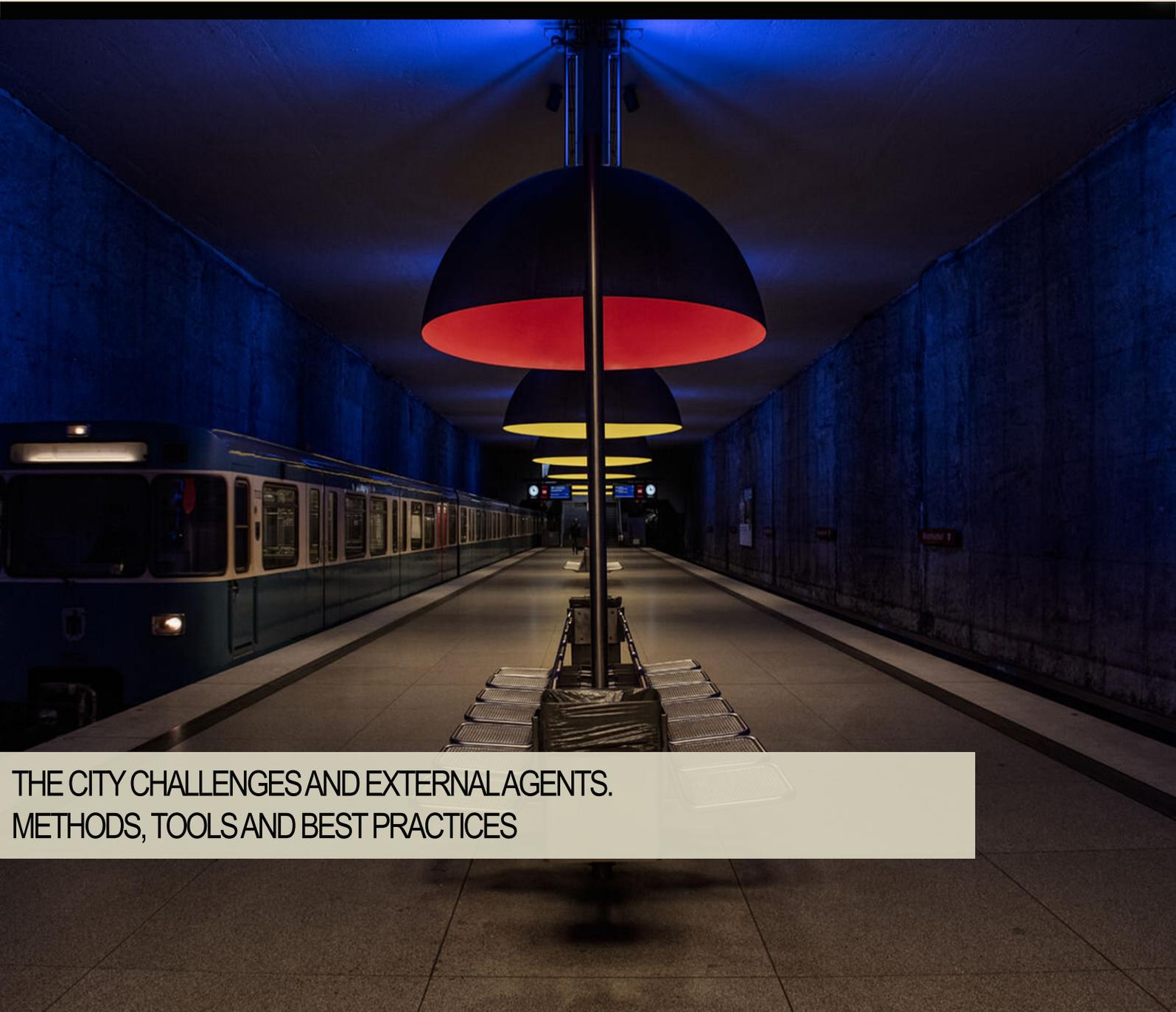


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THE CITY CHALLENGES AND EXTERNAL AGENTS.
METHODS, TOOLS AND BEST PRACTICES

THE CITY CHALLENGES AND EXTERNAL AGENTS. METHODS, TOOLS AND BEST PRACTICES

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The Berlin Mobility Lab Flaniermeile Friedrichstraße

Exploring cooperation in developing Tomorrow's Cities

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Abstract

In Berlin, measures that promote cycling and walking have moved up the political agenda and gained momentum over the last four years. This is due partially to the strong involvement of civil society actors in designing, planning and implementing the promotional measures. This article will use one of the measures as an example that illustrates the immediate benefits and future potential of cooperative planning and civic involvement in the design and implementation of strong measures to make transport more sustainable. Cycling and walking are vital to achieving "Tomorrow's Cities", a vision developed by the German Environment Agency. Tomorrow's City avoids unnecessary traffic. It is quiet, compact, green, climate-friendly and dominated by mixed-use developments. However, multiple, sometimes controversial measures changing the status quo are necessary to achieve this vision. Allowing for more civic participation and involvement while promoting experimental modifications of public space help gain support for sustainable mobility in general, as well as the measures needed to achieve this goal. Flaniermeile Friedrichstraße, a mobility lab planned for 2020 at the heart of Berlin, serves as an interesting case of long-term civic involvement in cooperative public experiments that translates an idea of sustainable mobility into temporary practice.

Keywords

Tomorrow's Cities; Cycling; Citizen Participation; Road Transport Safety; Changing Cities e.V.

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1. Introduction

In 2017, the German Environment Agency (Umweltbundesamt, in the following: UBA) developed a vision for Tomorrow's Cities to show how sustainable transport solutions can turn urban areas into more livable, green and compact places. Walking and cycling play a pivotal role in the vision's implementation. Meanwhile, Berlin has seen tremendous civic engagement efforts to grow the mode share of cycling over the last four years, culminating in the so-called "Volksentscheid Fahrrad", a successful petition for improved cycling infrastructure (in the following: 'cycling referendum'). Ever since, civic engagement for more sustainable transport by the referendum's initiators CC-Central e.V. has gained momentum and issues like safety in road transport, quality of life and better walking and cycling infrastructure have grown in importance. As part of these efforts, Berlin's local authorities in cooperation with CC Central e.V. have decided to conduct a mobility lab ('traffic experiment') in its central and famous Friedrichstraße (Senatskanzlei Berlin, 2020; SenUVK-Berlin, 2020a), from mid-August 2020 to January 2021. This article outlines the UBA vision for "Tomorrow's Cities", briefly discusses the benefits of civic engagement in the realm of transport, and outlines the concept for the mobility lab as well as its formation process concluding with the authors' views on the course of action taken in Berlin. Data and statements presented in this article are the sole responsibility of the authors and do not necessarily reflect the views of any of the institutions named herein.

2. Background

In order to meet the objectives of the Paris Agreement (UNFCCC, 2015), the necessity and the urgency for substantial changes in the transport sector have gained common ground. Economic growth, the rising share of the global population living in urban areas and analysis found in a large body of academic literature point to the essential role of urban transport solutions integrated with new urban development approaches.

Cities worldwide including New York, London, and Melbourne strive to improve their livability by emphasizing pedestrian and cyclist-friendly urban design in order to raise these mode shares and reduce transport-related emissions (see NYCDOT 2008, 2009; Mohamad, 2019; ITS International, 2019). A practical approach to doing so in Barcelona, Spain, is the urban planning concept of the Superblock, which is widely studied for its pedestrian and cycling-friendly characteristics (Barcelona, 2014; O'Sullivan, 2017; Bliss, 2018; Macher, 2018; Zimmermann & Zimmermann, 2020). An even more ambitious proposal applied to the city and the region of Oslo aims at limiting and eventually ending the overall growth of vehicle kilometers travelled (VKT) through "the reallocation of road, street and parking space" to walking and cycling (Tennoy, 2019, p. 15 ff.).

Large spatial and financial resources can be derived from the re-allocation of road space now devoted to parking: Shoup estimates the parking subsidies provided to motorists in New York City at US-\$ 3 billion or more annually, based on 3 million curb parking spaces covering 17 square miles or 13 times the Central Park, with 97% of these on-street parking spaces unmetered (Shoup, 2018, pp. 50-51). The Centre for London reports "43 per cent of all cars are parked on-street, taking up well over 1,400 hectares of space (equivalent to 10 Hyde Parks in size)" (Barret et al., 2020, p. 12). Furthermore, ample parking supply fosters driving, which in turn leads to more congestion (Weinberger, 2018). Despite the hold that car parking has on land use, – blocking urban redevelopment and the potential for mode shift – political controversies over parking availability frequently arise to impede more stringent parking regulations and enforcement.

