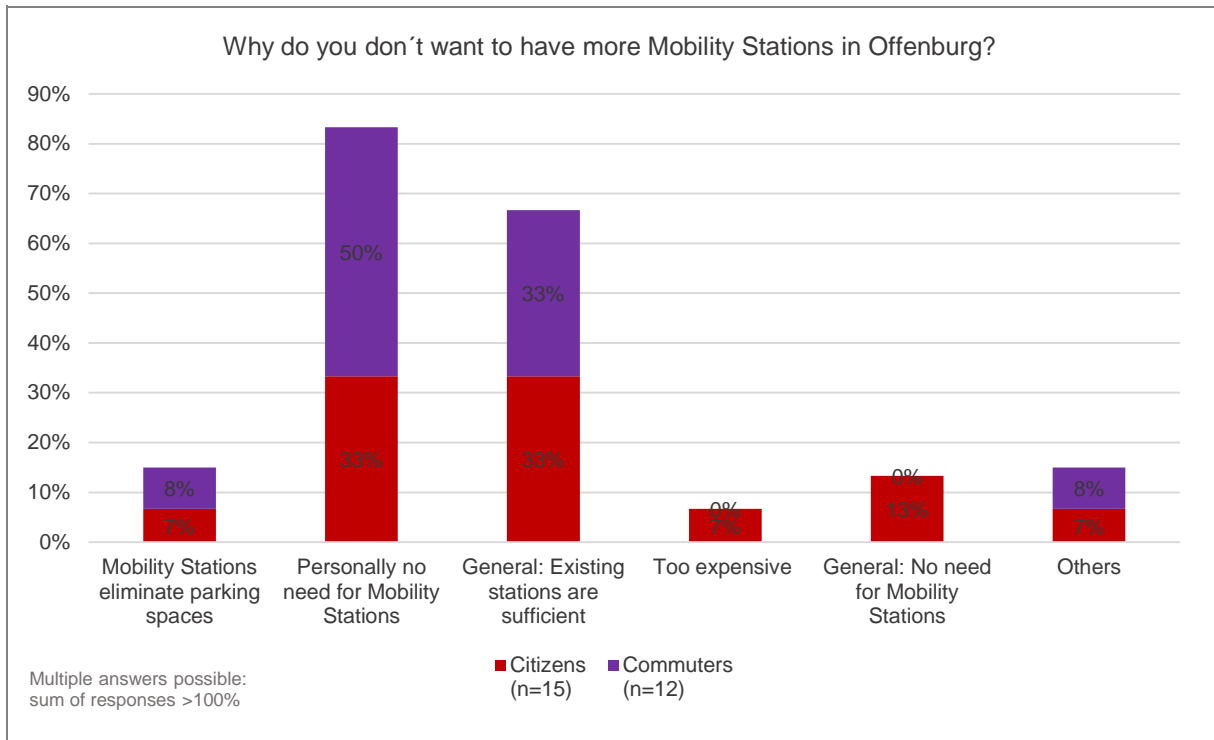
Figure 6-40: Reasons non-users are against the implementation of additional Mobility Stations.

The fact that this question was an open question and all participants could write their own ideas, made the analysis more complicated. Most of the answers could be categorized but few still remained and were listed under "others". Many non-users stated that they personally have no need for Mobility Stations (83%). Sixty-six percent of non-users, who don't want to have more stations, indicated that there is no need for more stations, because the existing ones are sufficient. Thirteen percent found that there is no need for such stations at all. Another 15% complained that Mobility Stations would eliminate parking spaces and 7% of the citizens thought that this service is too expensive. The preferable locations for more Mobility Stations, according to the non-users, are presented in Figure 6-41 and Figure 6-42.
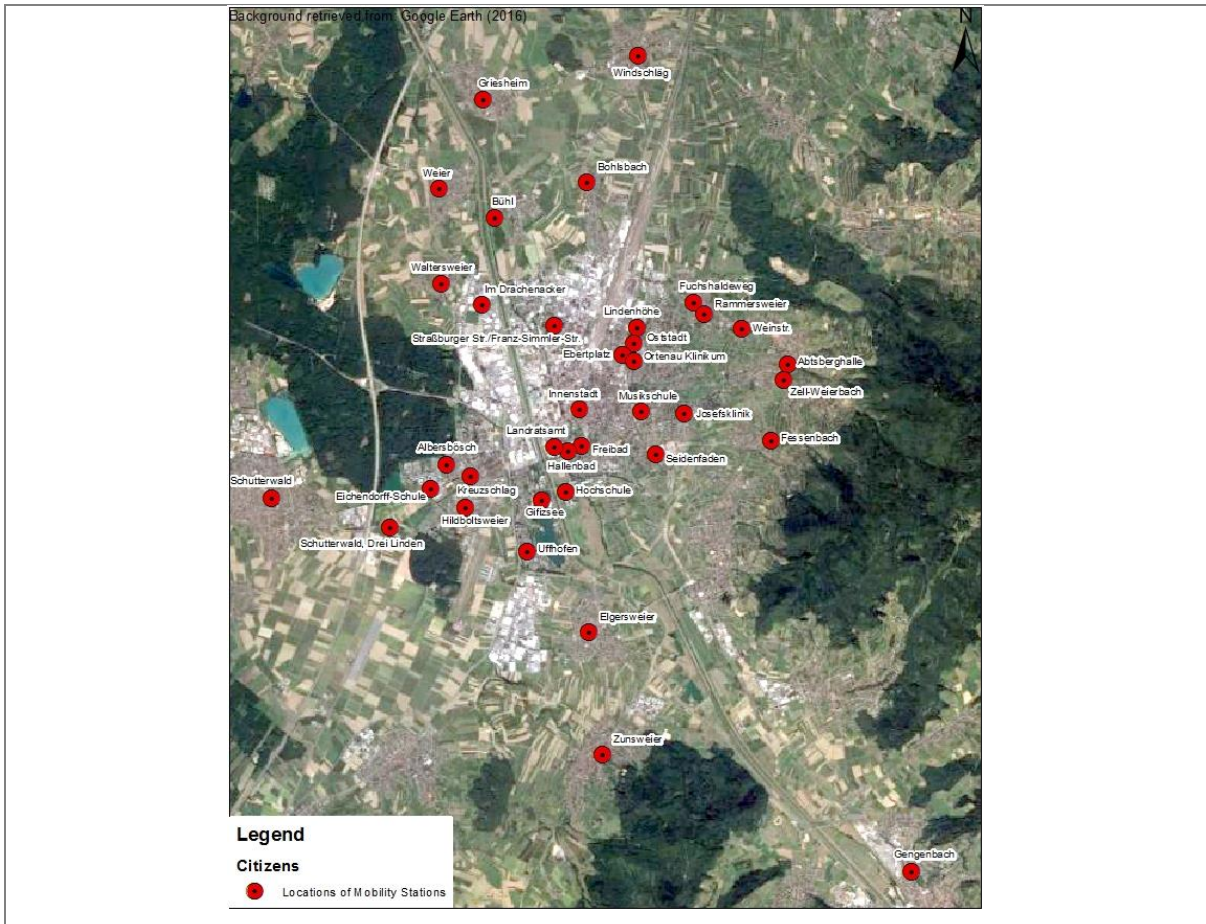
Figure 6-41: Locations of Mobility Stations according to citizens.
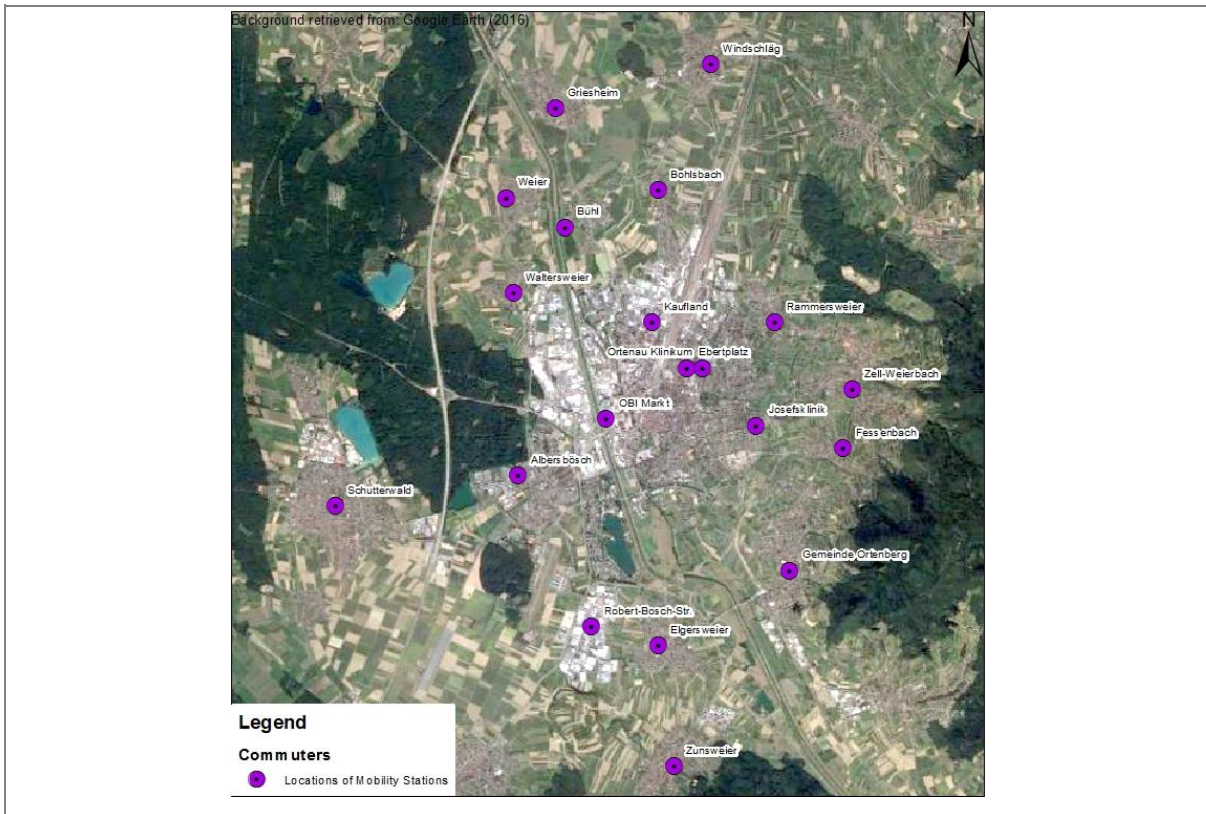
Figure 6-42: Locations of Mobility Stations according to commuters.

