Recommendations on

How to deal with limited urban space and conflicting demands for it, taking into account social, climate and environmental goals

EGUM WG 6: Future of urban mobility and inclusive and sustainable urban space Del 6.1

V6.0

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1.1 HOW TO READ THIS REPORT

Understanding that this report will serve different purposes for different audiences, we provide here a colour-coded "key" to the report to help readers find the content and level of detail most relevant to them.

> For those who would like a **brief overview** of the 17 modules for more efficient and sustainable use of urban street space, these can be found in chapter 2, highlighted in grey.

> For those who would like to take a **deeper dive** into the 17 modules, these are described in detail in chapter 4, and are highlighted in gold.

> In light blue boxes throughout the report, you'll find the statements from sub-group members that **diverge from the majority view**.

> For those looking for **inspiration**, the sub-group members collected examples of showcase activities to achieve more efficient use of street space. These can be found in chapter 7 in green.

1.2 EXECUTIVE SUMMARY

Cities are a backbone of our modern society, of the economy. Competitiveness requires quality of life in cities as well as an efficient mobility system – which itself depends to a large extend on how we organise our street space. Some good and fair organisation of street space may lead to bringing sustainability in all its dimension: economic, ecological and as well social.

Street space in cities is *per se* a limited resource. It has to serve manifold functions – not only transportation but also social and ecological functions. It is the 'space in front of our home' where most daily trips start or terminate. It is a space where children could play and where residents could meet. But space is also needed for greening and rainwater management ("green and blue plans") as part of climate adaptation as well as for delivery zones as a consequence of increasing e-commerce.

The growing and competing needs lead to more and more conflicting interests. Street space is currently still an underestimated factor for sustainable mobility. Space for walking and social communications, for storing bicycles, for providing shared mobility vehicles and for delivery zones all stand in conflict with the space demand of parked cars. And it is not only the growing *number* of cars causing problems for our limited street space. The growing *size* of cars reduces the number that can be stored on street space.

For these and many other reasons, we need to look at ways to better (re-)organise street space to serve all these functions efficiently and sustainably. While the specific local needs for reorganised street space might differ across Europe, the process of reorganising street space has many common aspects. Although not being used for the vast majority of time, parked cars consuming so much valuable space. Kerbside management can be developed as a catalyst for better parking policies – thus for attractive urban spaces. Parking policy as part of regional access strategies and parking policies favouring smaller and greener vehicles will be essential in this context with a view to increasing the positive impact of parking policies in the city (see

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EGUM UVAR recommendations on parking[1]). It is time to further develop alternatives to storing cars in valuable street space. This can be done through various combinations of push and pull means like access and parking regulations, a shift to neighbourhood garages (with related business concept) and car sharing as alternative to car ownership.

This paper also takes on board recommendations for a climate friendly city 2030 that were developed in the 'platform urban mobility'[2] of the German motor industry representatives with 9 cities.

This report puts together 17 strategic modules to deal with street space, with an aim to support sustainable mobility, reduce the need for car ownership and improve quality of life in neighbourhoods – also looking at road safety for pedestrians, cyclists, everyone independent from age or abilities. It includes both short term actions and long-term strategies and low-tech and high-tech approaches. The solutions generally also require appropriate local, national and European policy making – powered by a vision of sustainable mobility.

The cross-sectoral challenge of limited street space is high on the agenda of municipalities all over Europe – and became the subject of the sub-group "Future of urban mobility and inclusive and sustainable urban space" within the EGUM. A list of members of the sub-group can be found in Annex 8.4. The sub-group is made up on 31 members from various backgrounds who actively contributed to this report.

A key objective of the work was to initiate and support an open debate on how to best address the challenges created by space in cities. As urban street space is the subject of many demands and of controversial debates in cities, it should not be surprising that there were also diverging views in this sub-group. For the sake of transparency, the sub-group agreed that views that diverged significantly from the majority should be made visible to the reader (see page 80). There was also agreement that openly and respectfully discussing such diverging views – and the reasons behind them – can help us collectively move forward.

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[1] See Adoption of recommendations on Urban Vehicle Access Regulations (UVARs) - European Commission (europa.eu)

[2] see: (Microsoft PowerPoint - PUM-Bilder f\374r Ver\366ffentlichung .pptx) (plattform-urbane-mobilitaet.de)

2. Overview: 17 modules to make the use of street space more efficient and sustainable

There is no silver bullet to deal with the competition and conflicts around urban street space. The following 17 modules represent strategic modules and show how planning, regulation, technology and behavioural approaches may be used to make our cities more liveable, to make transport more efficient, to reduce the climate footprint and to adapt to climate change.