Unfortunately, efforts to raise walking and cycling mode shares also suffer from poor levels of safety in road transport. This is further detailed (2.3) after the UBA vision "Tomorrow's Cities" (2.1) and Walking and Cycling-friendly urban design (2.2), and followed by Citizen participation and civic engagement (2.4). Section 3 describes details of CC-Central's Concept for the "Flaniermeile Friedrichstrasse", and Section 4 provides the discussion.

2.1 Tomorrow's Cities

Today, many German cities suffer from the negative effects of fossil-fuel traffic such as exhaust gases, noise and lack of green and recreational space. Therefore, the UBA developed the vision "Tomorrow's Cities" (UBA 2017a) to show how an environment with less traffic, fewer cars and fewer hazards for health and climate can be achieved. The main questions leading to this vision are: How to increase the quality of life in urban areas, while at the same time reducing the burden on the climate and environment? How much mobility is needed to provide the same levels of accessibility as inhabitants enjoy in the city today? What would Tomorrow's Cities look like if sustainable transport had become reality?

The vision for Tomorrow's Cities primarily focuses on large cities with more than 100,000 inhabitants and concentrates exclusively on ecological questions related to noise, emissions and the use of space. The UBA further defines Tomorrow's City as a place where mobility is environmentally friendly, noise levels are low, green spaces are widely seen and compact housing and mixed-use developments are the norm. To sum it up, one can imagine it as a quiet, green, compact, mixed-use and climate-friendly city.

Tomorrow's City is compact, space-saving and reduces unnecessary traffic. Inner cities are built up more densely, but attractively, e.g. by exploiting spaces between buildings, making use of courtyards and repurposing underused parking space. The proportion of publicly accessible green and recreational spaces within walking distance is high. High-end green spaces and tree-lined squares and streets enhance the quality of life in working and living quarters. Everyday destinations can be reached by all with no need for private cars, because short distances can be travelled on foot, by bike or using other mobility aids such as wheelchairs or walking frames. The backbone of the transport system is a safe, reliable, attractive public transit network with high frequency service. Integrated and interconnected mobility services such as car sharing, bike rental systems or online ridesharing platforms have been established throughout the city and complement public transit. A statutory speed limit of 30km/h for inner-city streets adapts the speed of transport to urban life, increasing traffic safety. Therefore, feeling safe in city traffic and the entire urban environment has become widespread. All modes of transport are fully accessible to and affordable for all. Because the role of private cars in the transport system has become less important and measures like consistent parking management have made parking in cities expensive, there are hardly any private cars left that occupy public spaces. The planning policy "Living space rather than parking space" is implemented consistently. All transport within the city (people and goods transport) is greenhouse gas-neutral and (almost) emission-free. Only vehicles with electric motors are allowed in the inner city. Eventually, all public transit is also electric.

The concept of sustainable transport lies at the core of that vision. A compact city with mixed-use developments reduces the need for privately owned motor vehicles, with a long-term target of 150 cars per 1,000 inhabitants. This significant drop in the number of private cars frees up space that can be used for living and recreational purposes as well as environmentally-friendly mobility.

Even if there is currently no German city that comes close to this vision, the UBA is convinced that Tomorrow's Cities are achievable and suggests ten specific bundles of measures. All of them are closely interconnected and should be pursued in concert rather than looked at in isolation. Together, they help realize the envisioned city and stimulate the much-needed U-turn in the transport sector.

The first bundle of measures addresses the implementation of compactness and mixed use in cities. Tomorrow's Cities master the huge challenge of an increasing number of people drawn to big cities by combining compact housing with the further development of green and recreational spaces and consistent incorporation of environmental standards. The reduction of oversized roads and parking spaces frees up land for much-needed urban green spaces and public areas that are integral parts of Tomorrow's Cities and the focus of the second bundle of measures. Accessible green and blue spaces play an important part in social life and are important for ensuring desirable living quarters and vibrant public spaces where people can meet. This includes introducing vegetation to the roofs and facades of buildings, to streets, and to sports facilities and playgrounds as well. The third bundle of measures aims at the reduction of noisy road traffic as one of the biggest sources of sound pollution in cities and a significant health hazard. Therefore, long-term strategic

approaches to traffic prevention are necessary measures as are local speed limits, regular speed checks, soundproofing in residential areas, bans on through traffic and the protection of quiet areas. A fourth bundle of mainly monetary incentives and regulatory measures deals with managing private car traffic in a way that enables its environmental impact to be reduced. Measures of this bundle include managing the supply of parking space and distance-dependent tolls on city roads as well as speed checks and consistent, frequent citation of parking violations. Expanding active mobility networks is a fifth bundle that the UBA defines as fundamental for the realization of Tomorrow’s Cities. Walking is promoted by providing a comprehensive, safe and closely connected network of paths that link appealing, pedestrian-friendly shared spaces. For higher ranges of mobility, direct and safe cycle route infrastructures including bike super-highways, as well as safe, accessible and secure cycle parking, make that rolling mode more attractive. The following table shows the detailed measures of the bundle “expanding active mobility networks” as well as the time frame, the decision and the implementation level.

 Individual measures Expanding active mobility networks	Time frame	Decision	Implementation
Establishing a comprehensive, safe, attractive and direct pedestrian network , making use of supporting funding from the Federal Government and the Federal States		  	  
Amending the Road Traffic Regulations by adding pedestrian-friendly shared traffic spaces		 	 
Expanding cycle route infrastructure to create a comprehensive cycle route network that complies with the Road and Transportation Research Association (FGSV) recommendations for cycle routes.		 	 
Providing suitable bicycle parking facilities (including parking for e-bikes, well adapted to the cityscape) in residential, work and shopping areas as well as access points to public transport, car-sharing points and service stations.		 	 
Expansion of largely intersection-free cycle superhighways , connecting essential destinations (commuter routes)		 	 

 immediate;
  short-term;
  short- to mid-term;
  mid-term;
  EU;
  Federal;
  Federal state;
  municipality;
  company

Tab.1 Bundle “Expanding active mobility networks”: Measures, Time frame, Decision and Implementation; Source: UBA (2017a, p.31).

For detailed information about the included measures in the other nine bundles see the respective tables in Tomorrow’s Cities (UBA 2017a, pp. 24-43).

For trips unsuitable for walking and cycling, public transit is the most obvious choice and the backbone of environmentally friendly mobility in Tomorrow’s Cities. Therefore, a sixth bundle of measures addresses the improvement of public transit quality. Separate lanes and tracks for buses and trains ensure that connections are fast and reliable, services run frequently, give access to remote parts of the city and surroundings as well as appealingly presented and comprehensible information. Fostering participation and collaboration in planning and implementation through a seventh bundle of measures is needed to meet the needs of the people. Planning and decision-making processes in Tomorrow’s Cities are characterized by an early involvement of citizens and relevant stakeholders as well as transparency and high procedural standards. Tools like informal dialogue forums and experimental spaces such as urban transition labs are used to involve people and complement formal planning processes. To complete the seven already specified measures, three further bundles address the encouragement of integrated mobility services and e-mobility (such as car-sharing, bicycle

and e-bike rentals as well as car-pooling), environmentally friendly commercial transport within the city (including micro-depots, the consolidation of goods in urban distribution centers, emission-free last mile solutions and parcel boxes) and the exploitation of the benefits of digitization for the environment (e.g. integrated ticketing which improves multi modal travelling, steering freight traffic, electric shared cars and new forms of participation and communication).

After all, a city fit for the future is an ambitious community project that urgently needs the involvement of its citizens. Tomorrow's Cities are for people. Therefore, the core message of UBA's vision is that we must transform our urban transport systems in a way that is climate-friendly as well as environmentally and socially compatible to improve the living conditions in urban environments; see also Schubert et al. (2019). Cities must be transformed in a way to allow people to meet their daily needs by travelling short distances. Walking and cycling-friendly infrastructure, attractive public spaces where people can meet and a speed limit fit for a city built around public shared spaces are some of the most important requirements for a vibrant city with a high quality of life.

2.2 Walking and cycling-friendly urban design

The preceding paragraph about the vision for "Tomorrow's Cities" (UBA, 2017a) shows the relevance of active transport modes like walking and cycling for the much-needed U-turn in the transport sector. Together with public transit, walking and cycling are the fundamental components of sustainable urban mobility and the health of people and contribute to the environment. However, today's cities are built around private car traffic and both pedestrians and cyclists are highly marginalized. In order to change this, urban planners and decision-makers face the challenge of reducing the space given to motorized transport while at the same time creating attractive space for people and sustainable modes of transport.

