

An aerial photograph of a pedestrian crossing with white stripes on a dark asphalt surface. A person wearing a white hat, a dark jacket, and blue jeans is walking across the crossing. The image is overlaid with a large, semi-transparent red geometric shape that covers the top right and bottom right portions of the frame.

Paradigm shift or incremental changes?

Shaping mobility for liveable and social cities

René Bormann, Philine Gaffron, Ingo Kucz

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November 2022

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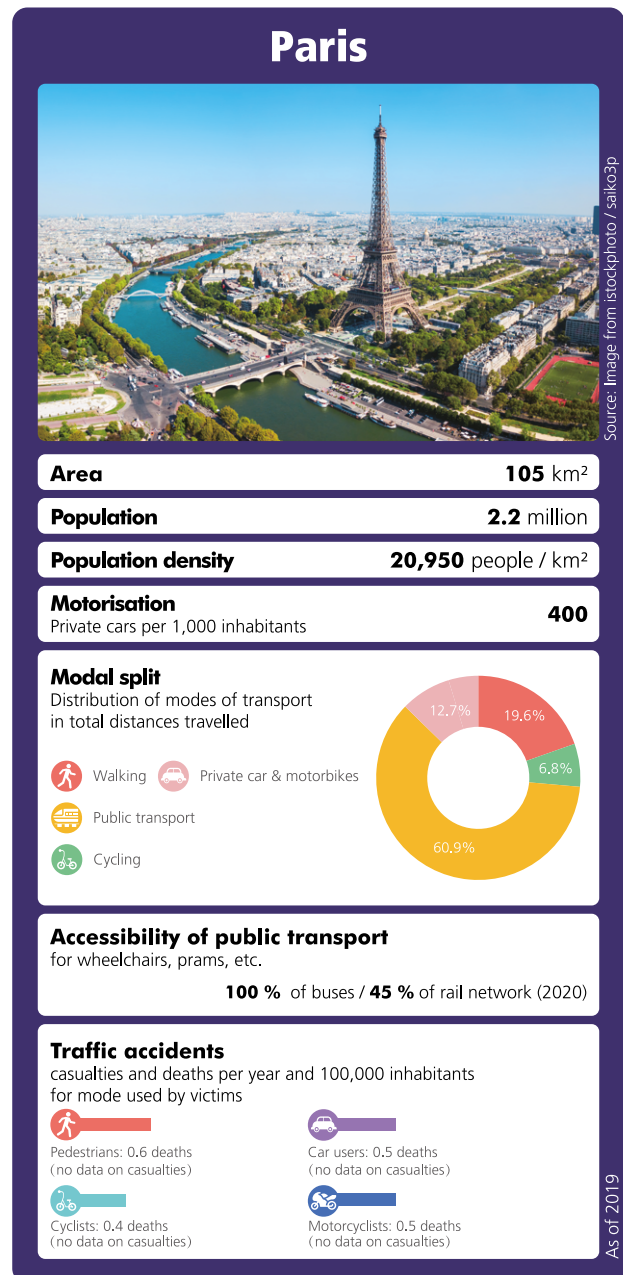
1. Introduction

All over the world, cities are engines of economic development and places of social and scientific innovation. They are associated with a promise of advancement, which is another reason why they attract new residents every year.

Many metropolises have experienced rapid growth in a short period of time, so urban development has also been driven forward at an equally rapid pace while public space is becoming increasingly scarce. At the same time, demand for its use is growing. As a consequence, negative effects on mobility and transport can be observed at all levels of sustainable development:

- Ecological development:** Noise and pollutants from the transport sector are increasingly damaging the urban ecosystem, and accumulating greenhouse gas emissions are frustrating urgently needed climate protection efforts. Compaction and sealing of land reduce biodiversity, diminish space for recreation and weaken urban climate resilience.
- Economic development:** A car-centric transport system leads to social and functional segregation. There is a growing demand for mobility of goods and people, with all the negative economic effects this brings as a result of congestion, pollution, damage to health, accidents and competition for space.
- Social development:** Regardless of their political context, cities are usually unable to deliver on the promise of economic advancement for all, which means that economic and social imbalances are being reinforced rather than remedied. Functional segregation leads to social disintegration of entire neighbourhoods, while groups with limited financial (and political) resources are more affected by factors detrimental to health; at the same time, they are often less mobile.

Many cities have recognised these skewed developments and the resulting problems of disintegrated urban and transport planning, and are beginning to change course. The Covid-19 pandemic in particular has once again highlighted many of these challenges and put cities' ability to act to the test. All over the



world, transport areas are being rededicated – often very hastily – to make room for people. Soft mobility – that is, non-motorised mobility such as cycling and walking – is being encouraged to counteract an increased shift to motorised transport.

In the absence of effective national strategies and with the aim of learning from each other in terms of implementing holistic approaches, cities, at their own initiative, have created various national and international forums under the heading »climate protection«.

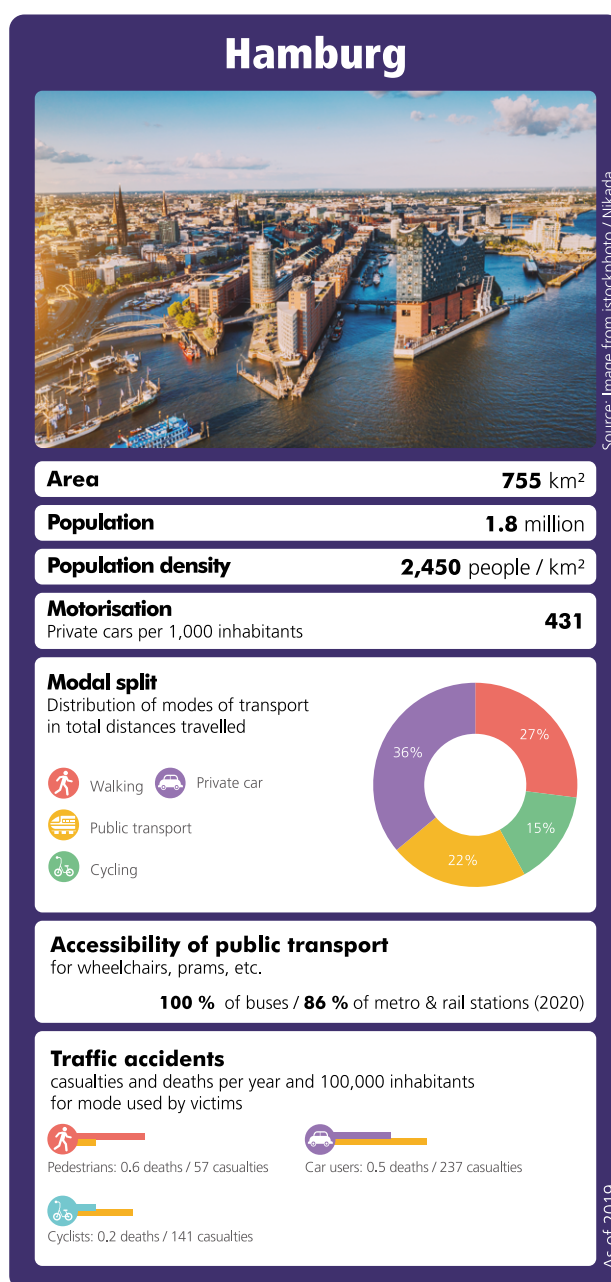
They are exchanging ideas in networks such as the C40 Cities Climate Leadership Group¹ or the Global Covenant of Mayors for Climate & Energy². It is along these lines that the search for possible solutions or so-called good practices for social-ecologically sustainable urban and mobility planning also serves as a motivation for this study.

Using four cities – Hamburg, Paris, Seoul and Shanghai – as examples, four teams with local expertise documented and commented on strategies and approaches, plans and concrete projects. The focus was on an integrative view of urban and mobility development in the social city.