1. Integrate Sustainable *Neighbourhood* Mobility Plans with SUMP
2. Develop green and blue plans for street space
3. Improve vehicle design guidelines in relation to public space design
4. Put in place traffic calming and shared space
5. Add parklets, cafés and other elements for better social interaction
6. (Re-)allocate sufficient space for walking
7. Integrate public transport into street space
8. Plan and build cycle infrastructure, including safe bike parking
9. Dedicate space to shared e-scooters, bikes and cargo-bikes
10. Try out innovative urban logistics approaches
11. Plan and implement e-charging hubs
12. Use car sharing to reduce demand for car parking
13. Use parking garages to reduce demand for on-street parking
14. Ensure compliance with the given rules
15. Improve visibility and other safety aspects
16. Use kerbside management for more efficient use of street space
17. Exploit technology on the way to automated transport through *Intelligent Parking Assistant* (IPA)

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1. Integrate Sustainable *Neighbourhood* Mobility Plans with SUMP

SUMPs represent a city-wide or even a regional plan but plans to reorganise street space needs to be much more detailed in the scale. The development of *neighbourhood* plans can be a way of implementing the overall SUMP objectives. Such plans can cover aspects not normally addressed by SUMPs (e.g. green and blue plans) and require much more detailed planning (e.g. locations for shared mobility, detailed street-by-street regulation of parking space, e-charging hubs and other detailed design elements). The SUMP approach can therefore also be a helpful methodology applied at the neighbourhood level.

Key Points:
- SUMPs are an established instrument to plan sustainable mobility at a city (or regional) level
- The neighbourhood level requires a detailed planning instrument to manage the demands for street space – and to allocate space for various mobility needs – making it a key instrument for achieving the objectives of a SUMP.
- The street space in front of the doors of citizens is often the subject of various claims – and the subject of intense and conflictual debates.
- Integrated planning methods – including participation and conflict management – are necessary to achieve the objectives of SUMPs at the *neighbourhood* level.
- Neighbourhood walks and other on-street communication methods create good opportunities to discuss details and conflicting interest with and among residents.

Cities are the players who need to organise street space and implement any re-design.
The European SUMP guidelines revision should make more reference to the aspects of street space and the neighbourhood level – as should any national SUMP training programmes.

2.   Develop green and blue plans for street space

Climate change has severe impacts on the entire transport sector – including urban mobility and the quality of life in cities. Street space serves not only transport and social functions but is also needed as ecological space. As climate change increases the risk of heat waves and of stormwater incidents – with strong impacts on urban mobility - climate adaptation becomes urgent – and it requires space. Largely, the level of sealing and the patterns of buildings determine the microclimate in our neighbourhoods. Greening and desealing are necessary to improve the microclimate and to better prepare for stormwater incidents.

CLIMATE ADAPTATION

Key Points:
- Climate change is increasing health risks for residents and stress on urban streets space – especially in terms of overheating and risk of flooding.
- Greening and de-sealing streets are necessary measures to reduce heat extremes and to improve rainwater management – a new priority for dedicating street space.
- Rainwater storage can happen both in swales and in parking lanes.
- Green and blue plans deal with overheating and with managing rainwater in case of events that bring the traditional infrastructure beyond its limits.

Who needs to act?
Local authorities are in the forefront to implement measures of greening street space and of considering stormwater management. They must communicate the needs and plan the detailed measures of climate adaptation and general greening in local streets.
Research and pilot measures should be integrated in European and national research and implementation support programmes.

3.   Consider the impacts of vehicle size and design on public space

Different types of vehicles use public street space. The larger the vehicles, the fewer can be accommodated. New types of vehicles come up and sometimes change the 'mobility landscape' Some developments bear new opportunities, some bear new challenges.
The ever-growing size and height of passenger cars is causing increasing problems for the use, design guidelines and regulations of public space. On the other hand, there are many vehicle types 'between shoes and cars' to be further considered and prioritised.
All involved parties need to be aware about the impacts of larger and higher passenger cars on the use of public space and on road safety (e.g. through limited visibility).

sIZE MATTERS

Key Points:
- Ever bigger passenger cars consume more space – fewer cars can be accommodated on same space
- The height of cars causes safety concerns for other road users by reducing visibility.
- Adapting street design guidelines to larger vehicles would allow fewer cars in the same space.
- As street space is limited, some de-incentivising of vehicles that consume much space could lead to a more efficient use of the given space.

- Municipalities should use new national legal frameworks to prioritise smaller cars – e.g. by designing and dedicating parking bays explicitly for smaller cars.

Who needs to act?

The European and national levels should reflect the impacts of ever-growing passenger cars on the use of limited urban street space and to consider the development of regulatory and fiscal frameworks that encourages smaller vehicles.

As regulations of e-scooters in public street space have demonstrated, a clear regulatory framework can reduce problems associated with certain vehicles and their use.

