Deutsches Institut
für Urbanistik

Sonderveröffentlichung

Rachel Nadkarni

Managing E-Scooter-Rentals in German Cities: A Check-Up

Impressum

Autorin:

Rachel Nadkarni

Redaktion:

Patrick Diekelmann
Sinje Hörlin

Layout:

Christina Bloedorn
Maria Saddington

Gestaltungskonzept Umschlag:

3pc GmbH Neue Kommunikation

Zitierweise:

Rachel Nadkarni: Managing E-Scooter-Rentals in German Cities: A Check-Up, Berlin 2020 (Difu-Sonderveröffentlichung)

Bildnachweise (Umschlag):

1. v. oben: © Busso Grabow (Difu)
2., 3., 4. von oben: © Wolf-Christian Strauss (Difu)

Zimmerstraße 13–15, 10969 Berlin
+49 30 39001-0, difu@difu.de, www.difu.de

Unterstützt von / Supported by

Alexander von Humboldt
Stiftung/Foundation

Berlin, Oktober 2020

Table of Contents

Zusammenfassung 3

Die Regulierung der E-Tretroller-Verleihsysteme in deutschen Städten: eine Bestandsaufnahme

1. Regulatory Approaches to E-Scooter Rentals 5

1.1 Voluntary Agreements 6

1.2 Special Use Permits 7

1.3 Public Tender 9

2. Municipal E-Scooter Management – Advancing into Year Two 11

2.1 Collect and Analyse Service Area Maps 11

2.2 Track Municipal KPIs 13

2.3 Collaborate with Public Transport Operators 15

2.4 Create Regulatory Pathways for E-Scooter Stations 17

2.5 Communicate to Achieve Compliance 20

2.6 Anticipate other Small Electric Vehicles & New Business Models 24

Appendix 26

References 29

Zusammenfassung

Die Regulierung der E-Tretroller-Verleihsysteme in deutschen Städten: eine Bestandsaufnahme

Seit über einem Jahr sind in Deutschland E-Tretroller auf öffentlichen Straßen zugelassen. Fast unmittelbar nach Inkrafttreten der Elektro–kleinstfahrzeuge-Verordnung (eKFV) am 15. Juni 2019 wurden landesweit Angebote zur Ausleihe von elektrischer Tretrollern per App eingerichtet, und bis Herbst 2019 waren sie in praktisch jeder größeren Stadt zu finden. In einigen dieser Städte traten ernstzunehmende Probleme auf: Geparkte E-Tretroller störten die Bewegung von Radfahrenden, zu Fuß Gehenden und insbesondere von Menschen mit Behinderungen. Aufgrund der anfänglichen Störungen im öffentlichen Raum begann eine gründliche Diskussion darüber, wie die neuen E-Tretroller-Verleihsysteme administriert werden können.

Eine der Hauptdebatten in kommunalpolitischen Kreisen befasste sich mit dem Thema Sondergenehmigungen für E-Tretroller-Verleihsysteme, um deren Betrieb und die Nutzung des öffentlichen Raums genauer zu regeln. Nur drei Städte haben diesen Weg beschritten. Da es in ganz Deutschland noch viele unerschlossene Märkte für E-Tretroller und andere Elektrokleinfahrzeuge gibt und weiterhin neue Unternehmen auf den Markt kommen, wird die Frage nach Sondergenehmigungen auch in den kommenden Jahren eine größere Rolle spielen.

3	Städte, die Genehmigungen für E-Tretroller ausgeben
45	Städte, die aktive E-Tretroller Sharing-Angebote haben
79	Städte mit > 100.000 Einwohnern, die somit ideale Märkte für E-Tretroller Angebote sind
58.707	Einwohner*innen hat Neu-Ulm und ist somit die kleinste Stadt mit einem aktiven E-Tretroller-Verleihsystem

Von den 45 Städten mit E-Tretroller-Verleihsystemen in Deutschland haben nur zwei Städte eine Sondergenehmigung erteilt: die Freie Hansestadt Bremen und die Landeshauptstadt Düsseldorf. Die dritte Stadt, die eine solche erteilen will, ist die Stadt Leipzig. Derzeit ist noch kein Anbieter gefunden worden, der bereit ist, die von der Stadt aufgestellten Kriterien zu erfüllen. Die anderen über 40 Städte haben freiwillige Vereinbarungen mit den Anbietern ausgehandelt, um den Betrieb zu regulieren. Da sich der Markt für Sharing-Elektrofahrzeuge weiter entwickelt und wächst, werden sich mehr Gemeinden mit der Frage konfrontiert sehen, wie diese Fahrzeuge im öffentlichen Raum gemanagt werden können.

Der dritte mögliche Regulierungsansatz – der in Deutschland bisher aber noch nicht praktiziert wurde –, besteht darin, eine öffentliche Ausschreibung für E-Tretroller-Verleihsysteme zu starten. Dies ist ein gängiger Ansatz in Städten der USA und in einigen europäischen Ländern, um E-Tretroller-Verleihsysteme anzubieten. Zuletzt gab die Stadt Paris die Ergebnisse seines öffentlichen Ausschreibungsverfahrens bekannt und schloss mit drei Anbietern einen Zweijahresvertrag ab. Wie die Sondergenehmigungsregelung legt eine Ausschreibung klare Standards für Anbieter fest. Öffentliche Ausschreibungsverfahren können zusätzlich genutzt werden, um E-Tretroller auf einen Markt zu bringen, der derzeit

nicht bedient wird, da eine öffentliche Ausschreibung es einer Stadt ermöglicht, Anreize zu bieten und gleichzeitig den Wettbewerb zu fördern.

Für viele Gemeinden ist eine freiwillige Vereinbarung angemessen und ausreichend, in anderen Fällen bieten eine Sondernutzungsgenehmigung oder ein öffentliches Ausschreibungsverfahren zusätzliche Mittel, um die öffentliche Ordnung unter den sich verändernden Marktbedingungen aufrechtzuerhalten. Diese Veröffentlichung bietet einen Überblick über den Status der einzelnen Rechtsrahmen im deutschen Kontext sowie sechs wichtige Handlungsfelder, auf denen aufgebaut werden kann, unabhängig davon, welcher Rahmen ausgewählt wird.

E-Tretroller in Berlin

1. Regulatory Approaches to E-Scooter Rentals

It has been just over one year since Germany began allowing e-scooters on public streets. Almost immediately after the Small Electric Vehicle Act (BGBI, 2019) went into effect on June 15, 2019, shared e-scooter services launched across the country, and by autumn 2019, they could be found in practically every major city. In some of those cities severe problems occurred: parked e-scooters disrupted the movement of cyclists, pedestrians and especially people with disabilities. Due to the initial disorder in public space, a profound discussion began about how to manage the new e-scooter rentals.

One of the major debates in municipal policy circles has been around the topic of special use permits for shared e-scooters in order to more closely handle their operations and the use of public space. Only three cities have committed to the special use permit route. Since there are still many untapped markets for scooters across Germany and new companies continue to form with both e-scooters and other shared small electric vehicle rentals, the question of special permits will continue to resonate.

3	German cities issuing special use permits for shared e-scooters.
45	Cities with active e-scooter rentals as of the start of August 2020.
79	Municipalities in Germany with over 100.000 residents, seen as ideal e-scooter markets.[1]
58.707	The smallest city with an active shared e-scooter operation is Neu-Ulm, with a population of 58.707 people.