For these four sample cities, it can also be said that urban and mobility development have in the past largely been independent of one another, and that motorised private transport has always been assumed to be a fundamentally prioritised element of personal mobility in this context. At the same time, the task of urban planning has been to ensure that growth is as business-friendly as possible. This has resulted in an expansion of infrastructure for the car-friendly city. Especially in cities undergoing meteoric growth, this disintegrated planning has hitherto tended to exacerbate the aforementioned problems.

The differences between the cities under consideration are manifold, however, which means that challenges and approaches to solutions sometimes need to be considered from very different angles:

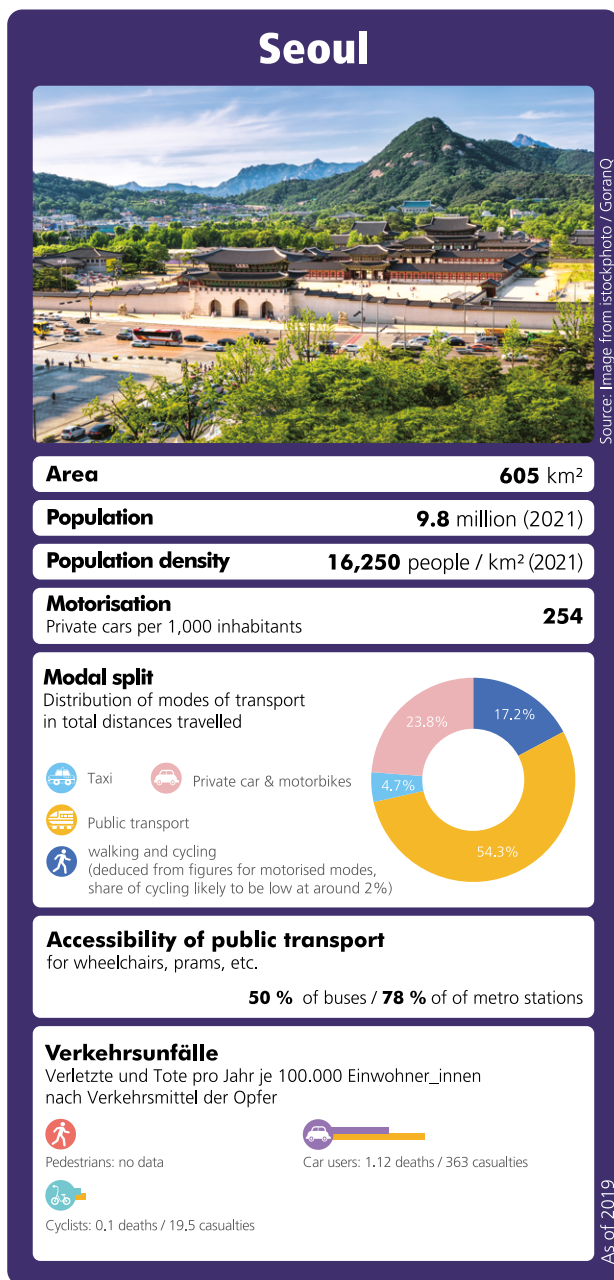
- **Paris** is much more than a city. Planning there is thus always also conterminous with the national interest, but on the other hand increasingly shaped by local factors. The city has in the meantime developed sufficient capacity to challenge national leadership and implement its own vision for sustainable transport.
- **Hamburg** is small compared to the other cities. Including the extensive metropolitan region connected to it, however, the catchment area is very large. Historically, it has been shaped by its port and trade and by the primacy of the economic realm over other fields of activity in the political sphere.



- **Seoul** is one of the first Asian megacities to make the leap into the league of global cities. Seoul is the power and nerve centre of South Korea and home to numerous global players in the field of high technology.
- **Shanghai** is the archetype of the modern megacity par excellence. In a very brief span of time, the

1. A global network of 97 major cities with a total of more than 700 million inhabitants (cf. www.c40.org).

2. A global forum of and for 11,500 cities and local governments of various sizes (cf. www.globalcovenantofmayors.org).



city has grown astronomically and combines developments and trends in China with a global orientation.

Despite these differences, Paris, Hamburg, Seoul and Shanghai are similar in terms of their respective national economic, political and cultural importance: they are supra-regional centres and drivers of national development in their countries. The cities are also similar with regard to the increasing functional separation of urban spaces and the orientation of their

transport policy towards the car-friendly city in recent decades. It is with all this in mind that we here attempt a cross-sectional exploration of good practices in the integrated planning of the social city – above and beyond the borders of political systems in particular.

Our basic assumption: By looking at four very different, but at the same time nationally and internationally significant major cities with different focal points in terms of integrated urban and mobility planning and social urban development, we obtain a useful cross-section of good practices. These are located at different points on the spectrum, from local-specific to universal.

Our objective: We document and focus on bases for action, political strategies and measures in the area of mobility transition, which – depending on their structure and responsibilities – are intended to make a contribution at local or national levels on the path to a socially acceptable mobile city. Each in their own way, they can serve to provide impetus, role models or constructive contrasts for other places.

Our approach: The independent teams of experts analysed the four cities' strategies and measures in terms of the following six aspects:

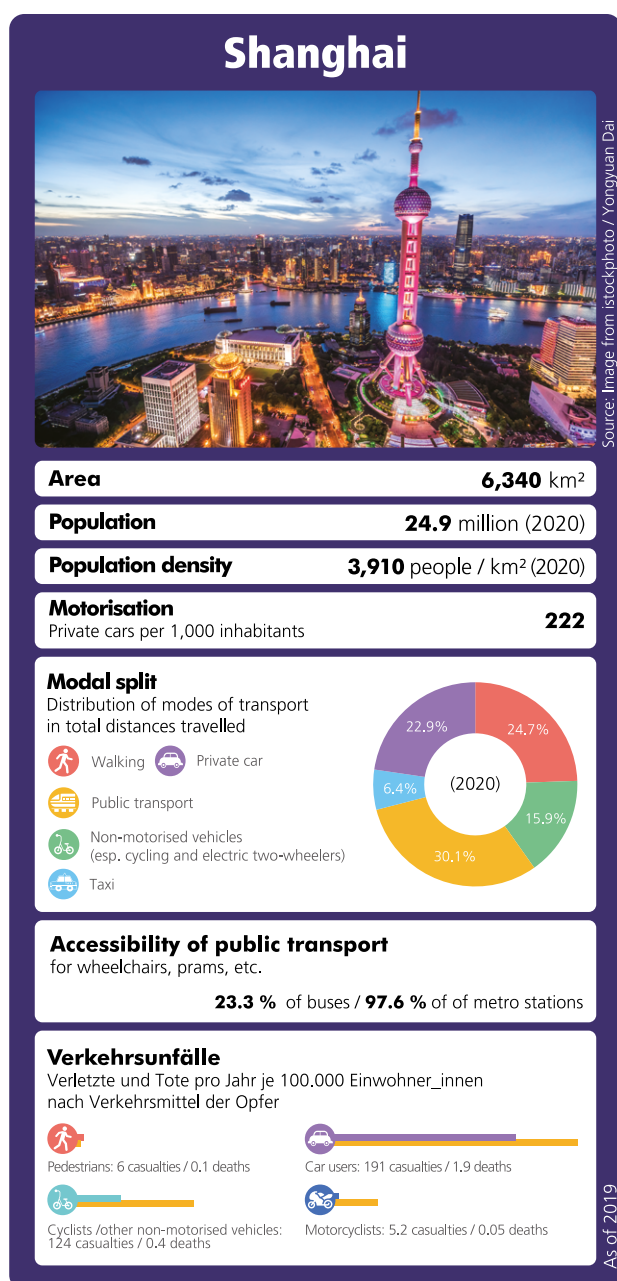
- 1. Looking back and status quo:** In order to understand the status quo, path dependencies, structures and historical events are relevant to the respective urban and mobility developments are recapitulated retrospectively.
- 2. What visions are there for the liveable and social city?** Under this rubric, the experts discuss the available visions of the city from these standpoints, as well as their attractiveness and importance.
- 3. Status quo and foreseeable future:** The experts provide an outlook for the coming decade. They discuss what measures should be taken and how they are likely to work.
- 4. Affordability, availability and inclusivity:** Mobility in the social and liveable city should be affordable, accessible and inclusive. Here the experts analyse what measures cities are taking in this regard.