6.2.6 Use of Existing Offers

Information about the use of existing mobility offers in Offenburg can help to analyze the actual mobility behavior of the citizens and commuters. The question listed all offers available for individual mobility in Offenburg and participants were asked to choose how often they use the different offers: several times a week – once a week – once a month – more seldom – never. Results are given in Figure 6-43.
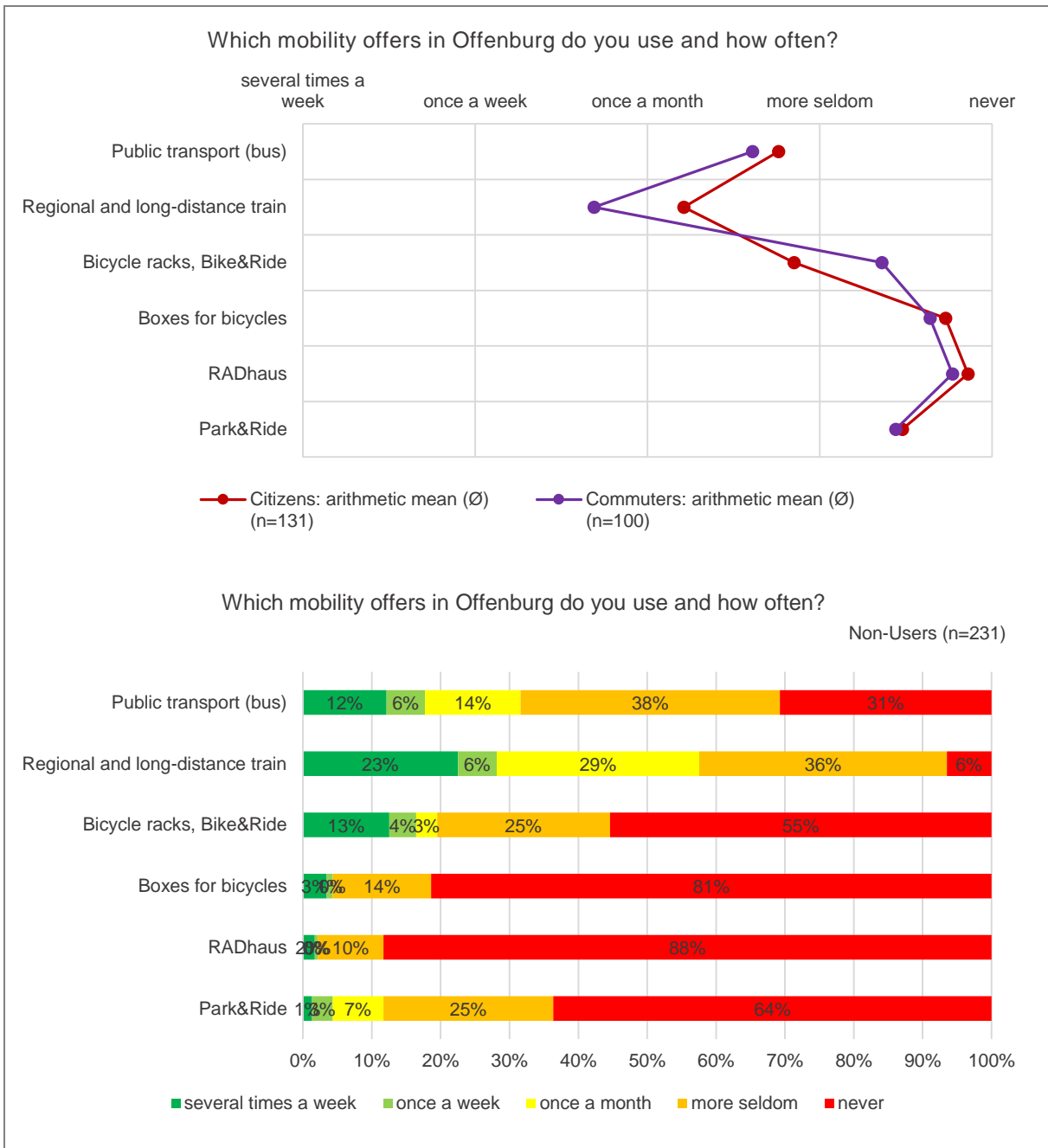
Figure 6-43: Use of existing mobility offers (non-users).

In the following, the results for the frequency of use of available mobility options are given:

- 18% of participants use public transport at least once a week;
- Regional and long-distance train services are used at least once a week by 29% of the citizens and commuters;
- 13% use bicycle racks for private bicycles and Bike+Ride several times a week;
- The majority of participants never use rentable boxes for private bicycles, the "RadHaus" and facilities for Park+Ride.

The different services are used for a wide variety of purposes (Figure 6-44) and there are only small differences between the responses of the two groups.
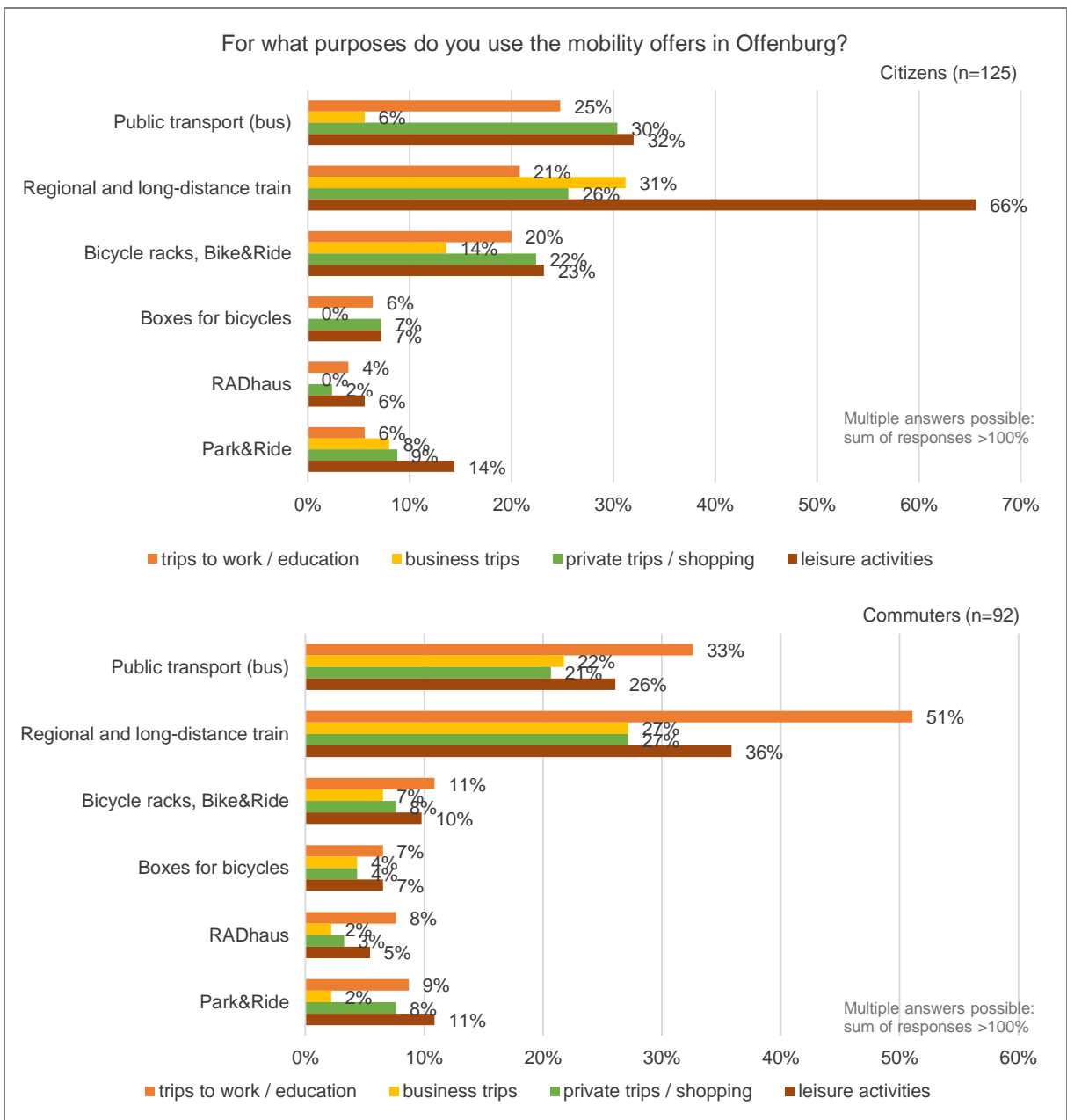
Figure 6-44: Purpose of use of existing mobility offers in Offenburg.

A significant difference between citizens and commuters lies in the use of regional and long-distance train services. The majority of citizens uses this service for the purpose of leisure activities (66%), whereas commuters use train services for their trips to work / education (51%).

6.2.7 Questions about Nextbike / Stadtmobil Südbaden

In order to analyze the degree of popularity of the two providers in Offenburg, *nextbike* and *Stadtmobil Südbaden*, the following questions were posed to the non-users of the integrated multimodal mobility services (Figure 6-45).
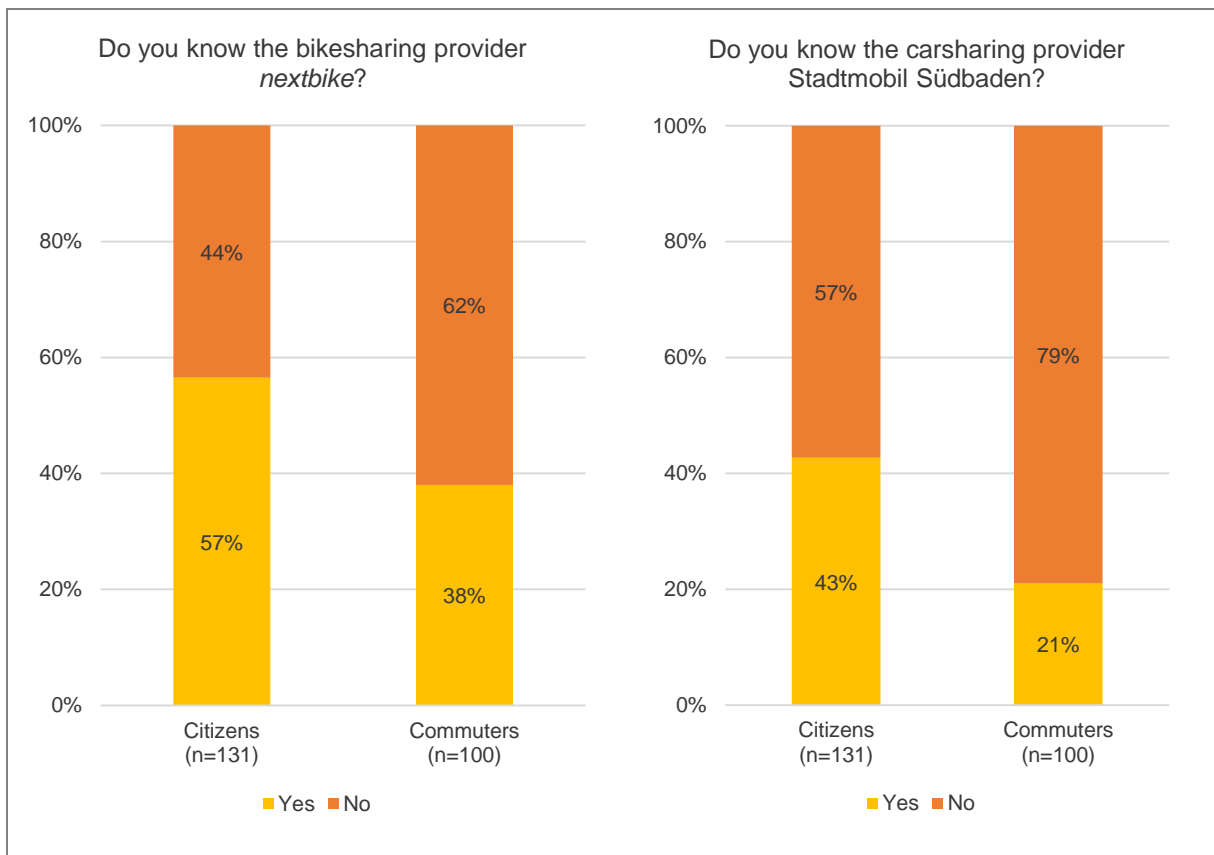
Figure 6-45: Awareness of the two mobility providers, nextbike *and* Stadtmobil Südbaden.

In general, the citizens of Offenburg were more informed about the different providers than the commuters. The bikesharing provider *nextbike* was known by 57% of the citizens and 38% of the commuters. A slightly smaller share was aware of the carsharing provider *Stadtmobil Südbaden* (43% of citizens and 21% of commuters).

The participants who indicated to know *nextbike* / *Stadtmobil Südbaden* were asked, why they don't want to use the bikesharing / carsharing services. The different answers to this question are presented in Figure 6-46.

In the beginning you said that you don´t use *nextbike*. Please tell the reasons, why you don´t use *nextbike*.

Reason	Citizens (n=72)	Commuters (n=38)
High costs	15%	11%
Usage too complicated (rent, return, etc.)	25%	21%
I prefer other modes of transport (public transport, own bicycle, own car, shared bicycle)	71%	55%
Not suitable for my daily trips (e.g. distance)	22%	32%
Feeling of insecurity in road traffic	1%	8%
others	10%	11%

Multiple answers possible: sum of responses >100%

In the beginning you said that you don´t use *Stadtmobil Südbaden*. Please tell the reasons, why you don´t use *Stadtmobil Südbaden*.

Reason	Citizens (n=53)	Commuters (n=21)
There is no suitable station near my home	28%	29%
High costs (per trip / membership)	25%	14%
Registration process too complicated	13%	14%
I prefer other modes of transport (public transport, own bicycle, own car, shared bicycle)	60%	67%
I do not have a driver´s license	0%	0%
Vehicles are not suitable for me	2%	0%
others	13%	10%

Multiple answers possible: sum of responses >100%

Figure 6-46: Reasons for not using the two mobility providers nextbike *and* Stadtmobil Südbaden*.*

Instead of using a shared bicycle or car, most participants in the non-user survey stated that they prefer their own vehicles. Citizens indicated that the usage of *nextbike* would be too complicated (25%). Interesting is that 32% of the commuters said that the shared bicycles are not suitable for their daily trips. The reason for this statement may be the long distances these commuters have to travel to reach their workplace. A large number of citizens (28%) and

commuters (29%) did not use the carsharing provider *Stadtmobil Südbaden*, because there are no suitable stations near their homes. This response shows that the accessibility of services plays an important role and that an extension of the network of Mobility Station would probably generate more users. Another 25% of citizens found that the costs for membership or per trip are too high.