Of the 45 cities with shared e-scooters in Germany, just two have issued special use permits to providers: Bremen and Düsseldorf. The third city issuing special use permits, Leipzig, has not yet found a provider ready to meet their criteria. The other 40+ cities with shared e-scooter services have negotiated voluntary agreements with the providers as a means of managing the operations (see section 1.1). As the market for shared small electric vehicles continues to evolve and grow, more communities will be faced with the question of how to manage these vehicles in public space.

The third, untested, option is to issue a public tender for e-scooter services. This is a common approach to bring micromobility rentals to cities in the US and in some European countries. Most recently, Paris announced the results of its public tender process for e-scooters, locking in three providers for a two-year contract. Like the special use permit, a tender establishes clear standards for providers. Public tender processes can additionally be used to bring e-scooters to a market that is not currently served, as a public tender allows a city to offer incentives while still fostering competition.

For many communities, a voluntary agreement will be appropriate and sufficient, but in other cases, a permit or a public tender process will provide additional means to maintain order within the shifting market conditions. This document provides an overview of the status of each regulatory framework in the German context, as well as six key policy areas to build upon, no matter which framework is selected.

[1] Claus Unterkircher, General Manager for Germany, Austria, and Switzerland at Voi, has stated on at least two occasions that Voi sees potential in any city with 100,000 or more residents. (Panhorst, 2009)

1.1 Voluntary Agreements

The vast majority of German municipalities are using a voluntary agreement as the means of negotiating with shared e-scooter providers. In August 2019, the Association of German Cities (Deutscher Städtetag), German Association of Towns and Municipalities (Deutscher Städte- und Gemeindebund), and the operators on the market at that time signed a Memorandum of Understanding outlining standards of practice across the member communities (Deutscher Städtetag, 2019). A Memorandum of Understanding, or MoU for short, is not a legally binding document but rather a joint vision statement of the signatories. This MoU is meant as a helpful starting point for setting up voluntary agreements with e-scooter providers coming to a new community.

- The Associations' MoU highlights the purpose of joint action between municipal governments and the e-scooter providers and the agreed upon areas of cooperation. The purposes for cooperation include:
- Promoting safety on public roads and in public space
- Managing and maintaining the quality of public spaces, e.g. historic sites
- Jointly advocating for and pursuing infrastructure for bicycles and e-scooters
- Supporting ongoing innovation in the broader mission of the sustainable transportation transformation (Verkehrswende)

The Memorandum of Understanding then outlines areas where cooperation between a municipality and provider are needed. The MoU does not itself specify what exact agreements should be made, given the diversity of communities that it covers, but instead offers eight topic areas where discussion is recommended and expected before a provider begins operation:

1. Determine demand and business area
2. Set Parking and No-Riding Zones
3. Discuss the relationship with public transport
4. Arrange data sharing standards
5. Agree on a data privacy policy
6. Create standards for redistribution, maintenance, and vehicle disposal
7. Select contact partners and communications protocols
8. Organize channels for citizen communication

Since the Associations' MoU was adopted in August 2019, there have been changes in the e-scooter marketplace: e.g. Lime absorbed competitor Jump, and Circ was purchased by Bird, who has continued to operate both brands in 2020. Additional entrants to the market include Spin, a Ford Motors subsidiary, and Wind, a Berlin-based start-up. As a result of these market shifts and experience gained over the first season of operations, the Association of German Cities announced in June 2020 that this Memorandum of Understanding will be updated to at minimum include new e-scooter providers and potentially with changes to the text itself.

The direct voluntary agreements between municipal authorities and the providers generally follow the model outlined in the MoU from the Associations, with details varying. Among the most common aspects are statements about data protection and data transfers from the providers to the municipality. In a nod toward information sharing from the municipalities to the providers, some model agreements also include maps of no parking areas and slow-speed zones. Overall compliance with voluntary agreements has been good so far, with operators focused on building positive brand associations rather than acting as 'disruptors,' as was the approach that some

of these same companies took during early launches in US-American cities. Still, these agreements are voluntary and the only recourse if a company chooses not to abide by the agreement is to share the points of contention with the public through the press.

1.2 Special Use Permits

The primary benefit of the special use permit is that it gives the city the authority to hold providers to the agreed terms. While compliance with negotiated voluntary agreements has been good, they leave municipalities few options. So far, there are only three German cities that are issuing special use permits for e-scooters – Bremen, Düsseldorf, and Leipzig. Many German cities do not consider special use permits as a viable option, due to legal uncertainties around a 2009 case from Hamburg (Fahrrad mit Werbetafel auf öffentlichem Gehweg, 2009). In contrast, the three cities mentioned above, do not see any conflict between the case law and the possibility to manage e-scooter rentals through special use regulations.

The 2009 legal case focused in large part on the advertising panels on the shared bicycles and the question of whether the bikes served primarily a transport purpose or an advertising purpose. In the interpretation of the three special permit granting cities, the court ruled only narrowly on the facts described in the 2009 case, meaning that there is still flexibility to issue special permits that relate directly to use of the public street. The issue of advertising is no longer a part of the discussion; instead, the main concern is parked e-scooters disrupting the movement of pedestrians, cyclists, and especially people with disabilities.

The special use permits issued for e-scooters are tailored to shared micromobility services and are very similar to the voluntary agreements used in other cities. Both Bremen and Düsseldorf have been successful with their permits; both cities have implemented permits for shared e-scooters and bike rentals. The City of Leipzig is working directly with their public transport company, LVB, as the special permit holder, and requires that all shared micromobility services be station-based. At this time, only bike share services are currently approved in Leipzig.

An e-scooter parked in the Bremer Vorstadt neighbourhood of Bremen.

Comparison of Cities with E-scooter Special Use Permits

Bremen	
• First Issued: Oct. 2019 • Companies: Tier and Voi • Permit fee: €50 per e-scooter	Bremen used the city's existing special use permit catalogue as a bridge to begin permitting e-scooters while discussing new special permit regulations specifically for micromobility. Importantly the existing catalogue included an "or similar" clause that allowed the City of Bremen to apply an existing special permit category to a new use. This clause allowed the city to issue a special permit under the category that was written for construction vehicles stored in the public way. The fee listed with this use also carried forward to free-floating e-scooters and bikes (Hansestadt Bremen, personal interview, 2020), (Hansestadt Bremen, 2018).
Düsseldorf	
• First Issued: Nov. 2019 • Companies: Tier, Voi, Lime, Dott, and Bird • Permit fee: €20 per e-scooter	Düsseldorf initially allowed e-scooters under a voluntary agreement, but after the first few months of operations, the City of Düsseldorf decided to issue special use permits. Interim special use permits without fees were issued from November 2019 to January 1, 2020 during discussions on the final regulations. Fully detailed special use permits were issued with fees starting January 1, 2020 as a 6-month long trial through July 2020. The impact of the Covid-19 pandemic on the trial is unknown. Documentation on the situation after July 2020 is currently unavailable (Landeshauptstadt Düsseldorf, 2019).
Leipzig	
• First Issued: TBD • Companies: TBD • Permit fee: TBD	The City of Leipzig began a program to develop multimodal mobility-stations with the Leipzig public transport operator in 2015. Since then, the City has had a standing requirement for all mobility operators in public space to coordinate within the same system of stations and the public transport system's mobility as a service smartphone application. In Leipzig, special use permits for mobility stations are issued to the public transporter, LVB. LVB has an open tender process to select one or more station-based e-scooter rental services, but there are no applications as of August 2020. The initial rollout in Leipzig will be e-scooter deployments at the existing mobility stations. Assuming a successful first phase, the selected vendors will be allowed to develop e-scooter only stations, again through the LVB as the official permit holder (Stadt Leipzig, personal interview, 2020).