See also ACEA comment p.34

4. Put in place traffic calming and shared space

Streets with separated uses leave little space for pedestrians and no space for playing. To counter this problem, traffic calmed areas and shared spaces were introduced. A core idea was to allow pedestrians to use the entire width of the street and not be restricted to (narrow) sidewalks. These roads remain available for motor vehicle use – however, with reduced speed and less car dominance.

Key Points:
- Traffic calming allows the reallocation of street space – extending the space for walking and offering the entire width of a (traffic calmed) street for playing.
- Reducing / limiting the speed of vehicles is a core pre-requisite to give pedestrians a safe feeling when sharing street space.
- The shared space approach goes beyond traffic calming to removing features such as kerbs, road surface markings, traffic signs, and traffic lights.
- The same basic objectives of planning, designed, operation to enable safe, convenient and comfortable travel and access for users of all ages and abilities regardless of their mode of transportation can be found in 'complete streets' or 'living streets'.
- Pure shared space without dedicated 'safe areas' for pedestrians might cause concerns for people with visual or hearing impairments.

Who needs to act?

National governments set the legal framework (Highway Codes and related guidelines), establishing how and where traffic calming and shared space can be applied. Local authorities implement traffic calming and shared space approaches.

In an initiative report on road safety[3], the European Parliament called on the EU Member States to implement 30 km/h in urban areas as a default. The European Commission is encouraged to support local authorities through research and demonstration programs.

5. Add parklets, cafés and other elements for better social interaction

Walkability depends also on the quality of urban space – not only as moving but as well for resting and for social communications. It is a common human desire to sit outside when the weather allows. Parklets are a comparatively new instrument to convert some street space (mainly in parking lanes) through the installation of greening and spaces where people can sit, meet, etc. The installation of parklets can give street space more quality. Cities in Europe are discovering how to test, implement and maintain such temporary or permanent installations in urban streets.

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[3] See https://www.europarl.europa.eu/news/en/press-room/20210930IPR13926/european-parliament-issues-wake-up-call-on-road-safety

Key Points:
- Such installations (sometimes temporary, sometimes permanent) help to change the perception and usability of street space
- Outdoor seating areas of cafés, pubs and restaurants have become very popular across Europe. There should also be non-commercial areas with seating and other communication opportunities.

Who needs to act?
Local authorities can test or implement such installations. Pilot measures and related evaluation should be integrated in European and national research and implementation support programmes.

6.   (Re-)allocate sufficient space for walking

Despite being a natural, least expensive and a very healthy mode of transport, walking is the most underestimated and often least supported in municipal transport strategies.

Enough space for walking side-by-side on sidewalks should be as normal as sitting in car side-by-side.

Key Points:
- Although used for 20 – 25% of all (door-to-door) trips in European cities, walking is the most underestimated mode of transport.
- Walkability is an indicator of inclusiveness; the signed Convention on the Rights of Persons with Disabilities needs to be translated into inclusive street space.
- Vehicle parking is often an obstacle for pedestrians.
- The quality of urban space impacts the perception of the time spent walking; 'boring' urban space gives the impression that the journey is longer.

Who needs to act?

Local authorities can implement actions to better organise or re-design local streets.
Whereas there are European strategy papers on other sustainable modes, there is not yet a European walking strategy on the same level. The EU SUMP Topic Guide on supporting and encouraging walking should be applied by local authorities and integrated in the national SUMP programmes. Some countries have national walking strategies; these may serve as blueprints for other countries.
Research and pilot measures should be integrated in European and national research and implementation support programmes.

7.   Integrate public transport into street space

Collective (public) transport is the most space efficient way to transport high volumes of people and is the backbone of the urban mobility system. Space is required both for undisturbed vehicle operation, and for waiting areas at stops. The role of pleasant walking conditions as a feeder to public transport needs to be emphasised.

Key Points:
- Separated infrastructure (bus lanes, tram tracks) is a prerequisite for undisturbed, efficient operation of public transport - to be prioritized over parking.
- Walking is the most important feeder for public transport. This means walkability is part of public transport quality; attractive walking space extends the catchment area for public transport.
- Waiting areas at public transport stops need space – beyond the space taken by the shelter itself. There are as well aesthetic aspects of waiting areas.

- Intermodal connections and transfer areas need space for a convenient change of vehicles, including the connection to other modes (Bike&Ride, Park&Ride, hubs for bike-sharing, e-scooters, carsharing, taxi, Kiss&Ride)

Who needs to act?

Cities are responsible for the design and operation of local streets.
Public transport operators need to understand that good walking conditions near stops increase the catchment area and should focus the conditions for this form of feeder transport.
Authorities and operators preparing design principles of on-street public transport stops need to consider the provision of sufficient space for a waiting area, a shelter and relevant information, while still respecting the space of pedestrians and cyclists.

