Freiburg im Breisgau, Germany

Creating a livable city through ecomobility

ICLEI Local Governments for Sustainability

Freiburg uses transport planning to drive the mobility paradigm shift in which people's safety and needs are placed before those of vehicles. The city deploys a holistic approach toward achieving a broader spectrum of high-quality living, environmental and social benefits. Its long-term vision and efforts in promoting ecomobility proves successful: with affordable alternatives to car use, more than one-third of its residents do not own a car.

ICLEI Case Study #210 - December 2018

Freiburg in context

The City of Freiburg im Breisgau is a medium-sized city situated in Southwest Germany, in the Federal State of Baden-Württemberg. It serves as a gateway into Germany for travelers from Switzerland and France. The city itself is compact, with a population of 229,636 (2017 census). Freiburg's economy is mainly based on tourism, university and research, public administration as well as a broad range of services provided to the surrounding region.

Freiburg has achieved a large number of awards over the last 30 years. Some more recent ones include the "Germany Sustainability Award 2012" – reflecting the city's sustainable initiatives, infrastructure and commitment to sustainability, German "Federal Capital of Climate Protection 2010" and "European Green Capital Award" Finalist in 2009. Since 2008 Freiburg profiled itself as a Green City. The "green approach" is evident in its environment and mobility policies, city and town planning, as well as implementation strategies. The city's comprehensive and reliable transportation system aligns with its vision and is a major contribution to its sustainability.

Freiburg's ecomobility journey

Considered as a leading city in sustainable transport, Freiburg's mobility policy has drawn national and international attention for the priority that it asserts to environmentally-friendly means of transport.

In the 1960s when traffic congestion was at all-time high in Freiburg, a crucial decision was made to hold on to its existing tram network and to expand it consequently. In 1969, Freiburg adopted its first "General Urban Transport Policy" and boasted integrated transport planning that included conventional vehicle traffic, walking, cycling and public transport. The transportation plan has helped keep the city compact and pedestrian-oriented (Broaddus 2010). It is worth noting that the city's decision to keep the trams is different to many other German cities at that time in which the vision of automobile city resulted in enlarging the streets and reducing public transport infrastructure. For Freiburg, the underlying thinking was clear and still underpins today's transport management strategy – to develop an efficient urban mobility system that would appeal to the residents and does not adversely affect its urban development, nature and environment.

Facts & Figures

Population (2017)

229,636

Land area

153.07 km^2

Modal split (2016)

Walking: 29%
Bicycling: 34%
Public transportation: 16%
Personal automobile: 21%

EcoMobility
An ICLEI Initiative

Freiburg was among the founding members of ICLEI in 1990 and is a participant in the EcoMobility Alliance.

Freiburg's ecomobility journey - 70 years and beyond

	1950s - 60s Ensure a good level of mobility	1970s - 90s Restrict car use and improve walking, cycling and public transport	2000s - Present Further promote ecomobile modes of transport
PRIVATE CARS 	**1969** General Urban Transport Policy focused on accommodating car use and sought to ensure a good level of mobility within the city.	**1979** The Second General Urban Transport Policy emphasized the connection of transport and land use and favored ecomobile modes of transport over cars. **1987** The city council decided to traffic-calm all residential streets to 30 km/h by 1991.	Transport plan aims to shift car trips to ecomobile modes and make unavoidable car trips more sustainable. 90% of residents live in traffic-calmed areas of 30km/h or lower.
PUBLIC TRANSPORT 	A decision was made by the municipal council to hold on to its existing tram network and to expand it accordingly.	The city council decided to expand the light rail network. In the **1980s**, the city introduced the first transferrable flat-rate monthly transport ticket ("RegioKarte"). Tram network were extended to the new districts Rieselfeld and Vauban with car-free blocks.	**2008** The Transport Development Plan (VEP) 2020 was launched to ensure a more integrated land use and transport system. New light rail lines/extensions planned.
WALKING AND CYCLING 	**1969** General Urban Transport Policy boasted integrated transport planning that included walking, cycling, public transport, and conventional vehicular traffic.	**1970** The first bike plan was made with only 30km of bike paths in place. **1973** The city center was converted into a pedestrian zone.	**2012** The Cycling Concept 2020 was adopted to seek to increase the modal split of cycling to well over 30% by 2020; 420km of bike paths and cycling-friendly streets in the city.