1.3 Public Tender

To date no German city has used public tendering to solicit for e-scooter service providers to come to their city. This is an option that exists in the legal framework for municipalities to select mobility partners, and is used to secure public transit providers. The 2009 Hamburg case seems again to be the stumbling block, convincing many municipalities that public tendering is not a viable legal option.

Public Tenders for micromobility rental systems are starting to take shape in Germany, even if they have not been used for e-scooters. A public tender was used in 2019 to solicit for a station-based bikeshare system in KielRegion, including the City of Kiel and the surrounding areas. The tender approved a pilot program in 2019-2020, with the possibility of extending the system as late as 2025. The pilot phase has financial support from the Clean Air Emergency Program for research on the implementation. As a result of the public tender, the region now has standard bicycles available for rent, and the possibility to add pedelec and cargo-bicycles as the system grows (KielRegion, 2019).

Tendering processes are also sometimes used by public transport companies to find e-scooter and other micro-mobility partners, as is the case in Leipzig. Because these processes are business-to-business transactions, the detailed criteria of the competition and the incentive or fee structure is not available to the public. In at least nine other German cities, the local transport companies offer some form of partnership program with micromobility, run at least sometimes through a competitive tender-like process. Stadtwerke Jena ran a public tender announced through Ausschreibungen-Deutschland.de to bring 150 sit-on electric scooters to Jena. The system launched on August 15, 2020 and as part of the cooperation with the city, designated seated scooter parking spaces have been located near major destinations within the city centre.

It should be noted that public tender for e-scooters is very common in the international context. This is the standard process in many US-American cities and most recently in Paris. The French capital launched its e-scooter tender process with a request for proposals (RFP) in December 2019, applications were due March 2020, and the winners were announced at the end of July 2020. Their criteria addressed which vehicles would be accepted – including a strict self-governed speed limit and a no-seat requirement, along with criteria relating to user safety and data privacy, equitable distribution – including areas that are not profit generating, parking management, and environmental responsibility (Gauquelin, 2020).

If clarity can be found within the German legal framework, direct public tendering by cities could bring the power of competition to advance public goals. Berlin and Cologne each have four e-scooter operators, Frankfurt am Main and Düsseldorf have five, and that is just among the large operating companies, not to mention 2020's new entrants. With each company requiring a separate bilateral negotiation process, it is no surprise if monitoring compliance with agreed upon standards falls short. Besides, under the current voluntary agreements these metropolises have, there are no penalties if a company fails to meet the standards, creating an environment that risks becoming a race to the bottom. In comparison, under the public tender process the penalties for failing to live up to an agreement can be outlined in a graduated way, up to and including preventing a company from taking part in future tenders.

Much of the enforcement benefit derived from the public tender process also exists in a special use permitting process. The public tender offers a few other potential benefits that a permit does not.

- Regular opportunities to update requirements: Public tenders are typically time limited with specified opportunities for extensions. This can be useful for micromobility because there is so much development from one year to the next in the vehicle technology, vehicle form, and related parking challenges. Depending on the specific local political structure the ability to make decisions about extensions, term adjustments, and the fee schedule may be much faster in a public tender than a special use permit.

- Ability to limit number of market participants: Whether exclusivity is good or bad is a longer debate, but there are those who would say from a consumer perspective having one or a limited number of providers that offers full city-wide coverage and lots of available vehicles is better than many small providers because the customer can more easily identify and learn how to use the services. The public tender route is the only way to limit market participants.

- Option to provide direct incentives: There are communities where e-scooters or other micromobility systems are looked upon as a signal of the community's broader support for innovation and a way to encourage economic development. The public tender is the only way to bring in or expand micromobility services with direct financial incentives.

Sprotten Flotte bicycles in front of Kiel City Hall.

© KielRegion

Source: https://www.kielregion.de/news/details/gute-aussichten-fuer-die-sprottenflotte/

2. Municipal E-Scooter Management – Advancing into Year Two

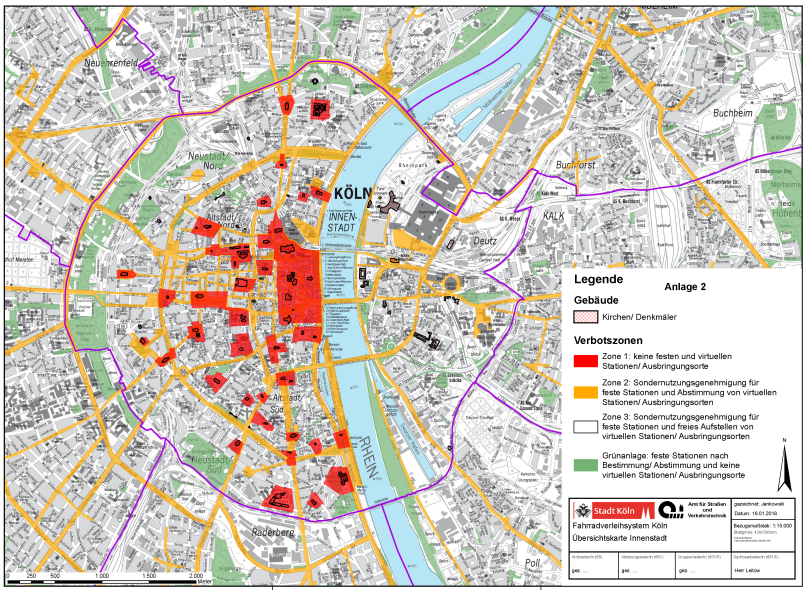
The e-scooter rental industry is evolving quickly and so are the tools used by cities to manage e-scooters in public space. As new services launch across the county and the first cities begin seeing the e-scooter industry mature, there are a number of strategies that can be used to advance public policy goals. Collected here are six policy recommendations for e-scooter management based on research and good practice cases in German cities that can be applied regardless of the regulatory framework utilized. Ultimately, a permit or a tender process will always give the city more authority and the operators more clarity than the voluntary agreements, but even if on a voluntary basis, all municipalities should engage directly with mobility service operators in these policy areas.

1. Collect and Analyse Service Area Maps
2. Track Municipal Key Performance Indicators (KPIs)
3. Collaborate with Public Transport Providers
4. Create Regulatory Pathways for E-Scooter Stations
5. Communicate to Achieve Compliance
6. Anticipate other Small Electric Vehicles & New Business Models

2.1 Collect and Analyse Service Area Maps

In 2019, Vienna's agreement with scooter companies left substantial flexibility on the setting of no parking zones to the operators. Their rule at the time stated that scooters could not be parked in front of buildings of cultural significance. Marcel E. Moran, a PhD Student, compared the operational areas of the six companies operating in Vienna in 2019. He found for instance that the no-parking areas around the Prater amusement park were different for each of four companies, with only a small sliver of the park consistently blocked off (Moran, 2019).

The City of Cologne map of distribution rules highlights areas in red where distribution is prohibited, and areas in yellow, where distribution requires additional special permission.