A good starting point is the provision of a comprehensive, safe and closely connected network of footpaths and cycle route infrastructure throughout the whole city, as this is the most important prerequisite for a walking and cycling-friendly environment. This includes pedestrian-friendly shared spaces and, wherever reasonable and possible, cycling super-highways (UBA, 2017a; ADFC, 2017, p.20). In order to support this development, the network of paths must be direct, since pedestrians especially do not appreciate time- and energy-consuming detours. This includes ubiquitous, linear, ergonomic and safe crosswalks, priority for pedestrians and cyclists at intersections as well as pedestrian lights and bicycle traffic signals with short waiting and long crossing times (Bauer et al., 2018; Büttner, 2019). The Superblock concept of Barcelona is an interesting example for comprehensive implementation of walking and cycling-friendly infrastructure in neighborhoods (Bliss, 2018). Above, the Global Street Design Guide published by the Global Designing Cities Initiative (GDCI) and the U.S. National Association of City Transportation Officials (GDCI & NACTO, 2016) shows many interesting examples of walking and cycling friendly attractive and livable urban design as well as examples of the reconfigurations of street layouts for that purpose.

Walk-friendly cities like Vienna and cycling-friendly cities such as Copenhagen have already recognized the importance of actively welcoming pedestrians and cyclists using both smaller, symbolic measures and investing in larger-scale infrastructure (Büttner & Weber, 2019, p.10). The United Kingdom also realized the need of investing in walking and cycling friendly infrastructure. Since 2013, the London Mini-Holland scheme, part of the London Mayor's Healthy Streets Approach, is aimed specifically at outer London boroughs where residents are more car-dependent than in inner London (DfT-UK, 2020a). In February, the UK's Department for Transport (DfT-UK) announced a new £2 billion funding package to create new era for cycling and walking (DfT-UK, 2020b).

Furthermore, a standard speed limit of 30km/h and traffic-calming measures such as shared spaces make cycling and walking safer, easier and more comfortable (Bauer et al., 2018, p.43; ADFC, 2017, p.30). Minimum standards are also a crucial part of walking and cycling-friendly urban design: They include sufficiently wide sidewalks and bike lanes, even road surfaces securing a good grip as well as good lighting and barrier-free

accessibility for citizens living with disabilities (Bauer et al., 2018; Grafl & Schulz, 2019, p. 19; HMWEVW, 2017, p.29ff.). In 2018, the UBA developed a draft of a national strategic plan for walking which points out several fields of action and measures to promote walking (Bauer et al., 2018).

Additionally, cyclists specifically need safe, secure and accessible bicycle parking in residential, working and shopping areas, access points to public transit and car-sharing stations for their everyday trips. Repair services, air pump stations and the possibility to take bicycles along for free on public transit (except during rush hours) are additional requirements of a cycling-friendly city (Büttner, 2019). These measures should be complemented by appealing building design, pedestrian and cycling routes leading through green spaces and attractive public areas that provide various possibilities for social encounter, recreation and communication which are not contingent on consumption. The high overall quality of public spaces is further enhanced by numerous seats and benches available, a minimal noise exposure, green and blue infrastructure such as trees and water fountains, and finally by the protection from weather conditions using techniques such as roofing elements or shade-giving trees (Aichinger & Frehn, 2017; HMWEVW, 2017, p. 33; Gehl, 2010). For more information about pedestrian mobility in urban areas as well as criteria and methods for planning and designing networks of urban public spaces giving preference to pedestrian use, see Galderisi & Ceudech (2010).

In summary, a walking and cycling-friendly urban design that incorporates the measures outlined above is crucial for the promotion of active modes of transport (UBA, 2017b). The Danish urban planner Jan Gehl sums up three integral factors for a good urban (street) design that is attractive for pedestrians and cyclists ("Cities for People", 2010): "safety, comfort and cheering" create streets for people (Aichinger & Frehn, 2017, p.7), while Tiboni and Rossetti (2014) identify urban structure, the quality of transport infrastructure, and safety for all road users as the essential success factors for walking and cycling.

2.3 Road transport safety

A large number of industrialized countries saw record highs of road traffic fatality rates around the year 1970. Since then, fortunately, these figures have been substantially reduced through a wide range of road transport safety measures. In the literature, these are structured mainly into a) Human (behavior), b) infrastructure, and c) vehicle technology (cf. OECD-ITF, 2008; BMVI, 2015). The European Transport Safety Council (ETSC) reports 5,180 pedestrians and 2,160 cyclists as road transport victims in the year 2018 (Adminaité-Fodor & Jost 2020). The EU-Commission has declared "Vision Zero" its objective in 2011, and since then repeatedly called for more resolute measures to be taken by EU member states to meet the objectives for safety in road transport by 2030 (EU-Commission, 2011, 2016). Since 2003, EU policies have achieved improvements such as the Pan-European emergency call "eCall 112" (Schaefer, 2019). This effort took more than 15 years to bear fruit and it mainly serves car drivers and car passengers, whereas vulnerable road users (pedestrians, cyclists, motorcyclists) hardly benefit at all.

The overall reductions in the number of road traffic victims (deaths and severe injuries) do not reveal the persistence of the high risk especially for pedestrians and cyclists. For the City of Berlin, recent data (see BMVI, 2020, p. 158) published by the Federal Ministry of Transport and digital Infrastructure (BMVI) show a high disproportionateness of road transport victims in 2018 confronted with their respective transport mode: Cycling mode share 15%. Traffic deaths: 24.4%. Walking mode share 27%. Traffic deaths: 42.2%. Motorised transport (car) mode share 32%. Traffic deaths: 6.7% (All mode share data see: Nobis & Follmer, 2019, p. 52, Table 7).

So far, publications on cycling and road safety have highlighted the Netherlands, in particular the Dutch "Sustainable Safety", or Sweden's "Vision Zero" programs for their successful systematic approach, including international studies on the effectiveness of measures and programs (Adminaité-Fodor & Jost, 2020; Busi, 2010; EU-Commission, 2016; Pirlone & Candia, 2015; OECD-ITF, 2008; Weijermars & Wegman, 2011; Department for Transport UK, 2020; Campisi et al., 2020; Dutch Institute for Road Safety Research, S., 2006; Walker, 2016; Racioppi et al., 2004; Furth, 2017).

The Dutch systematic safety approach overcomes the reactive black spot analysis which is still practice in numerous countries -including Germany- by planning and implementing comprehensive walking and cycling networks throughout the country. This is achieved by separating these vulnerable road users from other traffic wherever possible – else significant speed reductions are the norm which is strongly enforced; furthermore, particular attention is paid to road and intersection geometries: Reduced width of lanes to prevent high speeds, allocating cycle paths at intersections and roundabouts in ways that ensure high visibility of and for all road users, and applying road design standards including the use of colors to enhance the predictability of the next crossing or left-turn situation.

The well-documented Dutch developments of both road safety as well as cycling mode shares impressively prove their interdependency (Wagenbuur, 2011, 2018; BicycleDutch, 2011, 2018); statistical analysis of Dutch data also shows a significant influence of the separation of cyclists from other traffic on road safety and on bicycle usage (Schepers et al., 2013).

For decades, also the UBA has repeatedly been calling for a national speed limit of 30 km per hour for inner-city roads (e.g. Heinrichs et al., 2017). In line with the Dutch and the Swedish approaches, studies commissioned by the UBA and other German Federal administrations and authorities have highlighted that the impact of area-wide and construction-based measures are far more effective than traffic regulations and signage alone (Potthoff, 1994). However, the most recent traffic safety programme published in 2015 doesn't mention "Vision Zero" at all (BMVI, 2015) and the German Federal Ministry of Transport has yet to decide whether to adopt it as federal policy. In contrast to this, the City of Berlin now explicitly pursues "Vision Zero" as stated in the Berlin Mobility Act (SenUVK-Berlin, 2018, §10).

Safety for all road users is an essential prerequisite on the way towards Tomorrow's Cities, and a minimum requirement for the U-turn in the transport sector. Therefore, comprehensive networks for pedestrians and cyclists are inevitable and must be established timely. In order to implement the call for joint action for sustainable transport and road transport safety as agreed upon in the Stockholm Declaration of February 2020 (see Government Offices of Sweden & WHO, 2020, and Whitelegg, 2020) and to secure substantial funding, the EU Commission should integrate these measures into their Research & Development programs and the European Green Deal as well.