6.2.8 Components of "Einfach mobil"

The brand "Einfach mobil" not only represents the four new Mobility Stations in Offenburg, but also the "Einfach mobil"-card and the project website "www.mobil-in-Offenburg.de". In order to ask participants of the non-user survey about their awareness of these additional services, the following questions were asked (Figure 6-47).
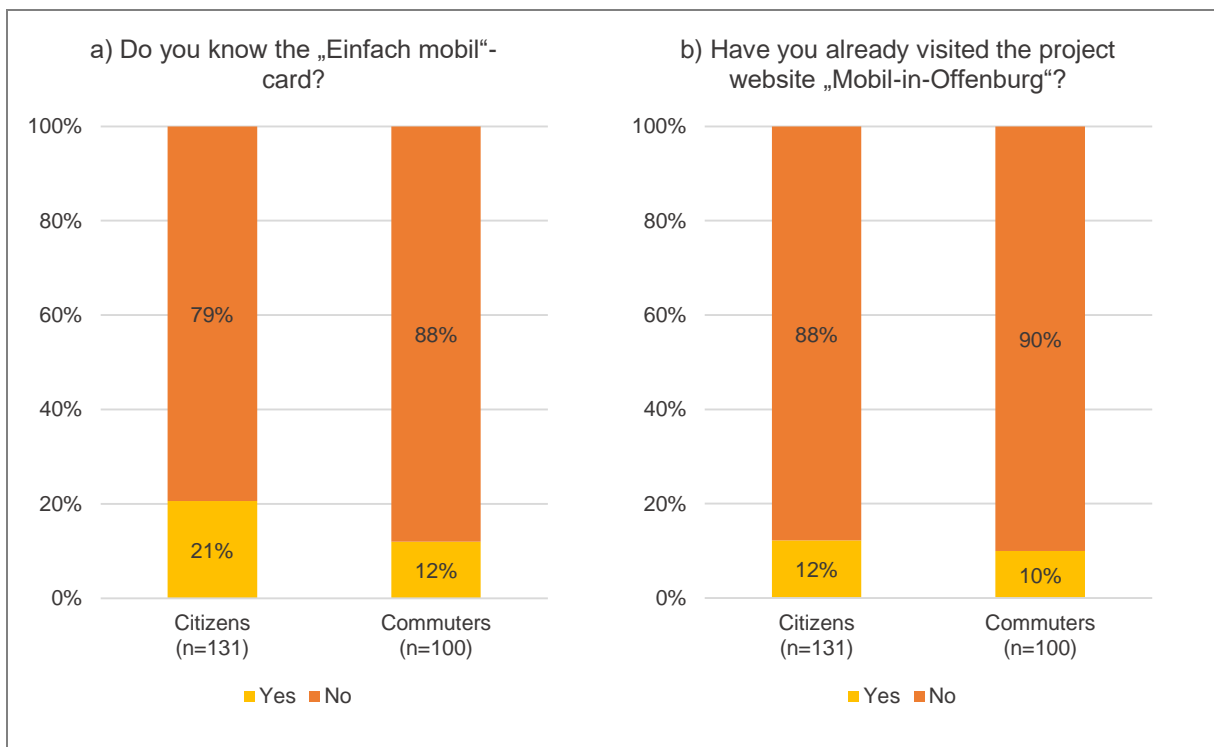
Figure 6-47: Awareness of additional components of "Einfach mobil": a) "Einfach mobil"-card, b) project website.

Only a small share of participants knew the "Einfach mobil"-card (21% of citizens and 12% of commuters). An even smaller share (12% of citizens and 10% of commuters) has visited the project website "www.Mobil-in-Offenburg.de". In the following questions (additional) components of the "Einfach mobil"-card were presented and participants could rate them in terms of importance (Figure 6-48 and Figure 6-49).
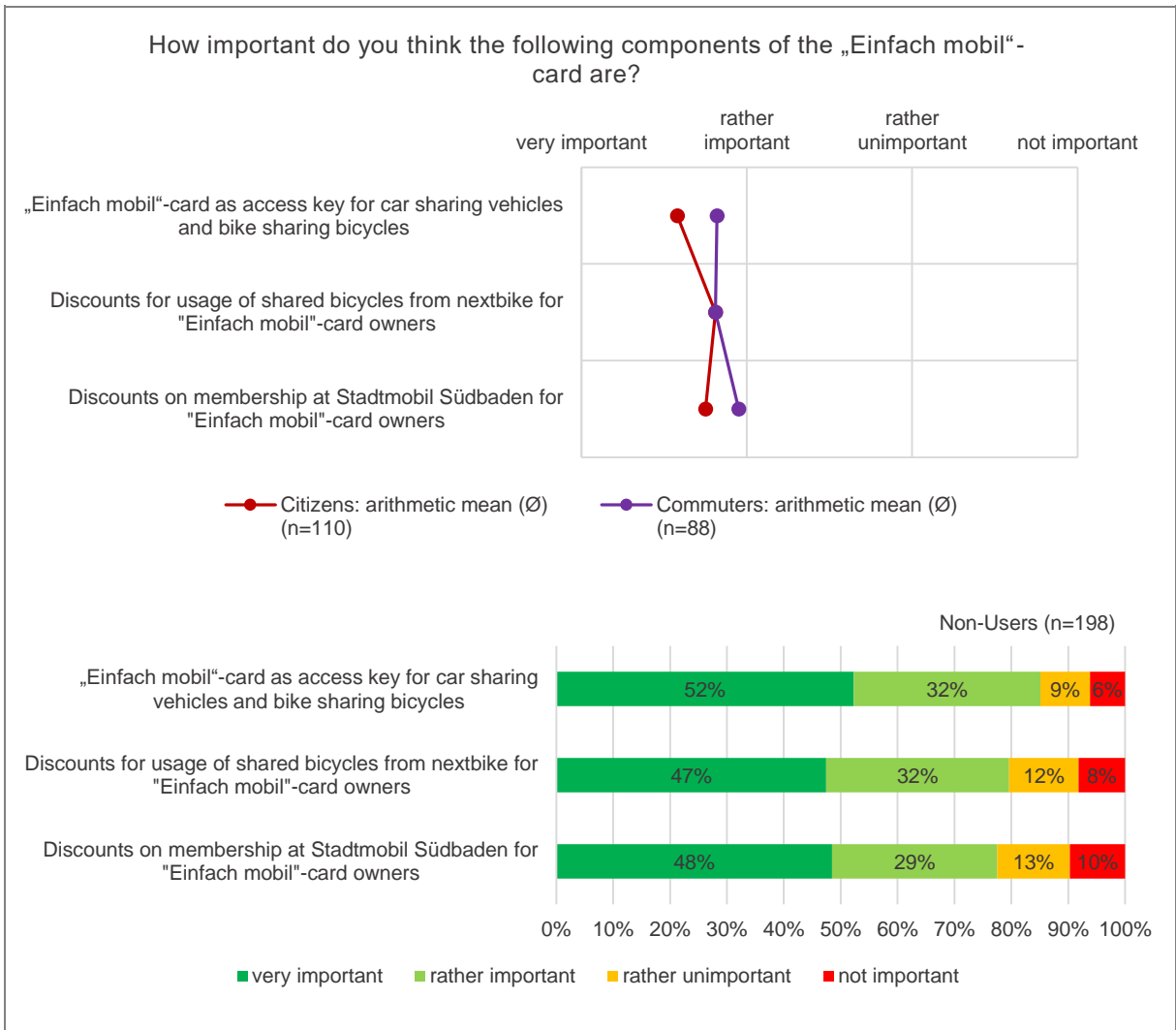
Figure 6-48: Importance of components of the "Einfach mobil"-card.
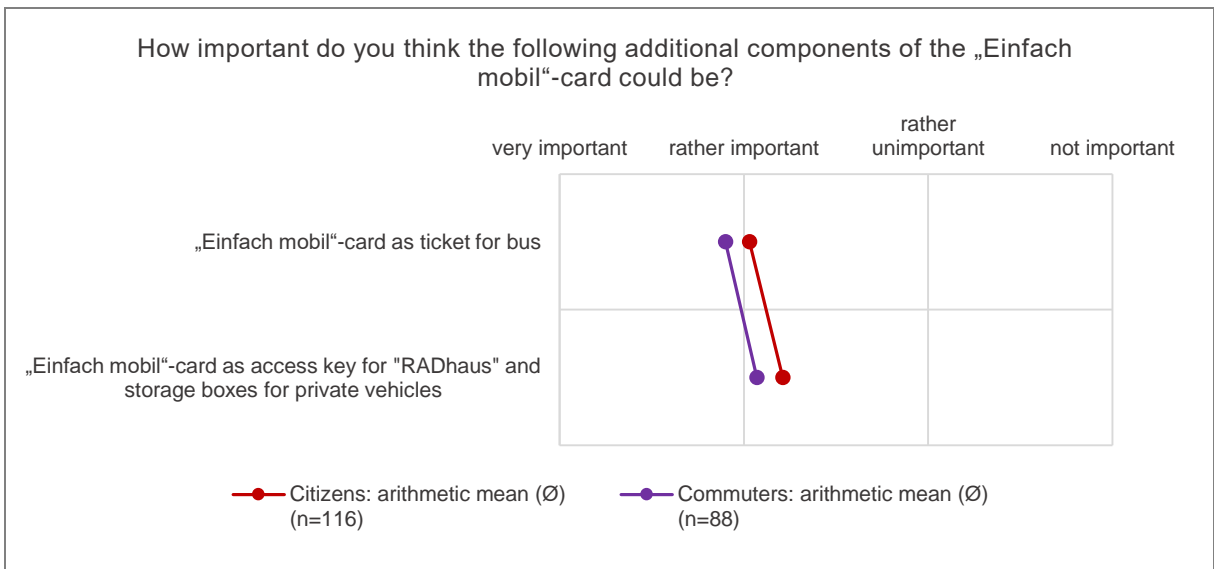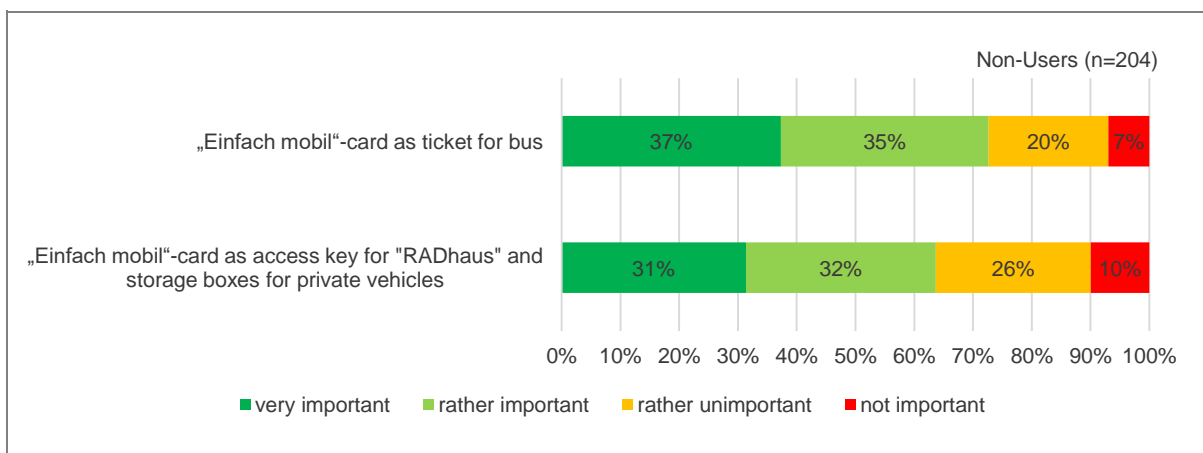
Figure 6-49: Importance of additional components of the "Einfach mobil"-card.

Overall, it is noticeable that participants of the non-user survey generally rated the different (additional) components of the "Einfach mobil"-card as important. The use of the card as access key for bikesharing bicycles and carsharing vehicles was rated as very important by 52% of the participants. Complementary offers for *nextbike* were rated as very important by 47% and discounts for *Stadtmobil Südbaden* customers by 48% of the participants. One possible extension of the "Einfach mobil"-card could be the use as a ticket for public transport. Seventy-two percent of all participants rated this additional component as very / rather important. The card as access key for the "RadHaus" and for the rentable boxes for private bicycles was rated as very / rather important by 63% of the non-users.

