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Case studies of new urban planning policy: effects of redesigning and redistributing public space in Europe

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Abstract

Most European cities experienced a long history of car-oriented city planning. In recent years, an increasing number of projects aim to shift the planning paradigm towards active mobility and livable urban areas.
In this contribution, we examine eight European case studies that aim to design more livable cities and promote active mobility. We compare these projects with respect to the planning and implementation process and involved stakeholders. Furthermore, various quantitative indicators are used to study the effects on mobility behavior and transport, livability, local economies and neighboring areas. In addition, we examine whether the projects are in line with sustainable urban development goals and embedded in local or regional strategies. For this, we develop a comparison scheme and collect diverse data for each case study.
We conclude that most projects require a long-term planning process and considerable communication effort alongside participation tools for citizens and stakeholders in order to be successful. When reducing the area consumed by motorized transport, contrasting views are observed. After controversial implementation processes, stakeholders often value the changes rather positive.

Keywords: *public space, active mobility, livability, planning policy, case study.*

1. Introduction

Decades of car-oriented planning have shaped most European cities significantly (Yassin, 2019). In recent years, more and more local projects follow a new paradigm in the distribution of public space in urban areas. In the context of sustainable urban development, mobility projects aiming to redesign and redistribute public space in favor of active forms of mobility and urban livability are changing planning policies on a local level. Especially due to changes and restrictions caused by the COVID-19 pandemic, the quality of public space is of particular importance for local recreation. Before and during the planning and implementation process, similar concerns and discussions of the involved stakeholders regarding the effects of the changes planned are experienced in most of these projects.

According to Gehl, the environmentally and people-friendly city of tomorrow is characterized by a high quality of stay (Gehl, 2011, 2015). One way to achieve this is to reduce motorized

individual traffic (MIT), which has a significant negative impact on this quality due to exhaust fumes and noise, in favor of strengthening the active modes of walking and cycling (Umweltbundesamt, 2017).
Studies show that active mobility does not only support individual well-being, lower stress levels and helps to prevent many diseases (Belter et al., 2016; Cavill et al., 2008; Tran, 2018). Additionally, increasing walking and cycling benefits the local economy (Bürklen et al., 2018; Simmons et al., 2015; Transport for London, 2018). Furthermore, walking and cycling are environment friendly, less expensive than driving (Scheck & Schürmann, 2019), and are thus open to nearly all segments of the population (Tran, 2018). For this presentation of successful examples of redesign and redistribution of public space, we address the following questions: What approaches are there to strengthening active mobility? And how can they be implemented within specific, existing urban structures?

What successful examples of measures for the redistribution and redesigning of traffic areas exist in Germany and other European countries? Which measures are particularly effective for redistributing or redesigning traffic areas at the neighborhood level?

The paper is structured as follows: Next, we present the five-step approach applied in this contribution to examine the selected case studies. This is followed by a brief description of the measures in the researched case studies. Finally, we present conclusions of the work.

2. Main Text

For the selection and examination of suitable examples of redesigned and redistributed public spaces, we applied a methodological approach consisting of five steps. First, potential case studies in Germany and Europe are identified that present a heterogeneous representation of redesign and redistribution measures of transport areas in favor of active mobility and/or for the creation of livable public spaces. Second, information for the potential case studies is collected using both publicly available online resources and additional data on the projects provided by local stakeholders and experts upon request. Third, the collected information is organized in a comparison scheme and short profiles are written. Fourth, from the large number of identified case studies, most promising examples are selected for a detailed consideration. Fifth, for the resulting shortlist of case studies, an elaborated comparison scheme is filled with information and a comprehensive report of the selected case studies is written.

2.1 Identifying potential case studies

Redistribution in this sense is understood as an administrative act that dedicates an area to a different use. An example is the change of categorization of a road from the superordinate road network to a pedestrian zone. In this case, the level of consideration is the partial area of the (former) roadway. There is no structural intervention required, but there is a legal intervention. In contrast, a redesign is understood to be a change in the utilization ratio of an overall area. An example is the reduction of lanes when widening sidewalks. In this case, the level of consideration is the total area of the road space. For a corresponding change, a constructional, but not a legal intervention is necessary.