© Stadt Köln

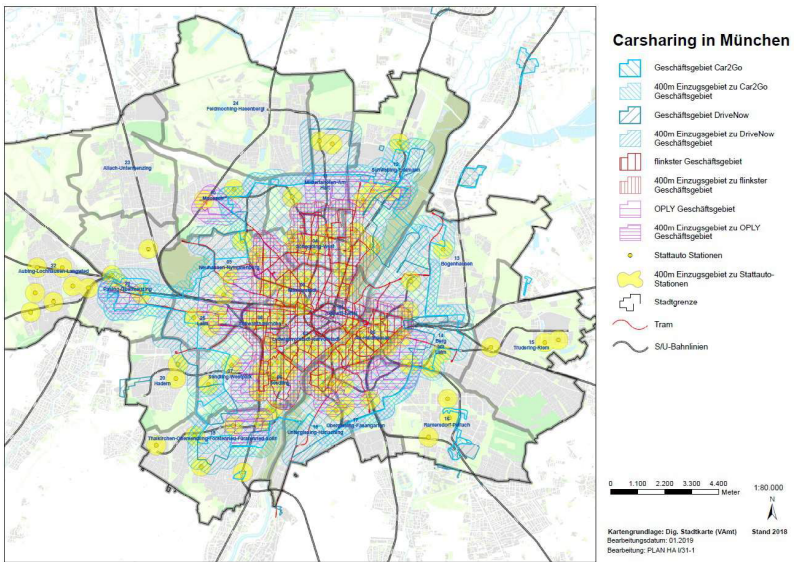
Source: Stadt Köln. (2018). Fahrradverleihsystem Übersichtskarte Innenstadt. Anlage 2 der Mitteilung 2048/2019.

A better approach is the no-parking areas map that Cologne asks all companies to sign on to as part of the voluntary agreement. Readily available as an attachment to their model agreement, it clearly shows what limits are expected for each of the no-parking or distribution zones. This makes it easier for customers, and the non-riding public, to know what is and is not allowed (Stadt Köln, 2018).

One problem that cities can help to solve is to create transparency about the operational areas of the different e-scooter operators. In most cases, a potential customer has to download the app and they sometime also have to create an account before they can see the operational area of a particular operator. While there are a number of reasons why the operational area may differ, this is essential information for customers to have when deciding if an e-scooter account is right for them. A published map of operational areas can go a long way in assisting customers to understand the marketplace and if e-scooters will make sense as an option for their travel needs.

The City of Munich created a valuable analytic map of the overlapping service areas for carsharing providers that could easily be adapted to e-scooters. Munich used this mapping exercise to also explore who was served by car-sharing (Hauptstadt München, 2019). In addition to better serving customers, such analytic approaches applied to mapping e-scooters could help guide policy decisions around the number and distribution of vehicles allowed, the designating of preferred parking zones, and potential service territory expansions.

Map of Munich showing the overlapping operational areas for carshare services. Analysis of the map showed that 72% of residents live within these operational areas.



© Hauptstadt München

Source: Hauptstadt München. (2019). Sharing-Mobility - Grundsatzbeschluss.

Policy Recommendation

Require all e-scooter providers to share a digital map (e.g. shapefile) of their service area, no parking zones, and slow-zones. Require updates either whenever there are changes, twice per year, or once per year, depending on the city staff team's capacity to compile and make updates to the comparative map. Make this map publicly available on the city's website to help constituents pick the appropriate service.

2.2 Track Municipal KPIs

Key Performance Indicators (KPIs) are metrics that businesses use to determine if they are moving in the right direction. The focus of a KPI is on performance outcome as opposed to static metrics. In micromoblity, a static metric is something like number of vehicles in operation, which is useful to know but does not shed light on how well the service is working. In comparison, a performance indicator would be daily number of trips per vehicle, which tells you if the vehicles are actually in use. E-scooter and other micromoblity companies have their own internal KPIs to determine how well customers are responding to their business as well as if their business operational targets are being met. Some of the data operators are collecting for this purpose can easily feed into the indicators that cities are interested in tracking.

Data sharing has been a point of contention between e-scooter providers and municipalities. Setting a standard set of municipal KPIs is a useful step to building trust, so that the providers understand how the data they share with the municipality will be used and what purpose it will serve. Ramboll, an international mobility consultancy, recently produced a list of more than 40 recommended KPIs for cities to track the impacts of micromoblity services in their community with respect to twelve strategic goals (Ramboll, 2020). Many of the recommended KPIs require input from user surveys and data from the operators, while others require data collection from municipal departments, e.g. number of citations issued to riders. A key data source highlighted is the trip data – from which origin, destination, and trip length can be derived. With this data, Ramboll recommends tracking the following trip indicators:

- Share of trips greater than 1 km vs. less than 1 km
- Share of trips connecting to a public transport station
- Share of trips beginning or ending in neighbourhoods with lower than average incomes
- Share of trips ending along a commercial corridor

Combining trip data with rider surveys makes these metrics much more valuable. When available such surveys can clarify if longer trips are in fact replacing car trips rather than walking trips or bike trips. They can also indicate if trips ending at a transit station are multi-modal trips or if nearby businesses were the intended destination.

A step to simplify KPI tracking is to use a standardized data transfer system like the Mobility Data Specification (MDS), utilized widely in the United States and a few European cities. The MDS is a set of open source data sharing templates to facilitate exchange of trip information and other operational data between shared mobility companies and municipalities (Open Mobility Foundation, 2019). The e-scooter companies can use this one software package to deliver real-time scooter location data to municipalities and municipalities can use it to update no-parking zones to all of the providers in a way that is easily integrated into the apps customers then use. In addition to using the open source MDS directly, which may require a more hands on work by the municipal staff, cities can now also work with third-party data analytics products that present this same information in simplified dashboards. Hamburg was the first German city to take this approach, working with Wunder Mobility as the intermediary platform (Hansestadt Hamburg, 2019).

Once there is familiarity with setting and tracking KPIs, the next step could be to negotiate around these indicators. If using a public tender, KPIs might

simply be used to calculate financial incentives. For instance, if a provider meets certain ridership targets at last-mile connections, they might be given a cash bonus at the end of the year. If operating with a voluntary agreement or a special use permit, direct financial incentives are not possible, but negotiating around KPIs could still be applicable. For instance, in setting the number of e-scooters allowed. Setting a fixed maximum number of vehicles is challenging because vehicle availability is critical to success, but often cities want to see less vehicles than the providers would like. Performance indicators may be a good way of getting to an appropriate number of vehicles that works for the operator while simultaneously advocating for public policy goals. The table below includes a few examples.

Example KPI Targets for Negotiated Agreements

Target	Explanation
1 scooter per X residents within the service territory	A target based on population encourages companies to build their service territory map to include as many residents as possible
1 additional scooter per X residents, when distributed in areas outside 5-min walk to transit	A target that ties to distribution goals encourages investment in last mile transport
X additional scooters allowed as a special event fleet	An event-specific target might be worthwhile for communities that experience an influx of activity on select days in the year, ensuring that the normal fleet is available to residents and e-scooters are also available at event venues
X additional scooters when Y trips per vehicle per day is achieved Z-months in a row	A bonus target based on intensity of use rewards companies that successfully gain ridership and helps to extend the life of the vehicles. The optimal number of trips or distance travelled per vehicle per day will depend on local weather and road conditions
X additional scooters when Y % of trips in the city centre terminate in preferred e-scooter parking locations	A target based on parking behaviour incentivises the operators to work more closely with their customers on good parking activity

While number of vehicles in the fleet is a clear means of implementing KPIs, there are of course other policy goals that should be tracked and discussed broadly. Municipal performance indicators for e-scooters also are an opportunity to put this new mobility service into context with other modes of transport. There are few comparative studies between shared services of all modes (e-scooters, bikeshare, and carshare) but most of the metrics are equally applicable across shared mobility operators. Some of the sustainability metrics, like vehicle life-cycle analysis and public resource use, are most valuable when compared across all transport modes. Safety metrics too are best compared across modes. If crash clusters appear for e-scooters and/or bikes in similar patterns, then those locations could be appropriate places for new infrastructure investments.