6.2.9 Influences of New Mobility Services on Mobility Behavior

Important questions with regards to the use of integrated multimodal mobility services are, if and how they have influence on mobility behavior in the short and long term. To analyze the potential changes, statements were given and the participants had to decide, whether they totally agree – rather agree – rather do not agree – totally agree. The first statements (Figure 6-50) were presented to the citizens.
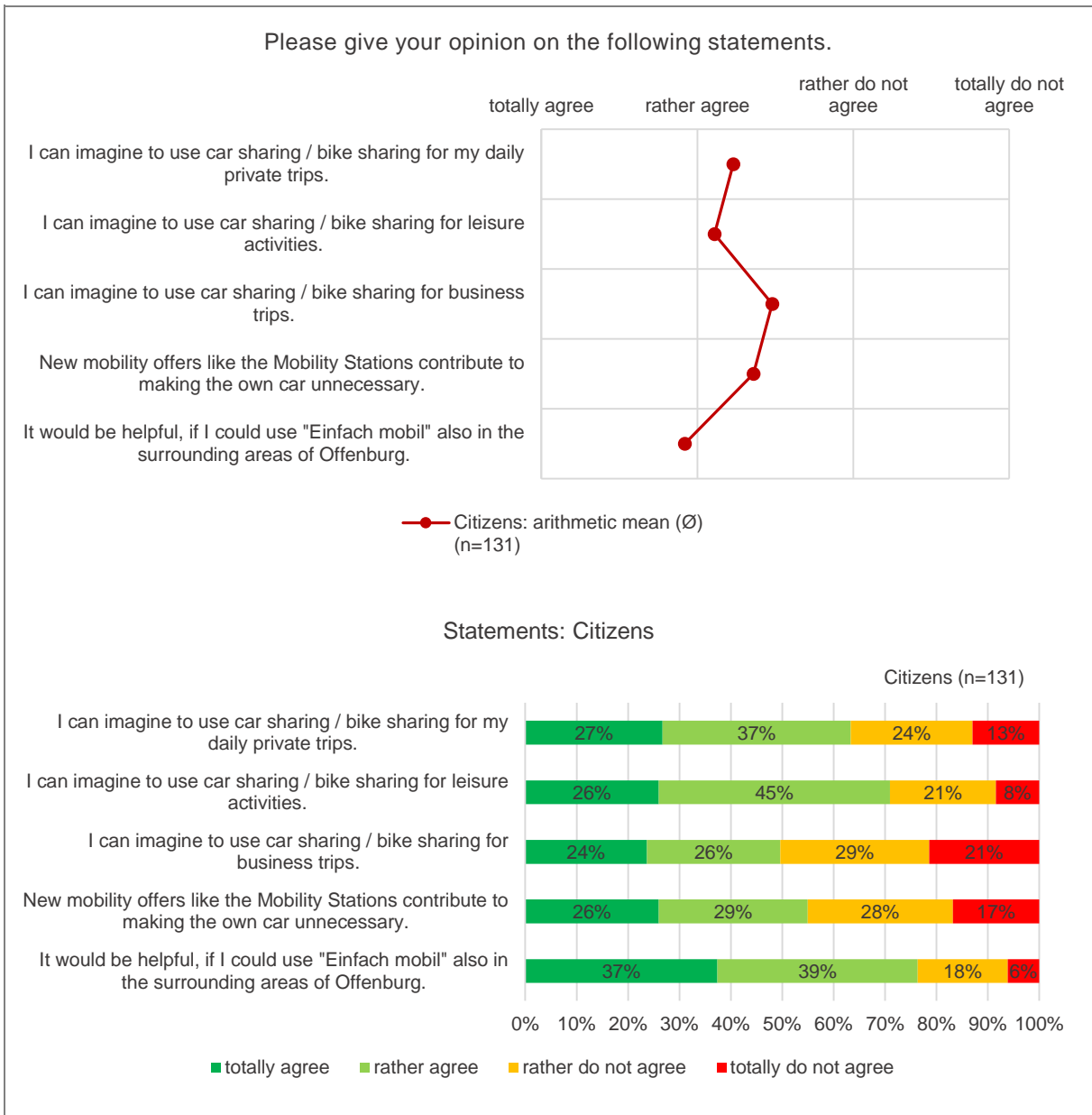
Figure 6-50: Statements about the influences of new mobility services on mobility behavior of citizens.

The first statement aimed to find out, if citizens can imagine to use carsharing / bikesharing for their daily private trips, and 64% of the participants totally / rather agreed. Another 71% could imagine to use the services for leisure activities. Half of the citizens stated that they would use the services also for business trips. Citizens had diverse opinions on the statement "new mobility offers like the Mobility Stations contribute to making the own car unnecessary". One half totally / rather agreed and the other half of participants rather / totally did not agree. This information indicates that many citizens still adhere to their private cars and don't think that shared vehicles would influence them in terms of car ownership. The majority of citizens (76%) stated that it would be helpful, if they could use "Einfach mobil" in the surrounding areas of Offenburg.

Commuters may have different expectations on mobility services than citizens and for this reason, the statements were adjusted (Figure 6-51).
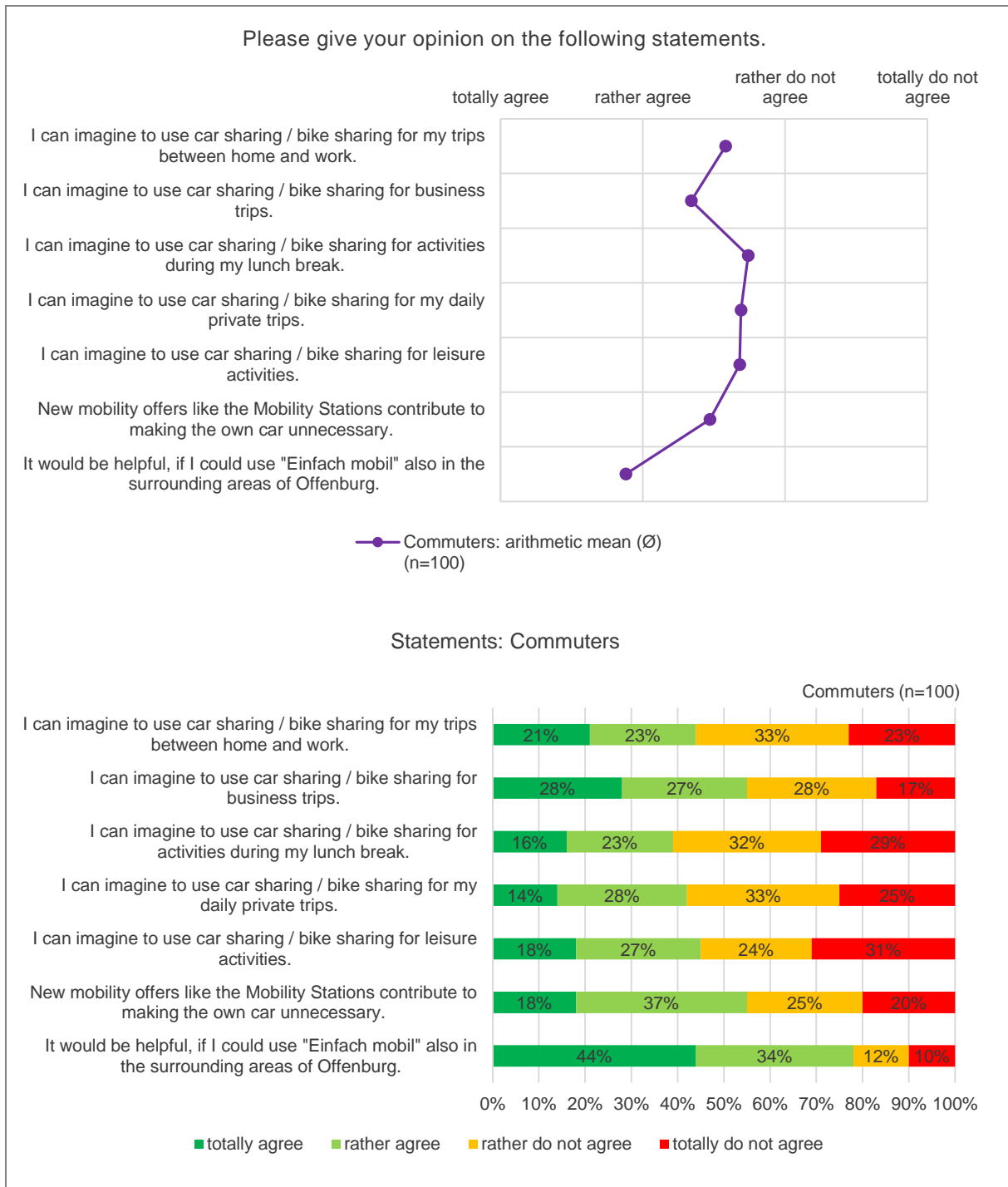
Figure 6-51: Statements about the influences of new mobility services on mobility behavior of commuters.

The first three statements aimed to find out whether commuters can imagine to use the mobility services within their working environment. Portions of respondents totally / rather agreed that they can imaging to use carsharing / bikesharing for their trips between home and work (44%), for business trips (55%) and for activities during their lunch break (39%). Forty-two percent of

participants indicated that they would use the services for daily private trips and another 45% could imagine to use them for leisure activities. More than half of the commuters totally / rather agreed that new mobility services could reduce the need for private vehicles. The majority of commuters (78%) stated that it would be helpful, if they could use "Einfach mobil" in the surrounding areas of Offenburg. The fact that commuters mostly live in the surrounding areas makes clear that they would appreciate the implementation of Mobility Stations in the neighboring villages.

The last question in the non-user survey gave citizens and commuters the possibility to write suggestions for improvement and own ideas about the services of "Einfach mobil". Figure 6-52 presents the results of the open-ended question. In order to obtain an overview, the different answers given in the questionnaires were categorized.
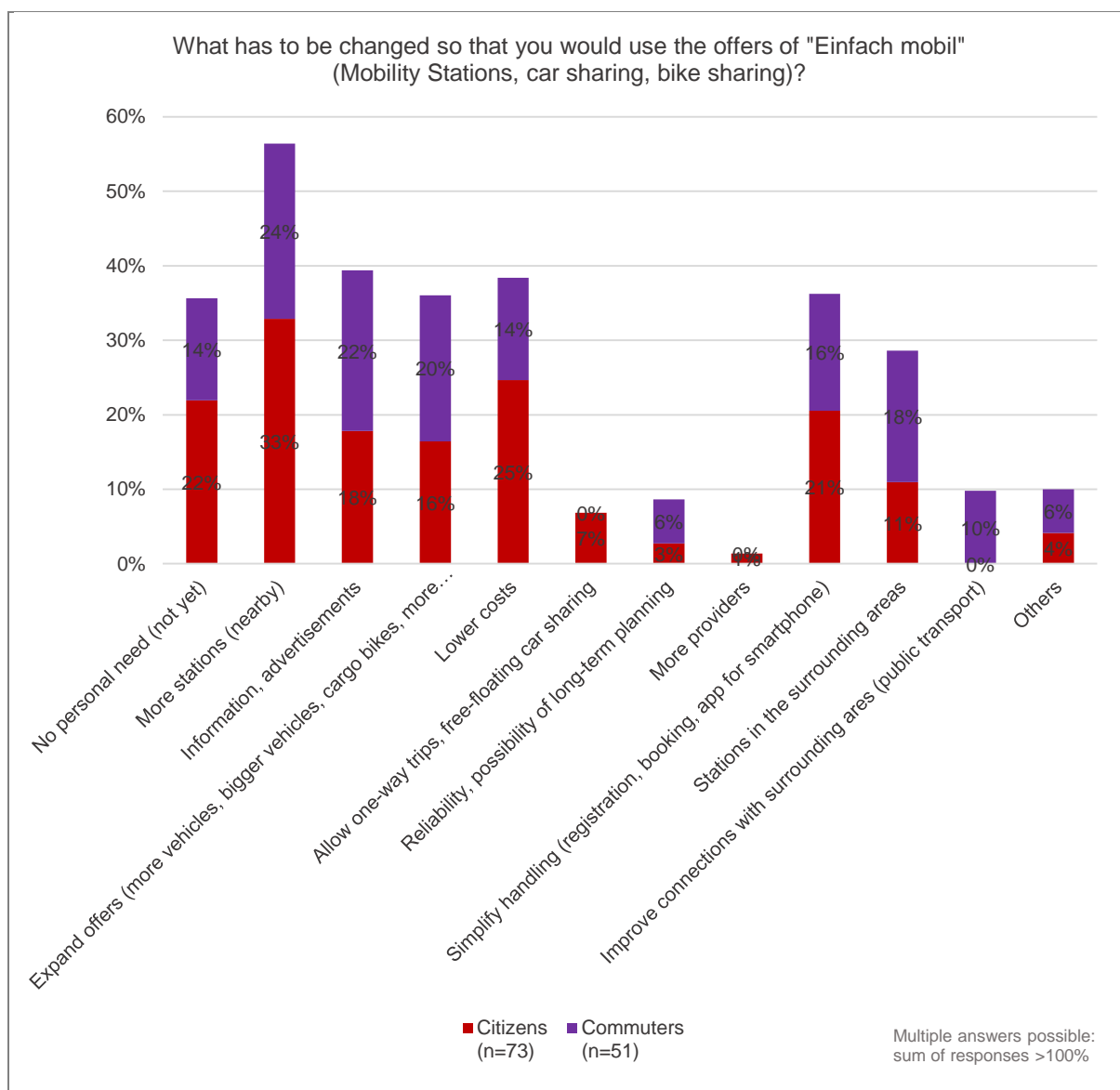
Figure 6-52: Suggestions for improvement of mobility services / Mobility Stations in Offenburg. Open question for non-users.