2.4 Citizen participation and civic engagement

While safety demands are getting more relevant when it comes to designing urban spaces and transport, citizen participation and civic engagement are also taken more seriously. Especially, against the backdrop of contested infrastructure projects, such as Stuttgart 21 or the expansion of Frankfurt/Main and Munich Airports, public participation in German planning processes has gained momentum. Main points of criticism revolve around the lack of information, transparency and feedback throughout the planning process as well as the lack of public access to hierarchically organized complex planning and approval processes, spanning over long periods of time (Hielscher et al., 2014, p.5f). In fact, a representative study conducted by TNS Emnid in Germany showed that 89% of the people want a greater say when it comes to infrastructure projects and 90% want more information regarding large-scale projects. Nearly two thirds think that it is the duty of the responsible authority to inform people more actively (TNS Emnid, 2012). Since 1992 more and more participatory procedures were introduced in Germany (Sackmann, 2014). With regard to large-scale infrastructure projects legal regulations were developed that make provision for the public to participate at given moments throughout the planning process (e.g. §25(3) German Administrative Procedures Act, BMJV, 2019). Moreover, German ministries filled the gap and published manuals on good public participation that highlight important planning steps, potential pitfalls, hallmarks of good participation as well as good practice examples (BMVI, 2014; Birmesdörfer et al., 2019). While the impact or practical implementation of these formalized participation processes is critically discussed by many scholars as well as practitioners, it has demonstrated a general recognition of the need to interact more closely with citizens (Bock & Reimann, 2017).

Sträß and Topp, for instance, highlight the positive impact that public participation can have in public transit planning. Examples from Mainz and Augsburg in Germany show that including citizens in planning processes can help yield better, cheaper and more acceptable results (Sträß & Topp, 2020).

In addition to formal public participation required by law, informal participation fostering civic engagement, as envisaged in *Tomorrow's Cities*, is more and more widely adopted. Unlike statutorily required participation that has to follow strict regulatory steps, informal processes are conducted on a voluntary basis, can go beyond the levels required by law (Bock & Reimann, 2017, p.44) and often foster civic engagement. In fact, a multitude of participatory measures, timelines and formats for informal participation processes exist and can be combined according to local needs and set objectives to facilitate a meaningful dialogue with citizens and civil society actors.

Since many infrastructure-related conflicts take place at the local level, the onus is often on local governments to ensure these legal provisions for participatory planning and approval processes are appropriately executed and citizens are properly included at an early stage. Fung & Wright (2001), Geißel (2008) and Mizrahi et al. (2010) suggest that the usefulness of participatory decision-making is very evident at the local level. There exist different levels of participation: Rau et al. (2012) clustered them into four categories ranging from information, consultation, cooperation to self-governance. What level of participation is pursued is decided on a case-by-case basis and depends highly on the amount of time available. The two dimensions vary depending on the extent to which decision-making power is given to citizens.

Some local governments make use of campaigns such as the EUROPEANMOBILITYWEEK (EMW) to engage citizens and civil society actors (European Mobility Week, 2020). The EMW is a campaign of the EU-Commission's DG MOVE and aims at promoting sustainable mobility at the local level. Cities and towns use it as an opportunity to showcase their work on sustainable mobility, raise awareness for related issues such as air quality or sustainable transport choices, and engage citizens and stakeholders through various formats. Both the necessity and the success of such campaigns have been proven in recent studies, e.g. to promote bike-sharing and car-sharing in Malta (Maas & Attard, 2020).

One of the more prominent features of EMW are mobility labs ("traffic experiments") that provide people and local governments the opportunity to test new transport measures and experience streets with a new allocation of space. During these mobility labs, motorized individual transport modes are generally put at a disadvantage compared to cycling, walking and public transit. Cities and towns use EMW to start a dialogue with citizens to get their opinion on proposed measures which demonstrate how a redistribution of space is possible and can benefit everyone. They further cooperate with local actors providing them with opportunities to bring in their ideas and activities, and thereby creating a positive and cooperative environment for urban change.

One of the advantages of these short to medium-term interventions and experiments is the fact that their temporary nature allows for the integration of new insights and ideas from citizens and stakeholders. German cities like Leipzig (see e.g. LIZ, 2019) used the EMW-campaign to offer citizens a glimpse of a potential future implementation of some planned traffic calming measures in order to gain their support for the complex steps that accompany these planned measures.

Another important feature of the EMW-campaign is the theme that changes annually and focuses on one specific aspect of sustainable mobility. In 2020, the theme is "zero-emission mobility for all" and touches upon several important issues such as accessibility, gender equality, distribution of urban space, sustainable mobility and participation. The latter is especially important when it comes to designing and changing public space in a way that considers the needs and interests of all citizens (Attard, 2020). Participatory processes and experiments can be appropriate means to ensure that all voices are heard. However, local authorities need to be extra careful when designing these processes, since participation rates increase with higher levels of education, income and skills, as pointed out by Böhnke (2011, p. 20). Hence, special attention needs to be paid to include marginal groups. In contrast, traffic experiments that change urban settings temporarily are experienced by everybody who happens to travel there.

In what follows, the paper presents an example of an urban mobility lab (traffic experiment) from the hands of the project 'Flaniermeile Friedrichstraße' pursued by the registered association Changing Cities in cooperation with Berlin authorities. In contrast to the participatory planning efforts and traffic experiments pursued by authorities and described so far, the following is an example of a citizen-led initiative to promote more sustainable transport in the center of Berlin.

3. Changing Cities' concepts for the center of Berlin

Flaniermeile Friedrichstraße is a project of Changing Cities Central (CC-Central) which incorporates many of the above-mentioned ideas. It is based on a citizen-led initiative, aims at strengthening both walking and cycling while at the same time improving road safety. Moreover, it is illustrative of many aspects of the UBA-vision for Tomorrow's Cities, and the authors present it here as an exemplary case of future-oriented, inclusive urban-planning in the realm of transportation.

3.1 Changing Cities e.V. – from „Volksentscheid Fahrrad“ to “CC-Central” and their concept for the center of Berlin

Changing Cities e.V. is a registered association (indicated by the addendum e.V.) that was originally founded to promote the so called “Volksentscheid Fahrrad” (bicycle referendum) in Berlin. A “referendum” is a political instrument, giving citizens the chance to influence policy in an act of direct democracy through petitioning should the required number of supporters be reached. In 2016, “Volksentscheid Fahrrad” easily surpassed the required quorum of 20,000 supporters by reaching 105,000 supporters within three weeks. It demanded comprehensive support for cycling in Berlin and its legal protection. Changing Cities e.V. provided the administrative backbone of the “Volksentscheid Fahrrad”, which was driven by volunteers.

In early 2017, the Berlin Senate began negotiations on the new “Berlin Mobility Act” (SenUVK-Berlin, 2018). The act was passed by the Berlin House of Representatives in July 2018 marking the first time in the history of Berlin that a law was written together with civil society actors in this case largely represented by the initiators of “Volksentscheid Fahrrad”.

To maintain momentum, the “Netzwerk Fahrradfreundliche Mitte” (Network Bicycle-friendly Mitte) was founded in the district of “Berlin Mitte” and renamed to “CC-Central” (Changing Cities Central) in 2020. This network differs from other local networks as it counts a very high percentage of urban planners with know-how in transportation planning amongst its members. Since 2017, members of the network have been regularly attending the meetings of the local district council, in particular the transport committee meetings. Over time, a trusting relationship has been established with the councilors of the parties represented there. Through intensive lobbying, the formulation of applications, and other techniques, it is now common practice for CC-Central representatives to be consulted as transport experts.

Parallel to conducting parliamentary lobbying and offering support to established parties involved in the political aspects of this transformation of the transport system, CC-Central also plans its own initiatives and projects. The implementation of Berlin's first bicycle street giving cyclists right of way at intersections, as well as the development of a web-based process enabling citizens to flag their demand for on-site bicycle-parking are just two examples.

CC-Central has developed different approaches for specific transport-related challenges in the district of “Berlin Mitte”. All of these concepts share common goals: On the one hand they aim at improving urban climate and air quality, eliminating through traffic and enhancing the quality of public space. On the other hand, they aim at ensuring access by car to the district of “Berlin Mitte” as well as to all property. These are translated into the following planning premises:

- Implementation of the Berlin Mobility Act (SenUVK-Berlin, 2018);
- Further development of sustainable and high quality economic uses;

- Securing and attracting existing residential locations;
- Adaptation measures to create resilience in the face of urban climatic extremes.

With these goals and planning premises in mind, CC-Central developed tailor-made solutions for transport-related challenges in the district of “Berlin Mitte”:

- Access and parking options for coaches;
- “Flaniermitte” - creation of the car-free shopping streets “Friedrichstraße” and “Unter den Linden” with an attractive urban setting;
- Ensuring car accessibility while prioritizing walking and cycling through redesigning public space;
- Private parking;
- “Flaniermeile Friedrichstraße - street of the future” – outlining the specifics of a future oriented re-design;
- Inner-city logistics;
- Local public transit improvement.

