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A Multi-Perspective Assessment of the Introduction of E-Scooter Sharing in Germany

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Abstract: Electric scooter sharing (e-scooter sharing) is a new urban micro-mobility service that is expected to shape individual urban mobility. The introduction of e-scooter sharing systems poses challenging questions for cities and transportation planners regarding their effects on their transportation system. This study addresses the question concerning the strategies which are applied for the introduction of e-scooter sharing systems in different operation areas in Germany. An interview study with 21 stakeholders with different backgrounds (local transport authorities, public transport providers, e-scooter sharing operators, municipalities, associations, planning offices and consulting companies, and other mobility providers) was conducted to reflect upon the introduction of e-scooter sharing systems in Germany and stakeholders' involvement in planning. The qualitative content analysis provides insights into the stakeholders' assessment of the introduction process and thus contributes to a multi-perspective understanding on the topic. Derived hypotheses and recommendations further contribute to knowledge sharing and learning from experience. The paper concludes with a description of three introduction styles: protective, pro-active, and laissez-faire.

Keywords: micro-mobility; e-scooter; stakeholder analysis; interview study; powered two-wheelers

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1. Introduction

Transportation systems are currently undergoing a transformation based on emerging technologies and new business models [1], such as shared mobility services [2]. Electric scooter (e-scooter) sharing is one of these new forms of urban micro-mobility [3]. According to current definitions from researchers and practitioners [3,4], e-scooter sharing is hereafter defined by the following characteristics. E-scooter sharing is a transport system that:

- Refers to small, lightweight vehicles of max. 55 kg;
- Offers short-term rental via apps;
- Uses battery-driven vehicles;
- Offers the ride for one person;
- Is based on a dockless rental systems that allows the scooters to be left at any point in the operation area;
- Reaches up to 25 km/h with motor support.

E-scooter sharing systems are used mostly in urban areas for short-distance journeys, and should serve first and last mile trips in urban settings. The introduction of e-scooter sharing systems is posing challenging questions for cities and transportation planners regarding their effects on the transportation system [3,4]. Among these pressing questions are issues regarding the environmental impacts of this mobility option [5], the life cycle of the vehicles [4], accidents related to e-scooter use [6,7], and parking space needed [8]. After the rapid emergence of e-scooter sharing systems in 2017, several cities such as San Francisco and Santa Monica prohibited e-scooter rental systems before introducing a permit

requirement [9,10]. Regarding the novelty of the transport system and the rapid emergence on the market, cities around the world are experimenting with these systems to better understand operators and market demand. In the early days of e-scooter sharing launches, cities often lacked an appropriate regulatory framework [8]. As a consequence, in response to heated discussions in the media [11], several cities established agreements with private mobility companies and passed policies to regulate e-scooter systems [8,12].

In contrast to other countries, Germany endeavored to control the introduction of e-scooter systems. Thus, compared to other countries such as the United States, where the first e-scooter sharing systems emerged in 2017 [3,13] and, respectively, in 2018 in France, Sweden, Austria, and Switzerland [11], these systems emerged relatively late in Germany. The first e-scooter sharing system was initiated in June 2019 in several German cities [14]. Although Germany is one of the remaining major European countries in which e-scooters have expanded the mobility offer, it leads, in comparison to Europe, in terms of the number of cities being served by e-scooters (shortly after approval) [15]. Due to the recent market entry of e-scooter sharing in Germany, detailed information regarding the introduction of these systems is still lacking and a comparison of different strategies is not yet available. Empirical experiences and knowledge are still lacking due to the inconsistent approaches in introducing the new transport systems.

The involvement of various local stakeholders in the preparation and planning of the introduction of e-scooter sharing has not been examined. Stakeholders are often defined as "any group or individual who can affect or is affected by the achievement of the organization's objectives" ([16] p. 46). What is essential, however, is knowledge of how the various stakeholders are involved in the processes of introducing and operating new services [17,18]. Stakeholder management is regarded as an important element of project success, especially for private–public partnerships [19]. For the introduction of e-scooter sharing systems in Germany, the question remains unanswered as to when and how stakeholders were involved in the process. Furthermore, for a multi-perspective view on the introduction of e-scooter sharing, it is essential to know the expectations of different stakeholders for their role in the process and their requirements regarding e-scooter sharing systems.

With regard to the research gaps related to stakeholder involvement in e-scooter sharing introduction, this paper addresses the following two main research questions with regard to German cities:

- How do German cities differ in the introduction of e-scooter sharing and what are possible explanations?
- Which conclusions and policy recommendations can be drawn from the analysis?

By addressing the research questions, this paper aims to derive lessons learned from different German case studies. The remainder of this paper is organized as follows: Section 3 describes the methodology of the study. Subsequently, Section 4 presents the results of the interviews, which are summarized and discussed in Section 5. Finally, recommendations for policy and practice are derived.

2. State of the Art

With the market introduction of e-scooters, there was great hope that e-scooters would contribute to a multimodal, sustainable mobility system [20]. In the literature and media, e-scooters are often discussed as a sustainable mobility solution that meets travelers' needs for flexibility, personalized mobility with low environmental impact, and high social inclusion potential [5,21]. A growing body of literature on shared e-scooters has focused on travel behavior [22–24], safety concerns [6,7,25,26], and environmental impacts [4]. Looking at the cities where e-scooters have been introduced, it becomes clear that the handling and consequences of this innovation are unclear. A simulation study by [27] predicted that e-scooters would be a particularly strong alternative to private automobiles for trips between 0.5 and 2 miles. At the same time, studies show that (1) e-scooter trips replace mainly trips that could have been undertaken by walking or cycling [28]; (2) dockless micro-mobility solutions can cause (safety) conflicts with pedestrians and people with disabilities [6];

and (3) the spatial availability of the new offers could be determined merely by demand and therefore not be evenly distributed across the city but could be concentrated where the early adopters are living and traveling [29,30]. However, there are assumptions that micro-mobility modes, such as e-scooters, might have positive impacts on public transport use [31] and will not result in significant diversion from public transit on long-distance trips due to their higher relative cost on trips [27].

The basis on which the discussion on e-scooters is taking place has not yet been sufficiently scientifically substantiated. There is still a lack of empirical research on both actual use and realistic potential. In a recent potential analysis for Germany, Gebhardt et al. (2021) estimated a theoretical substitution potential of about 10% of all trips by motorized individual transport (MIT) by e-scooters, although this is an optimistic and certainly unrealized potential [32]. Selective data from various suppliers of e-scooters are available, but it is unclear to what extent they have been collected, evaluated, and interpreted in a scientifically well-founded manner. Furthermore, the available data refer almost exclusively to offers in the inner-city area. Moreover, the (social) sustainability potential (i.e., social inclusion and public health) of e-scooters has not been systematically assessed in the literature [30]. Milakis et al. (2020) provide a literature review on the possible implications of micro-mobility for accessibility, air pollution, safety, physical activity, and subjective well-being [30]. However, empirical evidence is still lacking.