5. **Safety and reliability:** Safety and reliability are an important basis for mobility in the social city. The experts assess where the cities stand in this respect.
6. **Ecological sustainability, internalisation of external costs and traffic avoidance:** The ecological dimension of urban and mobility development is an important pillar for a sustainable city. The experts point to relevant decisions and plans of these metropolises in this connection.

This study is subtitled »Shaping mobility for liveable and social cities«. It is a meta-study, bringing together key findings from studies on the four cities. Although when it gets down to the details each city pursues its own overall strategy, this results in a broad overview that can provide an impetus and ideas for other cities.

The structure: Based on the research, eight key fields of action and strategies were identified in the four metropolises (cf. Chapter 2). In all the cities, we have found content-related and process-related design strategies in these fields for a liveable and social city. Here we provide the assessments of the four expert teams by way of direct citations as examples.

Overarching conclusions that can be inferred for the eight fields of action in the overall view are presented in Chapter 3. Additional important areas of action from the topical field of socio-ecological urban and mobility development, which were also mentioned in the case studies, but were not explored in greater detail there, are summarised in Annex 1 in the form of a supplementary glossary on the mobility transition. Annex 2 also provides a list of suggested works for further reading on the topic.



2. Strategies and measures – eight fields of action for future mobility

The four cities under consideration in this study are embedded in different urban, regional and national contexts and have experienced very different historical developments. At the same time, they all face the realities of climate change and the global economy, as well as fundamental demand for human-friendly living spaces, not least within the framework of the United Nations' Sustainable Development Goals (SDGs). Against this backdrop, they are pursuing in part similar, in part quite different strategies to achieve their goals, which are summarised below within the framework of the eight identified fields of action.

2.1 Social urban policy formulates clear and comprehensible visions and goals

Cities are adopting different strategies in formulating a target vision for the social city and mobility transition. **Seoul** provides the following example of a long-term vision:

*Seoul Metropolitan Government (SMG) published an extensive strategy document **Seoul Transportation Vision 2030 in 2013**. The document provides a general long-term vision of an inclusive and liveable urbanity and specifies axes to guide actions. The strategy can therefore be understood as part of the larger effort to establish Seoul as a magnetic city, attracting residents by virtue of its high quality of life in addition to excellent job opportunities.*

This strategy is spelled out in the form of a slogan:

»Seoul, where you can live conveniently without relying on a car.« Although this refers to mobility, it aims at quality of life in the urban setting and public life.

Associated with this, a normative target is set out in quantitative terms, as follows:

The Seoul Transport Vision sets precise targets for 2030: »The Triple 30«, a 30 per cent reduction of car volume and commuting time in comparison

with the 2012 base case, as well as an extension of the share of green mobility to 30 per cent.

Shanghai is also pursuing the vision of a city with a sustainable transport system based on a long-term master plan:

*In 2018, the Shanghai Municipal People's Government published the **latest master plan for the city up to the year 2035**, in which five distinctive visions are described regarding future transport. By highlighting the dominance of public transport, in 2035 Shanghai is set to have a comprehensive transport system that is »safe, convenient, green, efficient and economical«.*

The Shanghai master plan is part of China's overarching goal of becoming climate-neutral by 2060. On this basis, two concrete goals have been formulated for Shanghai:

*To cope with climate change, Shanghai is committed to becoming a more resilient eco-city as stated in the **Shanghai master plan (2017-2035)**. Two measures in particular are aimed at achieving ecological travel patterns: to **replace internal combustion-engine vehicles with lower-emission vehicles**, and to **discourage driving by improving the public transport system** and encouraging green transport.*

Shanghai has taken on board the vision of a city of short distances and thus the connection between easy accessibility in the urban area and a functional mix in the master plan:

*With a view to changing mobility behaviours, policymakers in Shanghai have also attempted some innovations in the city's allocation of resources, for instance by developing the **notion of a »15-minute community life circle«** in its master plan **2017-2035**, aiming to ensure that vital social infrastructure and services can be reached within a 15-minute walk from all residential communities - the »community life circle«. Such destinations*

can be divided into **six categories**: elderly care facilities, hospitals, multimodal transport hubs, schools, cultural and entertainment facilities, and commercial centres.

The 15-minute city is probably the strongest and most appealing vision in the European context, and it was also one of the decisive factors in the 2020 **Paris** local elections. It is concise, addresses local residents and thus voters, and functions as a commonly shared vision:

The 15-minute city model was introduced during Mayor Hidalgo's re-election campaign in 2020 to capture the range of measures envisaged to achieve carbon neutrality goals by 2050 in the mobility sector [...]. Thanks to these efforts, Paris' Mayor Anne Hidalgo has earned a reputation as a leading advocate for transport innovation and urban sustainability, recognised in a variety of high-profile global forums devoted to cities and climate change.

In **Hamburg**, too, council elections took place in 2020. The mobility transition and the social city also played a decisive role in these, even if none of the parties had developed a vision as strong as the one presented in Paris. The new red-green coalition, however, subsequently established an authority for transport and mobility transition. Hamburg had a qualitative strategic framework for transport development as early as 2014:

In 2014, the Hamburg Ministry of Urban Development and the Environment published a programmatic brochure entitled »Green, just, growing city on the water - Urban Development Perspectives for Hamburg«.

- **more city in the city**: enhancing urban quality of life through more residential development, more areas of mixed use and shorter distances;
- **the just city**: providing appropriate and affordable residential properties in attractive neighbourhoods with good access to educational infrastructure;
- **the green city**: maintaining and developing environmental quality with urban green, nature

conservation and climate protection, while balancing ecological goals with social and economic responsibilities;

- **urban development in the economic metropolis**: focussing on the port, transport infrastructure and industrial activities, while also integrating research and development.

There are also quantifiable targets for transport development for the different modes. There is no overarching narrative that unites urban and mobility development, however. A strategic transport development plan is also being drawn up, but at the time of writing it is not yet available as a long-term planning instrument.

The example of Paris clearly shows how important broadly effective and at the same time relatively specific goals are when it comes to political and social acceptance of far-reaching transformation plans and their implementation. Anne Hidalgo personifies a political vision and leadership in that city and has thus achieved a high level of credibility - at least in the city of Paris itself.

2.2 Social urban planning puts people at the centre and makes time policy a benchmark

The aforementioned example of Paris shows how the strong political vision of a 15-minute city is leading to a paradigm shift: away from the focus on overcoming ever greater distances as smoothly as possible - and thus as quickly as possible - to easy accessibility, thus making this a key new driver of sustainable urban policy. This means that the focus is now moving toward urban development policy rather than infrastructure policy.

In **Shanghai**, this goal is already enshrined in the above-mentioned master plan. Analyses reveal the considerable need for action to realise the 15-minute city:

A study in 2017 found that only 12 per cent of Shanghai's residential compounds have all these six categories within their 15-minute walking sphere, most of them located in the very centre of the city. Commercial destinations, transport

facilities and educational infrastructure have relatively good coverage, whereas elderly care and health care facilities are highly concentrated in the centre of the city.

This focus on accessibility implicitly brings with it a new category: time policy under the primacy of sustainability goals. Instead of being able to cover greater distances in as little time as possible, the focus is on shifting toward a prioritisation of rapid travel over the shortest possible distances. Improved spatial accessibility is thus becoming an instrument with which to obtain real-time savings for individuals and society. Transport planning is becoming time planning in a new configuration. Because historical analyses show that people have generally travelled longer distances while the average travel time has remained the same, this development is quite remarkable. The Paris and Shanghai concept of the 15-minute city³ is aimed at reversing this empirically observable correlation.