To guide future mobility developments, the city of Freiburg has developed a strategic urban mobility plan called the Transport Development Plan (VEP) 2020. The plan, which was most recently revised in May 2008, advances a vision for Freiburg in 2020. In line with the Land Use Plan 2020, it aims to provide a mix of mobility options that are "social and environmental friendly". Some of the most important implementation steps of the VEP 2020 include:

- Reduction of (motorized) traffic through integrated urban and traffic planning;
- Relocation of the car transport to walking, cycling and public transport; and
- Compatible handling of non-relocatable car transport including parking management system, car-sharing network and controlled development of the road network.

Description of activities

Low speed and less noise

Recognizing the need to look into an urban mobility model that is ecomobile and economically efficient, the city of Freiburg has put a lot of effort in reducing personal automobile ownership and car-based travel. Since 1973, the public has seen the introduction of car-free zones in the historical city center. Many streets have been converted to car-free zones in districts such as Vauban, restricting car use and providing public space for social events and activities. Moreover, Freiburg has deployed an approach to channel through traffic onto arterial roads as well as increase the use of one-way streets, aiming to reduce vehicular traffic volume.

Car traffic has also been discouraged by the introduction of low-speed zones in all residential areas and "play streets" ("Spielstraße", speed limits are even further reduced in these residential streets, where pedestrians and cyclists have priority over automobiles). Currently 90% of the residents live on streets that have a speed limit of 30 km/h or lower [*Image 1*]. Since November 2018, the city has introduced a speed limit of 30 km/h to several main roads at night between 22h and 6h and one main street (B31) for the whole day. The formal basis of such ambitious intervention is that the residents will benefit from city-wide noise reduction and better air quality.