In addition, the use of e-scooters is a new and rapidly emerging phenomenon that has not yet been extensively examined in any scientific mobility survey. For example, the last national survey on mobility behavior in Germany is from 2017 [33], when e-scooters were nonexistent on German roads. Another challenge in the scientific assessment of the potential of e-scooters is that these services have so far been found almost exclusively in the inner-city areas of large cities. However, potential in terms of the feeder functions for the first and last mile [34] is primarily attributed to them in decentralized locations, which cannot be fully measured at present [24,35].

Based on a media analysis of public opinion on e-scooter systems in the United States, [11] concludes that cities should pre-emptively introduce legislation to minimize conflicts from the introduction of e-scooter systems. In the United States, there are some examples of local regulations for e-scooter sharing, such as Portland's e-Scooter Pilot Program [13] or San Francisco's Powered Scooter Share Program Permit [10]. Ma et al. (2021) who analyzed current municipal requirements for the use of e-scooters in 156 cities in the United States mention that existing guidelines are rather vague and vary drastically across different areas [36]. They conclude that municipalities should introduce more actionable guidelines driven by quantitative performance metrics. The publication of [17] provides an assessment of regulations related to e-scooter sharing systems in the United States. The authors conclude that greater coordination between cities and the private and public sectors is needed to facilitate collective learning and smoother transition paths toward urban micro-mobility [17].

For other regions (such as the United States) which have introduced e-scooter sharing systems earlier, there are already some first insights into the regulations that have been applied for the introduction of these systems. The mentioned study by Anderson-Hall et al. (2019) draws conclusions from news articles, policy, and municipal reports related to e-scooter sharing programs [17]. However, in-depth insights into the perceptions and assessments of different stakeholders affected by the introduction of e-scooter sharing systems are still lacking.

In June 2019, the German government passed the *Personal Light Electric Vehicles Regulations* (German: *Elektrokleinstfahrzeuge-Verordnung*), which regulates the operation of e-scooter sharing systems [37]. By passing this regulation, the introduction of e-scooter-sharing systems was then permitted in Germany. This regulation controls, among other things, the minimum age for driving e-scooters (14 years), the allowable traffic areas (cycle tracks and roads, but not sidewalks), compulsory insurance, and general rules of conduct, such as a blood alcohol limit of 0.05% which also applies to other motorized

vehicles [37]. Shortly after passing the national regulations, the Association of German Cities (German: Deutscher Städtetag) published a memorandum of understanding (MoU) between the Association of German Cities, the German Association of Town and Municipalities (Deutscher Städte- und Gemeindebund), and e-scooter sharing providers [38]. The MoU comprises joint areas of cooperation, such as accident prevention to facilitate the integration of e-scooter sharing systems into urban transport systems. However, the MoU is of non-binding legal nature and must be supplemented by local agreements. Besides the national regulation and the MoU, local authorities set up specific regulations, called voluntary self-commitment declaration or quality agreement that control for regulating the services in terms of maximum vehicles per city, restricted areas, and parking locations by geofencing or the provision of all geo-referenced vehicle locations in real time among others [39,40].

3. Methods

This section provides a description of the study's methodology. First, the interview preparation is presented. Then, the interview partners are introduced in Section 3.2. Subsequently, the qualitative data analysis approach is described.

3.1. Study Design

We applied a qualitative study design and used semi-structured expert interviews to collect our data. Qualitative methods and expert interviews in particular are a well-established and empirically founded method to gain in-depth insights into the beliefs, attitudes, and assumptions of individuals [41]. The guiding questions covered topics regarding the process of implementation of e-scooters, the cooperation between providers and municipal representatives as well as with other stakeholders, user groups, and the relationship of e-scooters to other mobility offers envisioned future developments.

3.2. Interview Guidelines

The interviews were based on semi-structured interview guidelines that were developed by the project team. The guidelines used open-ended questions that were somewhat adapted to the context of each interview. The interview guidelines comprised five sections:

1. Status quo of e-scooter sharing operation. Exemplary questions: Since when are e-scooter sharing fleets are operating in the city? How many vehicles are available?
2. Introduction of e-scooter sharing systems and cooperation with other stakeholders. Exemplary questions: Which role did the municipality play in the introduction of e-scooter sharing systems? Did the city set up a quality agreement?
3. Target groups and users. Exemplary question: Are there any insights to the target groups of e-scooter sharing in the city?
4. Future perspectives: Exemplary questions: Are there any plans to expand the offer or reduce the number of e-scooter vehicles? What would an e-scooter sharing system ideally look like in a year?

3.3. Stakeholder Analysis and Sampling

To determine key stakeholder categories and identify relevant experts for our study, we conducted a stakeholder analysis. The analysis generated six domains: transportation authorities and policymakers, public transport providers, e-scooter sharing providers, other private transport companies, stakeholder associations, as well as planning offices and consultation companies. From each domain, we then identified relevant corporations and positions for our interviews. Some of the domains referred to inter-/national organizations, while others required a selection of specific regions or cities to continue with the sampling of particular interview partners. In the next step, we analyzed suitable cities.

In line with our research motivation to understand differences of introduction strategies of municipalities we also analyzed, in particular, special distinctions in the handling of e-scooter sharing among German cities. We found two criteria to systematize the differ-

ences, the level of implementation (from no implementation to multiple providers) and the regulatory arrangement. Within this framework, we selected six German cities: Berlin (multiple providers, minimal regulation), Leipzig (no implementation, strict regulation), Hanover, Wolfsburg and Brunswick (one or two providers, special arrangement with providers), and Munich (multiple providers, special arrangement with providers.

Based on the analyses of stakeholders and cities, we conducted 21 interviews online with selected stakeholders that were identified as relevant in the area of e-scooter sharing.

All interviews have been conducted by video or phone call due to restrictions on business trips in the context of the COVID-19 pandemic. However, empirical studies have shown that telephone interviews are comparable to face-to-face interviews with regard to their quality [42]. In addition, telephone interviews also promise advantages such as a lower tendency for socially desirable responses and smaller interviewer effects [43]. The participants were informed that their names and details of their position that might reveal their identity would be anonymized and analyzed in aggregate form.

3.4. Factsheet of Selected Cities

The selected cities for our study are briefly outlined in the following.

Leipzig, a city in the east of Germany with around 500,000 inhabitants, does not have an e-scooter offer but is dealing with its eventual introduction [44].

The city of Hanover (appr. 530,000 inhabitants), was one of the first German cities to establish e-scooter sharing systems from summer 2019 onwards with now around 2000 e-scooters being available in Hanover [45]. In Hanover, e-scooter sharing is ruled by no local voluntary self-commitment (German: freiwillige Selbstverpflichtung) but general rules according to the StVO (Straßenverkehrsverordnung—German Road Traffic Ordinance) and the Personal Light Electric Vehicles Regulations (German: Elektrokleinstfahrzeuge-Verordnung) [46].

Wolfsburg, a city with approximately 120,000 inhabitants in the north of Germany, launched e-scooter sharing at the beginning of 2020, now reaching a number of 350 vehicles from one provider [47]. The local voluntary self-commitment (German: freiwillige Selbstverpflichtung) can be accessed at the city's website [48].