Suitable examples of redesign and redistribution of space in German and European cities and neighborhoods incorporate the principles of sustainable urban development in general and the promotion of active mobility in particular. In addition, the needs of the population are integrated by offering participation opportunities. The measures are also characterized by good transferability and thus have exemplary character. This involves researching various sources using diverse search terms and keyword combinations to obtain the most comprehensive and wide-ranging coverage of measures in the specified context. In addition, databases and resources from prior projects supervised by the German Environmental Agency are used for the German cases.

2.2 Collecting information for all potential case studies

Information for the potential case studies is collected using both publicly available online resources and additional data on the projects provided by local stakeholders and experts upon request. For the identified projects, all information which is available online is collected. Following the internet research, local contact persons are identified for the identified case studies. These stakeholders are contacted individually, informed about the project and the objective, and asked to provide further information. This results in further contacts and comprehensive material. In addition, further information is obtained from individual project partners involved in the ongoing research project.

2.3 Developing a case study comparison scheme

The collected information is organized in a case study comparison scheme and short profiles are written. The identified case studies for redesigns and redistributions are entered into the diagram for the purpose of a comparative overview. In addition, the individual case studies are examined for their conformity with the goals of sustainable urban development. Accordingly, the comparison scheme is made up of different subsections and criteria. Therefore, a wide range of operationalizable indicators is selected in order to allow for comparing the case studies in detail.

In the vertical dimension of the comparison scheme, the concepts and measures brought into experience are listed. In the horizontal dimension, it contains the consideration and assessment criteria to be analyzed per case study. The main components of the comparison scheme are shown in Table 1**Fehler! Verweisquelle konnte nicht gefunden werden.** and described in the following. The scheme contains four categories which are structured by further sub-categories. For these, various specific indicators are defined. In Table 2 in the annex the case studies are compared using a selection of the presented indicators.

Table 1: *Main categories of the case study comparison scheme and a selection of indicators used*

Category	Sub-category
Spatial Context	City/municipality type
	Location and relevance within the city context
	Spatial setting
	Spatial dimension
	Initial traffic situation
Description of the measures	Problem dimension of the initial situation
	Objectives
	Original and intended dedication/use
	Redesign measures and elements used
	Embedding in superordinate strategy
	Integration in research project
Implementation process	Initiator of the measures
	Information on public participation
	Conflicts of interest and objectives
	Political framework
Evaluation	Impact of measures on e.g. traffic, quality of life and local economy
	Convergence with general goals of sustainable urban development
	Transferability aspects

The category **spatial context** serves to classify the redesigned or redistributed area and describes the urban conditions. This includes criteria such as the 'size of the municipality', the 'location' and 'relevance within city context' of the rezoned area, as well as information on the 'type of area' and 'spatial setting' (e.g. single street, square or quarter) in which the measure was implemented. In addition, the 'spatial dimension' - for example, length or area of a street or square - and the 'prevailing traffic situation' prior to the implementation of the measure are also considered.

The category **description of the measures** contains a brief description of the problem dimensions as well as the objectives pursued - for example, the promotion of active mobility or the improvement of the quality of stay. In addition, the original and intended use or redesign or redistribution of the traffic areas in the study areas is recorded. Moreover, it is noted which specific elements have been used and which measures have been implemented. These include, for example, the creation of new green spaces, the installation of traffic bollards, street furniture or bicycle parking facilities, or changes in traffic routing. Also recorded is the time period in which the measures took place, how the costs were financed, and whether the redesign or redistribution was part of an overarching strategy or research project.

Important criteria for the **implementation process** are the 'political framework conditions' under which a measure was implemented by the initiators and various stakeholders and which opportunities for public participation were used to resolve the conflicts of interest and objectives.