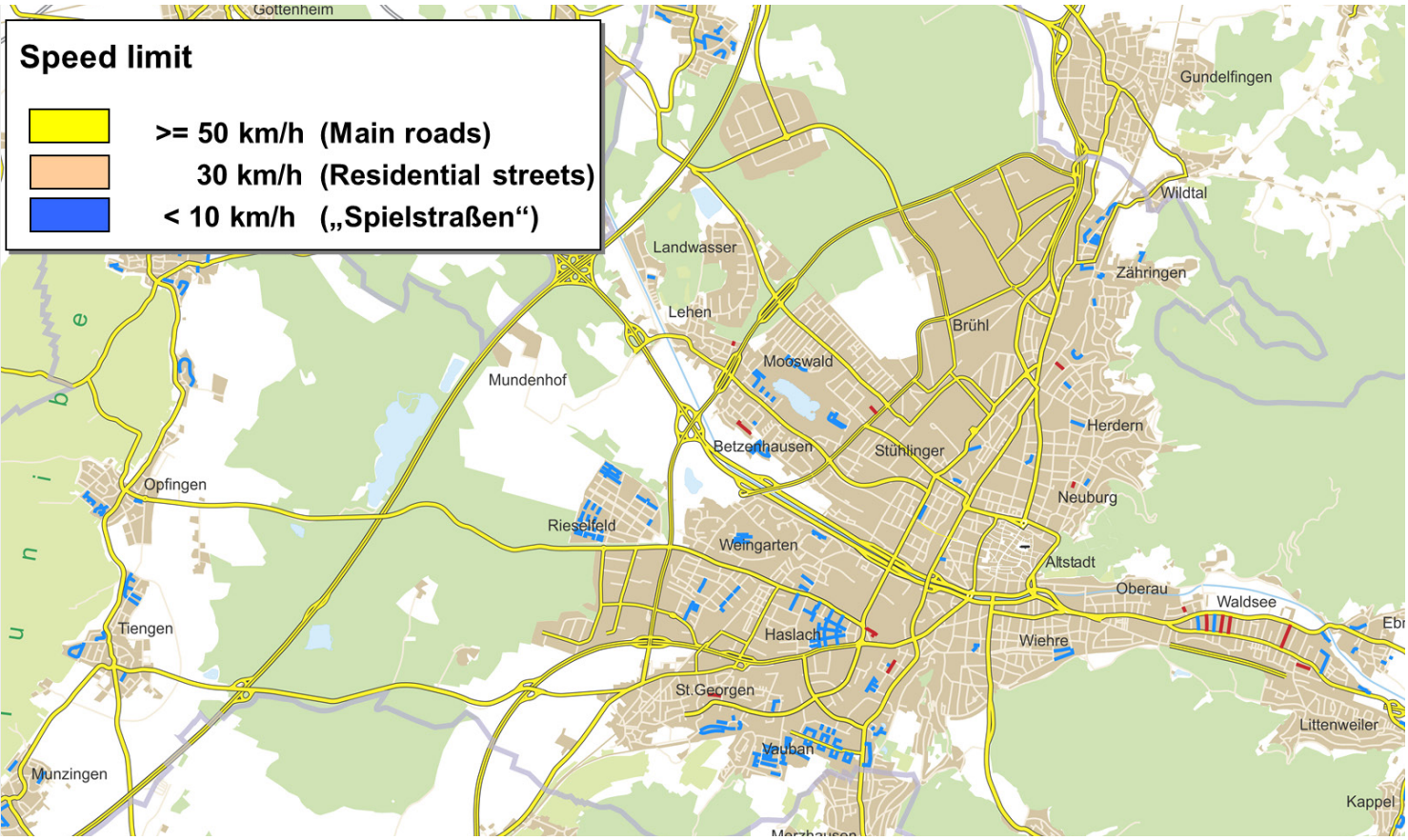

Image 1: Currently 90% of Freiburg residents live on streets that have a speed limit of 30 kilometers per hour (km/h) or lower Source: City of Freiburg

Compatible parking management

Parking management is another critical factor in restricting car usage, even though frequently underestimated. According to the studies in different cities, people choose their modes of transport based on the parking conditions at their destinations (Garthwaite 2011). Freiburg's parking policy is designed to make car use more expensive and less convenient. In residential areas next to the city center, parking is reserved for residents only and a special permit is required. Looking at on-street parking, it became more expensive with proximity to the city center: 2.5 Euro per hour (€/h) in the innermost zone (Zone I), 1.8 €/h in the intermediate zone (Zone II) and 0.8 €/h in the outermost one (Zone III) [*Image 2*]. Additionally, on-street parking in the inner city has been progressively replaced with multi-story parking garages to minimize space redundancy meanwhile the charges for on-street parking have increased by more than 20%. Currently there are 19 car parks in and around the city, with parking guidance system providing real-time information on available parking spaces.

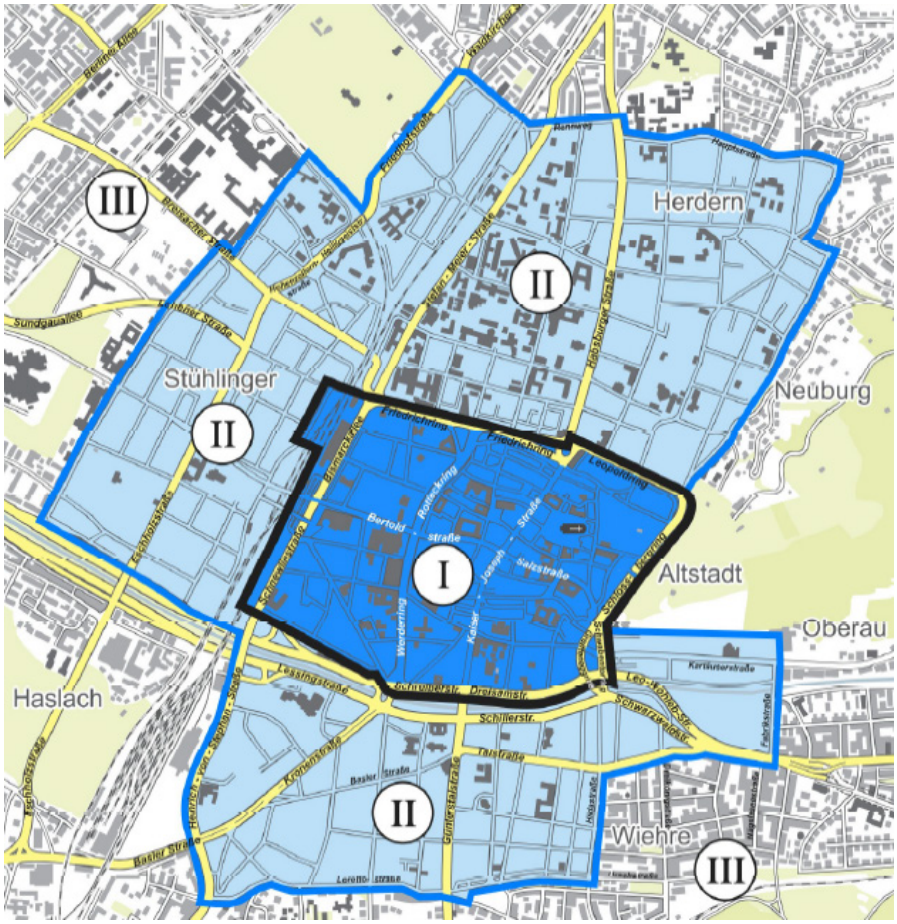

Image 2: On-street parking in Freiburg: it becomes more expensive with proximity to the city center

