



SUSTAINABLE MOBILITY IN SMALL AND MEDIUM-SIZED CITIES - THE EXAMPLE OF THE FRANKFURT RHINE-MAIN METROPOLITAN REGION

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Abstract

The transformation of the transport system towards sustainability is a manifold challenge on many levels. While there are many debates and approaches for large cities on the one hand and rural regions on the other, substantial parts of traffic originate in suburban small and medium-sized towns in agglomeration areas, where viable and specific concepts for a more sustainable mobility system have been lacking up to now. With the project “Suburban New Mobility”, mobility-relevant data and parameters from small and medium-sized cities in the Rhine-Main-Region were systematically collected and processed and their specifics in the relevant dimensions of transport supply, demand and organisation were elaborated. Thus, the project builds a data-based foundation for practical support as well as action concepts as a stepping stone to promote the transition towards sustainable mobility in small and medium-sized cities. This paper presents the project results and the derived requirements for action for transport policy, planning and consulting.

Keywords: sustainable mobility, transport planning, small and medium-sized cities

1 Introduction: Mobility in small and medium-sized cities

The transformation of the transport system towards sustainability is a current challenge on many levels. This transformation is planned and implemented mostly at the municipal level as municipal planning sovereignty allows and requires significant opportunities and obligations for planning and design of spatial and transport development. The transport offers at the place of residence have a crucial influence on individual’s mobility choices and mobility behaviour [1]. In this context, small and medium-sized towns in metropolitan regions are considerably challenged: Due to their importance as places to live and work, they usually have strong commuter flows and contribute to high regional traffic volumes. At the same time, they are obligated to plan and organise transport more sustainably in a highly dynamic mobility world. In the (academic) discourse on mobility transition, the importance of small and medium-sized cities has not been sufficiently recognised so far: the focus of funding lines, projects and living-labs is mainly on large cities or rural areas. Yet there are no tailor-made concepts for small and medium-sized towns in agglomeration areas [2, 3].

1.1 The transformation towards sustainable mobility

Hardly any other economic and social sector is currently undergoing such a fundamental transformation as mobility and transport. The transformation of the transport system towards sustainability and climate protection aims to make the mobility sector ecologically,

economically and socially feasible for current and future challenges. Central goals of sustainable mobility and transport development include zero emissions, cost efficiency and fiscal transparency, as well as social accessibility. The promotion and implementation of non-motorised mobility as an attractive alternative to motorised private transport is an important component of the mobility transition. In addition, new mobility offers are considered to be of central importance for the future of mobility [4]. On the supply side, these are, among other things, the topics of alternative drive technologies and infrastructures (electric mobility, hydrogen, etc.) as well as the concept of Mobility-as-a-Service (MaaS), which includes e. g. mobility offers of the “sharing economy” (car, bike or e-scooter sharing) or on-demand shuttles. Another focus is on the digitalisation of established modes of transport and mobility, such as the digitalised provision of information in real-time, individualised routing, digitalised billing and ticketing or digital assistance and safety systems [5, 6].

Technical, infrastructural and digital solutions have been well researched and mostly developed to market maturity. But the implementation of sustainable mobility requires a broad set of transport planning instruments from the fields of infrastructure, transport and mobility management in order to implement both supply- and demand-oriented steering impulses and concepts [7]. For this, the intended transport planning goals must be addressed and implemented integrately across all political and administrative levels of governance. Especially the fields of cooperation, steering and governance are of high importance for the introduction and implementation of new mobility services and have a high demand for knowledge exchange and further research [8-10].

1.2 The role and challenges of small and medium-sized cities in the German transport system

Especially in the field of transport and mobility, cities and municipalities have comprehensive responsibilities for planning. The sustainable mobility transition is thus planned, designed and implemented to a great extent at the municipal level. Small and medium-sized cities (10,000 - 50,000 inhabitants) in metropolitan regions face specific challenges: On the one hand, they have an elevated and steadily growing importance as places to live and work and are therefore considerable regional traffic sources. On the other hand, partly due to their limited financial and human resources, small and medium-sized cities seem to be only partially able to cope with the diverse challenges of integrated and goal-oriented transport and mobility planning in the context of a dynamically changing mobility world [3].