The **evaluation** is structured into the impact of the measures, the investigation regarding the convergence with the goals of general sustainable urban development and transferability aspects. Criteria such as the 'change in mobility behavior', for example 'parking', or the

'traffic volume' of different modes are used to record the effects of the measures on traffic. In the evaluation of quality of life, urban livability and quality of stay, there are overlaps with frequently mentioned sustainability indicators. The criteria of the comparison scheme include, for example, the 'length of stay of passers-by', 'noise emissions', 'air pollutant and greenhouse gas emissions', and 'traffic safety'. Social components of sustainability are captured by the criteria on measures to improve 'accessibility' for all persons as well as by 'observations of use by different population groups' or 'real estate price trends'. The economic impact is observed through a series of criteria regarding local retail and restaurant businesses (e.g. 'number of businesses', 'volume of sales' and 'sales area').

Regarding the convergence with the general goals of sustainable urban development, development goals for sustainable urban transport of the German Environmental Agency's (Umweltbundesamt, 2017) vision "Tomorrow's Cities" are used:

- Realizing the compact and functionally mixed city
- Providing urban green and public open spaces
- Reducing noise
- Expanding networks for active mobility
- Promoting integrated mobility services and electro mobility
- Improving the quality of public transport
- Controlling motorized traffic
- Strengthening participatory and cooperative planning and implementation

For transferability aspects as a criterion of the sub-criterion evaluation in the comparison scheme, the focus is on 'legal framework conditions' of the case studies.

The sub-criterion of 'responsibilities and required permits' is used to classify the municipal administrative structure of the respective sample municipality, which may differ in terms of the individual responsibilities. Associated in this context are the 'relevant legal bases' in individual cases - this indicator is used to examine comparatively which regulations (federal/state/municipal) were used to implement the respective transformation. For example, whether only minor measures in the form of road traffic regulations (such as new signage) were required, whether a (re)dedication of existing traffic areas in favor of bicycle or pedestrian traffic was carried out at the level of road law, or whether a development plan procedure has been carried out. The comparative analysis of the different solution paths in the municipalities serves to draw conclusions as to whether typical solution strategies are emerging in the already existing legal framework, or whether typical hurdles could make legal adaptation necessary in the future.

The indicator 'correspondence to legally binding or guideline-like partial or overall concepts' has the same basis of investigation as the indicator 'embedding in superordinate strategy' in the spatial context subarea of the comparison scheme. However, the focus here is not on the content of the respective comprehensive concept, as in the descriptive part, but on the degree of indirect or direct legal obligation. In this context, information on the criterion "whether public participation was formally required and/or whether and which informal participation instruments were used" is synthesized. While, for example, certain forms of public participation are mandatory in development plan procedures with a legally binding outcome,

many municipalities are increasingly making use of so-called informal participation procedures. In combination with the 'litigation' indicator, i.e. the question of whether the respective project was sued and what the outcome of the proceedings was, it may be possible to draw conclusions about behaviors that promote and hinder acceptance on the part of municipalities with ambitions in the implementation of future measures promoting cycling and walking.

In total, the comparison scheme consists of 65 indicators, for which information from the individual case studies is aggregated and assessed.

2.4 Selecting case studies

Out of the large number of case studies identified, we select examples for detailed consideration that serve as the basis for the eight comprehensive fact sheets. The guiding premise in these selection processes is a heterogeneity of the case studies to be selected with regard to the characteristics of the observation and used criteria (e.g. 'size of the municipality', 'urban-planning significance' of the measure area, 'objectives' and 'instruments used'). We select five case studies located in German municipalities and three from other European countries.

The aim is to reflect a certain diversity with regard to the type of city or municipality, and the location within the municipality. In addition, details on the implementation as well as the availability of data before and after the implementation and the feedback of the municipal contact persons on the requests for further material are considered.

2.5 Organizing detailed information and writing comprehensive reports

For the resulting shortlist of case studies, the elaborated comparison scheme (cf. section 2.3) and a comprehensive report of the selected case studies are created. For the preparation of the fact sheets, the data researched and provided by the responsible persons of the cities and municipalities are reviewed, processed, structured and entered into the comparison scheme. Subsequently, this data is prepared for the fact sheets in text form. Telephone interviews are held with experts from the cities and municipalities for the measures presented in order to gather further insights and information which is not available in written form.

Special attention continued to be paid during the research to collecting quantitative data, especially for the indicators in the evaluation category (e.g. 'changes in mobility behavior'). Using the comparison scheme, the case studies are presented in a consistent manner using this information.