The 15-minute city means an orientation towards a social-functional environment within people's reach. It is not the technical means of transport, but the immediate urban social space that creates accessibility. The human scale – in a sense, people's natural mobility – is explicitly becoming the guiding principle underlying innovative urban and mobility policy, as **Seoul** also shows:

*The focus on a human city and transport is underscored through an understanding of soft mobility as being more than a mode of transport, namely a **means for »vitalising« communities. Daily life should take place in walking distance or within reach of public transport [...]. According to Seoul's Transport Vision, mobility enables and ensures access to public goods and participation for all citizens. An improvement in the environment, microclimate and biodiversity is both consequence and prerequisite for these values and therefore at the heart of all the initiatives.***

This objective can be witnessed in Seoul's efforts to promote soft mobility and the symbolic conversion of street space into parks:

Seoul Metropolitan Government (SMG) has created a 16.7 square kilometre Green Transportation Promotion Area, which is associated with the goals of reducing traffic accidents, improving air quality, promoting walking and soft mobility and curbing the number of cars on the streets. Attractive and promotable projects such as the Seoul 7017 Skypark - the conversion of an elevated highway into a public park - further help to create icons to symbolise the current development trend of prioritising the human dimension.

An example from **Hamburg** shows how, with people at the heart of it all, the human dimension became the leitmotif of the 2019 International Building Forum, which was conceptually important to the development of the city:

*In August 2019, a five-day Building Forum was conducted focusing on seven of Hamburg's arterial roads connecting the city with the surrounding counties [...] The resulting publication was entitled **»Put people First! «**, and the output is intended to provide impulses and a basis for the future planning discourse in the city.*

The example of **Paris** shows how work is being performed on the city not only for, but with people:

*A set of strategic partnerships was developed together with planning agencies, academic institutions, consulting companies and experts to introduce urban innovation districts. As part of the Urban Lab "Paris & Co", city users are to experiment with intelligent traffic lighting, multi-functional docking stations and dedicated digital services to enhance mobility in the **»Paris Rive Gauche«** urban innovation district.*

Through consistent implementation of time policy in the city, the primacy of sustainability, with its social and ecological, as well as economic aspects, is accommodated in several ways: people gain flexibility in their individual uses of time, accessibility is decoupled from car ownership, the quality of life in the city is enhanced through the reallocation of public space away from cars, and fewer

3. In the meantime, many other cities have articulated comparable goals, for example, Stuttgart as a five-minute city and Brussels as a ten-minute city.

emissions, as well as more active mobility, improve health and well-being.

Thus, easy accessibility in the urban area is once again increasingly becoming an element in the urban fabric instead of the transport system. The concept of the 15-minute city makes this objective easy to communicate. For it to succeed in terms of social urban planning, it must of course be realised independently of the socio-demographic composition of the neighbourhood, and housing must be affordable for all groups in the respective locations. The considerable disparity between housing costs in cities such as Paris and their regional surroundings shows that there is also a need for action at this level.

2.3 Social cities redefine the linguistic framework for mobility

The transformation of urban and mobility areas into a social city, as well as related transport policy are symbolically and emotionally charged. More than almost any other socio-political transformation project, the move away from car-centred transport calls into question entire lifestyles among inhabitants of cities, but above all outside densely populated areas, and negates traditional narratives of economic prosperity. Regulatory and fiscal control instruments, as well as rising energy costs, which make private car-use more expensive or less attractive, do not chime with people's desire for a home of their own, which can usually only be realised in car-friendly locations because of land prices. This is because one consequence of a decision to live in less central locations can turn out to be (inevitably) high mobility costs with low accessibility. The financial advantage of lower housing costs combined with what is often only assumed to be comparatively cheap automobility turns out to be a disadvantage from this perspective.

In addition, Paris, Seoul and Shanghai are home to major car companies. A shift away from the car-centric city thus has a private-sector significance there as well. An appropriate political framing via symbols and images with positive connotations is therefore required to reduce a potentially confrontational polarisation because of this transformation

and to emphasise the beneficial effects of a low-car city.

Seoul is redefining the narrative surrounding car ownership, describing it as a mere burden on people rather than attempting to weigh its pros and cons:

*Rather than regarding the use of cars as a privilege and an indicator of wealth, **driving a car is being reframed as a mode of transport citizens should not be burdened with.** The strategy promotes a paradigm shift towards a transportation policy that prioritises social values over personal convenience. Key transformations include a **shift from mobility to accessibility, from individual transportation to shared mobility, from individual methods to linked and integrated means and from hardware to software.** Mobility in Seoul is set to become more holistic, multi-layered, smart and human-centred.*

The powerful idea of the 15-minute city in **Paris** can also be considered a successful example of positive framing. The theme is not transportation throughout the city with or without a car, but accessibility as a gain in quality of life through short distances.

Shanghai also opts for positive framing in the guise of the strategy »Shanghai Planning Guidance of 15-Minute Community Life Circle«. The »Community Life Circle« creates a positive triple term that is both appealing and normative.

The »**Hamburg Takt**« is another example of positive framing. Like other cities, Hamburg is planning a massive expansion of its public transport system. This expansion is expensive and involves infrastructural adjustments that can be burdensome for the people of Hamburg. However, it is not the infrastructural or the financial planning, but the goal to be achieved that is at the heart of the political narrative:

*The overarching current strategy for the development of public transport is the realisation of the **Hamburg Takt (Hamburg Rhythm)** through an extension of the networks and more frequent services on many lines. The intention is to make the consultation of time tables unnecessary.*

Thus, it is also about relating positive narratives that emphasise gains in order to generate consent and thus mobilise appropriate resources.

2.4 Social cities raise the potential of participation

All the cities examined in this project use participatory approaches in their urban and mobility development. In the European city, such opportunities have long been a fundamental part of planning processes. Despite the need for improvement, **Paris** has developed broad involvement of people through different participation formats:

Even though decision-making remains dominated by political, technical and administrative elites, policy formulation and implementation draw selectively on a variety of participatory devices and collaborative forums. In the past, ad hoc public debates have been instrumental in ensuring residents' support and in negotiating mitigation measures with those opposing specific mobility schemes, such as tramway projects, the remodelling of prominent public squares and pedestrianising specific segments of the street network. [...] In order to achieve carbon neutrality by 2050, the newly adopted climate plan takes stock of and acknowledges the need to further engage the wider public.

Hamburg is leveraging international and particularly multidisciplinary expertise within the framework of participation processes, thus providing a good example of participation beyond classical formats. Within the framework of the Building Forum, Hamburg is reaching out to international experts in vision and planning processes, among other things:

*Since 1984, visions and far-reaching concepts for urban development have on several occasions been drawn up within the framework of a so-called **Bauforum** (Building Forum), a large-scale planning workshop with invited external experts and - over the years - increasing levels of public participation.*

The success of the Building Forum format is illustrated by the slogan »Leap over the Elbe«. Building Forum 2003 is considered an important milestone in Hamburg's urban development:

In 2003, the topic of the Building Forum was »The Leap across the River«, addressing the better integration of parts of Hamburg located south of the Elbe, which had traditionally been less well-off and less accessible.

Some of the results of this Building Forum have already been implemented in urban planning or are in the planning stage. The example of Hamburg thus shows that participatory approaches not only develop within the framework of concrete planning, but can also serve as the starting point for long-term planning strategies.