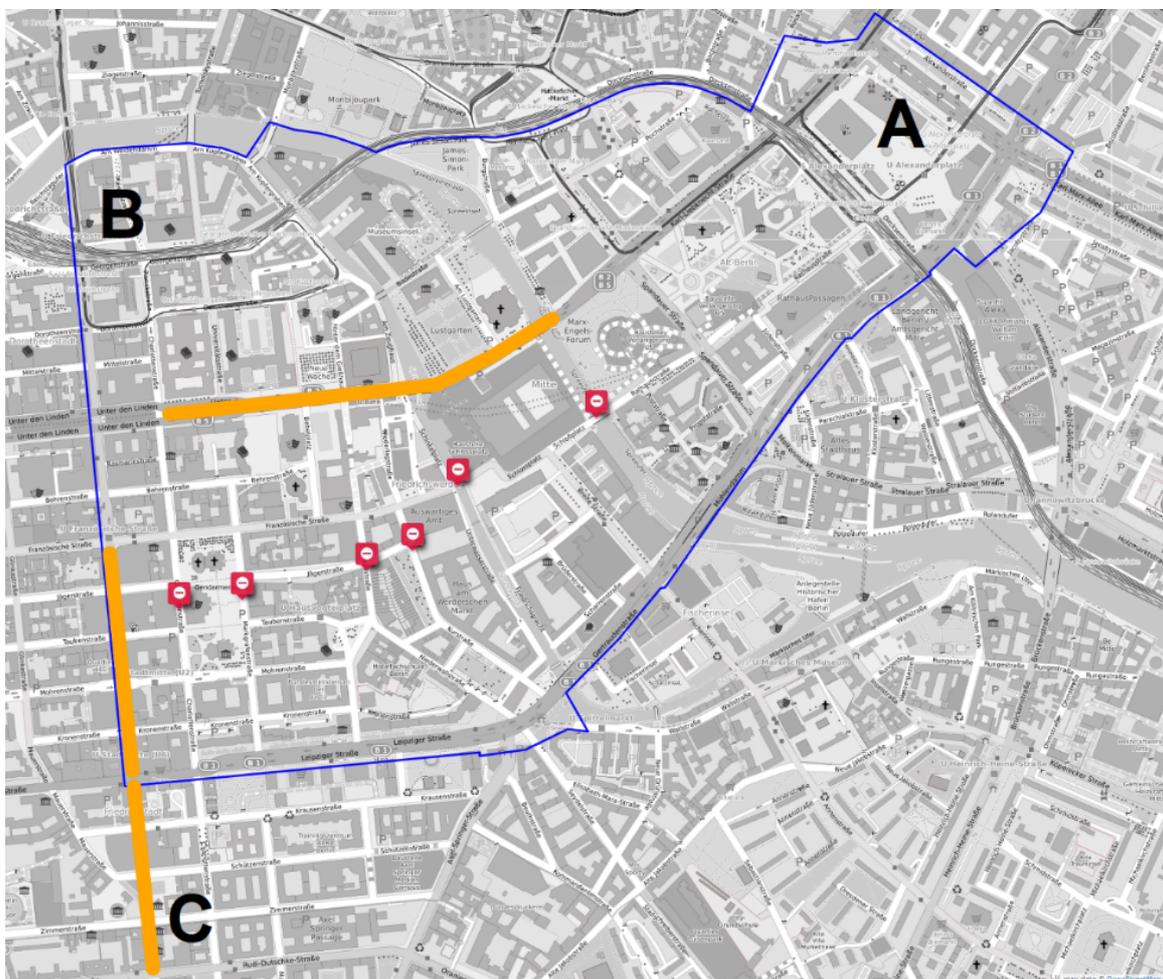


Fig.1 The specific planning area (blue border) with “Flaniermeilen” (promenades in orange; upper one is “Unter den Linden” and the second one, ending at the “C” is “Friedrichstraße”) and barriers to prevent through traffic (red markers). For better spatial orientation, Alexanderplatz is marked with “A”, Friedrichstraße station with “B” and Checkpoint Charlie – of course – with “C” on the map. Source: Lehmkuhler (2020).

By implementing these concepts, it is possible to free the historical centre from through traffic and in a first step, only minimal structural changes (e.g. six retractable bollards; see red marker in Fig. 1) are needed.

One of the most prominent concepts is the re-design of “Flaniermeile Friedrichstraße - street of the future” (Lehmkuhler, 2019), which is described in more detail.

3.2 The development-process of the concept for the Friedrichstraße

The Friedrichstraße has continued to present a challenge for urban planning and development in Berlin. The original concept for it as a “high quality shopping mile” implemented after the German reunification remains unsuccessful as evidenced by numerous empty stores and business closures to date (Latz, 2020). The Friedrichstraße fails to attract shoppers seeking more high quality urban space and an appealing environment: Private vehicle traffic currently takes up the bulk of road space, i.e. 13 meters of the 22-meters distance between buildings. Despite the fact that many people – especially tourists – use this street to get from metro-station Friedrichstraße to Checkpoint Charlie, there are no outdoor dining areas or recreational spaces. A lack of greenery and large stretches of sealed surfaces can lead to temperature spikes of up to 45 degrees Celsius in the summer and contribute to the unwelcoming feel of “Friedrichstraße”. This situation is partly due to the planning paradigm of the 1990s, pursuing the so-called ‘Stone City’ concept “Steinerne Stadt” (SenStadtUm-Berlin, 2016). In recognition of the failure of these developments, the status-quo on Friedrichstraße needs to be changed to allow for a more livable and attractive urban environment.

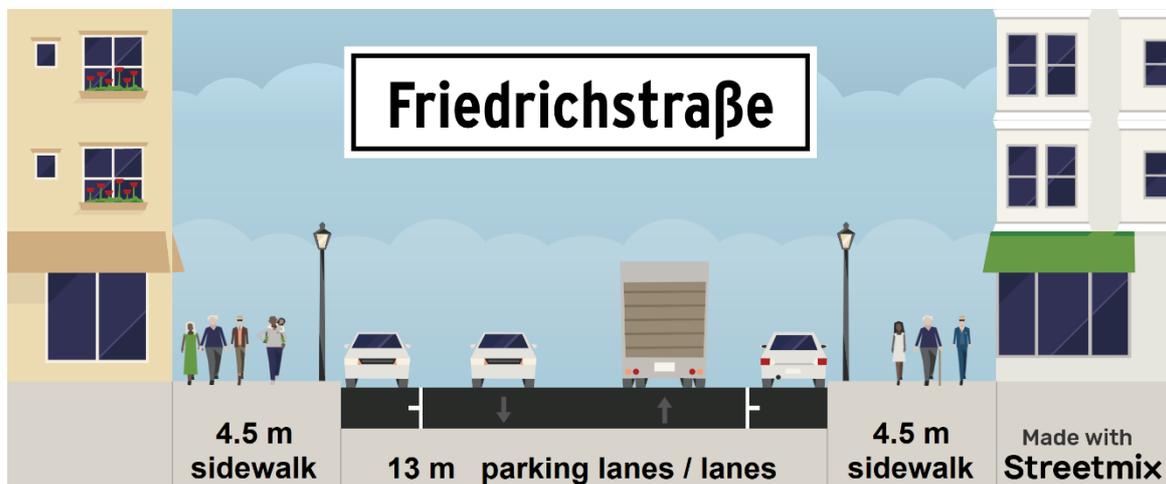


Fig.2 The current layout of the unwelcoming transit area Friedrichstraße is shown in the graphic. Source: Lehmkühler (2020).

In autumn 2016, CC-Central started developing alternative concepts for the Friedrichstraße. Among the first ideas was the radical notion of a “car-free Friedrichstraße”, that was met with skepticism even among the core group of “Volksentscheid Fahrrad”. Over time, the idea gained momentum and CC-Central started seriously working on the development of a concept focused not only on transport but also considering urban-ecological aspects.

Going back to their roots, CC-Central continued with their participatory planning approach and sought a cooperative discourse with all relevant stakeholders and citizens. By exceeding the legal requirements for citizen participation, CC-Central developed formats to elicit and integrate the ideas and knowledge of the local community. To accomplish their goal, CC-Central joined forces with a regional working group on the topic of mobility within the Green party of Germany (Landesarbeitsgemeinschaft Mobilität Bündnis 90/Die Grünen) in Berlin and founded the initiative “City for People” (Stadt für Menschen).

These associations organized a public demonstration on the Friedrichstraße in 2018. During the event, organizers offered a panel session with open discussion and collected ideas from attendees.



Fig.3 Impression of the current situation in the shopping street Friedrichstraße. Source: Lehmkühler (2020).

Citizens had the chance to write their ideas on a large paper (left picture) or on feedback cards (last picture) during the three-hour event. Most of the ideas submitted focused on the improvement of green spaces and outdoor gastronomy.