Policy Recommendation

Develop a set of Key Performance Indicators to track progress toward local policy goals that involve e-scooters along with standard data transfer methods to communicate with all providers. Use these KPIs to inform negotiations with e-scooter companies and develop further plans for e-scooter integration.

2.3 Collaborate with Public Transport Operators

E-scooters are seen as a potential first-last mile solution, achieved by creating connections between transit and e-scooters. There are at least ten cities in Germany where the public transport provider has an official relationship with one or more of the e-scooter companies operating in the city.

In Leipzig, the public transport provider (LVB) serves as the special permit holder and will select which e-scooter providers will operate in Leipzig. The City is still a collaborator in this process through its role as the permit granter. In this way, the City and LVB are working together to bring e-scooters in line with the other mobility priorities that have already been established. Last-mile connections are a clear priority in Leipzig, and the first phase of e-scooter operations is required to take place from the existing network of mobility stations located at key transit stations. As of August 2020, there are 37 mobility stations in the network, connecting public transport lines to mix of car-sharing, e-vehicle charging, and bike-sharing services depending on the location (LVB Move, 2020). Only after a first phase of deployment at these mobility stations will the City of Leipzig consider allowing LVB and its selected e-scooter operators to create independent e-scooter stations in the city.

These yellow and blue kiosks accompany Leipzig's 37 existing "Leipzig Mobil" mobility stations.

© Nikhil Nadkarni

Another model that is emerging are promotional partnerships between the local public transport provider and the e-scooter companies. Bielefeld Stadtwerke, which runs the tram and bus services, has established a partnership with Tier through the Stadtwerke's flowBie program, a collection of private partnerships for on-demand mobility. Tier e-scooters are promoted on the flowBie website, signs, and other platforms (Stadtwerk Bielefeld, personal interview, 2020). The Verkehrsverbund Rhein-Neckar worked with Tier to create a short term 'Heroes' promotion in Heidelberg, Mannheim, and Ludwigshafen that eliminated the unlocking fee for people working in essential professions and were also transit pass holders during April-May 2020, at the height of the Covid-19 Pandemic (Verkehrsverbund Rhein-Neckar, 2020).

Berlin's BVG – the operator of subways, trams, and buses – has taken their partnerships one step further to create a Mobility as a Service App (Jelbi) along with Jelbi stations in BVG-managed parking lots. Both Tier and Voi

are partners in the Jelbi program (Jelbi, 2020). BVG's program, itself a 2-year pilot, is not about price integration but rather app integration. With the Jelbi app, Berlin customers do not need to have each and every service-provider's app on their phone, but rather can connect to any of the participating providers through Jelbi. Like with service area mapping, this is about making it easier for customers to choose whichever service is right for the specific trip they are planning. With the real time route mapper tool in the Jelbi app, customers can compare travel times across modes, and see which of the vehicles are available closest to them from all of the participating operators. This type of integration is focused on the customer experience and has mixed results from providers. Some are excited about the access to a broad range of potential customers, while others are focused on creating brand loyalty (BVG, 2020). Leipzig's public transport provider also runs a Mobility as a Service App, and one of the requirements for their e-scooter search, is that all providers must participate in that program (Stadt Leipzig, personal interview, 2020).

This Jelbi station at Nollendorferplatz, Berlin offers parking for carshare, bikeshare, and e-scooter operators adjacent to public transport connections.

Policy Recommendation

While many of these collaborations between public transport operators and e-scooter rental operators are business-to-business decisions, a city government can use its influence to encourage these types of connections and help the public understand why such collaborations are important. The actual first-last mile use of e-scooters needs further tracking and study. Cities running mobility surveys or giving input to provider-run mobility surveys should ask for data collection on how e-scooter-public transport connections are working.

2.4 Create Regulatory Pathways for E-Scooter Stations

The future of free-floating e-scooter rental systems will likely include stations. There are a lot of benefits of stations for both the municipalities and the e-scooter operators. Most especially, stations offer a designated and reserved parking location for e-scooters. At particularly busy intersections, this is a huge benefit for everyone involved. Riders know where to drop off their scooter and where to pick one up, the municipality and the operator then do not need to deal with conflicts with businesses putting out dining tables or merchandise nor with the pedestrians that are trying to move along the walkway. Berlin launched e-scooter parking corrals in June 2020 and Tier began testing a physical station with docks that charges the e-scooters in Essen in August 2020.

Virtual Stations (No Docks)

Several cities are creating stations on their own initiative to increase orderliness in busy areas. Because the vehicles are self-locking, this can be as simple as working with the providers to identify preferred parking locations in the app. If the preferred parking location is on the sidewalk-level, for instance at the edge of a park or pedestrian zone, there does not even have to be an indicator in the physical world, although signs and painted markings can help guide riders to the correct location.

Cologne is planning to incorporate virtual e-scooter stations as part of their mobility station program. Starting this year, the City of Cologne will create 10 mobility stations at strategic transit connections in the city centre, the first two of which are expected to open in 2020 (Stadt Köln, personal interview, 2020). In each case the city will be converting a portion of a public parking lot. The model is to convert approximately 10 parking spaces into the station with two spaces being dedicated to each of the following: e-scooter parking, bike parking, cargo-bike parking, electric-vehicle charging, and carsharing. In Cologne, the operators will not need to have a special permit to distribute their vehicles at the mobility stations, but there are applicable fees if they want to include their company logo on the station infrastructure.

Berlin has developed a model curbside e-scooter station to replace a parking space. This program is being coordinated through the citywide and district planning offices so that there is distribution across neighbourhoods. The first e-scooter parking space opened in the Friedrichshain-Kreuzberg district in June 2020 with an additional 20 parking space conversions are in the planning stages that district alone (Neumann, 2020). Compliance from riders has been mixed so far with some riders continuing to park adjacent to the designated parking zone but on the sidewalk.

Getting customers to choose a virtual station over parking immediately at their destination will require a combination of awareness raising, incentives, and penalties. One incentive that is being discussed in a few places is giving riders additional free minutes on their next e-scooter ride if they park in the designated space. Such incentives are only possible when the e-scooters have accurate enough GPS capabilities to determine which side of the curb the vehicle is parked. The large e-scooter companies are working on improving the level of detail in their vehicle mapping, but that rollout is an ongoing process. The technology similarly limits the ability to enact penalties for not parking in a designated location. Another challenge is raising awareness of these new spaces. These official traffic signs have limited visibility in comparison to all of the other messages in the public

realm. Without highlighting the existence of these new stations in the apps and in the physical world, it may take a long time for customers to find and start using the new stations.

The Bergmannstraße e-scooter station is marked by parking signs and reflective safety bollards in the street.

© Rachel Nadkarni

Docked Stations

Two e-scooter operators in the German market are currently testing out the idea of physical docking stations. Berlin-based Tier was selected by WestNetz GmbH, an energy distributor, as a partner to trial the operations of an e-scooter charging and docking station in Essen (Körner, 2020). Spin, the California-based subsidiary of Ford Motor Company, announced it is entering the German market in 2020 starting with Cologne. Spin launched its first docks, "Spin Hubs," in Washington DC in August 2019. One of the innovations that Spin has been exploring in a few US markets is the idea of locating these Spin Hubs not only in the public street but also on private property, like at hotels and larger work and residential complexes (Spin, 2020).