Shanghai has a rather limited history of participation so far. This is set to change in the process of people-oriented urban development:

*Public participation has not historically been a major part of the planning process [...]. Since the planning authority possesses all essential means and resources to make a comprehensive plan, public participation has in most cases only reached the level of »informing« - the one-way flow of information from the authority to the public. **The drafting of the Shanghai 2035 master plan, however, took an innovative approach that levelled out the participation playing field.***

Cities are also increasingly relying on digital technologies in the area of participation and information, and the Covid-19 pandemic has also in this instance significantly accelerated this development. The option of participating independently of location, as well as partly time-delayed within the framework of digital participation above all makes possible greater frequency and potential reach within urban society:

*Seoul has established various participation formats such as **M-Voting**, an app through which citizens can vote – almost on a daily basis – on issues put up for debate by the **SMG** [Seoul Metropolitan Government, IK]. Additionally, the SMG actively informs citizens on projects and provides a multitude of quantitative data sets on all sorts of relevant topics to lower the threshold for start-ups and initiatives to utilise data and improve services.*

At the same time, the example of **Seoul** illustrates that precisely because of the relative ease of implementa-

tion in the digital sphere, the risk is particularly high that the quantity of information made available will increase rather than the quality of participation:

*Involvement of expert opinions and extensive public participation through surveys and questionnaires ensures public support and the delivery of real value to citizens. **Participation in Seoul is fundamentally linked to the notion of smartness** and the employment of digital tools. In 2020, the SMG presented its E-Governance technology, which is based on a »citizens-as-mayors« approach [...]. Participation does not seem to go substantially beyond the level of »informing citizens«, however, which might partially be due to the sheer size and complexity of topics discussed.*

Nevertheless, the administration also invites urban society to participate actively in political decision-making processes, also with the aim of improving its own decision-making culture:

*As the first of its kind in an Asian city, the SMG has established the Seoul Innovation Bureau, which looks for insights and ideas from citizens to inform policy. Aside from qualitative improvements through public input, the **initiative aims to draw citizens actively into the policymaking process and to transform government organisational culture.***

Paris has also leveraged digital opportunities to offer a very broad consultation process on a specific issue:

*Following the City Council's **decision to generalize the 30 km/h limit to most of the city's road network**, with the exception of the ring road and priority pedestrian lanes, an **online public consultation was launched** in November 2020.*

And in Shanghai, digital interaction with citizens is also playing an increasingly important role – although, as in Seoul, this does not necessarily equate with actual participation in decision-making:

*The city planning authority has utilised a **series of channels to communicate ideas and send out information**, most importantly through **online forums and social media accounts** to enable*

*the public to offer their thoughts and obtain instant feedback [...] but the consultation results **only affected the end product to a limited extent** because of the prevailing political agenda.*

Participatory elements and feedback from civil society in the guise of digital technologies are nevertheless comparatively important for China in Shanghai:

*Although some argue that the public sector in China is relatively strong compared with its civil society, Shanghai is regarded as more visionary than other megacities, such as Beijing, in terms of public participation. The **government constantly monitors public perceptions and publishes reports online to canvas people's reactions.***

As long as attention is paid to an inclusive overall concept with socially and physically barrier-free formats, digitalisation can generally help to increase the reach of participation processes. Participation that is both broad and representative can produce new ideas and solutions that legitimise transformation processes through political and social acceptance – if the results of such processes are actually taken into account in decision-making.

2.5 Social cities make visible the need for effective governance structures

When it comes to urban and mobility development, each of the four cities is enmeshed in procedural and structural framework conditions, many of which lie outside their domain of competence or responsibility. On one hand, this involves formal responsibilities, such as the financing of federal roads in Hamburg. On the other hand, however, there are also symbolic responsibilities that have not been clearly spelled out in practice, as the example of Paris shows:

*Due to the capital city region's strategic role, **all issues related to urban and spatial planning have long been shaped by national policy goals**, and justifies, to the present day, **strong, direct state interventionism down.***

The example of Paris makes it particularly clear that governance structures can be used to resolve conflicts between objectives in which there is a struggle over planning and de facto sovereignty of interpretation

over the city (here also in its role as a dominant region in the national context), which extends above and beyond the areas of responsibility of municipal urban, regional and mobility planning. With regard to the important question of the guiding vision, Paris displays:

Several visions for the liveable and the social city competing with one another in the Paris Region. They have been championed by political and administrative elites, and driven primarily by efforts to achieve leadership over spatial planning and transport developments in the capital city region.

This unclear responsibility, accompanied by multiple urban planning visions, leads to tensions, loss of time and openly confrontational positions:

A revised version of the region's strategic planning document was [...] adopted in 2013 with the support of local authorities - 1,291 municipalities, seven départements - setting policy priorities by 2030 [...]. A number of policy initiatives in the region emanated from the City of Paris before crossing municipal boundaries [...]. In doing so, the region not only pushed back against state imposition of spatial and transport planning agendas, but also against municipalities, including the powerful City of Paris.

The conflicting goals of governance structures seen in the example of Paris are also evident in other cities. In **Hamburg**, conflicts between objectives within the city can be observed due to the high degree of autonomy of municipal districts vis-à-vis the Senate and their mutual independence:

*The city consists of seven boroughs, which are run by directly elected administrative committees with a quasi-parliamentary structure [...]. The strongest political group also selects the head of the Borough Authority, whose main areas of responsibility are construction law and transport planning. Political majorities in the boroughs can differ from one another and from the constellation at the city level and this has particular implications for coherent transport planning strategies and their implementation: **the two levels of administration are responsible for***

different hierarchies of the road network, and strategic decisions at one level can be relevant - but not necessarily complementary - to elements of the network which are run and funded by another level.

In **Shanghai**, some of the responsibilities for infrastructural projects lie at the national level, which means an additional governance level is involved in decision-making, adding to the already considerable internal administrative complexity of the city of Shanghai:

*The Office of the Mayor in Shanghai is composed of a mayor and seven deputy mayors [...]. A deputy mayor [...] reports to the mayor, oversees urban and transport planning in the city [...]. In particular, he supervises the municipal transportation commission and road transport administration [...]. The commission's main task [...] is to design, construct and manage all transport-related infrastructure and facilities within the city [...]. **Planning decisions for these, however, come from above. The National Development and Reform Commission, based in Beijing, has to approve plans and budgets for all major infrastructural projects in the country [...].***

In addition to formal, systemically based governance structures, informal decision-making structures also play an important role in urban development. The examples of Hamburg and Seoul serve as examples of the effectiveness of informal principles and premises.

Thus, in **Seoul**, strong economic interests influence major decisions in the political sphere:

*As the capital city of South Korea, politics in Seoul is strongly centralised. The city's outstanding economic and political importance make it an indicator of conditions in the country. Critical public concerns are therefore highly contested and debated. **For much of its history of industrialisation, big business maintained close relations with the political sphere and exerted a correspondingly strong influence on policymaking.***

In **Hamburg**, the influence of the economic sphere serves as an implicit paradigm for urban and transport planning. Due to the historical and still significant role of the port, the following still holds true today:

While major decisions regarding transport development and mobility planning have always been made in the public domain, the influence and prioritisation of economic considerations over wider social and environmental concerns has also been notable. This has included decisions on road construction, the general goal having been to »keep traffic flowing« in order not to hamper »the economy«.

Overall, each of the four cities has set itself the goal of becoming a liveable or people-centred city. An examination of governance structures, however, shows that they do not yet live up to this claim. None of the cities seems to have a governance structure that can be cited unreservedly as good practice. Although there are some good approaches (cf. sections 2.1 and 2.4), a conservatism with regard to structure, process and function apparently continues to pose a significant hurdle - partly also because the cities are embedded in national structures whose priority-setting they, as municipalities, cannot influence or only do so indirectly.

It will therefore be important to assign unclear or even competing responsibilities to the respective decision-making level that is able to take meaningful action, so that synergetic effectiveness can be achieved in as many fields of action as possible, as described here.

2.6 Social urban policy internalises costs for the mobility transition

The cities under consideration hardly rely on user- or polluter-related financing of infrastructures and services. To a large extent, local authorities or the state fund public transport as well as private transport through subsidies or transfer payments.

In all cities, however, private cars account for the most serious negative effects in the transport sector. An appropriate internalisation of the external costs

of car use would therefore have two positive effects for the city: an increase in financial resources (for example, for the expansion of socially and environmentally compatible means of transport) and a simultaneous reduction in car traffic.