In total 73 citizens and 51 commuters wrote their comments to the question "what has to be changed, so that you would use the offers of "Einfach mobil" (Mobility Stations, carsharing, bikesharing)". Thirty-six percent indicated that there is no personal need (at the moment) and did not write further suggestions. A large number of citizens (33%) and commuters (24%) called for more stations near their homes and 29% even specified the area as "in the surroundings of Offenburg". Some participants stated that they did not know enough about the offers and wanted to have more information and advertising (18% of citizens and 22% of commuters). Many responses could be summarized in the category "expand offers". Sixteen percent of citizens and 20% of commuters would like to have additional offers, e.g. a wider range of vehicles, larger vehicles, cargo bicycles or scooters. Almost 40% of all participants indicated that they would use the services, if the costs were lower. A simplification of the handling through integrated registration and booking or a smartphone application would be important for 21% of the citizens and 16% of the commuters. A good connection of the services with public transport in the surrounding areas would make the use more attractive for commuters (10%). In total 9% of the participants wanted more reliability and the possibility for long-term planning.

6.3 Visitor Survey

The staff of the hotel "Mercure" in Offenburg started to distribute the 400 printed questionnaires to their guest on September 19, 2016. Visitors had the possibility to take part in the survey for more than three weeks. Unfortunately, the response rate was rather low (3%), which could be due to a low frequentation of the hotel within this period or a lack of interest of the hotel guests. Regarding the small number of completed questionnaires (12), the following analysis cannot be seen as representative, but provides a first impression on how visitors think of the new integrated multimodal service. Table 6-5 shows the demographical composition of visitors. More women (63.6%) took part in the survey among visitors. There were no participants younger than 18 years and older than 65 years. About 17% of participants have a university degree.

Table 6-5: Demographics of participants in the visitor survey.

		Visitors
Time frame		19.09.2016 - 12.10.2016
Sample (printed questionnaires)		400
Participants		12
Response rate (%)		3
Gender of respondents (%)	Male	36.4
	Female	63.6
Age group of respondents (%)	Under 18 years	0
	18 – 29 years	18.2
	30 – 39 years	18.2
	40 – 49 years	36.4
	50 – 59 years	18.2
	60 – 64 years	9.1
	65 – 74 years	0
	75 years and older	0
Respondents with university degree (%)		16.7

The first questions intended to collect information about the visitor: the purpose of the visit (private or work) and the mode of transport used for the trip to Offenburg (Figure 6-53).
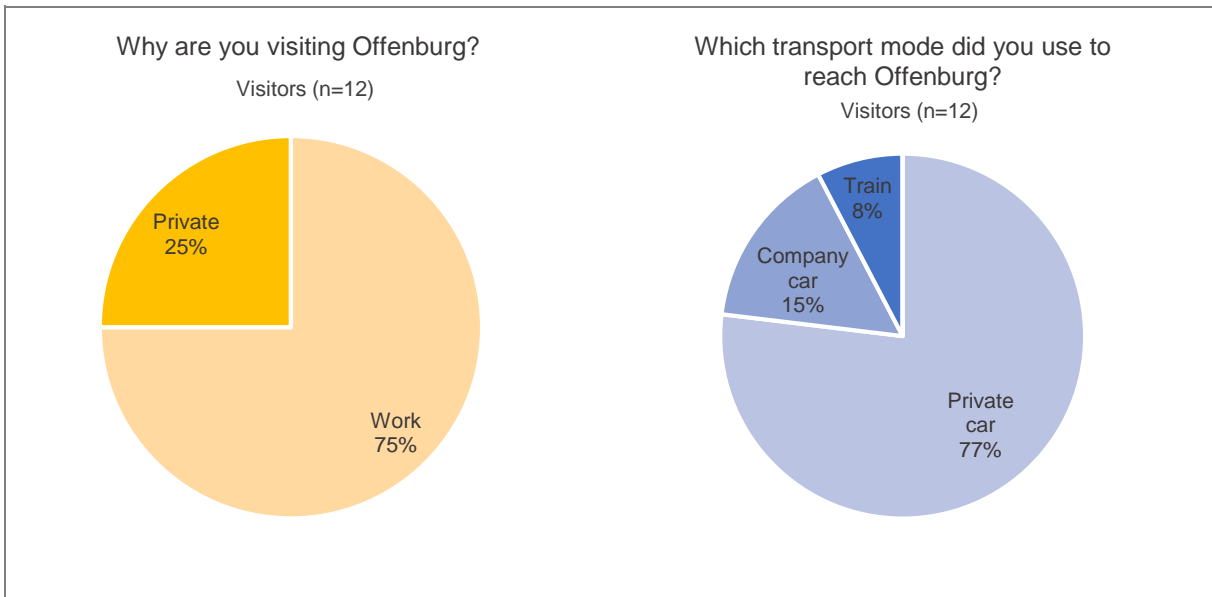
Figure 6-53: Information about the visit: a) purpose of stay and b) transport mode used for the trip to Offenburg.

Seventy-five percent visited the city for work and the rest indicated private purposes for their stay. The majority of visitors traveled to Offenburg with their private car (77%), 15% used a company car and 8% came by train.

In order to examine, which of the new mobility services visitors already know, the general question in Figure 6-54 was posed.
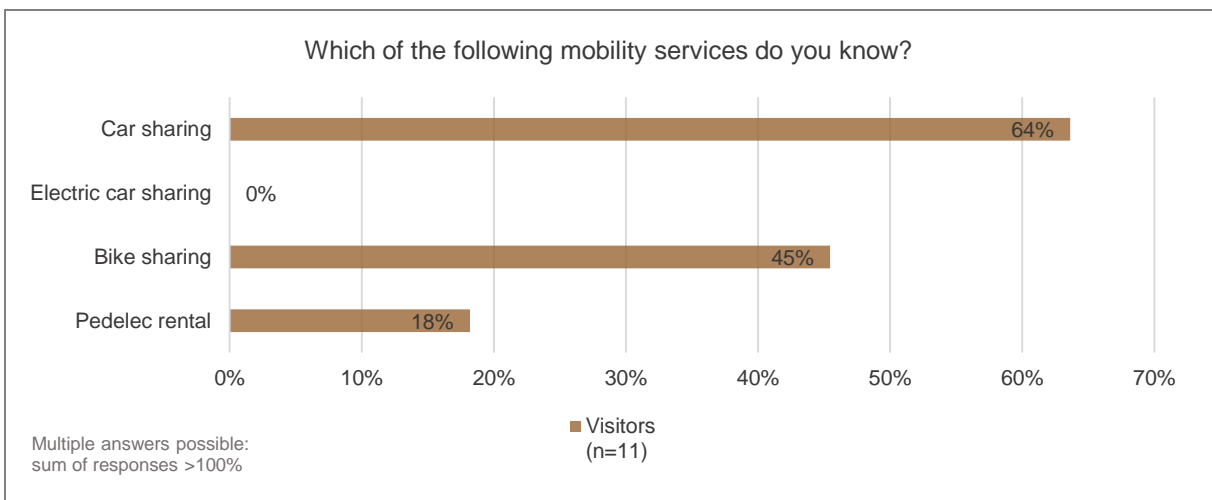
Figure 6-54: Awareness of mobility services of visitors.

Carsharing was known by 64%, bikesharing by 45% and the possibility to rent pedelecs was known by 18% of participants in the visitor survey. No one had ever heard of electric carsharing as new mobility service.

The following questions about the new integrated multimodal mobility service in Offenburg intended to find out, if visitors already became aware of the brand "Einfach mobil" and the Mobility Stations. In addition, it should be determined, if these services are generally adopted and whether there is interest in the usage (Figure 6-55).
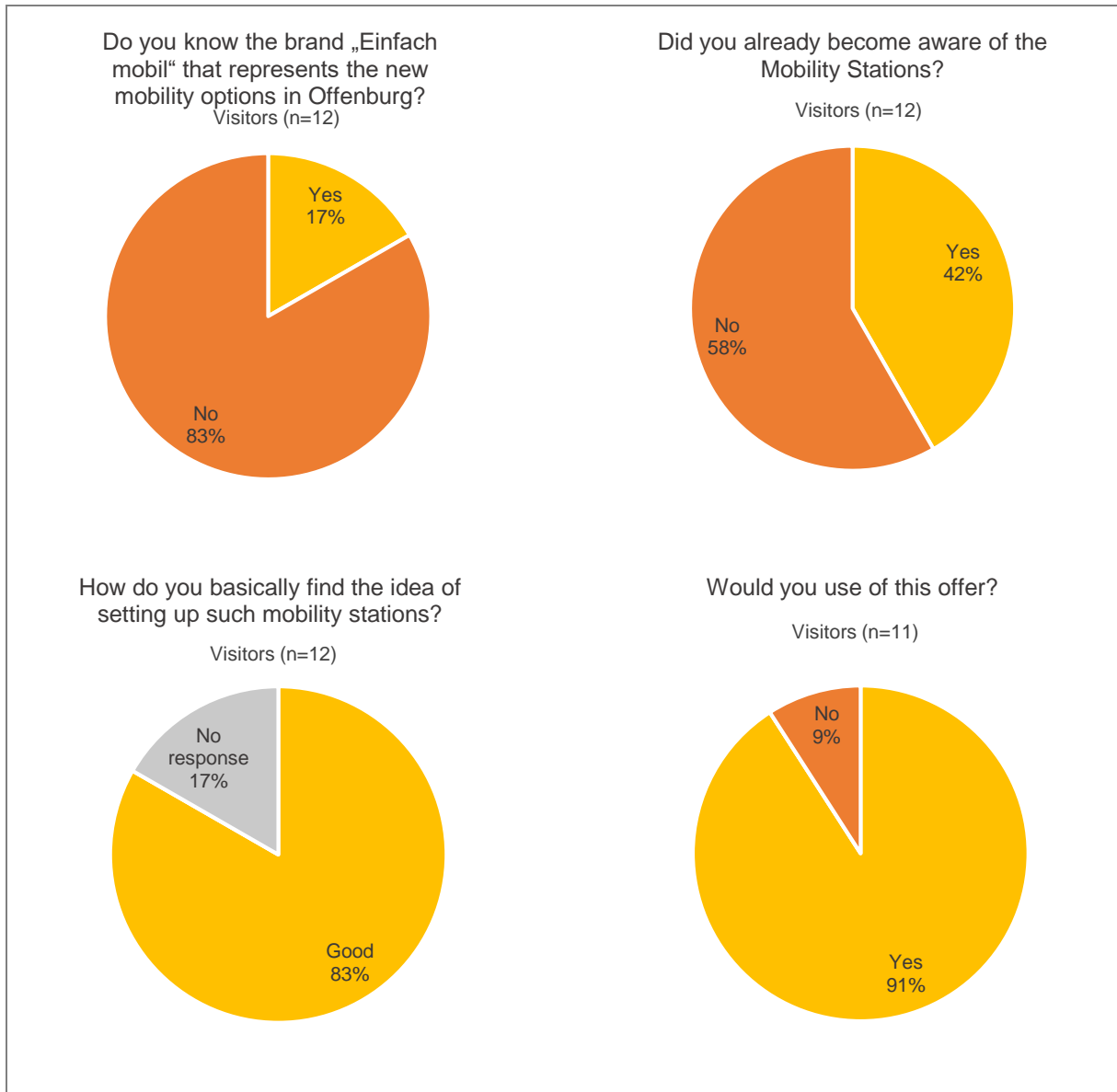
Figure 6-55: Awareness of "Einfach mobil" / Mobility Stations. General interest in the usage.