The case studies are presented comparatively in individual documents (i.e. fact sheets). For this purpose, the categories of the comparison scheme are used. In addition, a uniform site plan and photographic representation are included. Following the completion of the fact sheets, they are reviewed by the responsible municipal officials to clarify remaining open questions. A total of eight case studies is selected for further in-depth presentation in the fact sheets. Five of them are situated in Germany in the cities of Potsdam, Munich, Berlin, Cologne and Dessau-Roßlau, and three are international examples from Barcelona, Oslo and Pontevedra.

2.6. Results

This section presents the results regarding the selected eight case studies. For each of the case studies, table 2 in annex summarizes the core information, such as the initial situation, the objectives of the measures taken and implementation components.

Konrad-Wolf-Allee (Potsdam, Germany)

The redistribution of the traffic artery Konrad-Wolf-Allee into a green multifunctional area in the large housing estate Drewitz on the outskirts of Potsdam, completed at the end of 2013, is a successful example of increasing the quality of stay and life to upgrade peripheral urban areas (Landeshauptstadt Potsdam, 2012, 2014b). By deconstructing the MIT infrastructure, the newly won areas could be loosened up by meeting possibilities, street furniture and green spaces and fit into the cityscape as connecting elements, just like the embedded streetcar line (Gartenstadt Drewitz, 2019; Landeshauptstadt Potsdam, 2019a, 2019b).

The measures resulted in the unsealing of 2.5 hectares of areas used for motorized traffic and the creation of 1.5 hectares of green spaces, playgrounds and recreational areas for residents. The park, which was praised in a survey of residents in 2018, is a successful example for the redistribution of space (Landeshauptstadt Potsdam, 2014a, 2019a). In addition, there are the newly created neighborhood meeting places like a café, a community center and a neighborhood meeting place. Overall, the green volume was roughly tripled as a result of the redesign (Landeshauptstadt Potsdam, 2014b). The redesignation and the area-wide limitation of the maximum speed in the study area to 30 km/h have significantly reduced traffic volume and noise pollution (Landeshauptstadt Potsdam, 2019a).

Sendlinger Straße (Munich, Germany)

Sendlinger Straße in Munich was redistributed and redesigned as a pedestrian zone in sections: After the successful redistribution of the northern section in 2013, the measure was extended to the southern section in 2017 and initially implemented and evaluated on a test basis (Förster et al. 2017). Mobile urban greenery and street furniture was installed during the test phase (Stadt München, 2020). In the course of this redistribution and redesign of the southern section of Sendlinger Straße, attention was paid to extensive participation opportunities and a comprehensive evaluation of the impact of the measure (Förster et al., 2017). By including local retailers, residents and passers during the implementation process, the interests of these groups were recorded and addressed (Förster et al., 2017). The positive results of the evaluation led to the permanent designation as a pedestrian zone in 2017 and to further conversion measures, in the course of which accessibility was improved, new green spaces were created and new street furniture was installed (Stadt München, 2020).

The measures to transform Sendlinger Straße opened up new spaces for outdoor gastronomy. The increase in the attractiveness of Sendlinger Straße for pedestrians was accompanied by a strengthening of the street as a retail location within Munich's popular city center (Förster et al., 2017). Among other things, the improvement in air quality led to a perceived increase in residential quality by residents. The low barrier design after the continuation of the traffic trial and the installation of seating is perceived as positive by various groups of users (Förster et al., 2017). Accessibility continues to be guaranteed due to the location in Munich's inner city and the associated good public transport connections. Sendlinger Straße is a good example of how

the establishment of a pedestrian zone can promote the quality of stay, encourage use as a shopping and strolling mile, and at the same time have a positive effect on the local retail trade.

Protected Bike Lane at Hasenheide and Pop-Up Bike Infrastructure (Berlin, Germany)

The redesign and redistribution of the road space of Hasenheide in Berlin is an example of how to deal with the integration of cycling in heavily-trafficked transport arteries and thus promote active mobility. The car parking lane along the traffic arterial has been redesigned and designated as a green marked bike lane. More than two meters wide, it is additionally protected by physical barriers (SenUVK Berlin, 2019). For cyclists who previously had to ride in mixed traffic due to the lack of bike lanes, the situation was significantly improved with the completion in 2019.