See also ACEA comment in 4.7

8. Plan and build cycle infrastructure, including safe bike parking

Cycling has become a main option of sustainable mobility. The European Commission, Council and European Parliament have adopted the European Cycling Declaration in order to promote, increase and improve conditions for cycling – with benefits also for other modes (such as micromobility).
To optimally encourage cycling, it is necessary to improve the entire cycling system – involving plentiful safe cycling infrastructure, sufficient high-quality bicycle parking facilities and measure to encourage bicycle use among people who do not cycle or who cannot afford it.
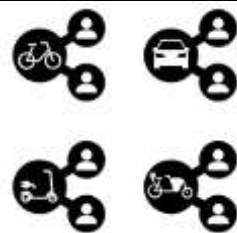
Key Points:
- Cycling is a very efficient and sustainable mode of transport – thus a key module of SUMPs in many cities.
- Cycling requires safe and attractive infrastructure, which is often a conflict when it comes to limited space in urban streets.
- Safe bike parking is a pre-requisite to promote cycling.
- In many densely built urban neighbourhoods, there is not enough space for safe and convenient storage of bicycles in homes. Bicycle parking on street space can make cycling more attractive.

Who needs to act?

Design and implementation of street-related bike infrastructure is the responsibility of road authorities. National and European design guidelines and recommendations should consider sufficient space for safe cycling and good bike-parking.
Safe and convenient off-street bike parking supplements good cycling conditions. Employers, shopkeepers and housing companies should take this seriously by providing good bike parking.

9. Dedicate space to shared e-scooters, bikes and cargo-bikes

Whereas shared bicycles have become part of the urban transport system over the last decades, shared e-scooters and cargo bikes are comparatively new, and e-scooters have created challenges in public space in recent years. Dedicated stations to pick up and leave the vehicles after help to organise such services without disrupting or endangering pedestrians.

- Shared (micro-)mobility vehicles can be part of sustainable mobility strategies
- As e-scooters, bicycles, cargo-bikes are usually to be parked on the pavement, it may cause obstructions for pedestrians. It is important to consider their placement and find solutions to ensure they do not inconvenience pedestrians
- To well integrate shared micro-mobility vehicles in sustainable mobility strategies, it requires clear regulations for operators – especially geo-referenced no parking zones – and dedicated areas to leave the vehicles behind with becoming barriers to other road users
- Shared cargo bikes can replace a significant share of car trips of 'private micro-logistics' – like grocery shopping, transport of children… - but need easy access

Who needs to act?

Local authorities are the key players for the design and operation of local streets. In most cases, the operation of shared mobility services is a private commercial business – which may be subsidised or contracted by local authorities (within a national legal framework). Authorities should require certain quality and safety standards from operators, e.g. to create no-parking zones to avoid vehicles being left as obstacles for pedestrians or cyclists. To ease operation under such circumstances, local authorities should provide some street space for stations, where the shared vehicles should be left (small mobility hubs) – in narrow street space preferred in the parking lane in order to avoid conflicts with pedestrians.

The national level sets conditions for the vehicles (safety, maximum speed, etc.) and for users (e.g. minimum age).

10. Try out innovative urban logistics approaches

With the increase of e-commerce, last-mile logistics has become a pressing concern for cities across Europe. The increasing number of delivery vans is causing more and more problems in urban neighbourhoods with narrow streets where they are often parked illegally, whether on cycle lanes, sidewalks, or double-parked on main roads. A better organisation of urban street space – including delivery zones – can reduce the conflicts with all other modes, but it requires establishing and enforcing rules. Digital tools may help.

Key Points:
- Loading and unloading zones are an instrument to reduce conflicts caused by delivery vans – requiring the dedication of space for these and clear and consistent enforcement.
- Micro-hubs can be considered a new solution – facilitating a shift from vans to cargo bikes or other smaller and clean vehicles.
- Micro-depots and parcel lockers are effective solutions for storage of delivery goods and returns.
- Dealing with urban logistics should include the role of private micro-logistics, potential white-label solutions -independent from single operators- for micro-depots/parcel lockers, with strategies to local shops in order to revitalise neighbourhood and city – being integrated in Sustainable Urban Logistics Plans (SULPs)

Who needs to act?

On the operational level, logistics is a commercial market-based business.
Local and national authorities set the framework for operation.
Pilot project and research projects should further be supported to gain more knowledge and develop innovative solutions.

See also ACEA comment in 4.10, p.

11. Plan and implement e-charging hubs

Phasing out fossil fuel-based internal combustion engines is a key instrument to reduce transport-related CO_2 emissions. Battery-electric cars need charging facilities, some of which may be required on street in urban neighbourhoods where very little off-street parking is available.