A branded e-scooter docking station for a single provider is a clear special use permit, even in cities that are using voluntary agreements for baseline e-scooter operations. In order to grant a special use permit, there needs to be language in the regulations stating this and setting the fee for such a use. Many German cities already have permitting for bikeshare and carshare stations. Bremen noted that one of the very simple reasons they were able to move forward with e-scooter permits so quickly, was an "or similar" clause in their special use permitting language. Besides dimensions, there is little difference between a bikeshare station and an e-scooter rental station, so an "or similar" clause is a simple way to transition into allowing stations for e-scooters (Hansestadt Bremen, personal interview, 2020). As the range of vehicles used in these rental business models continues to shift, a more flexible definition is recommended – something like "station for rental vehicles."

The model that Spin is developing in their US operations, could also be a good fit for the German market. E-Scooter stations located on private property, for instance in municipal parking lots, commercial parking lots, or

on the premises of potentially large trip generators like suburban office complexes could increase orderliness and operational efficiencies. Docks may be part of the solution to making first-and-last-mile transport by rented e-scooter an economically viable option at city-edge locations. Like with a special permit, some policy changes may be needed. Building and land use codes need to have the flexibility to allow these docking stations.

Swiftmile produces stations that can be used with multiple rental e-scooter companies. The station shown here has scooters from Lime, Spin, and Bird.

Source: "Swiftmile charging station" by Swm2015 is licensed with CC BY-SA 4.0.

Yet a third model of e-scooter docking is emerging, the non-branded e-scooter dock. A California based start-up, Swiftmile, wants to be the "gas station for micromobility" (Swiftmile, 2020). In that goal they are creating docks for e-scooters and other micromobility devices that are interoperable across providers. Berlin's public transport operator, BVG, worked with Swiftmile to create the e-scooter docking component of the Jelbi Stations (see section 2.3. for more on Jelbi). Developing independent docked stations may be a good option for cities that have a multiple e-scooter providers, as it is sets a standard look for the entire community and reduces the need for competing e-scooter stations in the same location.

Policy Recommendation

Review the range of e-scooter station approaches – docked vs. virtual, brand-specific vs. brand-agnostic and develop a program that is appropriate to the number of providers and level of need. Set clear standards for e-scooter parking on private property. If the public realm is strictly limited in high interest areas, consider options to incentivize virtual or docked stations on adjacent private property before installation in the public way.

2.5 Communicate to Achieve Compliance

Monitoring compliance is possibly the biggest challenge for e-scooter governance but also where municipal governments can push for public priorities as the industry grows and evolves. It is not a small task to retool existing practices to monitor and ensure e-scooter compliance, since most public space monitoring systems in place in most German cities, as in much of the world, are geared toward checking driver behaviour.

Communicate and Coordinate

A proactive effort has been needed to add e-scooter monitoring to the task lists of staff at the local police, local order office, and the local planning and legal departments. Coordination between all stakeholders is critical. Cologne has routine communications with all new e-scooter providers entering the market. At the start of operations, check-in meetings between the City and the operator take place every six weeks, with more frequent emails and phone calls as needed. Additionally, all departments involved in mobility topics meet together regularly to discuss monitoring and enforcement concerns, at least once every few weeks, but as often as weekly when there are concerns that need to be addressed by the different divisions (Stadt Köln, personal interview, 2020).

In August 2020, Baden-Württemberg launched a campaign with several e-scooter operators, the police, and local public order offices to inform riders of the basic rules. #RideItRight will include targeted media messages, posters in public space and stickers directly on the e-scooters to teach new riders the basic requirements:

#RideItRight
- Only on bikeways or street
- No alcohol and drugs
- Only alone
- Look at your age
- No phone
- Park smart

Working together across the multiple apps and city and state-levels, the coordinated campaign is aimed at reducing the number of infractions and prevent crashes. In the announcements, the City of Stuttgart acknowledged that in the first year of operation, the city issued more than 400 rider warnings and fines and Baden-Württemberg identified more than 100 crashes resulting in injury across all cities with e-scooters in the state (Staatsministerium Baden-Württemberg, 2020), (Landeshauptstadt Stuttgart, 2020).

Track Municipal Engagement

The main topic of public concern is improperly parked e-scooters, but the scale of this problem remains under-researched. No matter the regulatory framework, most German cities have established protocols for relocating poorly parked e-scooters. Typically a member of the public or a city official can call the operator about the improperly parked scooter, after which the operator has a few hours to address the problem, and if not addressed, then the city may move the vehicle for them. Relocating vehicles that block walkways needs to happen faster. A reporting team from NDR followed a street-cleaning crew in Hamburg that regularly loses 15 min on the

sidewalk-sweeping routes to moving e-scooters out of the way (Lang, 2019). Not only is this not the agreed upon protocol, there is no compensation to the City for the added workload that the street-sweeping teams are taking on. Taking the time to record and analyse how often the City staff is engaged in e-scooter relocation is an important step to understanding the extent of the problem and improving the collaboration with operators. If there are recognizable patterns or hotspots, that information can be used to inform operational changes, like a proactive sweep by the operator's staff, or the creation of dedicated e-scooter stations at key locations.

Sidewalk sweeping crews in Hamburg using vehicles like this one have reported losing 15 min daily to moving e-scooters out of their path.

Source: "KW305_BSR" by antoniovera1 is licensed with CC BY-SA 2.0.

Test the Technological Solutions

A second major area of concern is vehicle use in low-speed or prohibited use zones. As with the parking problem, voluntary agreements leave little incentive to invest public funds in tracking how many infractions are occurring, since all of the limits in place are simply good will gestures. Still, the largest e-scooter companies are working on technology to improve the GPS locators on the vehicles in order to improve compliance with requests for zones where the vehicles either stop or move only at a walking-pace. All cities, perhaps especially those with voluntary agreements, should look for opportunities to test if the new technology is delivering on the promised outcomes and the extent to which investments in new customer trainings, GPS equipment, etc. are actually improving compliance or if stricter regulatory tools are also needed.

Prepare an End Service Plan

There is a unique provision is Stuttgart's voluntary agreement that deals with compliance at the end of a company's time in the city. When one of the early bikeshare operators went bankrupt, Stuttgart was left with numerous bikes to remove from city streets and dispose of at the City's own expense. Learning from that experience, Stuttgart requires a deposit of € 50 per vehicle at the time the voluntary agreement is signed for any new e-scooter rental service (Landeshauptstadt Stuttgart, 2019). The requirement is intended to provide the City with funding to dispose of any remaining

vehicles should another company withdraw from Stuttgart or go bankrupt. This requirement has not stopped e-scooter activity in Stuttgart where three companies are currently operating.

Zoom out

E-scooters, and shared mobility services more broadly, are expected to provide a range of benefits that align with municipal goals, but monitoring is needed to understand if the implementation of these services is actually making progress toward these public priorities. One way a municipality can leverage its communications with e-scooter rental companies is to advocate for the public good.