According to the German Federal Statistical Office (as of 31.12.2017 [11]), 46 % of all inhabitants in the state of Hessen live in towns and municipalities with a population of between 10,000 and 50,000. Within this group, small and medium-sized towns in metropolitan regions play a special role: Due to their prominent function as residential locations within the polycentric structure, they usually generate high volumes of commuter flows to the nearby urban centres [1, 3]. At the same time, the transport relevance of small and medium-sized towns does not seem to be sufficiently acknowledged and covered in the political, planning and scientific discourse [12]. The focus of the currently existing funding lines, projects and real laboratories is mainly on urban or rural spatial structures, but not on suburban structures of medium population density. Despite their prominent role, target-oriented concepts and solutions for small and medium-sized towns are often not the focus of transport policy and research [13].

2 Methodology

The research project “Suburban New Mobility” analyses both mobility and governance structures of all 98 small and medium-sized cities in the Frankfurt Rhine-Main metropolitan region [Figure 1] in order to develop a fundamental understanding of their role, significance and potentials in the context of sustainable transport using a mixed-method approach.

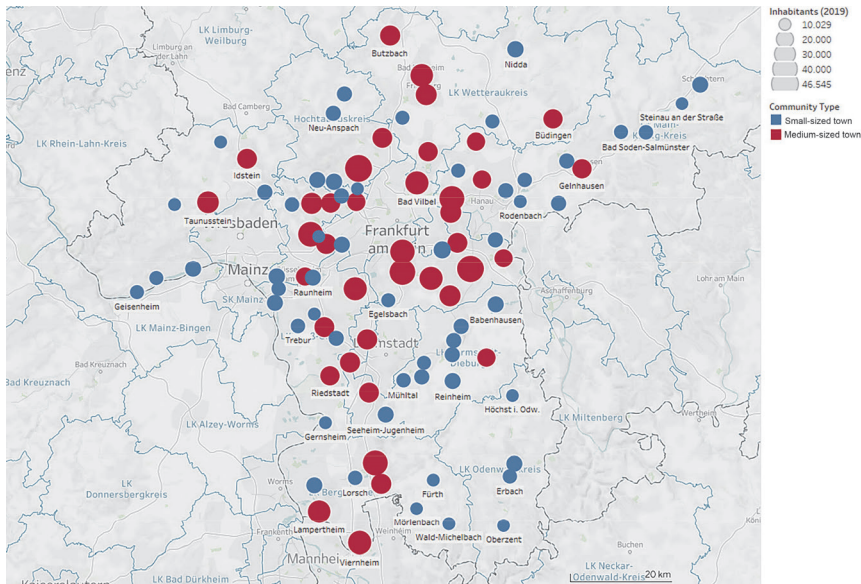


Figure 1 The 98 surveyed small and medium-sized cities in the Frankfurt Rhine-Main Region

An explorative data analysis of mobility and transport-related information is the central research focus. For this purpose, data relating to mobility and transport in small and medium-sized towns were accumulated and analysed from secondary data sources at municipal, state and federal levels.

In order to analyse governance structures and transport policy strategies, subject-specific frameworks and plans as well as the administrative structure of 25 randomly selected municipalities in the study area were analysed and evaluated with regard to the administrative integration of transport and mobility.

To complement the quantitative secondary data analyses, qualitative expert interviews were conducted with representatives from the municipal administrations of ten selected small and medium-sized towns and evaluated using qualitative content analysis. The qualitative research focuses on questions of municipal transport policy and administration, local transport-related discourses and the planning and design processes of transport services in small and medium-sized cities.

3 Key findings

3.1 Transport connections and services

Transport and mobility are directly related to spatial accessibility as well as to the availability and quality of existing transport services. Both aspects are central factors for the quality of a residential location and its economic attractiveness.