Key Points:
- Charging infrastructure is a pre-requisite for promoting e-mobility, but it requires a business case – which may include subsidies.
- E-charging infrastructure should be installed off-street rather than on-street, if possible, but urban neighbourhoods with little off-street parking may require on-street charging as well.
- On-street charging points require space for technical infrastructure, which should not obstruct other road users (esp. cyclists and pedestrians, including persons with reduced mobility).
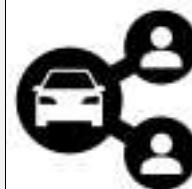
Who needs to act?

When installation and operation of e-charging points is carried out by private entities, local authorities need to set a framework establishing where charging points should / can be installed.
A national framework about operating e-charging infrastructure should enable access to charging infrastructure on public street space following the roaming principle, meaning it is independent of the home electricity provider and of the means of payment.
The responsible road authority may provide signage indicating the maximum charging time to allow use of the charging infrastructure by as many users as possible (business case). Deployment of e-charging hubs need to be coordinated with the grid operators.

12. Use car sharing to reduce demand for car parking

Carsharing has proven its potential as an alternative to car ownership – when sustainable modes provide conditions that enable regular daily trips without a car. Of all shared mobility options, car sharing has the strongest impact on car ownership.

Key Points:
- Car sharing – in conjunction with a high level of other mobility options – has the potential to be an alternative to car ownership, allowing cities to reclaim street space in an efficient way.
- The reliability of (station-based) car sharing services is a key aspect for it to be a real alternative to car ownership.
- Municipal support for car sharing has its largest potential in providing space for stations and integrating car sharing with other mobility services (esp. public transport).
- Independent quality criteria should be set to define cities' expectations of car sharing operators, especially if car sharing is to function as alternative to car ownership.

Who needs to act?

Car sharing operators are usually private commercial businesses.
Cities should provide space for on-street car sharing stations and should maintain independent quality criteria focussing on the role of car sharing as an alternative to car ownership.
Car sharing operators should provide a service level that satisfies customers' needs. These include easy handling, reliability and an attractive fare structure.

13.   Use parking garages to reduce demand for on-street parking

Many urban neighbourhoods suffer under the high demand for car parking space. One option to reduce the number of cars in neighbourhood streets is to shift the vehicles into neighbourhood garages or car parks. When such collective parking is provided are in the periphery of a neighbourhood, the volume of car traffic in neighbourhood streets will also be reduced.

Nevertheless, garages and car parks need space, which is hard to find in some urban neighbourhoods. They also require substantial investment, and the off-street spaces will be more frequently used, when they are less expensive than parking in neighbouring streets (and on-street parking regulations are enforced).

Key Points:
- Neighbourhood parking garages are a tool to shift from on-street parking to off-street parking.
- The investment cost for parking garages is high and requires appropriate parking fees to cover the investment and operating costs.
- Free on-street parking close to parking garages undermines the potential business case.
- Multi-use of parking spots of supermarkets, etc. may relieve the overnight parking situation.
- When long-term parking is shifted into garages, reduced on-street space can be used for short-term parking for deliveries, nursing services, craftspeople and others.

Who needs to act?

Cities set the framework through spatial planning and the management street space. The operation of parking garages can be done by a market-based private company or through a municipal parking management company. A city should limit on-street parking and implement pay parking around parking garages to create a business case for such garages.

14.   Ensure compliance with the given rules

An efficient mobility system and fair and inclusive share of street space requires understandable rules and regulations – and they need to be kept. As street space is limited, there are competing interest of using this limited space. We have written regulations and unwritten principles of fairly sharing public space in order to have a fair share and safe use of street space for all. This is related both to the regulatory framework and to the extent to which the rules are kept – or whether some user groups are disadvantaged or discriminated against.

Key Points:

- A key objective of a Highway Code is to ensure the safety of all road users.
- Compliance with the rules is a pre-requisite to ensure a well working and efficient mobility systems; this may require strict enforcement.
- The implementation of transport measures should not disadvantage certain groups of road users.
- Where enforcement is not sufficient, other measures may be needed (e.g., bollards), but these are usually costly and also take up space.
- Soft methods based on targeted communication, should accompany regulatory measures

Who needs to act?

The national level is called upon to set the framework of parking regulations and sets the rates and the local level enforces. Local authorities – especially enforcement departments – must take action when the rules are not obeyed.

The national level must provide a functional framework to allow for digital technologies – including for enforcement.

15.   Improve visibility and other safety aspects

Seeing each other is one of the key aspects of safety in mixed-use urban streets. The organisation of urban street space defines the visibility conditions. This includes (but is not limited to) car parking.