Depending on the regulatory framework utilized, the municipality has more or less formal routes for influencing how the e-scooter services evolve. Even if the agreements are voluntary, the power of discussion can be strong. So far, e-scooter rental providers in Germany have sought to be collaborators with municipal governments, as compared to the combative "disruptor" approach espoused when e-scooters were first launched in the United States. Positive community reception is dependent on continued good relationships, meaning there is an opportunity for municipalities to work together with e-scooter providers to monitor progress to goals that go beyond daily operations.

Even if progress toward the sustainable transport goals cities have for e-scooters are slow or uneven, the simple act of keeping them at the forefront of public discussion is essential to eventually making progress. Cities can take an active role in tracking key performance indicators around sustainability and making the public aware of the progress made or not each year.

A Tier employee swaps e-scooter batteries from a cargo-bicycle. Tier's success in Bremen is in part due to the use of employees rather than gig-workers for such tasks.

Source: https://www.tier.app/wp-content/uploads/2019-12-16-TIER-Swapper_with_eCargoBike-scaled.jpg.

Another policy area to consider is labour standards. Bremen is using the opportunity that the special permit provides to require operators to only use company staff to charge the vehicles. Some e-scooter operators have built their business model on community members charging the vehicles in

return for a small sum. Some have interpreted this type of gig-work as flouting labour laws. In 2019, community members charging e-scooter in Berlin were being paid €4 per e-scooter, but all the costs of collecting and charging the e-scooters was borne by the independent contractor, and these contractors were working in public space without the insurance to cover workplace injuries that an employee can access (Waschbüsch, 2019). Not all e-scooter operators use the gig-work model, but by locking out those that use such questionable practices, Bremen has made a clear push for the industry to meet at least the minimum labour standards (Hansestadt Bremen, 2019). As with sustainability goals, cities using voluntary agreements have the option to at least ask about how gig-work is utilised and what the conditions of that system include.

Policy Recommendation

Establish firm communication protocols with e-scooter operators to monitor and address on-going operational challenges. Develop a goal-based agenda for routine discussions with operators – annually, semi-annually, or quarterly as appropriate. The discussion should include collaborative review of identified key performance indicators and progress toward stated goals for operations, sustainability, safety, and other local concerns. Document communications to keep political leaders and the public informed on the e-scooter service market. Finally, consider end-of-operations planning for the case an operator leaves the market and/or ceases operation in a particular area of the city.

2.6 Anticipate other Small Electric Vehicles & New Business Models

E-scooters were determined to be roadworthy vehicles on June 15, 2019 as part of a new vehicle classification: Small Electric Vehicles (eKFV). They are by no means the only vehicle in the new class and the free-floating e-scooter rental systems common today are only one of many business models through which e-scooters are available to the public. Already e-scooters are starting to diversify slightly in their shape. One of the 2020 entrants in the German e-scooter market is Zeus, an Irish company that touts its 3-wheel design as a major improvement in vehicle stability.

Vehicle Diversity

The Small Electric Vehicles Act has a helpful set of vehicle criteria that can be used to anticipate future needs, particularly around parking. There are limits on the dimensions, weight, and speed, as well as standards on how the vehicles can use existing infrastructure. For the purposes of creating parking spaces for vehicles in this class, the dimensional limits are useful.

Dimensions: EKFVs are limited to 2 m long by 0.7 m wide by 1.4 m high (BGBI, 2019)

Most e-scooters on the market today have an overall length closer to 1.2 m, but parking spaces created for these small electric vehicles should anticipate that 2 m long vehicles will need to fit within the space. Furthermore, the current e-scooter shape allows the vehicles to be stacked close together with the handlebars turned, so that vehicles are nested together. The deck of an e-scooter where the rider stands is generally less than 0.2 m wide, making organized e-scooter parking very efficient. There are other models in development, with and without seats that will need the full space. For instance, a Canadian start-up, Scootility, is aiming to build the 'SUV' of e-scooters and is developing a model with a rigid front basket that can fit at least one carry-on size suitcase (Scootility, 2020).

Irish company Zeus, with its three-wheeled e-scooter model, is now available for rental in Heidelberg.

© ZEUS

Source: https://www.vrn.de/mobilitaet/e-tretroller/zeus/index.html.

Business Model Diversity

Then there are the business model differences that may create a broader range of parking needs. E-scooters are beginning to have a role in package delivery and partnerships between the e-scooter rental companies and other businesses are forming. For instance, responding to an increase in demand for home deliveries as a result of the Coronavirus Crisis, Voi developed partnerships in Sweden and Norway to link delivery personnel with e-scooters (Voi, 2020). This new use-case means that delivery staff is temporarily parking an e-scooter for a few minutes at each delivery site. This is a different activity than parking the vehicle and walking away, and such short-term, mid-use parking, may be worth allowing even in areas where ending a public rental is prohibited.

On the other hand, there are the private e-scooter owners. E-Scooters can be purchased from some of the well-known operators (both Bird and Tier are also e-scooter sellers), as well as at electronics stores and discounters. There is additionally the month-to-month lease option from Swapfiets. Specific to the private market are collapsible e-scooters which offer more convenience - they can be taken on public transport and can easily be brought inside the home for charging and overnight storage. Whether collapsible or not, private e-scooters will need to park in public space at various times. The locking mechanisms for private e-scooters are similar to those for bikes, and the general rules set by the Small Electric Vehicles Act state that bike parking rules apply to e-scooters as well. Securing an e-scooter to an immovable object is done with a cable or U-lock, as with a bicycle. The simple post frame of an e-scooter does mean that it is important to secure an e-scooter to a rack that has two points of contact on the ground.

The first stations are being designed for shared e-scooter rentals only, without secure racks for private e-scooter owners. It is then important to convey to private e-scooter owners, and the public order office, that private e-scooters may be locked to a public bike rack and are not required to be parked in the designated stations. Additionally, publicly run parking garages that have bike parking should be prepared to accept private e-scooters if they have not already done so. No substantial infrastructure changes are needed, but policies should be reviewed to ensure they say “vehicles” and not “bicycles” wherever necessary.

Policy Recommendation

Develop e-scooter parking plans that are future-proofed to accommodate other models within the same vehicle classification. Follow developments in the diversification of business models to ensure that e-scooter policies do not hinder appropriate uses of the public streets and parking areas. Update policies for bike parking as necessary to ensure that private e-scooter owners are within their rights to utilize those spaces as well.

Appendix

Cities in Germany with E-Scooters

Cities with E-Scooters	Population 2018	Voluntary Agreement	Special Use Permits	Public Tender	Partnership with Public Utility
1 Aachen	247,380	X			
2 Augsburg	295,135	X			
3 Berlin	3,644,826	X			
4 Bielefeld	333,786	X			X
5 Bochum	364,628	X			
6 Bonn	327,258	X			X
7 Bremen	569,352		X		
8 Dortmund	587,010	X			
9 Dresden	554,649	X			
10 Düsseldorf	619,294		X		
11 Duisburg	498,590	X			
12 Erlangen	111,962	X			
13 Essen	583,109	X			
14 Frankfurt a. M.	753,056	X			
15 Fürth	127,748	X			
16 Gütersloh	100,194	X			
17 Halle (Saale)	239,257				pilot sponsored by city tourism agency
18 Hamburg	1,841,179	X			
19 Hannover	538,068	X			
20 Heidelberg	160,355	X			VRN - regional coordination
21 Herford	66,608	X			X
22 Herne	156,374	X			X
23 Hildesheim	101,990	X			
24 Ingolstadt	136,981	X			
25 Kaiserslautern	99,845	X			
26 Karlsruhe	313,092	X			
27 Köln	1,085,664	X			
28 Ludwigshafen	171,061	X			VRN - regional coordination
29 Lübeck	217,198	X			
30 Mainz	217,118	X			
31 Mannheim	309,370	X			VRN - regional coordination
32 Mönchengladbach	261,454	X			X
33 München	1,471,508	X			
34 Münster	314,319	X			
35 Neu-Ulm	58,707	X			
36 Nürnberg	518,365	X			
37 Osnabrück	164,748	X			
38 Paderborn	150,580	X			

Cities with E-Scooters	Population 2018	Voluntary Agreement	Special Use Permits	Public Tender	Partnership with Public Utility
39 Potsdam	178,089	X			
40 Rostock	208,886	X			
41 Saarbrücken	180,741	X			
42 Stuttgart	634,830	X			
43 Ulm	126,329	X			
44 Wiesbaden	278,342	X			
45 Wolfsburg	124,151	X			

(as of Aug 1, 2020)

References

BGBl. (06. 06 2019). Elektrokleinstfahrzeuge-Verordnung vom 6. Juni 2019 (BGBl. I S. 756).