Another measure for cycling in Berlin was the construction of pop-up bike lanes during the COVID-19 pandemic in 2020. To enable cyclists to maintain the minimum distances to protect against infection (Götting & Becker, 2020), 18 temporary protected bike lanes (pop-up bike lanes) were constructed in Berlin within a few weeks (Czeh, 2020; SenUVK Berlin, 2020a). The Senate Department's order was provisionally valid until the end of December 2020, while the initial intention was to gradually make the pop-up cycle lanes structurally permanent (infravelo GmbH, 2021; SenUVK Berlin, 2020a). Consequently, two of the 18 pop-up bike lanes are in the process of being converted into permanent bike lanes (infravelo GmbH, 2021). This results in accelerated implementation of measures to promote safe cycling, some of which had already been planned previously and some of which are required by the Berlin Mobility Act (SenUVK Berlin, 2018). The approach for the construction of the pop-up bike lanes is to be used for further projects, as the combination of temporary arrangement, evaluation and subsequent permanent structural implementation has proven itself in the opinion of the City of Berlin. The temporary arrangements and their evaluation make it possible to identify the need for improvements and to accommodate these in the permanent adoption (Bezirksamt Friedrichshain-Kreuzberg, 2020). This also allows planning processes to be shortened and planning costs to be saved (Bezirksamt Friedrichshain-Kreuzberg, 2020). For a simplified imitation in other municipalities, a manual for the temporary installation and expansion of bicycle facilities as well as corresponding rule plans were published (SenUVK, 2020b).

Severinstraße (Cologne, Germany)

Severinstraße in Cologne is the central shopping street in the southern area of Cologne's city center and thus an important address for the neighborhood known as the Severinsviertel. The street is characterized by mixed use with a variety of stores and restaurants; residential development, offices and services (CIMA, 2019; Deutscher Verkehrssicherheitsrat, 2019). The street, formerly dominated by car traffic, was strengthened in its function as a neighborhood shopping street by dismantling the MIT infrastructure and converting it into a traffic-calmed business area with completion in 2019 (Deutscher Verkehrssicherheitsrat, 2019; IFH Köln, 2019). Short-term parking areas were designated for delivery traffic, while at the same time new amenity areas and sufficient space for pedestrians and cyclists were created. Thus, Severinstraße serves as an attractive connecting axis for bicycle traffic between the city center and the southern districts of Cologne (Deutscher Verkehrssicherheitsrat, 2019). Residents have the option of parking their private cars in a nearby neighborhood garage. In addition, shared mobility providers were also included in the planning (Deutscher Verkehrssicherheitsrat, 2019). Exemplary is the involvement of different social groups to address their respective needs in terms of increasing the attractiveness and safety of pedestrian traffic (AB Stadtverkehr, 2019).

Kavalierstraße (Dessau-Roßlau, Germany)

Kavalierstraße forms the center of the city of Dessau-Roßlau with adjacent administration and public facilities. The redesign included various measures to promote public transport and active mobility and was completed in 2018 (Stadt Dessau-Roßlau, 2014, 2017). By reducing car parking spaces and narrowing the roadway, space was created for bike lanes and bike parking as well as generous sidewalk areas (Stadt Dessau-Roßlau, 2014, 2017). New greenery, lighting and street furniture further contribute to the quality of stay. Signage as a traffic-calmed zone is intended to increase traffic safety. The traffic-calming measures were intended to achieve a reduction of approximately 30 % in the number of motor vehicles. After 19,000 vehicles/day before the conversion, an average of 9,600 vehicles/day were counted in February 2019. Thus, the motor vehicle volume decreased even more than targeted in the forecast (12,000 vehicles/day). In addition, the traffic flow was stabilized through the coordination of traffic signals (Stadt Dessau-Roßlau, 2019). The new central stop for streetcars and buses provides public transport with a hub for linking various lines (Stadt Dessau-Roßlau, 2017). Overall, the Kavalierstraße is viewed positively by the population and politicians after the finalization of the measures.