Only a small portion of visitors were aware of the new brand "Einfach mobil" (17%), but 42% already noticed the Mobility Stations. The idea of setting up Mobility Stations is rated as good by 83% of participants and almost all visitors would like to use the service (91%).

Figure 6-56 shows the responses of the visitors to the statements about potential changes on mobility behavior. The first three statements aimed to find out whether visitors can imagine to use the new mobility services for their trip to the hotel and for activities during their stay in Offenburg.
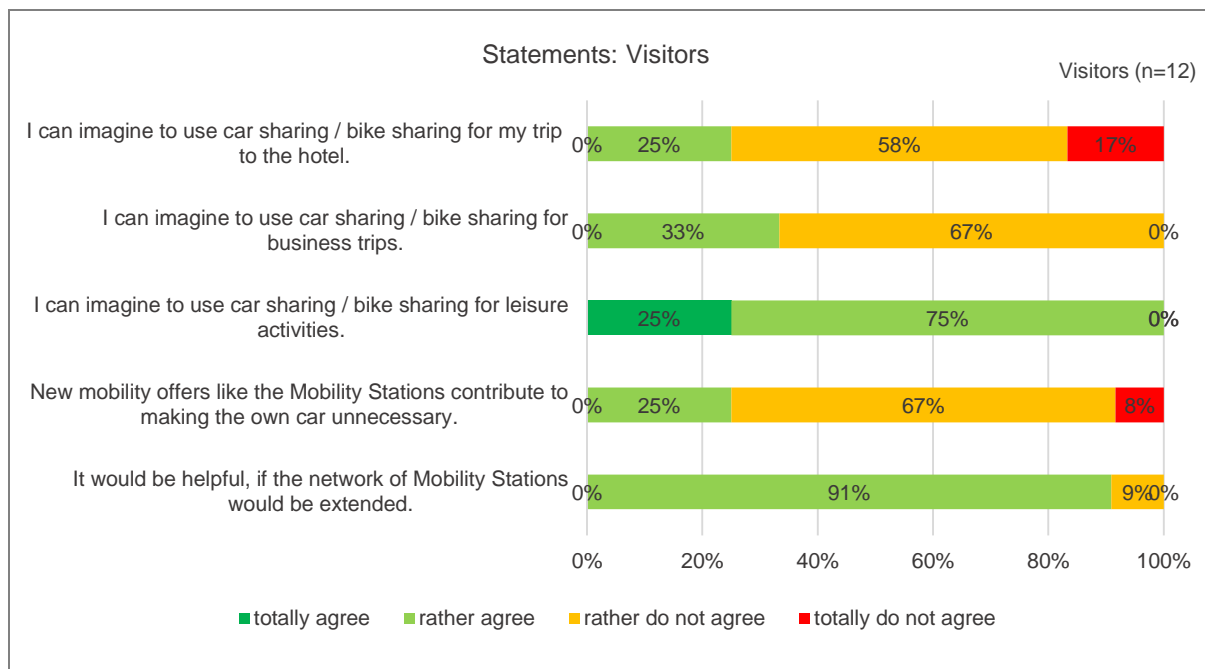
Figure 6-56: Statements about the influences of new mobility services on mobility behavior of visitors.

Small portions of respondents rather agreed that they can imagine to use carsharing / bikesharing for their trips to the hotel (25%) and for business trips (33%). All participants indicated that they would use the service for leisure activities. Twenty-five percent of visitors rather agreed that new mobility services could reduce the need for private vehicles. The majority of visitors (91%) stated that it would be helpful, if the network of Mobility Stations would be extended.

7 Summary of Results and Recommendations

In this chapter, the findings of the previous sections are reflected and used to derive recommendations for the implementation of additional Mobility Stations in Offenburg. The level of awareness of users and non-users regarding the new service is presented. Responses, which named potential locations for future Mobility Stations, are summarized and suggestions for an extension and improvement of the components are given. Then, recommendations for the "Einfach mobil"-card, the project website and the services of *nextbike* and *Stadtmobil Südbaden* are introduced. A summary of (potential) impacts of the new integrated multimodal mobility service in Offenburg concludes the chapter.

7.1 Raising Awareness for "Einfach mobil" and Mobility Stations

One goal of this thesis was to investigate the perception of the new integrated multimodal mobility service "Einfach mobil" in Offenburg. Therefore, in the beginning of the user and non-user questionnaires, participants of the survey were asked to state whether they were aware of the new brand "Einfach mobil". The responses indicated that the majority of users were already aware (88% of customers of *nextbike* and 80% of customers of *Stadtmobil Südbaden*). In contrast, the new brand was only known by 50% of the citizens, 33% of commuters and 17% of visitors. Those participants, who were aware of "Einfach mobil", mainly named the new logo at the Mobility Stations and on vehicles (bicycles, cars) as reason for their awareness. According to the responses of citizens and commuters, advertisement and events contributed only little to publicize the new brand.

The next question in the user and non-user questionnaires was about the awareness of Mobility Stations. Similar to the first question, the share of users, who were already aware of the Mobility Stations, was significantly higher than the share of non-users. Around 80% of *nextbike* customers, 87% of *Stadtmobil Südbaden* customers, 66% of citizens, 39% of commuters and 42% of visitors already noticed these stations. The majority of non-users, who knew the Mobility Stations, indicated that they learnt about the stations by chance while walking past. Publication in media was named by 33% of non-users and advertisement by 14%, hence these efforts seemed to play a minor role in raising awareness of Mobility Stations.

Based on the responses, a first recommendation for raising the awareness of "Einfach mobil" and of the Mobility Stations is to keep on making the brand visible in public space. The corporate design together with the new logo has an impact on the degree of brand awareness and a high recognition value. The city already initiated the creation of a uniform appearance of all options for local mobility in Offenburg. This trend should be continued for all additional components and stations in the future.

In the context of the question "what has to be changed so that you would use the offers of "Einfach mobil" (carsharing, bikesharing, Mobility Stations)" in the non-user questionnaires, many participants indicated that they would need more information and advertisement (18% of citizens and 22% of commuters). The following list provides some suggestions for actions to provide non-users with information and to promote the service.

- Articles in the local newspaper "Offenblatt";
- Distribution of brochures with information;
- Distribution of flyers and postcards;
- Postings on the website of the city of Offenburg;
- Promotion of the "Einfach mobil"-card;
- Marketing campaigns for environmentally friendly mobility.

The survey within the framework of this master thesis was also used as marketing measure for "Einfach mobil". All participants, who filled out the non-user questionnaires, could pick up an "Einfach mobil"-card for free. In total, 100 non-users made use of this incentive and registered for "Einfach mobil". These people then received their card with a letter of information. The goal of this strategy was that the new customers also register for *nextbike* and *Stadtmobil Südbaden* and then use the Mobility Stations. Future evaluation projects should also contribute to raise the awareness of the new integrated multimodal mobility service.

7.2 Extension of the Network of Mobility Stations

One question aimed to find out, how non-users basically find the idea of implementing Mobility Stations. Almost all citizens (93%), commuters (94%) and visitors (83%) indicated that implementing such stations is a good idea. After this positive feedback, the participants of the survey were asked, if they want to have more Mobility Stations in Offenburg. Whereas 69% of *nextbike* customers and 56% of *Stadtmobil Südbaden* customers argued for the expansion of the stations, only 46% of citizens and 37% of commuters wanted to have more Mobility Stations. A large share of participants in both groups were undecided.

In total, 41 users and 91 non-users, who wanted more Mobility Stations in Offenburg, specified their answer with a description of potential locations. In Chapter 6 answers of the respective groups (customers of *nextbike*, customers of *Stadtmobil Südbaden*, citizens and commuters) were analyzed and visualized in separate maps. In a further evaluation step, the locations, which were named by more than one group, were collected. Figure 7-1 contains an overview of the locations.
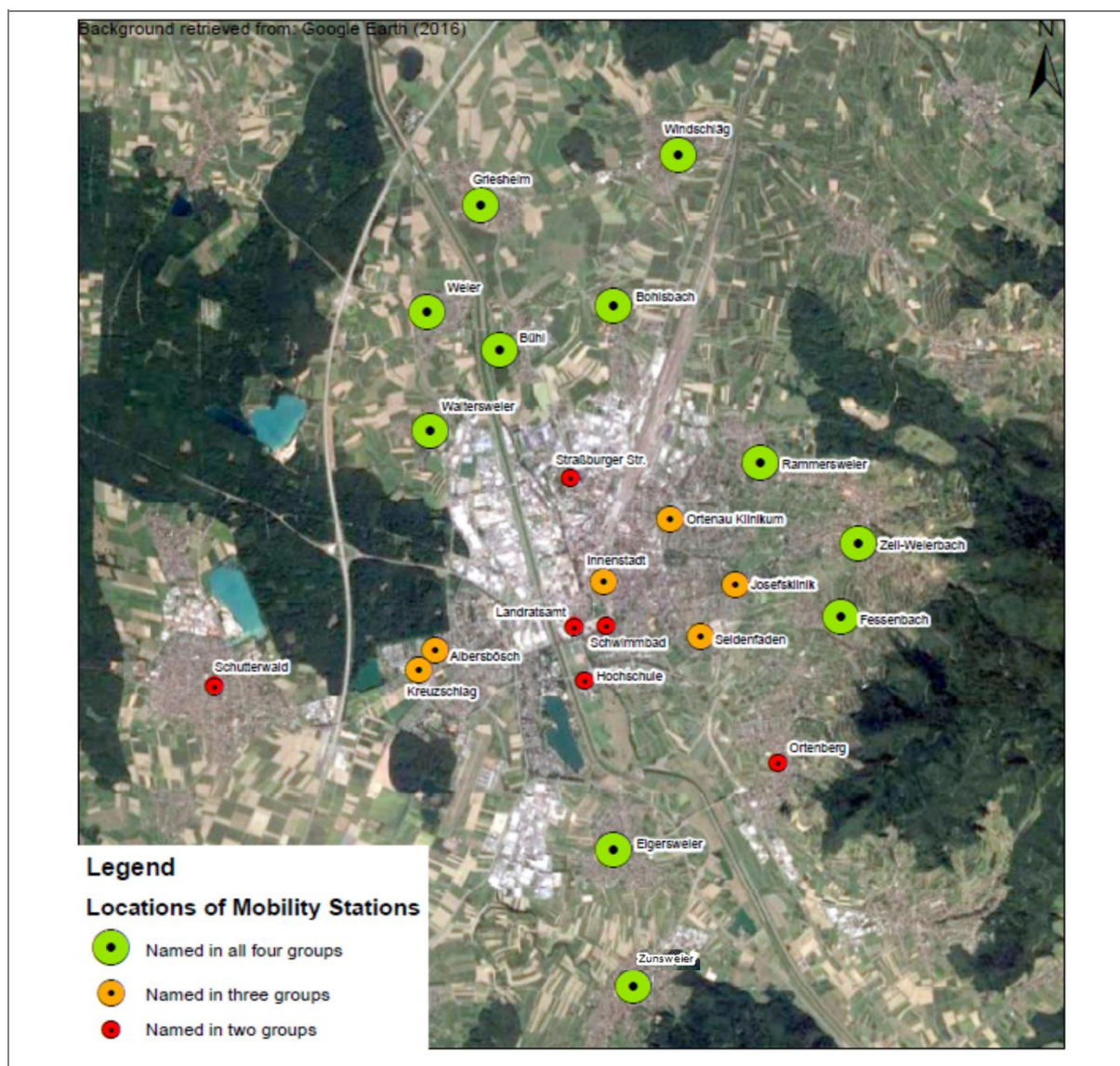
Figure 7-1: Possible locations of Mobility Stations according to response of the user and non-user survey.

The eleven surrounding districts of Offenburg (green color) were named at least once in all groups. The residential areas Albersbösch, Kreuzschlag and Seidenfaden, the hospitals "Ortenauklinikum" and "Josefsklinik", as well as the city center were named as potential locations for Mobility Stations by participants of three different groups (orange color). Points of interest, like the "Landratsamt", the public swimming pool and the university, the municipalities Schutterwald and Ortenberg, and locations along the Straßburger road were named by two groups.