BVG. (2020). Difu-Dialog: Mobility as a Service – "Game Changer" für urbane Mobilität? Deutsches Institut für Urbanistik.

Deutscher Städtetag, D. S.-u. (2019). Nahmobilität gemeinsam stärken.

Fahrrad mit Werbetafel auf öffentlichem Gehweg, 4 K 2027/08 (Verwaltungsgericht Hamburg 31.03.2009).

Gauquelin, A. (2020). Analysis of Paris' e-scooter RFP. Abgerufen am 28.07.2020 von https://shared-micromobility.com/analysis-of-paris-escooter-rfp/

Hansestadt Bremen. (2018). Sondernutzungskostenordnung.

Hansestadt Bremen. (2019). Muster Sondernutzungserlaubnis für das Fahrzeugverleihsystem.

Hansestadt Hamburg. (2019). Hamburg startet mit Wunder Mobility Deutschlands erste Plattform. Von https://www.hamburg.de/pressearchiv-fhh/12793478/2019-08-21-bwvi-mobilitaetsdienste/ abgerufen

Hauptstadt München. (2019). Sharing-Mobility - Grundsatzabeschluss.

Jelbi. (2020). Mobility Partners. Abgerufen am 24. 08 2020 von https://www.jelbi.de/en/mobility-partners/

KielRegion. (2019). Fahrradverleihsystem KielRegion . Abgerufen am 13.08.2020 von https://ausschreibungen-deutschland.de/550686_Fahrradverleihsystem_KielRegion_2019_Kiel

Körner, T. (2020). Erste Ladestation für E-Scooter auf Essener Stadtgebiet. Westdeutsche Allgemeine Zeitung, https://www.waz.de/staedte/essen/sued/erste-ladestation-fuer-e-scooter-auf-essener-stadtgebiet-id230079838.html.

Landeshauptstadt Düsseldorf. (2019). Informationsvorlage der Ordnungs- und Verkehrsausschuss OVA/030/2019.

Landeshauptstadt Stuttgart. (2019). Freiwillige Selbstverpflichtungserklärung für Anbieter von Leihsystemen für E-Scooter und sonstige Elektrokleinstfahrzeuge nach der eKFV in der Landeshauptstadt Stuttgart. Von https://www.stuttgart.de/leben/mobilitaet/elektromobilitaet/e-scooter/ abgerufen

Landeshauptstadt Stuttgart. (2020). E-Scooter: Stadt und Land weisen auf Verkehrsregeln hin. Von https://www.stuttgart.de/service/aktuelle-meldungen/august-2020/ein-jahr-e-scooter-in-stuttgart-stadt-und-land-weisen-auf-verkehrsregeln-hin.php abgerufen

Lang, C. (2019). E-Scooter: Chaos in Großstädten, Video. Abgerufen am 03.08.2020 von https://www.ndr.de/nachrichten/hamburg/Ein-Jahr-am-Start-Die-Bilanz-der-E-Scooter-in-Hamburg,escooter296.html

LVB Move. (2020). In-App Map of Mobility Stations. Abgerufen am 24.08.2020

Moran, M. E. (2019). Six Scooter Companies, Six Maps: Spatial Coverage and Regulation of Micromobility in Vienna, Austria. Von https://static1.squarespace.com/static/559921a3e4b02c1d7480f8f4/t/5db69e7215366869893d227f/1572249222346/Final+Report+-+Marcel+Moran.pdf abgerufen

Neumann, P. (2020). Versprochene Parkplätze für E-Scooter lassen auf sich warten. Berliner Zeitung, https://www.berliner-zeitung.de/mensch-metropole/versprochene-parkplaetze-fuer-e-scooter-lassen-auf-sich-warten-li.90362#:~:text=In%20Kreuzberg%20wurde%20die%20erste,Zw.

Open Mobility Foundation. (2019). Mobility Data Specification. Von https://github.com/openmobilityfoundation/mobility-data-specification#mobility-data-specification abgerufen

Panhorst, C. (07. 08 2009). E-Scooter: Anbieter liefern sich Rennen ums Bielefelder Pflaster. Neue Westfälische.

Ramboll. (2020). Achieving Sustainable Micro-Mobility: Green Paper April 2020. https://ramboll.com/-/media/files/rgr/documents/markets/transport/m/ramboll_micro-mobility_greenpaper_a4_0320_lowres_v.pdf?la=en.

Scootility. (2020). Company Pitch. National Shared Mobility Summit Pitch Competition.

Spin. (2020). Spin Hubs. Abgerufen am 24. 08 2020 von https://www.spin.app/real-estate

Staatsministerium Baden-Württemberg. (2020). Start der Kampagne #rideitright. Von https://stm.baden-wuerttemberg.de/de/service/presse/pressemitteilung/pid/start-der-kampagne-rideitright-1/ abgerufen

Stadt Köln. (2018). Fahrradverleihsystem Übersichtskarte Innenstadt. Anlage 2 der Mitteilung 2048/2019.

Swiftmile. (2020). Swiftmile Interview with CEO and Co-founder Colin Roche. Von Youtube: https://www.youtube.com/watch?v=At3viOIQE0U abgerufen

Verkehrsverbund Rhein-Neckar. (2020). TIER-Pendlerticket für ÖPNV-Kunden. Von https://www.vrn.de/verbund/presse/pressemeldungen/pm/014614/index.html#:~:text=Der%20Tretroller%20Anbieter%20TIER%20Mobility,TIER%2DTretroller%2DFahrten%20anbietet abgerufen

Voi. (2020). Voi (2020). Voi supports the restaurant industry: offering e-scooters for increased home delivery demand.

Von https://www.voiscooters.com/blog/voi-supports-restaurant-industry/ abgerufen

Waschbüsch, L. (09.07.2019). E-Scooter in Berlin: Saftig ausgepresst. Berlin TAZ, S. https://taz.de/E-Scooter-in-Berlin/!5605912/.

Municipal management of e-scooters has been a major debate in the first year of operations in German cities. Of the 45 cities with e-scooter rentals so far, only two are issuing special use permits, while the rest negotiate voluntary agreements with the private operators. For many communities, a voluntary agreement will be appropriate and sufficient, but in other cases, a permit or a public tender process will provide additional means to maintain order within the shifting market conditions. This document provides an overview of the status of each regulatory framework in the German context, as well as six key policy areas to build upon, no matter which approach is selected.