Brunswick launched e-scooter sharing rather late compared to other cities. In July 2020, a first e-scooter sharing system entered the market and was shortly followed by a second one. In September 2020, there are 500 e-scooters in operation in the city of nearly 300,000 inhabitants [49]. The local quality agreement is available online [50].

In the German capital Berlin, which comprises nearly 3.7 million inhabitants, five e-scooter sharing services operate in the inner-city area, especially at tourist hotspots. The dockless systems are considered as "common use" and all providers have committed to several agreements with the City of Berlin. In November 2019, the City of Berlin issued regulation plans for the parking of e-scooters and allowed the conversion of parking spaces allocated to cars along streets into e-scooter parking [51]. In 2019, around 11,000 e-scooters were located on Berlin streets [45]. This places Berlin, compared to Europe, in first place.

In Munich, a city with nearly 1.5 million inhabitants in the south of Germany, e-scooters have been available since early 2019. The number of e-scooters in the inner city is around 5400 [45]. A maximum of three e-scooters from one supplier may be installed at one place, whereas parks and pedestrian zones are taboo for parking. The local voluntary self-commitment (German: freiwillige Selbstverpflichtung) can be accessed at the city's website [40].

3.5. Data Analysis

The interviews lasted from about 30 to 60 min and were digitally recorded during the respective phone or video call with the consent of all informants and subsequently transcribed. For the analysis, we used MAXQDA [52]. The transcripts were analyzed both deductively and inductively following the approach of qualitative content analysis [53]. In this process, text paragraphs or single expressions are assigned to categories (or "codes") in

order to aggregate and abstract the content. Several codes were predefined being derived from the interview guidelines. Some codes were developed inductively, that is from the data. In a first step, the text was analyzed by assigning broad categories to them based on the content, like "introduction of e-scooter sharing" or "wishes for improvement". In a subsequent step, sub-categories for segments were created that have specific qualities in common. These "codes" are used to identify patterns and specific themes in the data. This is carried out multiple times to refine the code system. The resulting code system comprised 12 categories with more than 40 subcodes. Not all of them were considered for the publication.

Subsequently, the codes were used to compare the cities and find characteristics. To ensure the anonymity of the participants, references to the respective cities will not be displayed. Specific quotes from the interviews were used to underline the content of the codes and used for the following data analysis.

4. Results

The results section covers two aspects. The first and main part entails the findings with regard to the differences between cities when introducing e-scooters and is structured by the presented three main categories and further subcategories. The second part provides insights on our experts' assessment of how e-scooter sharing should ideally be designed in order to foster sustainable urban transport.

4.1. Introduction Styles of Electric Scooters

The following section answers this research question: How do German cities differ in the introduction of e-scooter sharing and what are possible explanations?

As a result of the analysis, we found three main categories to explain and systematize differences in the introduction as well as in the outcome: (1) market entry of e-scooters, (2) responses of municipalities towards operators, and (3) regulation strategies.

4.1.1. Market Entry

As described above, e-scooter providers have not entered the market in all cities. Moreover, in some cities multiple providers competed, and in others only one was present. There were several reasons for that. While some cities had used their power to actively prevent or limit transport companies from launching their product in their city, others just let it go.

To prepare for market entry in a city, transport companies had to communicate with the local authorities. In some cases, the cities approach the e-scooter providers. However, it is usually the inverse (that is, the e-scooter providers approach the cities) which are then often overwhelmed by substantial demand.

In some of the interviews, the interview partners expressed their doubts towards the e-scooter sharing providers:

> "*We had a total of, I think, 14 or 15 companies, one of which was for electric motorcycles. All the others were the e-scooters, all of which wanted to come to X [city was pseudonymized]. From Start-Ups, which you have not heard about before, to American and Canadian consortia, which wanted to present themselves with a giant investment capital on the market*." (Transport authority 1).

Cities were rather annoyed by the interest. The following quote illustrated that this resentment was even understood by some of the e-scooter companies: "*[T]they [cities] sometimes had eight to ten requests from e-scooter providers. [. . .] And I think there is a lot of skepticism among the cities, because they thought ten providers with 1000 e-scooters each is too much.*" (E-scooter operator).

The decisive factor was whether or not a business relationship could be established between the city and the transport company after the initial contact. In some cases, consultations on the market launch conditions took place, in others, this did not occur.

In conclusion three different styles of market entry were identified:

(1) No market entry after rejection;
(2) Market entry with conditions;
(3) Free market entry without conditions.

4.1.2. Responses to Operators

As already indicated above, the interest and responses of cities towards the requests from transport companies varied significantly. We identified three main responses:

First, there was hesitation or even disapproval: Some interview partners expressed their skepticism towards the usefulness and also the business conduct of the e-scooter companies: This may be illustrated with the quote by a public transport company:

> "*I have not yet found a city that is not annoyed by the e-scooters*." (Public transport company).

Second, we found ignorance of the cities towards the requests from the transport companies, at least from the companies' point of view. They felt that some cities lacked the awareness that mobility service innovations could help in attracting a more sustainable transport system. This is illustrated by a quote from a transport company representative, criticizing a lack of strategy and learning ability in some cities:

> "*There is no concept and no strategy how to integrate new mobility offers. [...] there are cities that think "we don't really need anything except public transport and bicycles." And even though it [the city's strategy] hasn't caused a shift away from cars in the last 30 years, somehow that's not taken into account*." (Public transport company).

However, we also found openness and interest in finding solutions; in some cities, the transport companies were invited for meetings along with further stakeholders. They were interested in finding suitable solutions or compromises in line with the stakeholders' interests. For example, in the following case: "*[. . .] we discuss together what the city wants, what we can fulfill, which are perhaps also demands that we cannot fulfill.*" (E-scooter operator).

In conclusion, we identified the following three responses of local authorities towards the requests from e-scooter sharing companies interested in entering the local market:

(1) Hesitation
(2) Openness
(3) Ignorance

4.1.3. Regulation Strategies

It became clear that the chances for transport companies to enter a city essentially depends on their understanding of their role and power to regulate and steer. Some of the authorities did not see themselves having an active part in deciding over a company's business illustrated with the following quote:

> "*It seems as if we have introduced it [e-scooter sharing systems], of course not. These are systems that operate privately and economically. In other words, they approach the cities and do this, for example they introduce the offer on the basis of the existing legal framework [. . .].*" (Transport authority 2).

Furthermore, not all stakeholders, transport authorities, and public transportation companies really felt concerned by the new transport service and did not consider it their duty to become involved in the service introduction process.

Other cities, though respecting entrepreneurial freedom, took a rather active role in negotiating the conditions of an upcoming introduction:

> "*We have also drawn up a quality agreement, which is primarily concluded between the city and the provider [. . .] The city checks whether the offered supply meets the demand, or whether it is possible to provide more or less than is being demanded, so that a system can really [. . .] be a correct and important component of the transport system*." (Transport authority).

In some cities, the operation of e-scooter sharing was initiated by a pilot phase that comprised several months and others decided to introduce the systems step-by-step:

> "*The city wants to do a test phase first, where we said we would not do a test phase but start with a smaller system, which is more controlled and will then adapt it gradually to the demand*." (Responsible person for e-scooter sharing at municipality).