INTER VISIBILITY

Key Points:
- Being able to move around safely is a prerequisite of sustainable mobility.
- Main aspects of increasing road safety in relation to space are speed reduction and visibility between road users and distance between road users moving with very different speeds
- Keeping zones clear from parking (and other obstacles) is a way to ensure visibility between road users – especially at intersections and areas of pedestrian crossings
- The implementation of transport measures should not disadvantage certain groups of road users
- Where enforcement is not sufficiently done, other measures might be implemented (e.g. bollards) – usually costly and also taking space
- A further safety aspect is related to accessibility for fire fighters – including to keep hydrants and other technical safety installation free from parked vehicles.

Who needs to act?

Local authorities have to consider the spatial organisation of street space with good visibility between road users as a pre-condition of safety – from design, regulations to enforcement.
Design guidelines (on the national level) need to consider visibility as important aspect of road safety

16.   Use kerbside management for more efficient use of street space

Kerbside management refers to the planning, regulation, and optimization of activities and space along the kerbside of streets. This includes managing parking, loading zones, public transport stops, bike lanes, and pedestrian areas. The goal is to balance the needs of various users, reduce congestion, improve safety, and enhance the overall efficiency of urban spaces. Modern digital tools allow a more flexible organisation of the street space and the application of market principles (demand-based pricing, etc.).

Some initiative should be taken to allow a price structure for car parking that takes the size / the consumed space into account – in order to give incentives for smaller cars. Such approach requires technological digital solutions and a revised legal framework.

KERB SIDE MANAGE MENT

Key Points:
- Kerbside management is a tool that allows a more flexible use of street space.
- Digital tools allow a more flexible fee calculation and invoicing – but the technical and legal framework still needs to be defined.

- Parking fees set according to the size of cars would create market-based incentives for smaller cars in urban areas to achieve a more efficient use of street space.
- For some demands, street space can be used flexibly over time, e.g. as a delivery zone over the day, and a parking zone during the night. Digital tools and variable message signs can allow for more flexibility in the use of street space.
- For such flexible allocation of street space, the provision of data is a necessary tool to adapt dedication of space accordingly.

Who needs to act?

Although being a market-based instrument, in most European cities the use of digital kerb side management is at the very beginning. There is the need on all levels (Europe, national, local) to discuss the potential and develop recommendations and a framework on how digital tools can be used to allow a more dynamic and flexible use of kerbside – respecting requirement of privacy and data protection. Research projects should enhance knowledge and technical development of the required digital tools. The national level needs to set the legal framework, while local authorities would implement the new digital dimension of organising street space, flexible pricing of pay parking, etc.

See also ACEA comment in 4.10, p.

17. Intelligent Parking Assistant (IPA) – Initiative to exploit upcoming technology of tomorrow already today

Already today, some cars are able to find their parking spot by automated valet parking. The technological development towards autonomous cars will require cars to park themselves also in public street space according to the given legal rules. Geo-referencing and sign recognition are already in use for speed keeping. Currently, in Europe the innovation platform 'Enhancing Automated Valet Parking' (EAVP) takes the initiative to develop similar tools that could be used for parking. In combination with information about available parking spots, such a tool could help with compliance with rules to ensure street space is used for the intended purposes.

IPA

AUTOMATION

Key Points:
- The innovative initiative should be used to integrate existing and upcoming technology to achieve some parking that does not interfere with regulations and rules – and even more important that does not create barriers for other road users
- Like ISA for speed, IPA could support drivers in finding a legal parking spot and avoiding disturbing or endangering others.
- Automated cars will be required being programmed to follow the rules of the Highway Code.
- Automated transport under conditions of mixed traffic works better when all players in the street space play according to the same rules.
- When the car itself "insists" on parking according to the rules, this will greatly ease enforcement efforts.

Who needs to act?

A development of ISA to a mandatory "Intelligent Parking Assistant" requires a broader discussion of the European level, the Member States and the automotive and digital industry. The EGUM report can serve as some initiative (see also D 6.2)
As such tools will be required for automated/autonomous cars in the near future anyway, this technology should become available within the next years.

3. Introduction: Street space – the limited resource

In its first meeting on 8 March 2023 (online), the working group defined challenges and collected approaches to mitigate and solve problems. The WordCloud below highlights the challenges – as seen by the group members:

What are seen as main challenges for urban street space? The word cloud is a result of the first meeting of the working group.

The working group member defined clusters on safety, on space consumption for (parked) cars and on features of urban planning and a broad collection of SUMP aspects.

Why is the focus on street space so important?

Street space in urban areas needs to serve many crucial functions. At the same time, it is social space, transport space, ecological and economic space. We see growing conflicts between the various functions and new challenges such as new mobility models (e.g., micromobility and the growth of e-commerce with related deliveries). This is a call to look closer at the various functions and to develop a better balance to serve current and future needs.