Fig.4 Collection of ideas. Source: Lehmkühler (2018).

CC-Central collected and evaluated all of the ideas and used them in the development of the concept "Friedrichstraße – Straße der Zukunft" (Lehmkühler, 2019). However, not only ideas from citizens, but also wishes and concerns of retailers located on the northern part of Friedrichstraße were considered in the concept

development. Aside from the nearly unanimous view that "Friedrichstraße is in a bad state and something needs to happen to stop the negative trend", retailers pointed out that the sojourn quality, i.e. the experience of dwelling in the area or passing through it, could be significantly improved through the development of green areas and trees. To start the process, CC-Central established direct contact with the active commercial and cultural stakeholders of Friedrichstraße. Additionally, they maintained close contact to the Senate Administration for the Environment, Transport and Climate Protection (Senatsverwaltung für Umwelt, Verkehr und Klimaschutz", SenUVK-Berlin) as well as the Mayor of the district Berlin Mitte.

As a result of this extensive lobbying and the inclusion of numerous stakeholders, the District Mayor of Berlin Mitte arranged for a two-day closure of the northern part of Friedrichstraße to car traffic (see @rbb24, 2019). To enable a first glimpse of the potential "Flaniermeile Friedrichstraße", greenery was provisionally placed throughout the event location. However, due to the short-term nature of the event, relevant elements of CC-Central's concept concerning transport and logistics were not realized. Nonetheless, the new urban space was very well received by numerous visitors.



Fig.5 Citizens and tourists visiting the autumn event "Flaniermeile Friedrichstraße". Source: Lehmkuhler (2019).

3.3 CC-Central's concept for the "Flaniermeile Friedrichstraße"

As described, the concept of a "Flaniermeile Friedrichstraße" was developed by CC-Central and is based to a large extent on suggestions and ideas from citizens, stakeholders and retailers. Hence, the primary planning principle of Friedrichstraße is the increase of sojourn quality. In particular, the concept aims at creating a pedestrian zone that also caters to the needs of cyclists. To achieve this and avoid conflict, CC-Central came up with the following concept elements:

- Clear delineation of zones through physical segregation;
- A safety lane for emergency services, including police, fire rescue and ambulances;
- Specific logistics and taxi zones in adjacent streets;
- Blue-green infrastructure.

Relevant elements will be explained in more detail in the following paragraphs.

Traffic routing for a peaceful co-existence of pedestrians and cyclists

The agreeable coexistence of pedestrian and cycle traffic will be achieved through a newly installed “safety lane”, which will run through the middle of the Friedrichstraße and move to a lateral position at subway entrances. As the expansion of the pavement shall be on the same level as the existing footpaths, the cycle-path will be in fact lower in the altitude profile and limited by a slanted curb (see Fig. 6 picture). The cycle path, which also serves as a safety lane, has a width of 5 meters, 0.44 meters of which will be taken up by a slanted curb. Additionally, to provide orientation for visually impaired people and in order to prevent other road users from accidentally entering the safety lane, so-called tactile surfaces will be placed along the perimeter of the slanted curb. To prevent misuse of the safety lane through other motor vehicles there is the option to include retractable bollards at either end. London City authorities permit the use of the cycle superhighways for their emergency vehicles (see 4ChordsNoNet, 2016, and ViperUK, 2017). The London Fire and Emergency Planning Authority has investigated attendance times and has found no “discernible impact” as documented in the London Safety Plan 2017 (see London-FEP, 2017, p. 24, #116).

The case of temporary emergency use will be indicated to cyclists and pedestrians through traffic lights installed at the edges of the safety lane (red flashing lights, bilateral, along the whole course of the lane). Upon activation of the red signal, cyclists are to clear the safety lane and pedestrians are to cease crossing it. Once the emergency vehicle has vacated the safety lane, the signals will be turned off and the safety lane can be used as a two-direction cycle path and traversed by pedestrians again.

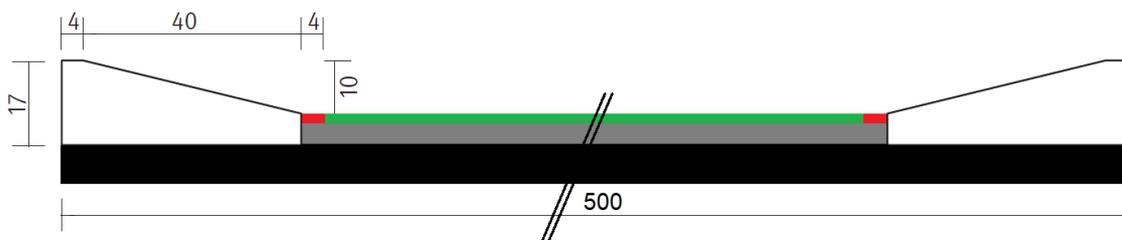


Fig.6 Cross-section of the embedded “safety lane”. Source: Lehmkühler (2020).

In this manner, a physically segregated bi-directional cycle path is created in the “safety lane”, which only has to be cleared for the temporary use of emergency services. A total of 17 meters out of the overall 22-meter road width is therefore dedicated to pedestrians. The resulting cross-section of the urban space Friedrichstraße is illustrated in the following graphic.

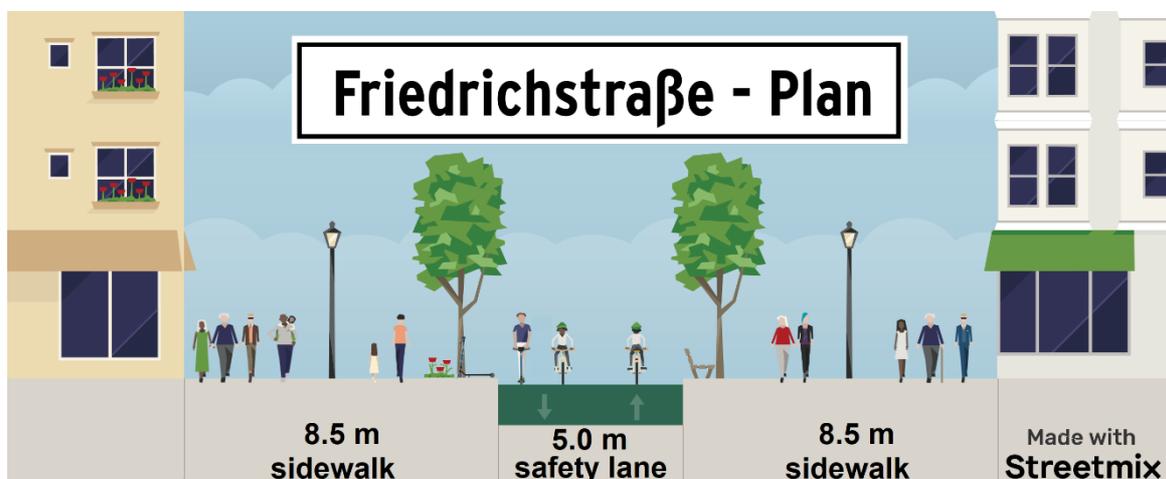


Fig.7 The planned layout of the “street of the future” Friedrichstraße. Source: Lehmkühler (2019).