Finally, some cities apply a strict regulation scheme and impose (officially or non-officially) requirements for the introduction of e-scooters. In one of our cases without an e-scooter sharing service, the city´s representative revealed that they had demanded that e-scooter sharing providers should use the mobility stations for parking and forbid free-floating operation.

One motif for imposing requirements such as this was seen as a strategy to protect existing mobility services such as bike sharing or public transport. This is illustrated here by a quote from a transport company representative complaining about the attitude of a city:

> "*The city has not yet seen an e-scooter here, because the city administration wants you to use the [existing public infrastructure of] mobility hubs, the city doesn't want e-scooters to be parked in the whole city [. . .]*." (Transport company).

The quality agreements are signed between city and operator covering regulatory guidelines based on self-commitment; that is, they are not legally binding. Currently, the cities in Germany are faced with legal uncertainties if and how to enforce rules for micro-mobility services. The existing federal regulation for e-scooters leaves many issues open, such as rules for parking or distributing the e-scooters; at the moment, local quality agreements fill the gap to regulate important details.

The quality agreements fill this gap by managing the details of the introduction and operation of an e-scooter sharing system, such as parking locations or data transfer. Although not legally binding, agreeing to a quality agreement makes sense from the operators' perspective as they aspire to a good relationship with the municipality. However, some e-scooter sharing operators experience challenges to adapt their business model to each local quality agreement covering only the conditions for one city.

Nevertheless, at this point, it is uncertain if the quality agreements persist when there is an increased conflict of interest between the city and the transport company. They were quite aware of the fact that the agreements were not binding: *"We respond to such an agreement rather voluntarily, but in the long run it is better to enter an agreement voluntarily, because one would like to maintain a "friendly" relationship with the cities."* (E-scooter operator).

Moreover, cities know that they have no full control over the new service:

> "*A legal character would require a legal framework or contractual relationship [. . .]. As a municipality we actually do not have any other means of action [other than the quality agreement, comment of the authors]. Maybe this is the first thing to do*." (Transport authority).

Conclusively, three regulation strategies of cities can be differentiated:

(1) Non-involvement in the introduction of e-scooters;
(2) Pro-active involvement in the introduction of e-scooters by negotiating balanced requirements;
(3) Protective regulation setting strict and rather unattractive requirements.

4.2. Ideal Design of Electric Scooter Sharing

This subsection answers the question of how the various stakeholders perceive and assess the impact of e-scooter sharing systems on the transport system. The findings from the stakeholder interviews are presented and discussed with regard to the challenges of current e-scooter sharing systems and requirements for an ideal e-scooter sharing system.

4.2.1. Challenges of Current E-Scooter Sharing System

The analysis showed that the interviewees' perception of the possible impacts of e-scooter systems on other means of transport is diverse. With regard to the impact of e-scooter sharing systems on e-bike sharing services, especially e-scooter sharing providers think that e-scooters complement rather than replace bike-sharing systems:

> "*I think they complement each other absolutely perfectly. The e-scooter is actually designed for distances of one to two kilometers, three kilometers maximum. The e-bike is then more suitable for medium distances—let's say three to five kilometers—in other words, it is actually a supplement that also serves different usage situations*." (Public policy manager of an e-scooter operator).

Other interview partners, however, assess the situation differently:

> "*Of course there will be problems on the cycle tracks and there finally, yes this innovation of this further means of transport on the cycle tracks that one must agree there naturally evenly also first with one another, thus both the one and the other, in order to understand evenly who may drive actually where*." (Bike traffic commissioner 3).

Interview partners also perceive the risk of a substitution of trips on foot or by bike (responsible person for e-scooter sharing at municipality). An interview partner from an association responsible for the rights of cyclists also took a critical view on e-scooter sharing:

> "*I am not a fan of these systems [. . .]. Every form of traffic needs its place, that is simply a fact. As far as e-scooters are concerned, honestly, whether they exist or not, it doesn't change the fact that for every form of mobility in the city—and that's where I see the e-scooter heading for the bicycle or moped or whatever you want to call it—you need their space. At the moment, the bicycle has very little room in the city, so the space has to be created somewhere else*." (Chairman of German Cyclist's Association).

Stakeholders were indecisive regarding the direction of the effects of e-scooter sharing on the public transport system. Although some interview partners considered e-scooter sharing as a beneficial complementary feeder system for public transport (team leader of transportation authority, area manager of e-scooter operator, and 18) some also expressed concerns regarding the potential negative effects of substituting trips by public transport (team leader at public transport provider 1). An interview partner also expressed concern that the integration of e-scooter services into multimodal apps will strengthen their power but will not cannibalize other means of transport:

> "*How does it work from the provider's side? They still have their own app. So now I ask you quite naively, for e-scooter providers the integration is actually a gain, so that they have a second channel, where the people end up, in the end exactly with the providers. Yes, okay. But the forwarding from the providers to public transport does not works, so to speak*. (Business and product developer of public transport provider).

Thus, an interview partner from a public transport company emphasized the need for cooperation with the new providers of shared mobility by emphasizing that pushing forward the transition of the transport system can only be achieved together (team leader at public transport provider 2).

The majority of interview partners assess e-scooter sharing systems as one aspect of a wide range of mobility systems that will provide sustainable and user-friendly mobility services. An interview partner concludes that only an integrated mobility system with various offers could contribute to a reduction in motorized transport:

> "*In other words, public transport alone is not enough to convince people to leave their own cars behind. That is simply a fact. It needs a complementary offer of e-scooters, of bike sharing, of all sorts—ridepooling, ridehailing, car sharing. Everything is part of it, and only the overall offer is so attractive that the users actually do or do not buy their own car or get rid of their second car... Whatever. In other words, you can't look at it in*

isolation, how many e-scooter rides are now replacing what, but I think it's the sum total of all of this. So that's one piece of the puzzle." (Public policy manager of an e-scooter operator).

4.2.2. Requirements for an Ideal E-Scooter Sharing System

To conclude the preceding sections, this subsection addresses the following question: What would an ideal e-scooter sharing system look like from the perspective of the different stakeholders and which role do the different stakeholders take up?

As shown in Figure 1, the interview partners expressed a wide range of objectives for an ideal future e-scooter sharing system. Most of the statements were linked to the topic of intermodality and multimodality (n = 30 statements) as illustrated by the following exemplary quote:

> "*So, I suppose that a mobility concept that is actually directed towards the future would be a decentralized one, with many transfer stations and decentralized offers. Information possibilities to know: When is the way with public transport shorter and faster? Or when is the fastest way by bicycle or with the e-scooter. Where are the nearest public rental services, whether they offer e-scooters or bicycles?*" (Bike traffic commissioner 1).