Figure 1: *The Protected Bike Lane at Berlin-Hasenheide (upper left) (Source: DLR); The redistributed Kavalierstraße in Dessau-Roßlau (upper right) (Source: Stadt Dessau-Roßlau); The redistributed Konrad-Wolf-Allee in Potsdam and its new park and recreational areas (bottom left) (Source: ProPotsdam / Adam Sevens); The pedestrianized center of Pontevedra (bottom right) (Source: Concello de Pontevedra)*

Superblocks (Barcelona, Spain)

Initial experience with a superblock in Barcelona had been gathered in the Gracia district in 2003. This led to a debate as to whether a city-wide transfer was possible. This city-wide approach is currently being implemented step by step with the Superblock concept of 2016 (Ajuntament de Barcelona, 2016). With the establishment of Superblocks, the city of Barcelona is pursuing the goal of reducing MIT and increasing the quality of life in the neighborhoods. At the same time, the concept is expected to have positive effects on urban climate and social cohesion, as well as creating new opportunities for economic activity (Ajuntament de Barcelona, 2016). Projections show that citywide implementation of the concept will reduce the number of pollution-related deaths due to improved air quality and reduced noise and heat stress (López et al., 2020; Palència et al., 2020). In addition, fewer traffic fatalities are expected, as well as an overall positive effect on the life expectancy of the population (López et al., 2020; Palència et al., 2020). Overall, the implementation of the 500 Superblocks could save the society of Barcelona 1.7 billion euros per year to the reduced health impact on the population and an increase in economic activity (López et al., 2020; Palència et al., 2020).

For implementation, four to nine adjacent blocks are combined into a new organizational unit called a superblock (Ajuntament de Barcelona, 2016). By installing modal filters and changing traffic routing, such a block is largely closed to motorized traffic. Only vehicles belonging to residents, delivery traffic, public transport and emergency vehicles are allowed to enter a block, while through traffic has to bypass the blocks (Ajuntament de Barcelona, 2016). In total, more than 500 such superblocks are to be built in Barcelona (López et al., 2020).

The public street space within the blocks, previously used by motorized traffic, is made available for alternative uses. Through redistributed and temporary or permanent installation of street furniture, the quality of stay of the public space formerly dominated by car traffic is increased and its function as a leisure, meeting and recreation space is strengthened (Ajuntament de Barcelona, 2016). Pedestrian traffic has priority and benefits from more space, safety and increased quality of stay (lower noise pollution, better air quality, reduction of barriers, more green spaces) due to the absence of motorized traffic. In addition, the reclaimed space is used to expand safe bike lanes in order to strengthen bicycle traffic (Ajuntament de Barcelona, 2016). Both the inclusion of the population in the redesign and redistribution of the gained space as well as subsequent studies to evaluate the health effects are central parts of the concept (Ajuntament de Barcelona, 2016; López et al., 2020; Palència et al., 2020). For each superblock to be implemented, participation opportunities are given to strengthen the participation and shared responsibility of the local population. This serves the intention to involve all stakeholders in the process and implement it according to their needs. For this purpose, there are multiple meetings between residents, city councils, organizations at different project levels. In addition, there are permanent online participation formats (Ajuntament de Barcelona, 2016; Joanneum Research, 2018). Overall, the concept is already considered exemplary, and in some cities the transfer is either being discussed or already in progress (Stadt Wien, 2020).

Car-free Livability Program (Oslo, Norway)

In Oslo, as part of the so-called Car-free Livability Program 2019, around 750 public street parking spaces were removed in an urban area of around 1.3 km^2 between 2017 and 2018 (Oslo Kommune, 2019). This made entering the city center by (private) car much less attractive due to the lack of parking facilities. The areas of the former public on-street parking lots were put to alternative uses. For example, the supply of parking spaces for the disabled and loading zones for delivery traffic was expanded (Oslo Kommune, 2019; Rydningen et al., 2017). In addition,

bicycle parking spaces were created and benches, planters, and further street furniture were installed (Oslo Kommune, 2019).