Transport accessibility and transport services in the small and medium-sized towns surveyed are strongly influenced by the Frankfurt Rhine-Main metropolitan area with its dense network of efficient suburban roads and railway lines. In 67 % of the small towns and as many as 85 % of the medium-sized towns, the nearest motorway connection is less than 10 km away. The average distance to the nearest regional centre is 19.4 km for small towns and 15.6 km for medium-sized towns. Only ten of the cities do not have a rail connection. Six of these ten municipalities closed an existing railway line between 1966 and 1986, while the other four never had a passenger rail connection. In contrast, 11 small towns (19 %) and 14 medi-

um-sized towns (35 %) have one or more suburban railway stations with direct connections to Frankfurt am Main. The other existing rail connections are also predominantly good: 43 of the small towns (74 %) and 38 medium-sized towns (95 %) have a direct, transfer-free rail connection to a major centre. Facilities for intermodal linking are the standard case: except three municipalities, whose railway station is located in a constricted inner-city location, all small and medium-sized towns with a rail connection have a designated Park & Ride facility. Bus services are sufficiently available in practically the entire study area. On average, almost 2,000 daily bus connections are offered on weekdays in each municipality (small towns: 1,312 departures/day; medium-sized towns: 2,903 departures/day), which in total indicates a high supply density. In relation to the number of inhabitants, the offer ranges from about 7 to 230 bus departures per 1,000 inhabitants, whereby municipalities with a limited bus offer predominantly have very good rail connections. Fundamental deficits in the public transport offer are therefore not evident.

Compared to the mostly well-developed classic public mobility services at the regional level (bus and rail), municipal services and so-called new mobility services, and thus additional mobility options as an alternative to private car use, are only available to a limited extent in the small towns examined and should be further promoted: 47 % of the small and medium-sized cities run their own city bus services, and thus have the possibility to directly plan and manage public transport themselves. In 26 of the cities studied, there is a car-sharing service, while only one city has a bike-sharing service as an additional public mobility option. In many places, sprawling and car-friendly designed settlements cannot be served efficiently by public transport and are often not very attractive for pedestrians and cyclists alike. Compact settlements, on the other hand, allow short internal routes that can easily be covered on foot or by bicycle. However, the existing urban structures, especially in the dense settlement cores are frequently it is difficult to integrate additional transport offers and infrastructures as well as safe and comfortable pedestrian and cycling facilities. Streets and open spaces are mostly dominated by cars, while pedestrian and cycling traffic often had little priority in the planning and distribution of space.

3.2 Responsibilities and opportunities of German small and medium-sized cities in shaping the transport system

Individual mobility behaviour is significantly influenced by transport connections and mobility infrastructures provided at the place of residence: the available transport services determine the individual mobility options and individual accessibility and action areas. From a transport planning perspective, local authorities therefore have a considerable influence on individual mobility behaviour through planning and design of accessibility and mobility services and infrastructures.

In general, the principle of public services of general interest anchored in the German constitution ensures a nationwide basic range of mobility services and accessibility. However, the legally standardised tasks of municipalities do not include a general mandate to design transport systems and ensure mobility access. Therefore, integrated transport planning utilises a wide range of direct and indirect legal frameworks and planning tools. Sectors with proven influence and regulatory potential are, for example, urban development, regional planning, land use planning and building regulations.

Furthermore, construction and operation of road infrastructure is traditionally a task of municipalities. They are responsible for the construction of municipal roads as well as for the pavements and car parks on classified roads within the local area. As road traffic authorities, they are also responsible for a large number of traffic regulations and, as local regulatory authorities, for traffic monitoring.

At the same time, small and medium-sized towns with, have no normative tasks and power in the area of public transport. Here, the regional districts usually act as public transport authorities, using their own institutions and the transport associations as public transport authority organisations.

3.3 Transport policy in small and medium-sized cities

The range of transport policy issues and challenges in small and medium-sized towns is broad and currently highly prioritized in municipal politics.

While the necessary transformation of the mobility sector is certainly present in the political agenda of most municipalities, the perception of mobility is still strongly influenced by the car as the supposed main mode of transport, especially among opinion-formers and decision-makers. Although, for example, the promotion of cycling infrastructure or the barrier-free improvement of public transport stops have increasingly moved into the focus of municipal transport policy, a change in mentality and action in the municipal political sphere is often still somewhat reticent. While the urgency and potential of the issue is widely recognised, the willingness and (political) courage to accept and endorse restrictions on cars, for example by removing car parking slots in public spaces, in order to promote other modes of transport, is still very controversial in many municipalities.