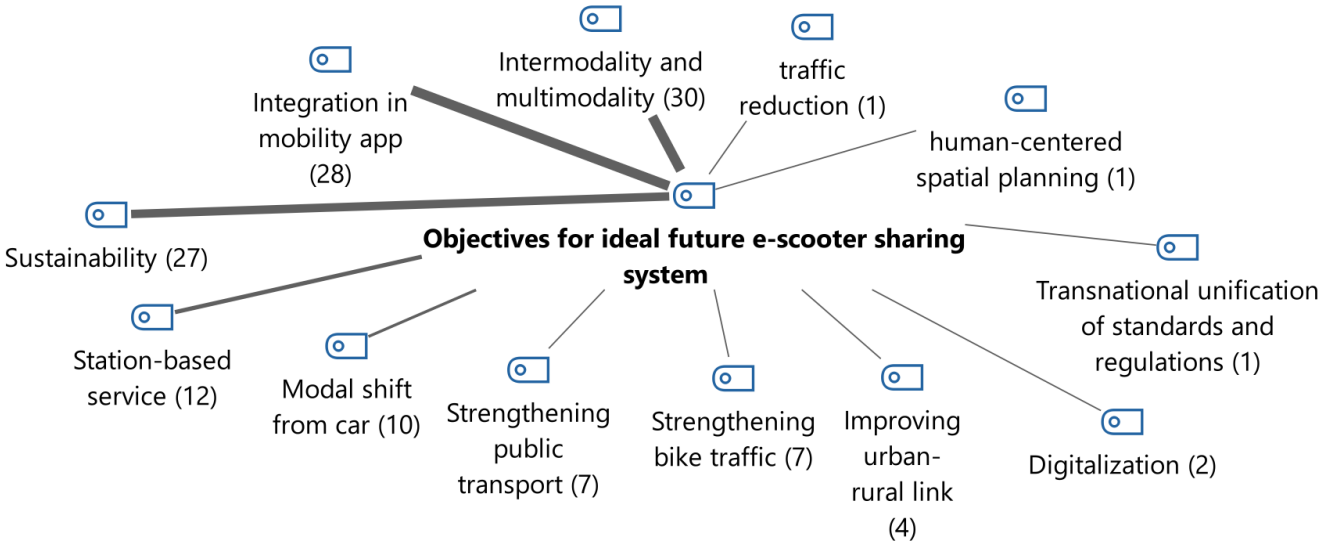

Figure 1. Overview of the subcategories of the category solutions and wishes and the number of nominations in brackets (line thickness marks the frequency of codes in the subcategory).

Related to this is the aim for an integration of e-scooter sharing systems in a cross-modal mobility app (n = 28). Furthermore, nearly every interview partner mentioned objectives that are related to sustainability aspects (n = 27), such as the need for exchangeable batteries (responsible person for e-scooter sharing at municipality).

Service providers in particular aim for unification of regulations of the introduction and operation of e-scooter sharing systems:

> "*If I come from Poland, where the e-scooters are allowed to drive 28 km/h and you are only allowed to drive on the sidewalk and then come to Germany, where you are not allowed to do exactly that, then I think it is relatively complicated, also in terms of parking. And I think these are challenges, if you look at the whole thing a little bit on a European level, that you create more uniform rules, also to make it easier for users to follow the traffic rules.*" (Public policy manager of an e-scooter operator).

However, it should be revealed that one interview partner also expressed the wish that e-scooters will not survive on the market:

> "*I think it's a completely crazy idea. Yes, and I actually hope that the system does not survive, because it is just insanity to control such a vehicle physically.*" (Bike traffic commissioner 4).

5. Discussion

The discussion section includes, on the one hand a discussion and interpretation of the results, and on the other hand, hypotheses are derived from reflection on the findings.

5.1. Summary of Results

Developing, adopting, and enforcing regulations for the introduction and operation of e-scooter sharing systems is a challenging task for municipal transportation planners and other stakeholders [17]. For approaching the introduction of e-scooter sharing systems in Germany, a qualitative interview study was conducted with 21 stakeholders from different backgrounds with multi-perspective views on the topic.

To conclude, the analysis revealed that a multi-perspective view on the introduction of e-scooter sharing systems is essential for meeting the various facets of the topic. The paper contributes to the growing body of literature in the field by providing in-depth insights into the opinions, beliefs, and attitudes of different stakeholders that are more or less affected by the introduction of e-scooter sharing systems. The study thereby follows the recommendations of recent publications to facilitate collective learning and smoother transition paths toward urban micro-mobility [17].

The analysis revealed that the introduction strategies varied considerably between the different cities. While some cities under consideration chose a city-driven, so-called "come-here" strategy, others behaved rather passively following an operator-driven introduction strategy. One of the interviewed cities prevented the launch of e-scooter sharing due to a progressive strategy that comprises strict regulations, such as the need for a station-based system.

It was shown that the involvement of local stakeholders differed between the cities under consideration. In particular, while some cities aimed to involve nearly all relevant stakeholders, others made a deal with the e-scooter sharing providers only. The involvement of public transport providers took place mostly in the form of a consultation process situated at the lower rung of the ladder of participation by [54]. Real reconciliations and discussions in the process of planning took place between different departments of the municipality and the e-scooter sharing providers. Furthermore, it was shown that social associations and citizens' representations were not involved in the planning process.

Furthermore, it was shown that the interviewed transport authorities do not feel the need for the mandate to be involved in the preparation and introduction process of launching e-scooter sharing. This finding can be explained by the fact that the current local traffic plans that are designed by the transport authorities did not include e-scooter sharing systems. However, the interview partners expressed their intentions to consider e-scooter sharing systems for the development of traffic plans for the next decade. The traffic plan for the region of Frankfurt is one of the first local plans that addresses the new systems [55].

It was further shown that the local quality agreements set up by the cities to control the introduction and operation of e-scooter sharing systems played an important role in the stakeholders' assessment of the introduction phase. The majority of interview partners expressed their contentment with the national regulations (German Personal Light Electric Vehicles Regulations [37]) that were assessed as being helpful as a framework for the negotiation process. However, the memorandum of understanding (MoU) between the Association of German Cities, the German Association of Town and Municipalities, and e-scooter sharing providers [38] was only addressed once in an interview.

It was shown that shared mobility providers, such as bike sharing, carsharing or ridepooling providers, lack a comprehensive strategy by cities to integrate shared mobility services into the existing transport system to achieve sustainability goals. Furthermore, shared mobility providers take a critical approach to e-scooter sharing. In contrast, the majority of other interview partners, ranging from public transport providers, munici-

palities, or transport authorities, expressed their openness to these alternative transport services. However, it was shown that all stakeholders are equally aware of the potential risks of e-scooter sharing on the existing transport system and urban structure. Thus, the wishes of the interview partners for a fruitful and sustainable operation of e-scooter sharing systems point in the direction of an integration of e-scooter sharing systems into the existing transport system. Accordingly, the integration of e-scooter sharing services into a multimodal app was seen as a goal by some of the interview partners.

Based on the combination of the three introduced categories (i.e., market entry, response/attitudes, and regulation strategy) and their three characteristics, three introduction styles can be described: protective, pro-active, and laissez-faire (Table 1).

Table 1. Description of three introduction styles: protective, pro-active, and laissez-faire according to market entry, response/attitudes, and regulation strategy.