In order to ban motorized through traffic from the city center, certain streets were closed to private car traffic in a further step. Through traffic must use the ring road encircling the city center or the tunnel system (Rydningen et al., 2017). In parallel with the measures aiming at restricting private car traffic, measures to promote active modes were launched (Oslo Kommune, 2019). These included, among other things, the expansion of the bicycle network, the establishment of pedestrian streets, the creation of shared space areas, and an upgrading of public space through temporary and permanent redistributions (Oslo Kommune, 2019).

With this concept, the city of Oslo aims to reduce MIT in favor of active modes and public transport, increase urban quality of life and reduce CO_2 emissions (Rydningen et al., 2017). To this end, initial surveys of the population on the use of public space in the city center were already conducted between 2012 and 2014 (Oslo Kommune, 2019). To counter the expected resistance from parts of the population as well as from retail and gastronomy representatives, the measures were accompanied by targeted information campaigns and participation opportunities (Peters, 2017). Initial results confirm the concept: In 2018, for example, Oslo recorded a reduction of 11 % in traffic in the city center compared to 2016 and a significant increase in the number of pedestrians in public spaces (Oslo Kommune, 2019).

Pedestrianization (Pontevedra, Spain)

In the Spanish city of Pontevedra, numerous measures have been implemented since 1999 to give pedestrian traffic priority over other modes and to increase the quality of urban living space (Concello de Pontevedra, 2015). The best-known measure is the exclusion of MIT, first from the historic old town and subsequently from a large part of the entire city center. This measure was accompanied by the removal or underground relocation of all on-street parking and the creation of additional parking spaces on the outskirts of the city center (Beltrán, 2019). The establishment of a city-wide speed limit of 30 km/h and the replacement of intersections with traffic signals by traffic circles also contribute to the prioritization of pedestrian traffic over motorized private transport (Beltrán, 2019; Concello de Pontevedra, 2015).

By taking this approach, the City is pursuing the goal of reducing dependence on the automobile while promoting walking. It also aims to reduce the impact of traffic on people and the environment, thereby improving the overall quality of life in the city (Concello de Pontevedra, 2015; Beltrán, 2019).

Since the implementation of the measures began, the city has achieved some successes. For example, three-quarters of the former MIT trips are now made on foot or by bicycle (Concello de Pontevedra, 2015). Between 1999 and 2014, the volume of motorized traffic was thus significantly reduced and CO_2 emissions were cut by 66 % (Concello de Pontevedra, 2015; Beltrán, 2019). The increased attractiveness of the city center and the denial of building permits for large shopping centers in the periphery also had a positive impact on the local economy. Smaller stores in the city center were able to weather the ongoing economic crisis in Spain more successfully than in comparable cities in the country (Burgen, 2018). In contrast to cities in the region that tend to shrink, Pontevedra's population increased by 12,000 inhabitants (Beltrán, 2019). Several international awards in the fields of mobility and urban planning (Concello de Pontevedra, n.d.; UN Habitat, n.d.) testify that the city's efforts and its positive impacts have been recognized.

3. Conclusion

In this paper, successful projects of the redesign and redistribution of traffic areas in favor of active mobility and the quality of stay are presented. The selected good practice examples stem both from Germany as well as other European countries. They represent a wide range of spatial settings, objectives and measures taken. Especially with respect to the objectives of the presented examples, there seems to be at first glance a large diversity that is surely not least reflecting the focus of traffic planning activities in the individual municipalities. At a second glance, though, they can all be summarized to one common goal: increasing the livability of the city. For its achievement, the redistribution and reallocation of urban space in favor of social interactions and economic activities, the strengthening of active mobility and the reduction of negative effect of motorized transport are seen as central components. In that sense, all considered case studies are in line with the goal of sustainable urban development and according operationalizations.