Source: City of Freiburg

Also noteworthy is the parking space management in the district of Vauban, which has been one of the most recognized development projects in Freiburg. In order to limit car use, the district has set up "parking-free residential streets" and separated parking to prevent through traffic. Overall residential parking space to unit ratio there is less than 0.5, provided with 470 spaces in two peripheral parking garages. Car owners in Vauban have to purchase a parking spot in a car park with a monthly maintenance charge of 70 Euros. This regulation ensures a high-quality of living in the district and is widely accepeted among the inhabitants, although some people sometimes misuse the system and undermine the efforts to promote car-free living. A recent case study pointed out that 67% of car-owning residents in parking-free blocks are dissatisfied with being unable to park outside their home (Nicole Foletta and Simon Field 2011). Nonetheless, such parking policies can be fine-tuned by adjusting provision standards against factors such as public transport accessibility. As a rule of thumb, the areas with good access to public transport should aim to limit car parking supply.

Public transport: backbone of its transportation system

Complementing to its car-restrictive measures, Freiburg offers a combination of ecomobile modes of transport that are affordable, reliable and accessible. In order to achieve this, Freiburg undertook the provision of an integrated public transport network which includes a range of modalities with high-quality services. At present, around 90% of all residents have a public transport stop within 500 meters of their home, aligned with the Sustainable Development Goals 11.2.

With the ability to transport large numbers of passengers efficiently and effectively, the tram ("Stadtbahn") system is the centerpiece of the city's public transport and has been constantly expanded and upgraded. Operated by Freiburger Verkehrs AG (VAG), its tram network consists of 5 routes travelled by 72 vehicles across the city, with 73 stops distributed over 43.9km of tracks. Trams are fast: during rush hour, trams run approximately 7.5-minute intervals; they have their own tracks separate from car roads and have priority at most of the junctions, as a result, 83% of the passengers choose tram as their preferred mode of public transport.

Complementary to the trams, city buses serve as feeder modes to bring people to transfer hubs, with a total network of 165.6km and 18 bus lines. Like trams, city buses are also fast and reliable because of traffic signals priority at many intersections. Freiburg has also improved regional rail services and bus services. Since 1985, the annual number of passengers in the city and the surrounding region doubled, reaching to 124.9 million in 2017 (RVF 2017).

Trams, buses and regional services have been further enhanced by the integrated ticketing system. Freiburg's approach to make its public transport a world-class system is to provide efficient service at an affordable rate: single ticket costs 2.30€, it allows passengers to use a ticket for different types of services and several trip segments. The monthly transport card "RegioKarte" costs 60€ and it offers reduced fares for commuters for unlimited travel within the entire region. The introduction of the regional ticket helped increase public transport trips region-wide by 70% between 1991 and 2007 (RVF 2008). Another key factor in increasing the ridership of public transport is to make it accessible and socially inclusive. Freiburg achieved this by refurbishing its stations which can be easily accessed and are barrier-free to ensure accessibility for all residents.

Walking and cycling

The city's commitment to sustainable transport has been accompanied by its infrastructure interventions aimed at improving walking and cycling conditions.

Ensuring good walkability is important. With the concept of compact urban development in mind, Freiburg has set up car-free zones in the center, traffic-calmed all residential streets, and encouraged short trips. Realizing the need to promote walking, the city plans to widen sidewalks, improve street lighting and extend the pedestrian network with new tramways.

Cycling is an equitable, affordable and efficient mobility option. Guided by signboards indicating specific cycling rules for any stretch of roads, Freiburg's cyclists are able to ride safely: the average number of cyclists-related accidents in Freiburg is 500 per year, with 80 of them badly injured. Overtime Freiburg has developed a dense network of bike paths, extending to 472 km, out of which 230 km are dedicated cycle tracks (alongside streets or separate routes) and 120 km are cycling-friendly. With cycling as the second most popular transport mode in Freiburg, the city does not rest on its laurels. It has planned to boost the modal share of cycling in the city to over 30% by 2020, according to the Cycling Concept 2020 (Radverkehrskonzept Freiburg 2020). The plan looks at measures and steps that can be taken to create a safer and better cycling environment in the city. Notably, the cycle lanes are divided into three categories - priority, main and additional routes *[Image 3]*. In terms of priority routes, the paths can be 3m wide if it is only used cycling while it is approximately 4m to 5m wide if the space is shared with pedestrians. Where the bike path is placed next to main road, the width will be designed to be equal or more than 2m. Main routes also allow cyclists to travel safely and at a relatively fast speed. Additional routes are simpler, more basic paths. Width of such paths ranges from 2m on separate tracks to 1.6m where space needs to be shared.