Introduction Style	Protective	Pro-Active	Laissez-Faire
Market entry	No market entry after rejection	Market entry with conditions	Free market entry without conditions
Responses to operators	Hesitating	Open	Ignorant
Regulation strategy	Strict requirements/protective regulations	Negotiating balanced requirements/pro-active involvement	Non-involvement

5.2. Derived Findings

Based on the interview study findings, several hypotheses can be derived that can serve as a basis for future research. These hypotheses provide an answer to the second research question: Which conclusions and policy recommendations can be drawn from the analysis? It should be noted that the hypotheses need to be further explored based on empirical data and quantitative studies regarding the introduction strategies of e-scooter sharing systems.

- The German Personal Light Electric Vehicles Regulation creates suitable framework conditions for the introduction of e-scooter sharing systems.
- Transport authorities are hardly involved in the introduction of e-scooter systems.
- The introduction strategies do not foresee an integration of the new e-scooter sharing systems into the existing public transport systems but rather a co-existence of different systems.
- E-scooter sharing providers are aware of the fact that local quality agreements are not binding but they voluntarily adhere to the specific conditions to "*maintain a friendly relationship with the cities*" (area manager of an e-scooter operator).
- E-scooter sharing providers do not see a competitive situation between e-scooter sharing and public transport but aim to be integrated as a feeder system for the first and last mile. However, transport authorities and public transport providers question the possibilities of integration.
- The involvement of public transport companies and transportation authorities mostly takes places in form of consultation.
- E-scooter sharing operators do not see a competitive situation between their offer and bike sharing since they perceive that they complement each other due to the different trip lengths.
- The cooperation between cities regarding the topic of e-scooter sharing is rather rare and informal, which might impede collective learning.
- The integration of e-scooter sharing systems in the existing transport system and multimodal apps is a common goal of different stakeholders.

From analyzing the interviews, several recommendations for policy and practice can be derived that might guide future introductions of e-scooter sharing systems. A first recommendation is linked to the finding that each city has created and applied its own local agreements with e-scooter providers. It was shown that national regulations need to be

adapted to the specific local context (e.g., in terms of the maximum number of vehicles or the size of the area of operation). However, it was also shown that there is hardly any knowledge exchange between the cities. However, to facilitate experience sharing and knowledge transfer, cities and local authorities should make efforts to improve exchanges (e.g., through regular meetings, sharing of best practices, or dissemination of lessons learned). Another recommendation is that stakeholders such as transport authorities and public transport providers should be involved in planning the introduction of e-scooter sharing. Adding to this, cities should strengthen the dialog and cooperation with e-scooter operators to adapt the offer to the specific needs of the market, also pointed out by [56]. Furthermore, based on the expressed vision to integrate e-scooters in a multimodal transport system, all stakeholders should begin discussing ways to facilitate integration. For this purpose, data analysis of usage patterns, which was a condition for the permitting process in some cities, should be used to improve our understanding of e-scooter usage. These data can be further used to readjust regulations and agreements. Further recommendations for a safe and integrated e-scooter sharing concept that fits into the cityscape can be read in [56].

6. Conclusions

The interview study was driven by a lack of empirical knowledge and experiences regarding the introduction of e-scooter sharing systems. The in-depth insights from the interviews assist in facilitating collective learning about these new transport systems and thus might contribute to a smoother transition toward these growing alternative transportation options. In conclusion, despite national regulations and the MoU, introduction strategies varied considerably between different cities. The interview study revealed that not all stakeholders are involved in the planning process of e-scooter sharing systems. Furthermore, the understanding of roles was revealed to be ambiguous. Based on the insights obtained, several hypotheses were derived that require further investigation.

As a limitation of this study, the non-comparative approach does not allow for comparison of the cities. However, this was not the aim of the study, and requires a more quantitative approach. As another limitation of the study, no statements can be made regarding the success of the different introduction strategies of e-scooter sharing systems in the cities as no measures exist to assess the success of the systems, and data on key performance indicators, such as the life cycle duration of the vehicles or the potential to encourage a shift from private motorized transport are lacking. However, there are some first implications for the creation of assessment criteria related to the introduction of e-scooter sharing systems that can be derived from this study. First, it was shown in the interviews that the distribution of space between the transport modes is a relevant aspect for the interviewed stakeholders in the assessment of e-scooter sharing systems. Furthermore, the possibility of e-scooter sharing systems to meet the challenge of the first and last mile by serving as a feeder system was addressed by the stakeholders as a desirable feature.

It should be further considered that the research was conducted against the light of the ongoing COVID-19 pandemic. At the time of the interviews, the German government implemented various measures to reduce the spread of the virus, among them social distancing measures and stay-at-home mandates. Likewise other modes of transport, e-scooter sharing systems were affected by the pandemic situation [57]. However, the changes due to the COVID-19 pandemic were out of focus of the paper. Interested readers are referred to current studies regarding the effect of the pandemic situation on e-scooter systems and demand of users around the globe [57–60].

The interview study provides an impetus for further research questions that need to be addressed to approach e-scooter sharing systems. An important question arises regarding the relationship between different stakeholders: What can a good collaboration between stakeholders look like that benefits all sides? Future research needs also arise regarding the impact of the ongoing COVID-19 pandemic situation on sharing mobility sectors and e-scooter sharing. What are the long-term implications for the operation of

e-scooter sharing services? How can we learn from the pandemic situation to create and operate resilient systems?