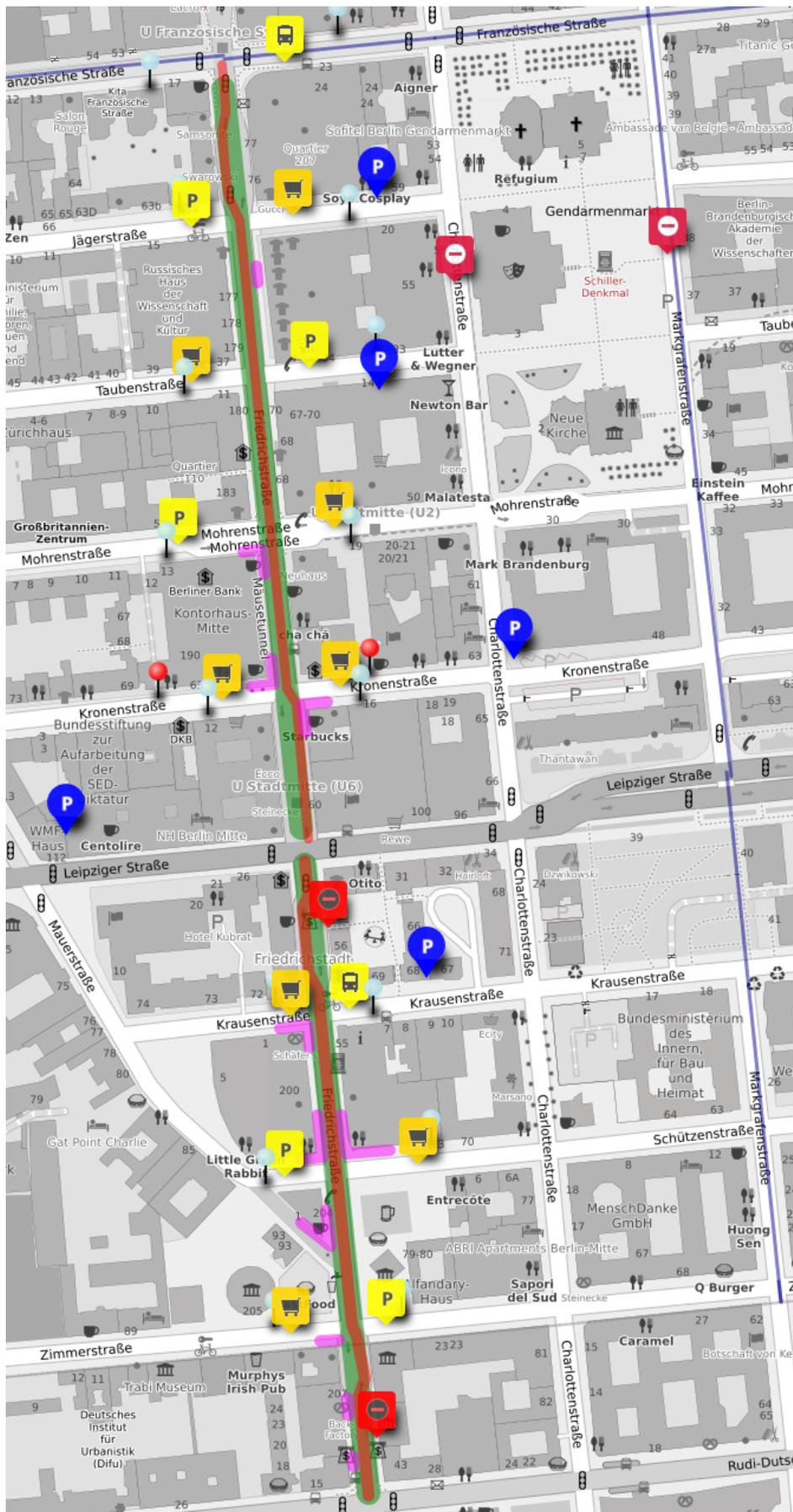


Fig.8 Details of the current and future Friedrichstraße. Source: Lehmkuhler (2020). In extract of the plan shown above, the logistics zones are represented in Ochre with the symbol of a shopping trolley and the taxi stops in yellow with a black "P". The turquoise pins highlight the turning areas for 3.5-tonnes vehicles and the red pins the crossing points for larger lorries. The segments in pink show the current outside areas of cafes and restaurants.

Specific logistics and taxi zones

Urban logistics and freight-delivery play an important role in the creation of the concept for the Friedrichstraße. To ensure seamless delivery of goods, the following elements were included in the concept:

- reconfiguration of the adjacent streets to include spaces for logistics;
- logistics zones can also be used by taxis and Berlin’s public transit services (BVG) after 07:00 p.m.;
- logistics and taxi zones will be rigorously (and ideally automatically) monitored to prevent misuse.

Logistics zones will be created in the existing space with minimal effort: The creation takes place merely through markings on the street and the installation of signages. The zones will be co-located with entrances to underground car parks in adjacent streets. The width of the side streets and the location of the entrances to underground car parks allows them to serve as turning areas for courier-, express- and parcel-delivery vehicles of up to 3.5 tonnes overall weight.

Larger trucks that are used for deliveries to grocery stores and other shops will require a different “pass through/over” procedure, which is also outlined in CC-Central’s concept. In the project area this scenario occurs in the Kronenstraße and is marked by red pins in the following map; the logistics zones will have to be monitored strictly.

In addition, CC-Central’s concept considers the transformation of the underground station “Französische Straße” into a logistics hub. The suggestion by CC-Central includes the remodeling of the underground station through demolition of one platform and the potential installation of a freight rail track next to the remaining second platform. While the existing passenger service of Metro Line 6 can continue to run on the remaining outer tracks; the middle track could be used to carry freight on an underground train for subsequent redistribution via e.g. low-carbon carrier bicycles in the local area. However, this innovative approach is still in the development process.

Blue-green Infrastructure

A central element of the improvement of sojourn quality is the integration of blue-green infrastructure. Blue-green infrastructure combines green areas and water supply. Especially in densely populated urban areas this is – in the literal meaning of the word – essential for survival. At its most basic, the blue component requires a concept for rainwater management, in which the areas of vegetation act as a buffer in the event of heavy rainfall (see Fig. 8).

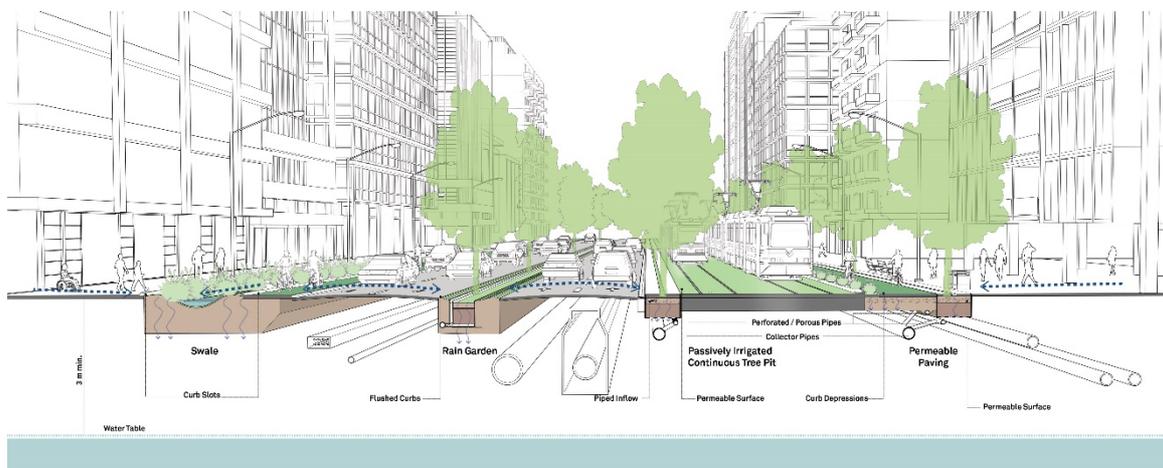


Fig.9 “Green Infrastructure and Stormwater Management”, GDCI, 2020, Retrieved 05.07.2020

Even though the “sponge city” is a planning principle adopted by the city of Berlin, its implementation in the context of the Friedrichstraße remains a long-term goal requiring a step-wise approach to several challenges related to the existing underground infrastructure for instance. As a result, CC-Central developed a plan that

enables the revegetation of urban space using temporary measures. Since urban planning regulations demand strict linearity in the planning area, the current plan for the greenery distribution intends to plant a pair of trees every ten meters. To protect the underground rail infrastructure, these trees shall be planted in suitable infiltration trenches, ensuring that there is no damage to the street surface due to tree growth.

3.4 The planned Mobility Lab "Verkehrsversuch Friedrichstrasse": current plan including excerpt of the traffic signage plan

CC-Central's concept will be put to the test in summer 2020 when a six-month mobility lab will start in Friedrichstraße according to §45 of the German Road Traffic code ("StVO", see BMJV, 2020). In Berlin, the central administration (Berlin Senate) is responsible for the concept and authorization of mobility labs. However, the specific implementation of the mobility lab is mandated by the subsidiary administration on the district level. In the context of transportation planning or in particular the layout of traffic signs, a so-called traffic signage plan (Verkehrszeichenplan) (see Fig. 9) forms the basis for the coordination between the different levels of administration and the police. An external service company for traffic safety will use the plan devised by CC-central to implement signage and marking. The traffic signage plan and the diversion plan for motor vehicle traffic for the mobility lab was created by the central administration and coordinated with the traffic authority of the district Berlin Mitte.