In the open question, where non-users could write their suggestions for improvement of "Einfach mobil", 57% of participants called for more Mobility Stations nearby their homes and workplaces. Another 29% specified that they want to have additional stations in the surrounding areas of Offenburg. The results from the ranking of statements also underline the importance of an expansion of the network of Mobility Stations to surrounding areas of

Offenburg. All customers of *nextbike*, 88% of *Stadtmobil Südbaden* customers, 76% of citizens and 78% of commuters totally or rather agreed that it would be helpful, if people could use "Einfach mobil" also in the surrounding areas of Offenburg. Almost all participants in the visitor survey (91%) rather agreed, that an expansion of the network would be helpful.

On basis of this analysis, the number of additional Mobility Stations can be estimated. According to all participants, stations in the surrounding districts would be helpful. This means a number of eleven stations. Six other locations were named by three groups and also six locations were named by two groups. In sum, within the framework of the survey among users and non-users, another 23 locations were identified for the implementation of Mobility Stations.

7.3 Configuration of Future Mobility Stations

The configuration of Mobility Stations plays an important role for the attractiveness of the integrated multimodal mobility service. Statements on how users and non-users rate components in terms of importance, can be used for improvement and further development of the Mobility Stations. Existing components can be modified and new components can be implemented, in order to satisfy users and to attract new customers.

Existing components of Mobility Stations

To evaluate the new Mobility Stations in Offenburg, users and non-users were asked how they would rank the existing components in terms of importance. The following list provides an overview of the answers for each component. The percentages present the sum of responses, which ranked the respective component as "very important" and "rather important".

- Carsharing: 75% *nextbike*, 100% *Stadtmobil Südbaden*, 80% citizens, 64% commuters;
- Parking spaces for carsharing vehicles: 75% *nextbike*, 100% *Stadtmobil Südbaden*, 81% citizens, 63% commuters;
- Bikesharing: 100% *nextbike*, 39% *Stadtmobil Südbaden*, 77% citizens, 83% commuters;
- Parking spaces for bikesharing bicycles: 88% *nextbike*, 44% *Stadtmobil Südbaden*, 79% citizens, 83% commuters;
- Pedelecs: 51% *nextbike*, 31% *Stadtmobil Südbaden*, 48% citizens, 45% commuters;
- Electric carsharing: 57% *nextbike*, 86% *Stadtmobil Südbaden*, 71% citizens, 57% commuters;
- Public transport (bus / train): 81% *nextbike*, 76% *Stadtmobil Südbaden*, 84% citizens, 93% commuters;

- Coach bus services: 37% *nextbike*, 29% *Stadtmobil Südbaden*, 62% citizens, 56% commuters.

Additional components of Mobility Stations

The modular design of the Mobility Stations in Offenburg allows a high flexibility in the configuration of stations. In order to understand the needs for additional components of Mobility Stations, participants of the users and non-user survey were asked to state their opinions. The percentages present the sum of responses, which ranked the respective additional component as "very important" and "rather important".

- Information desk: 50% *nextbike*, 46% *Stadtmobil Südbaden*, 83% citizens, 79% commuters;

- Service center: 62% *nextbike*, 33% *Stadtmobil Südbaden*, 68% citizens, 75% commuters;

- Cargo bicycles: 44% *nextbike*, 59% *Stadtmobil Südbaden*, 42% citizens, 33% commuters;

- Taxi stops: 32% *nextbike*, 16% *Stadtmobil Südbaden*, 26% citizens, 26% commuters;

- Racks / boxes for private bicycles: 50% *nextbike*, 72% *Stadtmobil Südbaden*, 84% citizens, 74% commuters.

Offers nearby Mobility Stations

Offers in the surrounding areas of Mobility Stations can also play a role in increasing their attractiveness for users and non-users. The responses given in the questionnaires are summarized below. The percentages present the sum of responses, which ranked the respective offers nearby Mobility Stations as "very important" and "rather important".

- Kiosk: 26% *nextbike*, 17% *Stadtmobil Südbaden*, 23% citizens, 24% commuters;

- Snack bar: 26% *nextbike*, 13% *Stadtmobil Südbaden*, 18% citizens, 17% commuters;

- Lockers / baggage spaces: 69% *nextbike*, 39% *Stadtmobil Südbaden*, 68% citizens, 72% commuters;

- Packaging facilities: 44% *nextbike*, 14% *Stadtmobil Südbaden*, 36% citizens, 29% commuters;

- ATM: 51% *nextbike*, 18% *Stadtmobil Südbaden*, 38% citizens, 48% commuters;

- Shopping facilities: 69% *nextbike*, 18% *Stadtmobil Südbaden*, 48% citizens, 48% commuters;

- Leisure activities: 57% *nextbike*, 10% *Stadtmobil Südbaden*, 39% citizens, 29% commuters.

Summary

Based on the overview given in this section, a ranking was created. The responses of all participants (customers of *nextbike*, customers of *Stadtmobil Südbaden*, citizens and commuters), who ranked the respective components as important (very and rather important), were used to calculate the mean percentage for each component. The results of this ranking are presented in Figure 7-2.

Component		Percentage
Public transport (bus / train)	⇑	84%
Car sharing	⇑	80%
Parking spaces for car sharing vehicles	⇑	80%
Bike sharing	⇑	75%
Parking spaces for bike sharing bicycles	⇑	74%
Racks / boxes for private bicycles	⇗	70%
Electric car sharing	⇗	68%
Information desk	⇗	65%
Lockers / baggage spaces	⇗	62%
Service center	⇗	60%
Coach bus services	⇒	46%
Shopping facilities	⇒	46%
Cargo bicycles	⇒	45%
Pedelecs	⇘	44%
ATM	⇘	39%
Leisure activities	⇘	34%
Packaging facilities	⇓	31%
Taxi stops	⇓	25%
Kiosk	⇓	23%
Snack bar	⇓	19%

Figure 7-2: Components of Mobility Stations ranked by importance.

The ranking summarizes the responses and can be seen as rough estimation of the importance of the different components and offers. According to these findings, the most important component of the Mobility Stations is public transport, followed by carsharing with dedicated parking facilities for vehicles, and bikesharing with parking facilities for shared bicycles. Racks and boxes to store private bicycles, electric carsharing, information desks, lockers and baggage spaces, and a service center also seemed to be especially important for participants of the survey. About half of the participants thought that coach bus services, shopping facilities nearby the stations, cargo bicycles and pedelecs would be important components of the Mobility Stations. An ATM, leisure activities and packaging facilities were ranked important by a smaller share of participants. The components, which were the least rated as important, are taxi stops, kiosks and snack bars.

Based on this analysis, recommendation for the implementation of future Mobility Stations can be derived. Almost all components, which are actually available at the Mobility Stations, are ranked as important by the majority of participants in the user and non-user survey. Therefore, it is wise to keep on making these services available at the existing stations and at all other Mobility Stations to be implemented. The provision of coach bus services and pedelecs seem to be less important and should not be extended. According to the findings in the ranking, the demand for racks and boxes for private bicycles, for information desks, and for lockers and baggage spaces is rather high. These components should be part of the Mobility Stations in the future. A service center with information and ticket vending should also be implemented. Cargo bicycles can be installed as extra component at selected Mobility Stations and shopping facilities in the vicinity can be a criterion for the selection of locations for future stations.

In addition to the questions about the components of Mobility Stations, statements retrieved from the open-ended questions are of great importance for the evaluation. There, users and non-users had the possibility to write suggestions for the improvement of the Mobility Stations. Many participants requested an extension of components and offers. According to *Stadtmobil Südbaden* customers, more vehicles and a larger selection of models should be available at the Mobility Stations. Trailers and seats for children would make the service even more attractive for them. Some users would also appreciate the installation of lighting and roofs. A prerequisite for *Stadtmobil Südbaden* users is the availability of sufficient parking spaces for carsharing vehicles. Citizens and commuters asked for more and larger vehicles and for the availability of scooters. Whether these suggestions can be taken into account is mostly the decision of the providers.

7.4 Improvements of Elements of "Einfach mobil"

Besides questions about the importance of components of the Mobility Stations, also questions about the features of the "Einfach mobil"-card were asked to participants of the user and non-user survey. Responses concerning the "Einfach mobil"-card and the project website "www.mobil-in-Offenburg.de" are reflected below.

"Einfach mobil"-card

In general, the feedback on the "Einfach mobil"-card was very positive. The following list shows actual and potential features of the card. The percentages present the sum of responses, which ranked the components of the "Einfach mobil"-card as "very important" and "rather important".

- Access key for carsharing vehicles / bikesharing bicycles: 86% users, 84% non-users;
- Discounts on carsharing: 88% users, 77% non-users;

- Discounts on bikesharing: 83% users, 79% non-users;

- Bus ticket: 74% users, 72% non-users;

- Access key for "RadHaus" / bicycle boxes: 75% users, 63% non-users.

Based on the results in the questionnaires, a ranking of the features was created. The responses of all participants (customers of *nextbike*, customers of *Stadtmobil Südbaden*, citizens and commuters), who ranked the respective components as important (very and rather important), were used to calculate the mean percentage for each component. The results of this ranking are presented in Figure 7-3.

Access key for car sharing vehicles / bike sharing bicycles	⬆	85%
Discounts on car sharing	⬆	83%
Discounts on bike sharing	⬆	81%
Bus ticket	↗	73%
Access key for "RadHaus" / bicycle boxes	↗	69%

Figure 7-3: Components of "Einfach mobil"-card ranked by importance.

The use of the "Einfach mobil"-card as access key for carsharing vehicles and bikesharing bicycles is rated as important by 85% of participants. Complementary offers for the carsharing and bikesharing services for "Einfach mobil"-card owners seem to be very important for users and non-users. Most participants also rate use of the card as ticket for local public transport as important. A smaller, but high share of participants wanted to have the "Einfach mobil"-card as access key for the "RadHaus" and for bicycle boxes.

"Einfach mobil"-website

According to the results in Chapter 6, only few participants have ever visited the project website. Some of these people claimed that they could not find helpful information. In the open-ended questions, also statements about an improvement of the virtual presence of "Einfach mobil" were given. People stated that an integrated registration for all providers at one platform and integrated information about availability, usage and prices should be implemented. An application for smartphones would help to simplify the use of the integrated multimodal mobility service.

7.5 Recommendations for Providers of Bikesharing and Carsharing

At the moment, two providers offer their services at the Mobility Stations in Offenburg: *nextbike* (bikesharing) and *Stadtmobil Südbaden* (carsharing). In the survey among users, 18 customers of *nextbike* and 63 customers of *Stadtmobil Südbaden* filled out the questionnaires

and gave feedback on the new integrated multimodal mobility service. Many customers of *Stadtmobil Südbaden* used the open-ended questions to write about their experiences and suggestions regarding the carsharing service. In the survey among citizens and commuters, the participants were asked questions about the providers in order to analyze their degree of popularity. This section summarizes responses of users and non-users regarding the providers *nextbike* and *Stadtmobil Südbaden*.

Nextbike

Due to the low participation of *nextbike* customers in the user survey, there are only two comments on the use of the service. One user complained that the software of the provider requires an activation of the location determination. According to this response, the setting should not be prerequisite to protect the privacy of users. Another *nextbike* customer stated that the uniform size of the bicycles makes them uncomfortable. In order to solve this problem, not only the saddles should be height-adjustable, but also the handlebars. In the non-user survey, citizens and commuters were asked to state why they do not use *nextbike*. The most common responses were that other modes of transport were preferred (63%) and that bikesharing would not be suitable for the daily trips (54%). Around 23% of non-users indicated that the usage of the service would be too complicated and 13% of respondents said that the high costs would hinder them to use bikesharing. Regarding these responses, a great task is to convince people of the positive effects of bikesharing. Through advertising and campaigns, residents and commuters should learn that cycling helps to improve their health and to protect the environment. Even if the bikesharing service would not be suitable for all trips, the importance of this mode within a multimodal trip chain should be clarified. The use of pedelecs for longer distances should be promoted. In the case of *nextbike* in Offenburg, the handling with the smart "Einfach mobil"-card and *nextbike*´s smartphone application is already very easy. Nevertheless, it is a hurdle for many interested citizens and commuters. More information on how to use the service and on-site information events could help to encourage potential users. With the help of the complementary offers, the price for the use can be reduced. Additionally, the possibility of trial subscriptions should be considered.