Complementing the bike paths are 9,000 bike parking spaces at journey destination and intermediate halts across the city. Apart from increasing the supply for bike parking, the city also enhances its services and integrates it well with public transport and other mobility options: under the Bike & Ride scheme, parking infrastructure has been provided near tram and bus stops. Near Freiburg's main train station there is a major bike station offering secure parking for 1,000 bikes, 200 public bikes for rental, together with bike repair and travel advices.

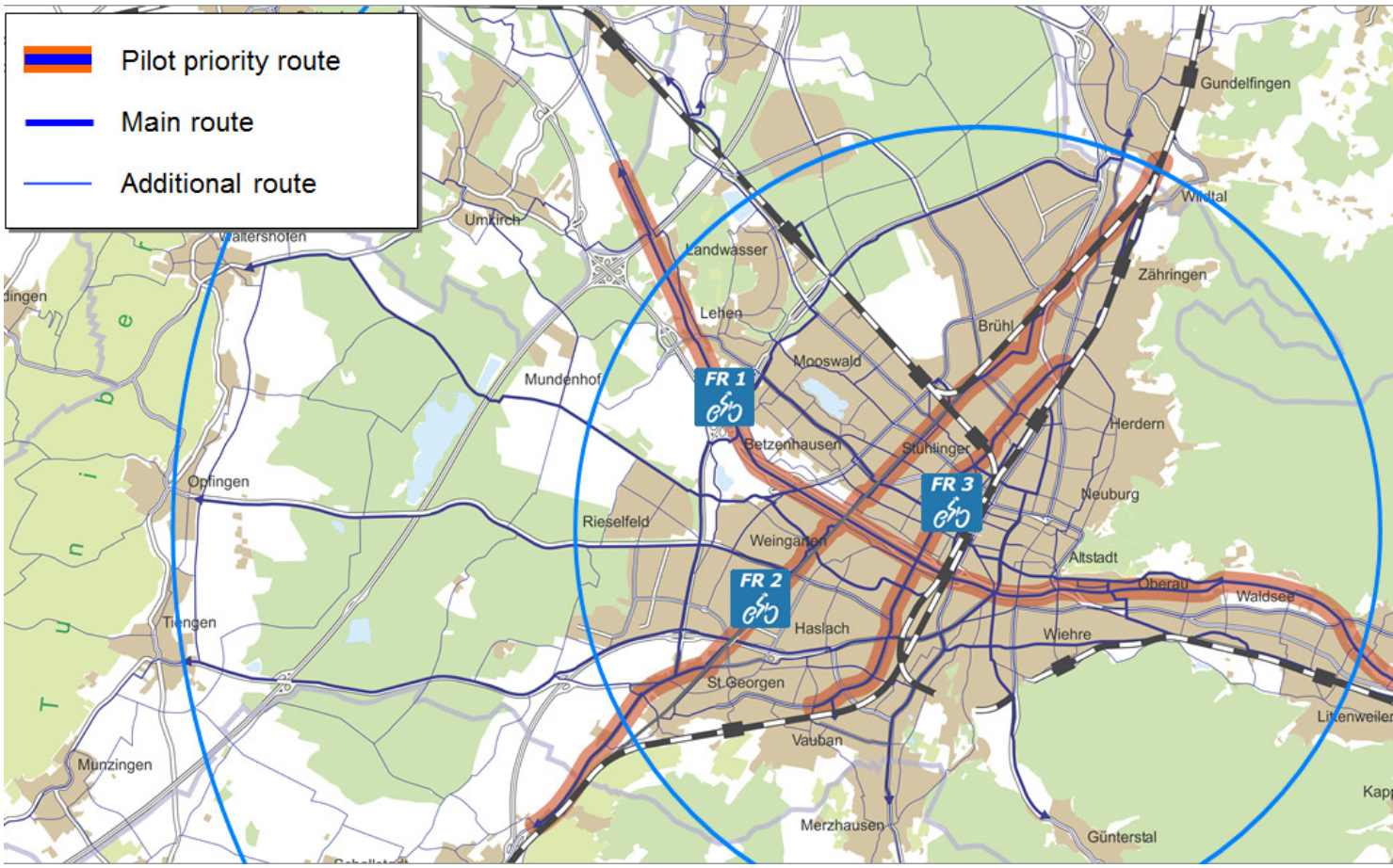

Image 3: According to the Cycling Concept 2020, the cycle lanes are divided into three categories - priority, main and additional routes Source: City of Freiburg