3.1 Street space is walking space, social interaction space for citizens and play space for children

Although almost everyone does it, walking is the most underestimated mode of travel. Walking counts in many European cities for 20 – 25% of all trips (door-to-door). Some very pedestrian friendly cities reach a much higher share, e.g. Paris (39%[4]), Barcelona (46%[5]). Overall walking is part of almost every single trip chain.

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[4] https://www.ifmo.de/files/publications_content/2016/ifmo_2016_mobility_cutting_edge_cities_en.pdf p. 47
[5] AM_Factsheet_Barcelona_WP2 (pastaproject.eu)

Walking is not only a mode for door-to-door connection. Although not counted in most statistics, it is the main mode to connect to public transport, with 94% of the feeder trips to and from public transport made by walking[6]. The quality of the walkway is part of the quality of the entire public transport based travel chain.

Walking is the most cost- and space-efficient way to get around. Depending on the structure of neighbourhoods and the provision of all kinds of infrastructure, walking contributes greatly to all strategies of making a city more liveable and at the same time mobility more efficient.


Urban street space: many functions in limited space (photo: S. Olgemoeller, adaptation: Glotz-Richter)

The 15-minute city is an urban planning concept in which citizens have access to everyday amenities and services, such as work, shopping, education, healthcare, and leisure within a 15-minute walk, bike ride, or public transport ride.

Walking space is also communication space: this is the chat among neighbours while standing in front of the door or walking side-by-side. Communication space is space where it is attractive to linger. People rarely interact with each other in unattractive settings. Space and safety are key topics for quality of life and family friendliness of street space. A good question is: are children able to play in front of their home?

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[6] See Helge Hillnhütter – presentation at Fußverkehrskongress (German National Congress on Walking), Bremen 2023 PowerPoint Presentation (fussverkehrskongress.de)

In many cities, sidewalks are – legally or illegally – used as parking space for cars. Passage with a baby buggy or by wheelchair or with an accompanying person (as needed by visually impaired persons or people with a walking frame) is not possible, which ignores important aspects of inclusion.
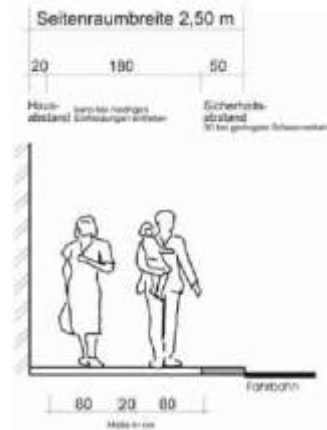
Illegal parking on sidewalks: even minimal standards for social inclusion are not kept. On-site check in Bremen-Findorff (photo: Glotz-Richter); graph: recommended minimal width of sidewalks[7]

Keeping minimal standards as part of social inclusion (photos: Glotz-Richter)

3.2   Street space: mobility poverty and gender equity

The way we currently organise street space has strong impacts on access to mobility – and with the usual different mobility patterns of societal groups it may support or hinder access to transport modes.

Women usually depend more on sustainable modes for the daily trips. Female individuals are more likely to become immobile due to the way transport infrastructure and services are organised.

Care-taking for children in urban areas means to deal with safety aspects of street space.

Reorganising street space to support walking, to providing space for children to play safely close to their home is a contribution to gender equity.

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[7] Source: Braeuer, Dirk / Schmitz, Andreas: Grundlagen der Fußverkehrsplanung. In: Handbuch der kommunalen Verkehrsplanung. Heidelberg 2004

Improving conditions of walking, cycling and better access to public transport -including shared mobility services (e.g. as feeder to public transport) reduces mobility poverty of current disadvantaged groups.

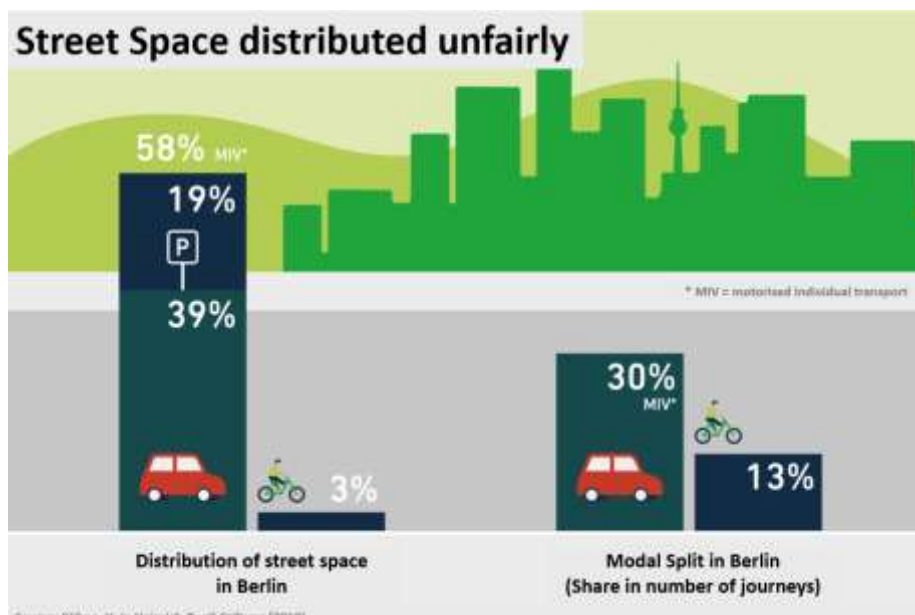## 3.3   Communications of all kinds, business, markets, street cafés, restaurants