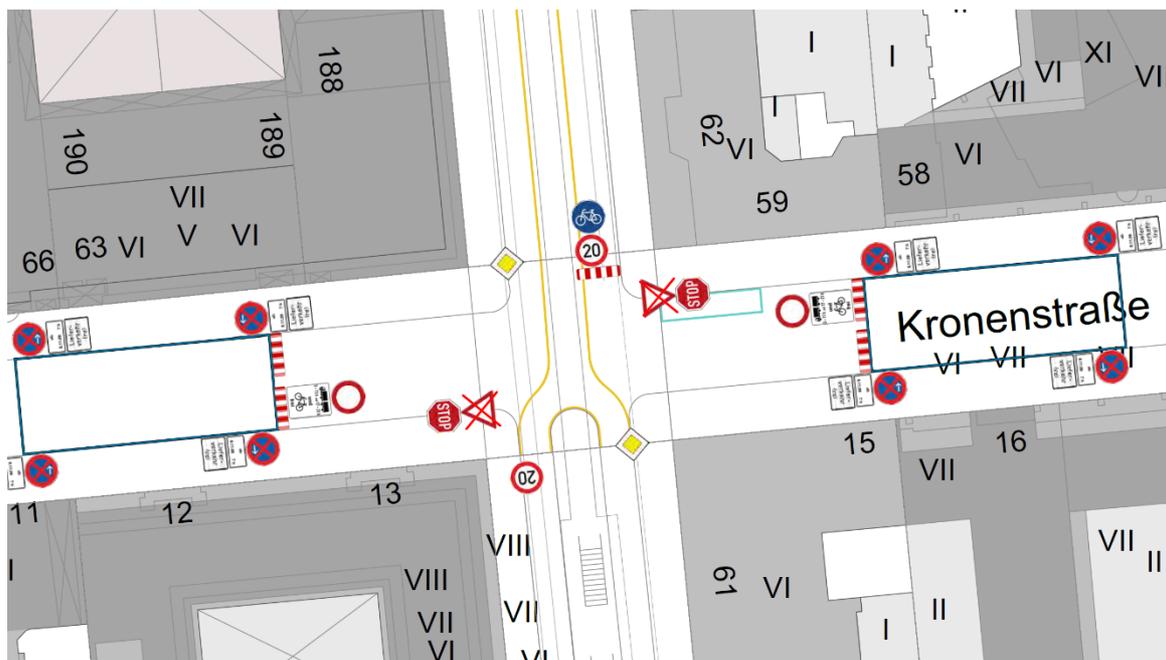


Fig.10 Excerpt of the traffic signage plan. Source: Lehmkühler (2020).

During the time of the mobility lab, several things will be put to a reality check. Firstly, the feasibility of combining pedestrian and cycle traffic will be closely evaluated. Moreover, the mobility lab will assess whether the creation of logistics and taxi zones is sufficient to ensure seamless freight and passenger transport. Due to the above mentioned constraints (e.g. underground line), Friedrichstraße will not see the implementation of complete blue and green infrastructure. However, there shall be a temporary installation of greenery (trees and bushes) without damage of the road surface. Since there is no existing access to groundwater, CC-Central has come to an agreement with BSR (Berlin city cleaning services) that for the duration of the mobility lab they will not only clean, but also supply the temporary greenery with water. Weekly meetings with the local government of Berlin will ensure a closed feedback loop between CC-central, local authorities and stakeholders.

In addition to the evaluation of the above-mentioned physical changes in Friedrichstraße, CC-Central's concept for the usage of the underground station "Französische Straße" as a "micro-hub" for urban logistics will be critically evaluated. Aside from the examination of physical possibilities during the planned evaluation, further aspects such as the costs of constructing a supply point on the urban fringe and possible operational models shall be carefully explored.

The mobility lab shall first be conducted for six months accompanied by scientific research and an independent project evaluation. This duration is unusually long for a mobility lab ('traffic experiment'), but it increases the chances of going directly from the stage of a study into a permanent remodeling of the "Flaniermeile Friedrichstraße" afterwards. Campaigns such as the European Mobility Week could be harnessed to further advertise the mobility lab and implement suitable activities in the newly established urban space. CC-Central and the involved units of the central administration are working together to ensure the implementation of the mobility lab in the timeframe from mid-August 2020 to the end of January 2021. In light of the current Covid-19 pandemic, however, this timeframe could change.

4. Discussion

CC-Central's concept for the "Flaniermeile Friedrichstraße" touches upon many important aspects central to the realization of UBA's vision of Tomorrow's Cities. In fact, the concept provides a holistic attempt to address multiple, concurrent challenges. Most prominently, it addresses measures relevant to the promotion of walking and cycling:

One of the most innovative elements is the concept's traffic routing that fosters a peaceful co-existence of cyclists and pedestrians. More often than not, pedestrian zones are scenes of conflict between cyclists and pedestrians, since they are equally attractive for both road users. For one, they often provide the shortest connection between two places and additionally attract vulnerable road users due to the fact that there is no car traffic. The concept offers a solution for said conflicts by introducing the safety lane, thereby physically separating sidewalks and bikeways.

Additionally, the concept takes into account the importance of blue and green infrastructure, by envisioning trees and water irrigation systems. With repeated maximum temperatures of more than 40 degrees Celsius, German cities also need effective measures to achieve a better state of climate resilience as discussed in detail by such authors as Papa et al. (2015), and Molinaro (2020).

A higher sojourn quality will also improve the attractiveness for pedestrians and cyclists. Suggestions from Tomorrow's Cities on lighting, speed limits, parklets, road surface quality, safe bicycle parking and accessibility can further improve the attractiveness of this urban area.

Considerations concerning urban logistics, which are highly relevant for pedestrian areas that offer multiple shopping opportunities, are also included in CC-Central's concept. Since logistics zones are located in adjacent streets, potential conflicts between cyclists, pedestrians and delivery vehicles are reduced. Moreover, it can help gain support from shop-owners, securing safe and seamless delivery of goods.

Many of the above mentioned elements improve road safety, however, it is important to expand active mobility networks continuously throughout the city and embed the "Flaniermeile Friedrichstraße" in a holistic citywide plan. Other relevant standards from Tomorrow's Cities touched by CC-Central's concept are urban green spaces and public areas, reduction of road traffic noise, managing private car traffic as well as fostering participation and collaboration in planning and implementation. The last on this list plays a prominent role in CC-Central's work as a civil society actor and representative. Hence, this organization has a legitimate interest in including relevant stakeholders in their planning processes and as a result has instigated informal dialogues with several local commercial and cultural stakeholders. The public demonstration on the Friedrichstraße organized together with other civil society actors forms the most important attempt to include the general public. Together, these two approaches tried to include as many opinions, ideas and concerns as possible.

However, limited financial resources did not allow for a district-wide formal public participation process. This is where the planned mobility lab plays a pivotal role. The mobility lab serves several purposes: Firstly, it formally includes the local administration in the operationalization and realization of CC-Central's concept. Moreover, at this stage adaptations that improve the concept might already be needed. Secondly, it puts the theoretical concept to a test. Practical implementation will show how the envisaged idea will work on the ground, where it potentially needs modifications and how it will be accepted by residents, tourists and local business. Thirdly, it establishes the basis for a permanent redistribution of public space in favor of cyclists and pedestrians, by showcasing the concept's feasibility.

The innovative character of the concept calls for a reality check in form of a mobility lab. In order to maximize the benefits of the mobility lab, the district's administration should conduct a comprehensive evaluation of the implementation process, as well as the effects on traffic, economic revenues, safety, air quality and noise. Furthermore, it is advisable to initiate a broad public participation process, ensuring all relevant voices are heard and public acceptance of implemented measures is achieved. Moreover, the district should make use of the non-permanent character of the mobility lab and adapt and/ or improve certain elements of the newly introduced design features on the ground where needed. International examples can provide interesting and relevant solutions to problems the mobility lab might encounter and should be considered where deemed necessary. In addition, participating in the European Mobility Week can help make Berlin's efforts known on an international stage. It might also be interesting to relevant local research institutions to support the city in above mentioned endeavors.

For these various reasons, decision-makers on regional and local levels – the Berlin Senate, the Berlin House of Representatives, and the district administration of "Berlin Mitte", should consider the detailed plans thoroughly. It may constitute a significant gain for the revival of Berlin's famous Friedrichstraße, for climate protection, and – given its origins in the bicycle referendum – for citizen participation in the German capital. It may also offer a blueprint for similar experiments elsewhere and towards the longer-term transition to more carbon-free mobility.

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Image Sources

Fig. 1: The specific planning area in the center of Berlin, source: Lehmkühler, 2020.

Fig. 2: The current layout of Berlin Friedrichstraße, source: Lehmkühler, 2020.

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Fig. 6: Cross-section of the embedded safety lane, source: Lehmkühler, 2020.

Fig. 7: The planned layout of Berlin Friedrichstraße, source: Lehmkühler, 2019.

Fig. 8: Details of the current and future Friedrichstraße, source: Lehmkühler, 2020.

Fig. 9: Green Infrastructure and Stormwater Management, source: GDCI, 2020 (s. References).

Fig. 10: Traffic signage plan (excerpt), source: Lehmkühler, 2020.

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