Make alternative mobility options convenient through car sharing

In the age of sharing economy, shared vehicles plug the gap between public transport and privately owned vehicles by tapping on the underutilized services in cities' existing mobility system, either ride-hailing or traditional car sharing schemes. Looking at Freiburg's car sharing, the local authority has been promoting its development with a detailed action plan and incentive measures – for instance, parking spaces in good locations are dedicated to car sharing providers. As of 2016, Freiburg developed a large and dense car sharing network, covering 115 stations near major train stations and tram stops as well as in the middle of residental areas. There are mainly three car sharing providers in the city: stadtmobil Südbaden AG, Grüne Flotte and my e-car. It is worth noting that the city has forged partnership with my e-car in promoting electric car sharing and installing necessary infrastructure.

While acknowledging that car sharing system contributes to the reduction of private vehicles on the road, what is more important is that such services must complement its public transport system, instead of attracting passengers away and increasing road traffic.

Results

Without any double, Freiburg has been successfully using policy changes to drive the mobility paradigm shift towards a more sustainable urban future: 40% of Freiburg residents do not own a car; the city has one of the lowest automobile density in Germany, with only 394 passenger cars per 1,000 residents – the figure in average in

the country is 560. Between 1999 and 2016, the city has recorded a drop in the modal split of cars of 32% to 21%. At the same time, the share of trips made by bicycle improved strongly from 15% in 1982 to 34% in 2016; and public transport's share of trips rose from 11% to 16%.

Freiburg: mobility in figures

29% - Walking mode share

34% - Cycling mode share

16% - Public transport mode share

40% of households do not own a car

90% of all residents live near a public transport stop (500 meters of their home)

43.9 km of light rail network with **72 vehicles**

472 km of cycle lanes, **9,000** bike parking spaces

165.6 km bus network with **65 buses** serving as feeder modes to bring people to transfer hubs

394 vehicles per 1,000 residents **- lowest** automobile density in Germany

1.41 Carsharing-vehicles per 1,000 residents

Challenges

Moving forward, there remains scope to examine the challenges of Freiburg's mobility solutions. The city acknowledges that its policies so far have only achieved in stabilizing the automobile density, however, its existing mobility system is still experiencing a fair amount of resistance and inertia again shifting from conventional motorized vehicles to alternative modes of transport. Although many transport strategies have been designed to deter the car ownership and usage, in practice, the number of cars has been on the rise: personal owned vehicles increased from 79,912 to 88,476 between 2009 and 2016. The city hopes that the modal share of motorized transport will sink and points to the integration of different means of transport. To date, the transportation company VAG has initiated a new mobility platform, aiming to provide a customizable package comprising public transport, taxis, bike parking, car sharing and personal mobility devises to fit the growing mobility needs in the city.

With a predicted increase in transport growth, the city is looking to further increase its public transportation ridership and promote cycling. To achieve this, the city plans to extend its tram network to the Fair and the new Soccer Stadium by 2020 as well as provide better access to inner city by opening a new bypass route in the inner city in 2019. In order to boost the modal split for cycling to well over 30% by the year 2020, the city is looking to preserve and regularly update its cycling infrastructure and exploring opportunities to cater for increasing numbers of electric bicycles.

Lessons learned

Cities aspiring to be more like Freiburg in terms of transport would be advised to integrate its transport planning and land use planning. In order to do so, there must be an alignment of vision and efforts across departments, as it ensures that the promotion of sustainable mobility is not isolated from other sustainable development goals and can be politically palatable. Redesigning existing roads and setting up low-speed zones is a crucial step for restricting car usage.

Furthermore, cities should aim to create a mobility ecosystem that is affordable and well-connected, and should place public transport and other sustainable mobility solutions as the core of the system. In order to do so, they need to complete the public transit network by linking up residential areas. Priority lanes should be provided to trams and buses.

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Beyond the development of public transport, cities need to accommodate both cyclists and pedestrians. To achieve this, they need to improve the pedestrian network and make bike lanes continuous and coherent. In many cases, dedicated lanes for cyclists and pedestrians can be spared from multi-lanes roads. Installing bike parking facilities near public transport stops is also a quick way to encourage the use of cycling.

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