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References

1. Shaheen, S.; Totte, H.; Stocker, A. Future of Mobility White Paper. Available online: https://escholarship.org/uc/item/68g2h1qv (accessed on 8 September 2021).
2. Kamargianni, M.; Li, W.; Matyas, M.; Schäfer, A. A critical review of new mobility services for urban transport. *Transp. Res. Procedia* **2016**, *14*, 3294–3303. [CrossRef]
3. Caspi, O.; Smart, M.J.; Noland, R. Spatial associations of dockless shared e-scooter usage. *Transp. Res. Part D Transp. Environ.* **2020**, *86*, 102396. [CrossRef] [PubMed]
4. Hollingsworth, J.; Copeland, B.; Johnson, J.X. Are e-scooters polluters? The environmental impacts of shared dockless electric scooters. *Environ. Res. Lett.* **2019**, *14*, 084031. [CrossRef]
5. Lee, M.; Chow, J.Y.; Yoon, G.; He, B.Y. Forecasting e-scooter substitution of direct and access trips by mode and distance. *Transp. Res. Part D Transp. Environ.* **2021**, *96*, 102892. [CrossRef]
6. Sikka, N.; Vila, C.; Stratton, M.; Ghassemi, M.; Pourmand, A. Sharing the sidewalk: A case of E-scooter related pedestrian injury. *Am. J. Emerg. Med.* **2019**, *37*, 1807.e5–1807.e7. [CrossRef]
7. Yang, H.; Ma, Q.; Wang, Z.; Cai, Q.; Xie, K.; Yang, D. Safety of micro-mobility: Analysis of E-Scooter crashes by mining news reports. *Accid. Anal. Prev.* **2020**, *143*, 105608. [CrossRef]
8. James, O.; Swiderski, J.I.; Hicks, J.; Teoman, D.; Buehler, R. Pedestrians and e-scooters: An initial look at e-scooter parking and perceptions by riders and non-riders. *Sustainability* **2019**, *11*, 5591. [CrossRef]
9. City of Santa Monica. Shared Mobility Device Pilot Program Administrative Regulations. Available online: https://www.smgov.net/uploadedFiles/Departments/PCD/Transportation/SM-AdminGuidelines_03-05-2019_Final.pdf (accessed on 7 September 2021).
10. San Francisco Municipal Transportation Agency. Powered Scooter Share Permit Application 2019. Supporting Documents. Available online: https://www.sfmta.com/reports/powered-scootershare-permit-application-2019 (accessed on 29 July 2021).
11. Gössling, S. Integrating e-scooters in urban transportation: Problems, policies, and the prospect of system change. *Transp. Res. Part D Transp. Environ.* **2020**, *79*, 102230. [CrossRef]
12. Hall, J.; Byrnes, E.; McMahon, C.; Pontius, D.; Watts, J. Identifying Best Practices for Management of Electric Scooters. The Ohio State University. Available online: https://kb.osu.edu/bitstream/handle/1811/87590/AEDE4597_eScooterManagement_sp2019.pdf?seque (accessed on 19 August 2021).
13. Portland Bureau of Transportation. 2019 E-Scooter Report and Next Steps. Report. Available online: https://www.portland.gov/transportation/escooterpdx/2019-e-scooter-report-and-next-steps (accessed on 19 August 2021).
14. Gubman, J.; Jung, A.; Kiel, T.; Strehmann, J. E-Tretroller im Stadtverkehr Handlungsempfehlungen für Deutsche Städte und Gemeinden zum Umgang mit Stationslosen Verleihsystemen. Available online: http://www.staedtetag.de/imperia/md/content/dst/2019/agora-verkehrswende_e-tretroller_im_stadtverkehr_web.pdf (accessed on 3 September 2021).
15. Hobusch, J.; Kostorz, N.; Wilkes, G.; Kagerbauer, M. E-Scooter–Freizeitspaß oder Alternatives Mobilitätsangebot? E-Scooter-Just for Fun or an Alternative Mobility Service. *Straßenverkehrstechnik* **2021**, *1*, 33–38.
16. Freeman, R.E. The Stakeholder Concept and Strategic Management. In *Strategic Management: A Stakeholder Approach*, 1st ed.; Cambridge University Press: Cambridge, UK, 2010; pp. 31–51.
17. Anderson-Hall, K.; Bordenkircher, B.; O'Neil, R.; Scott, S.C. Governing micro-mobility: A nationwide assessment of electric scooter regulations. In Proceedings of the Transportation Research Board 98th Annual Meeting, Washington, DC, USA, 13–17 January 2019.
18. Polonsky, M.J.; Smith, A.M.; Fischbacher, M. New service development: A stakeholder perspective. *Eur. J. Mark.* **2005**, *39*, 1025–1048. [CrossRef]

19. El-Gohary, N.M.; Osman, H.; El-Diraby, T.E. Stakeholder management for public private partnerships. *Int. J. Proj. Manag.* **2006**, *24*, 595–604. [CrossRef]
20. Eccarius, T.; Lu, C.C. Adoption intentions for micro-mobility–Insights from electric scooter sharing in Taiwan. *Transp. Res. Part D Transp. Environ.* **2020**, *84*, 102327. [CrossRef]
21. Semenov, A. Why will Micro Mobility Industry Make the Future? Available online: https://medium.com/@Splyt/why-will-micro-mobility-industry-make-thefuture-1b0a628ae3d0 (accessed on 1 September 2021).
22. Bai, S.; Jiao, J. Dockless E-scooter usage patterns and urban built Environments: A comparison study of Austin, TX, and Minneapolis, MN. *Travel Behav. Soc.* **2020**, *20*, 264–272. [CrossRef]
23. Bieliński, T.; Ważna, A. Electric Scooter Sharing and Bike Sharing User Behaviour and Characteristics. *Sustainability* **2020**, *12*, 9640. [CrossRef]
24. McKenzie, G. Spatiotemporal comparative analysis of scooter-share and bike-share usage patterns in Washington, D.C. *J. Transp. Geogr.* **2019**, *78*, 19–28. [CrossRef]
25. Allem, J.-P.; Majmundar, A. Are electric scooters promoted on social media with safety in mind? A case study on Bird's Instagram. *Prev. Med. Rep.* **2019**, *13*, 62–63. [CrossRef]
26. Mayhew, L.; Bergin, C. Impact of e-scooter injuries on emergency department imaging. *J. Med. Imaging Radiat. Oncol.* **2019**, *63*, 461–466. [CrossRef]
27. Smith, C.S.; Schwieterman, J.P. *E-Scooter Scenarios: Evaluating the Potential Mobility Benefits of Shared Dockless Scooters in Chicago*; Transportation Research Board, Chaddick Institute for Metropolitan Development: Chicago, IL, USA, 2018; Volume 60422.
28. Fitt, H.; Curl, A. *E-Scooter Use in New Zealand: Insights around Some Frequently Asked Questions*; University of Canterbury: Christchurch, UK, 2019. Available online: https://www.researchgate.net/profile/Angela-Curl-2/publication/333773843_E-scooter_use_in_New_Zealand_Insights_around_some_frequently_asked_questions/links/5d03179a4585157d15a95593/E-scooter-use-in-New-Zealand-Insights-around-some-frequently-asked-questions.pdf (accessed on 8 September 2021).
29. Mooney, S.J.; Hosford, K.; Howe, B.; Yan, A.; Winters, M.; Bassok, A.; Hirsch, J.A. Freedom from the station: Spatial equity in access to dockless bike share. *J. Transp. Geogr.* **2019**, *74*, 91–96. [CrossRef]
30. Milakis, D.; Gebhardt, L.; Ehebrecht, D.; Lenz, B. Is micro-mobility sustainable? An overview of implications for accessibility, air pollution, safety, physical activity and subjective wellbeing. In *Handbook of Sustainable Transport*; Curtis, C., Ed.; Edward Elgar Publishing: Cheltenham, UK, 2020; pp. 180–189.
31. Shaheen, S.; Chan, N. Mobility and the sharing economy: Potential to facilitate the first-and last-mile public transit connections. *Built Environ.* **2016**, *42*, 573–588. [CrossRef]
32. Gebhardt, L.; Wolf, C.; Seiffert, R. "I'll Take the E-Scooter Instead of My Car"—The Potential of E-Scooters as a Substitute for Car Trips in Germany. *Sustainability* **2021**, *13*, 7361. [CrossRef]
33. Kuhnimhof, T.; Nobis, C. Mobilität in Deutschland–MiD. Ergebnisbericht. Report. Available online: https://www.bmvi.de/SharedDocs/DE/Anlage/G/mid-ergebnisbericht.pdf?__blob=publicationFile (accessed on 24 August 2021).
34. Arndt, W.; Hertel, M.; Langer, V.; Drews, F.; Wiedenhöft, E. Integration of Shared Mobility Approaches in Sustainable Urban Mobility Planning. European Platform on Sustainable Urban Mobility Plans. Report. Available online: https://difu.de/publikationen/2019/integration-of-shared-mobility-approaches-in-sustainable-urban-mobility-planning (accessed on 20 August 2021).
35. Zou, Z.; Younes, H.; Erdoğan, S.; Wu, J. Exploratory Analysis of Real-Time E-Scooter Trip Data in Washington, D.C. *Transp. Res. Rec.* **2020**, *2674*, 285–299. [CrossRef]
36. Ma, Q.; Yang, H.; Ma, Y.; Yang, D.; Hu, X.; Xie, K. Examining municipal guidelines for users of shared E-Scooters in the United States. *Transp. Res. Part D Transp. Environ.* **2021**, *92*, 102710. [CrossRef]
37. Federal Ministry of Justice and Consumer Protection. Verordnung über die Teilnahme von Elektrokleinstfahrzeugen am Straßenverkehr (Elektrokleinstfahrzeuge-Verordnung-eKFV). Available online: https://www.gesetze-im-internet.de/ekfv/BJNR075610019.html (accessed on 13 August 2021).
38. Deutscher Städtetag. Nahmobilität gemeinsam stärken. Memorandum of Understanding 2. Zwischen Deutscher Städtetag, Deutscher Städte-und Gemeindebund und Anbietern von E-Tretroller-Verleihsystemen. Available online: http://www.staedtetag.de/imperia/md/content/dst/2019/mou_e-tretroller_dst_dstgb_final.pdf (accessed on 12 August 2021).
39. City of Dusseldorf. Musterentwurf einer Sondernutzungserlaubnis. Bereitstellung von Gewerblichen Verleihsystemen für Leihfahrräder/E-Scooter/Elektroroller in der Landeshauptstadt Düsseldorf. Amt für Verkehrsmanagement und Verkehrsregelung (Anlage 2 zur Vorlage OVA/030/2019). Available online: https://www.duesseldorf.de/medienportal/sitzungen/?L=0 (accessed on 30 August 2021).
40. City of Munich. Selbstverpflichtungserklärung der E-Scooter-Verleiher. Available online: https://www.muenchen.de/rathaus/dam/jcr:4f1d3f55-078b-4c9c-8cbe-94b416cc15be/Freiwillige%20Selbstverpflichtungserkl%C3%A4rung%20EKF-Sharing%20LH%20M%C3%BCnchen_Stand%2006.06.2019.pdf (accessed on 29 August 2021).
41. Gubrium, J.F.; Holstein, J.A. Forms of Interviewing. In *Handbook of Interview Research: Context and Method*; Sage Publications: Thousand Oaks, CA, USA, 2001; pp. 55–176.
42. Carr, E.C.; Worth, A. The use of the telephone interview for research. *NT Res.* **2001**, *6*, 511–524. [CrossRef]
43. Barriball, K.L.; Christian, S.L.; While, A.E.; Bergen, A. The telephone survey method: A discussion paper. *J. Adv. Nurs.* **1996**, *24*, 115–121. [CrossRef] [PubMed]