With regard to the implications and the lessons learned most projects have in common, we draw the following main conclusions:

- Planning involves a great deal of communication. In the process, common reservations of stakeholders are repeated in many places. Often, the main concerns are formulated by local retailers that fear declining numbers of customer. Despite these concerns of stakeholders, upon completion we experience a wide acceptance in almost all projects. The case studies are exemplary for the value of well-founded data and figures for gaining support by local stakeholders. For future projects, we recommend to ensure structured evaluations and collect quantitative date before and after the intervention. This would help to gain knowledge and collect arguments for future strategies.
- Acceptance seems to be especially high when step-wise implementation or initially temporary arrangements accompanied by evaluation. This also applies to participatory processes which allow for direct and specific feedback of the stakeholders. Need for improvements or adaptations can thus be easily identified and accommodated for in the permanent adoption or the next implementation steps. In addition, so-called tactical interventions, which are introduced only temporarily for the time being, might be suitable starting points for jointly and specifically identifying and testing alternative ways of allocating urban space.
- The implementation is often preceded by long planning processes, sometimes lasting several decades from the idea to the implementation. In fact, personnel continuity seems to have a positive effect on implementation likeliness and progress.
- Successful projects are embedded in local and regional strategies and responsibilities. For example, local reallocations of space dedicated to MIT may result in displacement of traffic at close quarters. Therefore, potential impacts on adjacent areas also need to be considered.

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Annex

Table 2: *Comparison of case studies*

Title of Measure	City	Municipality Type	Spatial Setting	Date	Problem	Objective	Implementation Components
Konrad-Wolf-Allee	Potsdam	Large city	Access road in outskirts	2010-2019	Oversized road space works as barrier in the residential area and causes through traffic, no green areas and no quality of stay	Create green areas, improve housing quality and quality of stay, reduce car usage and through traffic, support active mobility and PT, improve accessibility for people with disabilities, create a carbon neutral district	Create green areas and playgrounds, reorganize traffic management, install urban furniture
Sendlinger Straße	Munich	Metropolis	Shopping street at secondary location	2016-2020	On-street parking limits quality of stay and reduces space for walking and outdoor areas of local economy	Improve quality of stay and conditions for local economy	Transform street into one level, install bollards and urban furniture, create green spaces
Pop-up bike infrastructure	Berlin	Metropolis	Inner city main streets	2020	Several main streets without bike infrastructure and increased bicycle usage	Improve traffic safety, support cycling, provide safe bike infrastructure along main streets during COVID-19 pandemic	Fast implementation of bike lanes by using temporary rods, evaluate, make permanent
Severinstraße	Köln	Metropolis	Shopping street at secondary location	2010-2019	Dominance of driving and parking cars causes safety issues and reduces outdoor areas for local economy	Improve accessibility for people with disabilities, support active mobility, improve quality of stay and conditions for local	Put bollards, implement two mobility stations and 140 parking spaces for bikes, implement parking management and pricing

						economy, improve traffic safety	
Kavalierstraße	Dessau-Roßlau	Medium-sized city	Central main Street	2012-2018	Negative effects of high traffic loads in combination with bad conditions for active mobility and quality of stay	Support active mobility, improve quality of stay, reduce car usage	Reorganize traffic management in separated areas, create new green areas around tramway, install urban furniture and design new playgrounds and meeting points
Superblocks	Barcelona	Metropolis	Inner city district centers	Since 2012	Strong negative effects of motorized transport regarding air pollution, noise, safety and space consumption, lack of space for physical activity and social interaction	Support sustainable mobility, reduce car usage, prioritize walking cycling and PT, implement new green areas and squares for social interaction	Close internal roads for transit traffic by modal filters, speed limit of 10 km/h for access traffic, implement mobility hubs, cycling and walking networks, enhanced citizen participation
Car-free Livability program	Oslo	Large city	District and secondary center	Since 2016	Growing number of inhabitants and commuters utilizes the conventional transport system to capacity and causes increasing CO_2 emissions	Reduce car usage, improve quality of stay, prioritize walking, cycling and PT, reduce carbon emissions	Removal of on-street parking, ban of through traffic, install urban furniture, playgrounds and greenery, cultural events
Pedestrianization	Pontevedra	Medium-sized city	Old town squares and roads	1999-2014	Car oriented transport system caused several negative impacts on inhabitants and environment	Improve safety for pedestrians, reduce car usage and car dependency, reduce emissions, support social cohabitation, enlarge green areas	Replace central parking space by peripheral (underground) parking space, reduce speed limits, replace traffic lights by roundabouts, plant trees,

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