In many of the surveyed cities, there is a lack of established transport policy goals and thus a lack of the necessary framework for sustainably shaping and promoting change in the long term. Together with sometimes strong self-interest or a lack of expertise on the part of local politicians, this can hinder essential decision-making processes in transport planning. Additionally, once the transport planning goals have been articulated, stalled or lengthy administrative processes hinder implementation. In many small-town municipalities, one of the reasons for prolonged planning processes is insufficient staffing and/or funding. Often it is not possible to deal with conceptual activities or interdisciplinary planning in addition to everyday business - the focus of everyday action is more on the ad-hoc elimination of concrete problems than on the implementation of long-term strategies. Even where strategic and conceptual plans are in place, they are often de facto not integrated into day-to-day activities. While the basic concepts and objectives receive broad political approval, the implementation of the individual measures is often difficult, controversial or does not appear politically opportune.

3.4 Managing transport at the municipal level

Planning and implementation of concepts and measures at the municipal level requires sufficient staffing with professional expertise. The majority of the cities surveyed are dissatisfied with the current human resources in the transport sector and see an acute need to significantly increase them in order to be able to meet the current and future challenges. Although more positions have been created in recent years, these are still insufficient in many places to meet the growing demands due to the increasing importance of municipal transport issues and the resulting increase in transport planning tasks.

With 88 % most of the surveyed small and medium-sized cities do not have their own transport planning department, so tasks are not bundled and strategically brought together in one position. Instead, partial tasks and responsibilities of municipal transport planning are integrated within several departments and distributed in different administrative areas such as urban planning or environmental departments, which often prevents efficient and strategic mobility planning on a structural level.

The lack of qualified professionals for the transport planning sector in small and medium-sized towns is clearly articulated as a problem. As a result, individual areas of transport planning are outsourced to external planning offices at high cost without building up internal expertise. An improvement in transport planning can be achieved through better qualification of the professional staff and constant training on current trends, challenges and new legal framework conditions.

A frequent challenge is the high administrative and bureaucratic requirements for obtaining public funding at state, federal and EU level. The often complex application process alone requires a high level of human and time resources, which are often not available in the administration, so that many funding opportunities cannot be fully utilised.

3.5 Regional and Cross-municipal structures and approaches

Traffic does not end at municipal borders. However, cross-municipal cooperation and coordination in the transport sector are often insufficiently established. Coordination and cooperation with other municipalities and actors is mostly rather problem- or project-based than strategically embedded in adequate and sustainable structures for regular exchange and collaboration.

In some cases, a fundamental understanding of the potential and importance of exchange and cooperation with neighbouring municipalities as well as the development and implementation of possible common goals is completely absent throughout the surveyed municipalities

Particularly with regard to new mobility services, such as car-sharing or bike-sharing services, a regional cooperation of several small and medium-sized municipalities can significantly improve the attractiveness and negotiating basis in relation to private mobility providers and can initially enable the introduction and operation of those services.

With regard to the existing external support offers such as information platforms, events or training opportunities on the topic of transport and mobility, the municipalities complain about the lack of time and opportunity to apply these intensively and purposefully in daily practice. It is nevertheless important to strengthen external support services and network building in order to promote cooperation between municipalities and to generate synergies between relevant actors.

4 Conclusion

Small and medium-sized cities must develop their own competences in the field of transport and mobility in order to shape the transformation of mobility in a self-determined and sustainable way. This requires informed actors with adequate financial and human resources at all planning and decision-making levels, as well as more municipal decision-making power and technical know-how to accelerate processes and the implementation of measures. Financial flexibility together with more easily accessible funding lines are necessary to fully, partially or temporarily finance innovative and multimodal transport services and to establish them outside the major cities.

Many transport problems and solutions can only be effectively and efficiently addressed regionally and across municipalities. This requires the establishment of effective informal, possibly also formal structures of collaboration. Higher-level actors can act as region-wide multipliers.

The preservation and reurbanisation of vibrant town and city centres as an important interdisciplinary task of integrated urban development focusing on active inner development and higher urban densities can contribute to reduced travel distances and a shift towards more sustainable modes of mobility.

In order to effectively plan and design sustainable mobility, small and medium-sized cities need adequate financial resources, professionally qualified staff as well as local politics and administration willing to shape current and future developments. The leaner political and administrative apparatus can even be a structural advantage that enables them to adapt more flexibly to changing conditions, to proactively shape transformation processes, and to find creative, tailor-made solutions for a goal-oriented transformation of transport.

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