44. Scherf, C.; Knie, A.; Pfaff, T.; Ruhrort, L.; Schade, W.; Wagner, U. Mobilitätsmonitor Nr. 9.-November 2019. *Int. Verk.* **2019**, *71*, 66–69.
45. Tack, A.; Klein, A.; Bock, B. E-Scooter in Deutschland-Ein Datenbasierter Debattenbeitrag. Available online: http://scooters.civity.de/ (accessed on 29 August 2021).
46. City of Hanover. E-Scooter in Hannover: Mit Rücksicht Nutzen! Available online: https://www.hannover.de/Leben-in-der-Region-Hannover/Mobilit%C3%A4t/Verkehrsplanung-entwicklung/Elektromobilit%C3%A4t/E-Scooter/E-Scooter-in-Hannover-Mit-R%C3%BCcksicht-nutzen (accessed on 29 August 2021).
47. Behrens, N. Nun stehen die E-Scooter in Wolfsburg Bereit. Wolfsburger Nachrichten. Available online: https://www.wolfsburger-nachrichten.de/wolfsburg/article228623731/Seit-Donnerstag-stehen-die-E-Scooter-in-Wolfsburg-bereit.html (accessed on 28 August 2021).
48. City of Wolfsburg. E-Scooter in Wolfsburg.Homepage City of Wolfsburg. Available online: https://www.wolfsburg.de/leben/mobilitaetverkehr/e-mobilitaet (accessed on 29 August 2021).
49. Stachura, J. 300 Zusätzliche Leih-Scooter in Braunschweig. Available online: https://www.news38.de/braunschweig/article229662542/Braunschweig-E-Scooter-ausleihen-Lime-Tier.html (accessed on 29 August 2021).
50. City of Brunswick. E-Tretrollersharing/E-Scootersharing. Available online: https://www.braunschweig.de/leben/stadtplan_verkehr/sharing_Angebote/e-tretrollersharing.php (accessed on 29 August 2021).
51. City of Berlin. Senatsverwaltung Erlässt neue Regelpläne für das Parken von Lastenrädern und E-Tretrollern. Available online: https://www.berlin.de/sen/uvk/presse/pressemitteilungen/2019/pressemitteilung.863628.php (accessed on 28 August 2021).
52. VERBI Software. *MAXQDA 2020*; VERBI Software: Berlin, Germany, 2022. Available online: https://www.maxqda.com/ (accessed on 17 January 2022).
53. Mayring, P. Qualitative content analysis. In *A companion to Qualitative Research*; Flick, U., von Kardoff, E., Steinke, I., Eds.; SAGE Publications: Reinbek bei Hamburg, Germany, 2004; pp. 159–176.
54. Arnstein, S.R. A ladder of citizen participation. *J. Am. Inst. Plan.* **1969**, *35*, 216–224. [CrossRef]
55. Rhein-Main-Verkehrsverbund. Verbundweiter Nahverkehrsplan für die Region Frankfurt Rhein-Main. Available online: https://www.kelkheim.de/_data/19_11_13_RNVP_Entwurf_final_mit_Anlagen.pdf (accessed on 20 August 2021).
56. Turoń, K.; Czech, P. The concept of rules and recommendations for riding shared and private e-scooters in the road network in the light of global problems. In *Scientific and Technical Conference Transport Systems Theory and Practice*; Springer: Cham, Switzerland, 2019; pp. 275–284.
57. Turoń, K.; Kubik, A.; Chen, F. Electric Shared Mobility Services during the Pandemic: Modeling Aspects of Transportation. *Energies* **2021**, *14*, 2622. [CrossRef]
58. Huang, F.-H. User Behavioral Intentions toward a Scooter-Sharing Service: An Empirical Study. *Sustainability* **2021**, *13*, 13153. [CrossRef]
59. Dias, G.; Arsenio, E.; Ribeiro, P. The Role of Shared E-Scooter Systems in Urban Sustainability and Resilience during the COVID-19 Mobility Restrictions. *Sustainability* **2021**, *13*, 7084. [CrossRef]
60. Almannaa, M.H.; Alsahhaf, F.A.; Ashqar, H.I.; Elhenawy, M.; Masoud, M.; Rakotonirainy, A. Perception Analysis of E-Scooter Riders and Non-Riders in Riyadh, Saudi Arabia: Survey Outputs. *Sustainability* **2021**, *13*, 863. [CrossRef]