Carsharing

The feedback concerning the carsharing service of *Stadtmobil Südbaden* was significantly higher than for nextbike. Among the customers of *Stadtmobil Südbaden*, almost half of all participants gave suggestions for the improvement of the service. Obviously, since the introduction of the Mobility Stations, there have been increasing problems with the electric cars and the charging facilities. In the open-ended question, users claimed that the provider should solve these problems and provide more information regarding the electric vehicles. Some

users mentioned problems regarding the booking process. Another argument was the availability of vehicles. At the moment, *Stadtmobil Südbaden* offers six vehicles at the Mobility Stations and two more cars at another two stations in the city. On the basis of the current demand, it would be wise to check whether more vehicles should be provided in order to satisfy the customers´ needs. In the non-user survey, citizens and commuters were asked to state why they do not use *Stadtmobil Südbaden*. The most common responses were that other modes of transport were preferred (64%) and that people do not use the service, because there is no suitable station nearby (29%). Around 14% of non-users indicated that the registration process of the service would be too complicated and 20% of respondents said that the high costs would hinder them to use carsharing. Regarding these responses, a great task is to convince people that carsharing presents an attractive alternative to private car usage. Even if most people are not yet willing to totally forego their own car, the carsharing service could reduce the need for a second car. Information events and advertising, where the advantages of carsharing are presented and the whole process of using the service is explained, could help to lower the barriers to join the organization. With the help of the complementary offers, the price for the use can be reduced. Additionally, the possibility of trial subscriptions should be considered. In the open-ended questions to citizens and commuters, participants indicated that the reliability of the carsharing service should be guaranteed. In addition, some participants wished to have the possibility of long-term planning.

7.6 Impacts of the Multimodal Mobility Service on Mobility Behavior

With regards to further development of the integrated multimodal mobility service, important questions about the use of "Einfach mobil" are, if and how the service influence mobility behavior. Users were asked, which mode of transport they would have used for their last trip at the Mobility Stations with a bikesharing bicycle or a carsharing vehicle in case that these services would not be available. Further, potential changes in mobility behavior were analyzed by asking users and non-users how the integrated multimodal mobility service would influence their daily mobility decisions.

Modes replaced by the use of shared services

According to the responses in the survey among users, bikesharing replaced 64% of walking trips, 27% with a private bicycle and 18% of trips by private car. Forty percent of trips by carsharing replaced trips by public transport. Carsharing also replaced 26% of trips by private car and 25% with private bicycle.

Impacts on mobility behavior and travel preferences of users

Using the Mobility Stations potentially contributes to changes in mobility behavior towards more multimodality. Respondents in the user survey indicated that, since they use the Mobility Stations, they also use other mobility services more often.

- 38% of *nextbike* customers and 10% of *Stadtmobil Südbaden* customers indicated that they use public transport more often;
- 38% of *nextbike* customers and 36% of *Stadtmobil Südbaden* customers indicated that they use *Stadtmobil Südbaden* more often;
- 50% of *nextbike* customers but only 2% of *Stadtmobil Südbaden* customers indicated that they use *nextbike* more often.

The Mobility Stations influenced travel preferences by attracting people to become customers of the mobility services, which are integrated into the multimodal mobility service.

- 51% of *nextbike* respondents registered to *nextbike*, because they became aware of the service by the presence of the Mobility Stations;
- 22% of *Stadtmobil Südbaden* users joined their carsharing provider, because they became aware of the service through the Mobility Stations.

Potential impacts on mobility behavior of non-users

In order to analyze potential impacts on mobility behavior of citizens, commuters and visitors, the participants in the non-user survey were asked to imagine state their opinions to hypothetical situations.

- 64% of citizens and 42% of commuters can imagine to use bikesharing / carsharing for *private trips*;
- 71% of citizens, 45% of commuters and 100% of visitors can imagine to use bikesharing / carsharing *leisure activities*;
- 50% of citizens and 55% of commuters can imagine to use bikesharing / carsharing for *business trips*;
- 39% of commuters can imagine to use bikesharing / carsharing for *activities during their lunch break*;
- 44% of commuters can imagine to use bikesharing / carsharing for their *trips between home and work*;
- 25% of visitors can imagine to use bikesharing / carsharing for their *trips to the hotel*.

Impacts on car ownership

76% of nextbike customers, 88% of Stadtmobil Südbaden customers, 55% of citizens, 55% of commuters and 25% of visitors indicated that new mobility services, like the Mobility Stations, contribute to make private cars unnecessary.

8 Conclusions

This chapter concludes the investigations carried out within the framework of this master thesis. A review of all steps should indicate to what extent the study contributed to achieving the declared goals, which were defined in Chapter 1. Problems during the realization of the survey are pointed out, and suggestions for improvements and future evaluation projects are given.

8.1 Summary of Investigations

The overall goal of this master thesis was to contribute to the evaluation of Mobility Stations in Offenburg. Measures to assess the perception and acceptance of the new integrated multimodal mobility service "Einfach mobil" were developed and conclusions about a potential change in mobility behavior of users and non-users were drawn. A theoretical investigation on integrated multimodal mobility services in the first step provided the basis for understanding the new service in Offenburg. In order to get to know the area of investigation, the transport system and the development of the modal share were analyzed. Basic methods for empirical investigations in transport were explored and used for the planning and execution of a survey among five different target groups: customers of *nextbike*, customers of *Stadtmobil Südbaden*, citizens, commuters and visitors.

Within the survey planning stage, online questionnaires were chosen to be the most appropriate survey technique for the upcoming data collection. Due to restrained monetary and time budgets, the free online tool "Umfrage online" was used for realizing the survey. Questionnaires for the target groups were designed in order to obtain as much information about the new integrated multimodal mobility service as possible.

The questions should help to collect information about the main aspects of investigation. Customers of *nextbike* and *Stadtmobil Südbaden*, citizens and commuters had to answer questions about their awareness of the brand "Einfach mobil" and the new Mobility Stations. Questions about existing and additional components of the four new Mobility Stations and facilities nearby these locations were posed. Users of the bikesharing and carsharing services were asked about characteristics of their last trip with shared vehicles and their experiences at the Mobility Stations. Participants also stated, if there is a need for more Mobility Stations and which locations they think would be appropriate for implementing new stations. Not only questions about the Mobility Stations, but also about the "Einfach mobil"-card with its components and the project website "www.mobil-in-Offenburg.de" were asked. Additional questions about the use of existing offers intended to identify travel preferences of participants.

Citizens and commuters had to specify why they do not use the providers *nextbike* and *Stadtmobil Südbaden*. Questions about the demographical composition of respondents had to be answered in the end of each questionnaire.

After designing the questionnaires, the task was to address participants, to make them aware of the survey and to invite them to participate. With the help of the providers for bikesharing and carsharing, the users of these mobility services were invited via email. It was also possible to offer them incentives, if they completely filled out the questionnaires. Commuters and visitors were informed via articles in the local newspaper "Offenblatt" and information on the website of the city. Additionally, 5000 postcards with an invitation were distributed within the city area and some were sent directly to selected local companies. In order to increase the response rate, the city offered citizens and commuters, who participated in the survey, an "Einfach mobil"-card for free. Visitors in the non-user survey were represented by guests of the local hotel "Mercure", which is located in the immediate area of the Mobility Station "Messe". Due to the fact that visitors have little or no experience with the new integrated multimodal mobility service in Offenburg, the questions in their questionnaire were rather general and the results could only be used for rough estimations.

The data was collected and stored with the help of the online tool "Umfrage online". When the survey among users and non-users of "Einfach mobil" was closed, the raw data was then analyzed and visualized in the program Microsoft Excel. The potential locations of new Mobility Stations, according to users and non-users, were visualized in ArcMap 10.4. All results are presented in diagrams in Chapter 6.

According to the results, the majority of users but a significantly smaller share of non-users was already aware of the new brand "Einfach mobil" and the Mobility Stations. The main raison for awareness of participants was the visibility of the service with its brand and logo within the public space and on vehicles of *nextbike* and *Stadtmobil Südbaden*. When non-users were asked how they find the idea of setting up Mobility Stations in general, almost all participants stated that it is a good idea. Among customers of bikesharing and carsharing, most participants argued for the extension of the network of stations in Offenburg. Still a large share of citizens and commuters showed interest in having more stations. Noticeable is that many participants (users and non-users) did not want to decide whether they want more stations or not. In an open-ended question, all participants, who wanted more Mobility Stations, had the possibility to write suggestions for potential locations. The most named locations were residential areas and the eleven districts of Offenburg, where Mobility Stations would help to create better connection with the surrounding areas. Both, users and non-users rated the existing

bikesharing and carsharing services at the Mobility Station rated as important. Also the intermodal connection to public transport plays a central role for participants. In addition to existing components at the stations, racks and boxes to store private bicycles, information desks and lockers were rated as important by a large share of participants. The feedback regarding the "Einfach mobil"-card was generally very positive. Many participants rated the usage of the card as ticket for public transport as important. Until now, only a small amount of users and non-users have ever visited the project website and some participants stated that they would like to have more information about the different services and an integrated registration.

In order to find out, if and how the new integrated multimodal mobility service (potentially) influences mobility behavior, users and non-users were asked about (potential) changes in their daily mobility decisions. Responses showed that some users of the shared services became clients of the mobility services because they became aware of them through the Mobility Stations and that since they use the station, they use other mobility services more often. These findings indicate potential for future changes in mobility behavior towards more multimodality. Many non-users indicated that they can imagine to use the mobility services for private trips, shopping trips, leisure activities and business trips. According to responses in the non-user questionnaire, commuters can also imagine to use bikesharing / carsharing for their trips between work and home and for trips during their lunch break. Visitors stated that they can imagine to use the services for their trip to the hotel. Long term effects on travel preferences can be suggested. The majority of customers of nextbike and Stadtmobil Südbaden, citizens and commuters stated that new mobility services, like the Mobility Stations, contribute to make private cars unnecessary.

8.2 Limitations of the Work

The survey developed within the framework of this master thesis was the first attempt to collect first-hand data from users and non-users of the new integrated multimodal mobility service in Offenburg. Therefore, it was not possible to refer to previous studies and all assumptions had to be made from scratch. In order to capture experiences of users of the mobility services, customers of bikesharing and carsharing were identified as target groups. Mailing lists of *nextbike* and *Stadtmobil Südbaden* were used as sample frame to address potential participants. For reasons of privacy, these lists were only accessible for the providers and conclusions about the behavior of users could not be drawn. One problem was that *nextbike* only sent emails to customers who registered for their newsletter and therefore, not all customers were invited and the sample size was limited.

The sample frame for citizens and commuters was rather large and not very specified. The distribution of postcards should help to promote the survey and should lead to an increase in responses. Unfortunately, the advertising effect of the postcards was not sufficient and the response rates were too low, with regards to the time and cost-intensive efforts for designing and distributing the postcards. The fact that the questionnaires were relatively long and participants had to spend up to 15 minutes to complete the survey, could be seen as problematic. While analyzing the responses of the questionnaires, some problems regarding the formulation of questions and the given response options appeared. However, participants most often had the possibility to choose the field "others" and add own suggestions. Therefore, the non-response rate could be reduced.

Problems regarding the analysis of statistical data of the providers *nextbike* and *Stadtmobil Südbaden* were identified. Methods of data collection vary from provider to provider and often they focus on different key aspects of data. Therefore, a direct comparison could be difficult. In any case, it is strongly highlighted that there is a need for detailed and up-to-date data, since the analysis of statistical data is essential for the evaluation of the integrated multimodal mobility service and further research.

8.3 Future Evaluation Projects

The assessment of perception and acceptance of the new integrated multimodal mobility service and the analysis of potential changes on mobility behavior were first steps to evaluate the service "Einfach mobil" in Offenburg. This work undoubtedly has left gaps, but on basis of the collected data within the framework of this master thesis, further evaluation steps can be developed. With help of the survey among users and non-users, participants were made aware of the new brand and the Mobility Stations. Around 100 "Einfach mobil"-cards were sent to citizens and commuters, who made use of the incentive and registered on the website. These people now have the possibility to use the services and make their own experiences. In order to collect more specific information about the usage of "Einfach mobil", a survey among "Einfach mobil"-card owners could be developed. In this survey, only a small amount of printed questionnaires was filled out by citizens. The use of an online survey thus seemed to be appropriate for all participants and future surveys could dispense with the provision of printed questionnaires. Further investigation on the integrated multimodal mobility service could be done by means of face-to-face interviews with users and focus groups.

9 References

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10 Declaration of Conduct

According to §12 section 8 ADPO (General examination regulations) of the Technical University of Munich, I herewith confirm that I wrote this thesis entirely by my efforts and that I did not use any other sources, means of support and aid than those mentioned within the text.