None of the cities under consideration has set an appropriate price for car traffic so far, however. The extremely low costs for a resident parking permit in **Hamburg** or Germany as a whole illustrate how far away user-related internalisation of costs still is:

Until recently, German federal regulations stipulated that residential parking permits could not cost more than EUR 30.70 per year. This limit was long under discussion as being far too low to have any effect on car ownership and use. The decision on maximum charges has since been transferred to the federal state level, leaving it up to municipal administrations to levy charges up to the limits set in their federal state. However, residents in Hamburg still pay no more than EUR 65 for an annual permit which exempts them from any time limitations or parking charges that may apply in their area. Only a few other German cities – such as Tübingen or Freiburg in the South – are currently planning to levy significantly higher charges in future.

Paris and **Seoul**, on the other hand, show that businesses and other targets that generate transport can contribute to transport funding. They are following a similar path:

[In Seoul], a type of congestion charge is levied on facilities generating traffic such as offices, large department stores, hotels, and other commercial facilities. Charges are based on size and use of facilities and can be reduced depending on the extent of a facility's responsibility for traffic volume - reduction programmes, such as providing flex-time working, operation of commuter shuttle buses or offering paid parking spaces rather than offering parking for free.

Since 1971, **Paris** has levied a company-related transport tax, the »Versement Transport«, which funds public transport:

It depends on the percentage of the payroll of companies with more than eleven employees and below a ceiling fixed by the government. [...] It was renamed Versement mobility in 2020, and provides 60 per cent of the regional transport authority's budget.

However, the example of Paris also reveals a conflict between the objectives of access to the city and the internalisation of costs in the transport sector:

Efforts leading to car use reduction and the development of sustainable modes have, however, been criticised by adjacent municipalities and transport operators due to concerns about accessibility for commuters, some of whom primarily rely on car use because of an aging and ailing RER – Réseau Express Régional. Similarly, recurring attempts to consider the introduction of a congestion charge have been abandoned.

Comparable problems arise in many conurbations, especially those with a relatively centralised structure. In terms of both climate protection and affordable mobility (including in the context of rising energy prices), it will therefore be important to establish efficient alternatives to private cars as quickly as possible. Where the expansion or even new construction of regional rail transport cannot be implemented quickly enough, a solution should initially be based on express bus lines - which can offer at least roughly comparable advantages in terms of speed and reliability through bus lanes and preferential treatment at traffic lights. Decentralisation of work through home office solutions and co-working in suburban areas are further important steps that are becoming increasingly realistic, especially as a result of pandemic-related experiences and digitalisation pushes. Overall, it will be increasingly important to create suitable instruments that guarantee non-discriminatory access to mobility, regardless of social status.

In any case, significant resources are needed for an extensive expansion of public transport services. **Shanghai** has been using levies from private motorised transport users to fund public transport for a long time:

[Shanghai] has long used its financial budget to cover all operational costs of its public transport,

with over 80 per cent of the subsidies going to buses, and the rest to the metro system. A significant proportion of public transport subsidies, however, comes from the various fees charged to private vehicle owners for using roads in an attempt to better balance the relative attractiveness of private and public modes of transport.

In the funding of public transport, Shanghai shows that incentivising public transport operators to improve service quality can also make a difference:

The city used to make a yearly one-off payment to cover all the losses in bus operations, but now »purchases« bus services from bus companies in advance for an agreed price so that enterprises become more motivated to improve performance and attract more patronage.

The double benefits offered by internalising the social costs of private motorised transport mentioned at the beginning must therefore be accompanied by a narrative that presents the background and positive effects of such measures in an accessible manner. Secondly, it must be ensured that – even with a targeted decrease in the use of private cars – the quality and quantity of public transport services can be guaranteed in a socially and climate-friendly manner.

2.7 Social cities emphasise safety and health as a core KPI

Ensuring the physical and mental integrity of individuals is a central requirement of a social city. Some of the cities under consideration here have also taken measures to make road traffic safer, lower in emissions and more socially tolerable.

Speed is clearly a factor in dangerous road traffic, as the following positive development in the particularly vulnerable group of children in **Seoul** shows, in which a civil society initiative has played a special role:

Child road safety, however, has been a success story, with fatalities dropping around 95 per cent between 1988 and 2013 (from 1,776 to 82). This downward trend has been achieved through the designation of special zones with reduced

speed limits (30 km/h) and actively enforced prohibition of parking. A grassroots organisation »The Green Mothers« has contributed significantly to the decline of child fatalities by helping children to cross roads safely around schools.

Despite such significant improvements, however, accident rates in Seoul remain high:

In 2014, the country had the largest number of pedestrian fatalities per 100,000 residents of all OECD countries. The number of fatalities among the elderly was especially high, three times the OECD average per 100,000 residents. Pedestrians account for 38 per cent of fatalities, which highlights the need for action to protect the people most vulnerable and least responsible for accidents.

The fact that speed limits are a very effective measure to protect non-motorised road users has also prompted **Paris** to reduce the speed limit over a large area:

In the City of Paris, road safety has gained prominence over time and in the context of efforts to systematically re-assign road space away from car use [...] In 2015, 37 per cent of Parisian roads, especially around schools, were subjected to speed limits of 30 km/h. Since August 2021, this speed limit was extended to a large part of city's road network.

Nevertheless, children's special safety needs have still not been identified as a special field of action in many cities, as the example of **Hamburg**, among others, shows:

While no one would dispute the importance of a child-friendly environment or walkable city streets in principle, these concepts do not guide mobility planning paradigms in Hamburg, nor are they the subject of specific campaigns.

In addition to the danger of being involved in accidents in road traffic, environmental pollution is also important when it comes to social aspects. Noise levels above 50 decibels dB(A) at night are generally considered harmful to health, but:

Hamburg's strategic noise maps show that in 2017, 242,000 people lived in locations which were affected by an average environmental noise level of >50 dB(A) at night (10:00 p.m.–6.00 a.m.).

In addition, it is known that such emissions are often unfairly distributed in social terms: low-income households are more likely to be located along busy roads and at the same time are less likely to own a car than those who are financially better off.

Damage to health accounts for a particularly high proportion of the external costs caused by motorised road traffic. Nevertheless, in many places these costs continue to play a subordinate role in decisions regarding measures that could effectively reduce this damage (speed limits, access restrictions, redistribution of road space). There is still great potential here to develop effective narratives.

2.8 Social urban planning leverages the potential of digital technologies

Digitalisation is permeating and changing the ways in which cities navigate and manage mobility. Digital technologies have the potential to make cities more social if they are used carefully (see also section 2.4).

By global comparison, **Seoul** has an advanced digital strategy with diverse use cases in live mode:

Advanced digital tools such as TOPIS (Seoul Metropolitan Government's integrated transportation management centre) helps to collect live data on traffic and informs the city's traffic management systems, thus allowing for case-specific reactions to keep traffic flowing [...]. Data sets from the integrated payment system on users' actual routes (including interchanges) allow modification and improvement of the system based on actual demand.

TOPIS was implemented as far back as 2005 and completely rolled out by 2009. Other digital traffic control applications, such as automatic scans of parking violations by buses, are also in use. Especially in this area, consistent implementation of appropriate regulations can lead to a significant

enhancement of traffic safety, for example, by preventing drivers from stopping in the second lane or blocking lines of sight between motorised and non-motorised road users.

Shanghai is also making extensive use of digital possibilities to make traffic safer:

The traffic police force has also developed »Intelligent Police« technology, which utilises over 8,000 surveillance cameras in the city to provide real-time traffic condition reports, recognising jaywalking and horn honking and so on.

The two Asian cities are thus technologically more advanced than their European counterparts, also because they have addressed data protection-relevant aspects differently than in Europe.

Hamburg is regarded as a pioneer in the use of digital technologies, among other things in the area of mobility in domestic German competition with other metropolises:

The digital business association BitKom e.V. named Hamburg Germany's top Smart City 2020. The ranking was based on the assessment of 136 parameters for 38 indicators in five areas of activity [...]. For mobility the authors of the study assessed parameters for parking, smart traffic management, interconnected PT, shared mobility, multi-mobility, last-mile logistics and further pilot projects.

In the future, digital technologies are to play a role at all levels of mobility in Hamburg - both for end users, but also in the planning and operation of mobility and transport:

From 2022, the transit association intends to offer an app which provides automatic daily best-price ticketing via a check-in/be-out concept.

At the same time, Hamburg is also still at the conceptual stage with regard to some of the planned applications:

In 2016, the Hamburg Senate passed a strategy paper entitled »Transport 4.0« [...] on how the city was going to make use of digital technologies in the transport sector [...]. The strategy listed eight areas of activity

for implementation: information, intelligent traffic management and control, intelligent infrastructure, intelligent parking, mobility as a service (MaaS) and intelligent vehicles. The basis was to be provided by high quality and safe data and innovation was defined as the umbrella theme.

Digital technologies also have a very direct influence on the management of traffic - not only in the backend of daily public transport operations, but also, for example, in the management of road works and their impact on traffic:

In 2020, the City of Hamburg thus introduced the software tool TRIAS for a better (system-wide) coordination of road works and construction projects. It consists of a travel demand model in the backend connected to a planning and coordination tool in the frontend in order to enable better prediction of the impact of road works on traffic flows, individually and in combination.

In **Shanghai**, buses and subways run at very frequent intervals, but often not according to the timetable. The aim there is hence to improve the subjective reliability of the service with the help of real-time information:

With advancing technology, the city planning authority has started working with major online map services, such as Baidu and Amap, to provide real-time bus-arrival information to the general public in the hope that this will help passengers to better plan their time to catch buses, which could help restore some of the attractiveness of bus transport.

Non-motorised transport can also benefit from the use of new technologies, as in **Hamburg**:

Since the autumn of 2020, bike traffic in the city has been counted by about 100 infrared detectors around the city. [...] the new counters are intended to help monitor these developments more closely [the increasing number of cyclists] and thus also the effects of pro-cycling measures in Hamburg.

In **Paris**, parts of the Rive Gauche have been turned into an Urban Innovation District, where inter alia interactive digital services in the field of mobility are being tested within the framework of a strategic partnership between planning authorities, research institutions, consultancies and other experts (cf. section 2.2).

Cities are increasingly striving to leverage the diverse application possibilities of digital tools in the area of mobility. In addition to the issues of data protection and digital security, it will be important that their use does not serve as a substitute for those measures that actively reduce individual motorised transport, but rather effectively complements and reinforces these measures.

3. Mobility for liveable and social cities - towards the ideal

Paradigm shift or incremental change? The world's metropolises are facing immense challenges, including in the field of transport and mobility planning. A dilemma is becoming apparent:

- Measured in terms of social-ecological pressure to take action, the answer to the question posed here would have to go in the direction of a paradigm shift.
- Measured in terms of transformation steps that are considered realistic and acceptable in urban societies, incremental changes appear to be a more realistic answer in many areas.

Regardless of the current response, cities worldwide will have to develop and implement comprehensive adaptation and resilience strategies in the near future in order to be able to guarantee quality of life and justice for all in an era of urban growth, ecological threat scenarios and increasing social disintegration. In the area of mobility, this requires a paradigm shift away from car-centred infrastructures and the associated expectations of covering large distances in a comparably short time towards - and to a certain extent back towards - spatial accessibility, as well as efficient and affordable public transport systems.

Although the transformation of such a complex entity as a metropolis, where millions live, is challenging, the example of Paris – among others – shows that change can be initiated comparatively quickly under certain conditions. Rapid adjustments instituted in the course of the Covid-19 pandemic also illustrate that transport infrastructures change quickly and transformation can be accelerated if external conditions both create pressure to act and provide a political framework to justify it. At the same time, it has also become apparent that complex decision-making and governance structures without such external catalysts seem to be rather resistant to levels of flexibility to enable action. Among the eight fields of action outlined, it is striking that hardly any significant impetus can be derived from the descriptions of city governance structures.

When the four cities are considered together, they illustrate eight key principles that are necessary for achieving liveable and social cities:

- **Vision:** The sustainable city is compelling, with a strong and inclusive mobility vision that is clearly and coherently formulated. Paris shows that a coherent vision of mobility can decide an election – and that voters (want to) understand the connection between urban and mobility development and will reward efforts to think about these issues together. Shanghai and Seoul show that master plans help to structure political objectives in a comprehensible manner over longer planning periods.
- **People at the centre and time policy:** The sustainable city focuses on people's living environment in their immediate surroundings. Through an active time policy and the human scale as a planning premise, the city shapes the local environment, which can be accessed primarily by walking and cycling, and is thus socially just.
- **Positive framing:** The transformation of cities requires majority support and the will to change. Positive framing is thus an important basis for building majorities to enable transformative city and mobility design. At the political-strategic level, the 15-minute city in Paris or Shanghai is a successful example from which other cities can learn. At the more operational level, the example of Hamburg Takt offers an accessible concept.
- **Participation:** In the sustainable city, people have a voice, and within their respective traditions, the cities studied here already use participatory strategies. In Seoul, the digital strategy is already well developed. The (temporary) redesign of public spaces as a participatory project, as well as the use of participatory processes to develop long-term target images in European cities can be considered good practice.
- **Efficient governance:** The social city has efficient governance structures that are prepared for the challenges of the future. They are characterised by:
 - **Clear responsibilities:** The cities studied show that responsibilities for mobility and urban development are not always clearly spelled out. Conflicts between objectives in the system

are thus inherent. Clear responsibilities and appropriate management are prerequisites for a goal-oriented city design.

- **Mobility and urban development - two sides of the same coin:** Organisationally, mobility and urban development are for the most part implemented by separate administrative units. The strong example of the 15-minute city from Paris shows that the interdependent relations of these two perspectives can be conceived in combination more clearly at the political level. Urban and mobility development should be considered and planned closely together at the administrative level as well.
- **Efficient processes:** In view of the immense challenges faced by cities, fast transformation processes are necessary. Fast does not mean omitting relevant planning or participation steps, but rather accelerating the necessary implementation processes in order to adapt the necessary social-ecological design of the transport and mobility system to meet pressing problems.
- **Organisational transformation:** Administrations thrive on and with the people who shape these structures and live within these processes. Similar to the economy, both structural and cultural transformation processes are still urgently needed in many places to reduce friction between administrative levels.
- **Funding the mobility transition:** The sustainable city has convincing concepts for funding the transformation in order to meet design requirements and make optimal use of existing discretionary latitudes. These also leverage the principle of the social-ecologically just internalisation of external costs caused by motorised road traffic. This both generates financial resources and has steering effects.
- **Safety and health as core aspects of the social city:** Leading car manufacturers, as well as cities and countries such as Sweden are pursuing a Vision Zero with the goal of zero traffic fatalities. This has not yet been formulated as a planning paradigm by any of the cities considered, however. South Korea has nevertheless set the goal of becoming one of the top 10 safest OECD nations. Good practice would be a binding target, including measures within the framework of a prioritised Vision Zero, which would also be superimposed on other planning goals, if necessary.
- **Exploiting the opportunities of digitalisation:** The cities analysed show different fields of application for digital technologies. The sustainable city uses these consistently and at low thresholds for the design of a liveable and social city, in the area of planning and control, for the design of services and the participation of all population groups.

4. Final considerations

Climate protection and adaptation to climate impact, rising energy costs, the pressure of rising demand and soaring prices for housing, structural change in the retail sector and in the world of work, mounting social inequality in many places – all these factors impose changing demands on how urban development and urban mobility are planned and designed. Linked to this, there is both a need as well as opportunities for change towards more socially acceptable, healthier and climate-friendly mobility and transport systems.

The necessary measures and changes are potentially conflictual, especially if they specifically aim to make motorised private transport more expensive and less attractive or to mobilise additional financial resources for the expansion of public transport and its operation. There is therefore a need for bold and appealing visions that can bring people on board and forge majorities, both in the political sphere and civil society. The model of the 15-minute city offered by Paris and Shanghai is such a vision.

Making cities more liveable, sustainable and social requires both: a paradigm shift and incremental changes. The cities presented here exemplify impulses for transformation that are necessary and possible. These cities are breaking new ground, testing new instruments, driving innovation within their regulatory frameworks and responding to the impetus for innovation from civil society. Even if no metropolis in the world has yet fully implemented the needed transformation, many of the approaches presented here can also help other metropolises on their way to sustainable mobility in a liveable and socially just city.

Annex 1 – Supplementary glossary on the mobility transition

Although the following topics are touched on in part in the case studies, they were not explored in any depth there. In order to do justice to the breadth of the discourse on socio-ecological urban and mobility development, they are discussed in this Annex in a little more detail.

Greenhouse gas neutrality

The Paris Climate Accords from 2015⁴, which has been signed by 195 nations, stipulates global greenhouse gas neutrality by the second half of this century. Germany has set a target year of 2045 to achieve this in its current Climate Protection Law⁵, and many metropolises around the world have also set similar goals, although the target years vary, generally lying between 2030 and 2050.

These goals are not always spelled out in concrete CO₂ reduction targets for municipal transport and urban development, however - partly, because the necessary or expected absolute contribution of individual municipalities or metropolitan areas to national targets is often not clearly specified. However, the lack of such absolute reduction targets and verifiable interim targets prevents an up-to-date integration and budgeting of strategies and measures at all levels - from the municipal level to the evaluation of individual projects. This in turn makes it considerably more difficult to determine whether corresponding developments are trending towards targets or whether readjustments are necessary. In view of the most recent publications put out by the Intergovernmental Panel on Climate Change⁶, there is an urgent need for an appropriate national and municipal framework and depth of information.

Resilience in urban and mobility development

Resilience - the ability of cities to withstand and adapt to change - is not a new topic in urban planning, but

it has received increasing attention with the growing effects of climate change and the Covid 19 pandemic. In the area of overlap between urban and mobility planning, climate and pandemic resilience means, for example, measures to prevent overheating such as public water bodies, green and shaded areas. In urban areas, where available space is finite, the reassignment of existing traffic areas can play a role in this context, which also plays a role in satisfying an increased demand for non-motorised mobility. At the same time, improved quality and availability of public spaces for encounter and recreation within walking distance can fulfill important social functions - irrespective of, but especially also during a pandemic situation.

And while motorised individual transport has accounted for an increasing relative share of journeys during the pandemic, in many places it has at the same time decreased significantly in absolute terms. In addition to general lockdowns, a shift towards working from home and from face-to-face meetings to digital platforms have played an important role in this development.

The social city of the future should keep these experiences in its planning memory in order to optimally utilise them for the transformation in the sense of a paradigm shift.

Shift and reduce

The current discourse on the transport transition in the area of urban traffic is mainly oriented towards a shift of traffic away from classic motorised individual transport with combustion engines towards the green transport modes⁷, into vehicles with (partly) electric drives and into self-driving vessels. Depending on the perspective, these options are discussed in a complementary or competing manner. Above and beyond this focus on modal shift, traffic reduction or avoidance remains a relatively neglected aspect of the transport transition, though. The 15-minute city does encompass

4. Paris Agreement, UN reference: C.N.92.2016.TREATIES-XXVII.7.d.

5. German Federal Climate Protection Act from 12 December 2019 (Federal Law Gazette I p. 2513), as amended by Article 1 of the Act of 18 August 2021 (Federal Law Gazette I p. 3905).

6. Or IPCC (Intergovernmental Panel on Climate Change): IPCC Sixth Assessment Report (AR6), 2021-2022. Working Group III: Climate Change Mitigation, 4 April 2022.

7. Walking, cycling and public transport supplemented by sharing services such as partial bikes, partial cars or shuttle services.

this idea: having everyday destinations in close proximity is intended to help reduce total distances travelled within cities. The discussion about working from home triggered by the Covid-19 pandemic (see above) is also partly about avoiding journeys. Due to its potential effectiveness, however, the aim of traffic reduction offers a lever that warrants greater emphasis in the transformation discourse and action to be taken.

Just distribution of space

Especially in metropolitan areas, there is an imbalance in the share of space allocated to different modes of transport in terms relative to their share of journeys. As a rule, there is significantly more public space available for the private car than would be commensurate with its share of the modal split - especially if one considers the space available for both moving and parked cars. In the case of the green modes, this relationship is often reversed: here, there is significantly less space than would be appropriate - both in terms of the existing modal split and, even more pronounced, in terms of a desired modal shift.

A more future-oriented distribution of space for travel is being discussed under the title of "just allocation of space". During the Covid-19 pandemic, the designation of pop-up cycle lanes in many metropolitan areas brought about a short-term change in the distribution of space, at least on some roads. A much more significant redistribution of the limited space available for urban travel space would have to take place, however, to allow a significant expansion of an attractive, reliable (road-based) public transport system, improved safety, accessibility and barrier-free access for pedestrians and cyclists, as well as the qualitative improvement of public spaces.

City logistics

The role played by well-functioning city logistics in the context of socio-ecological urban and mobility transformation is frequently neglected in the discussion. Both delivery services and other supply and disposal vehicles performing generally use the same spaces as individual and public transport modes and are thus increasingly in competition. At the same time, such logistical functions must

continue to be made possible within the framework of a systemic transformation.

Central elements of city logistics concepts include: a clear framework for the shift to (partially) electrified vehicles, a reduction in the number of empty runs or, respectively, an optimised utilisation of vehicles by pooling trips (also between market players), a shift to cargo bikes or other small containers for the last mile (especially for deliveries of small lot or parcel sizes), and the reliable availability of loading zones.

Mobility data

As mentioned in the case studies, various instruments in the field of digitalisation and up-to-date data on traffic events can significantly boost both the quality and efficiency of traffic control. For planning and impact assessment in the field of transport and urban development, reliable and up-to-date data on mobility behaviour is also required. All too frequently, though, such data is not up-to-date, of insufficient quality or not comparable. In many metropolitan areas, planning and evaluation is often based on figures that are many years out-of-date.

Inter alia, more effective strategies are thus required to integrate and evaluate digital travel data from public and private sources in a useful way and to keep the database, which also reflects the context and background of mobility behaviour, as current as possible. In principle, at least the availability of data on current traffic events is less of a technical challenge than a regulatory and organisational one.

Vision Zero

The term "Vision Zero" describes the goal of reducing traffic accidents with fatal or serious injuries to zero. The set of measures to achieve this is broad and ranges from planning (e. g. the redesign of road space) via regulatory (e. g. clear reduction of speed limits) to technological solutions (e. g. improved vehicle sensors).

Vision Zero is suitable as an integrative and consensual objective for a socio-ecological urban and mobility transformation, under which many of the fields of action discussed here can be brought together. With

a consistent orientation towards this goal, the modal split shifts towards green transport modes, local and climate emissions decrease, the quality of public spaces improves and the usability of street spaces improves for everyone.

Annex 2 – Additional reading

Here is a list of suggestions by the authors for additional reading (in German). In view of the extensive literature in this field, we of course make no claim to being exhaustive. Nor do we want to suggest that we are evaluating any works that are not mentioned on this list in any way whatsoever.

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About this study

The present study summarizes the results of FES internal case studies for the cities of Shanghai, Seoul, Paris and Hamburg.

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We would like to thank the following people for their valuable contributions to the discussion leading to the creation of this paper:

Werner Faber, Association of German Transport Companies

Prof. Dr. Helmut Holzapfel, University of Kassel

Mathias Stein, Member of the Bundestag

Martin Stuber, German Confederation of Trade Unions

Edition Notice

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