Street space is the theatre for social interaction. It is a space where people meet neighbours, where children should be able to play nearby their home. The volume of car traffic and its impacts decide on the level of social interaction. "Busy streets" in terms of transport are not so busy in terms of social contacts – and traffic calmed areas have more social communications, more playing on street.
Noise, exhaust emissions and risks of accidents are significant aspects of interfering to good social communication in the streets.

Street space is also business space. Street cafés, market stalls, but also the entrance area to local shops are aspects to have a lively neighbourhood and part of the 15-minute city philosophy. Local shops make street space more appealing for walking.

3.4   Space for cycling (cycle paths / lanes) and for storing/parking bicycles

Some European cities show a share between 25 % and more than 40% of cycling in their modal split. A survey about Berlin showed that (2018) cycling had a model share of 13% but a distribution of street space of 3% - whereas the car with 30% modal split got 58% of the street space.

Street Space distributed unfairly

58% MIV*
19% [P]
39%

* MIV = motorised individual transport

3%

Distribution of street space in Berlin

30% MIV*
13%

Modal Split in Berlin
(Share in number of journeys)

Source: Kühne, H. in Heinrich-Boell-Stiftung (2018)

Graph: Kühne, H. in Heinrich-Boell-Stiftung (2018)

Cycling can contribute significantly to efficient organisation of transport – but it requires good infrastructure for moving and parking. Many urban neighbourhoods don't provide bike parking within buildings or in yards. Here, bike-parking needs to be provided in public street space.

3.5   Logistics: loading zones, micro-depots, micro-hubs

The amount of home deliveries period in Germany increased over the Corona by about 25%[8]. E-commerce found much more demand in the Covid-pandemic lockdown, when online purchase increased exponentially. One of the side effects is delivery vans that are parked for a nearby delivery on sidewalks, cycle lanes or in double-parking.
To reduce such negative impacts, new ways of delivery are necessary.

More and more delivery vans on limited street space become obstacles for other road users (photo: Glotz-Richter)

Logistics is not limited to commercial transport, but also relates to private households. The various needs to transport cargo (or persons) has been labelled private micro-logistics. In Germany, a significant 30% of all trips are related to shopping. Within urban areas, the average shopping distance is approximately 4 km. This constitutes about 17% of the total mileage driven and contributes to roughly 10% of transport-related CO2 emissions[9].

3.6   Shared mobility: stations for shared mobility (cars, taxis, bikes, cargo bikes, mopeds, e-scooters and more)

In recent years, the diversity of shared mobility options increased. Taxis are a long-experienced form of shared mobility. Station based car sharing already has a several decades long history – proven option to reduce the level of car ownership. Free-floating car sharing – being about 15 years on the roads – offers more flexibility but less reliability.

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[8] Data: P-Studie 2022 – Analyse des Marktes in Deutschland Eine Untersuchung im Auftrag des Bundesverbandes Paket und Expresslogistik e. V. (BIEK) download BIEK_KEP-Studie_2022.pdf
[9] See: *Policy paper on the future on-demand urban logistics*, H2020 ULaaDS project (Urban Logistics as an on-demand Service) D7.8 (2023) download https://ulaads.eu/wp-content/uploads/2024/03/D7.8.pdf

The service of bike-sharing has experienced some push in the last decade – showing also limits of some shared mobility services, especially if no sufficient parking zones have been allocated. Similar lessons were learnt with the e-scooters. Sidewalks became occupied by shared bikes or e-scooters without adequate governance and enforcement.

Further shared mobility services cover cargo-bikes and also mopeds (usually electric). Dedicated stations are necessary for the various shared modes – which requires street space to be favourably allocated to sharing mobility services contrary to private motorised vehicles.

Which vehicle creates more obstruction for pedestrians? (photo: Glotz-Richter)

3.7   Collective mobility: bus shelters and better waiting areas

Separated lanes for buses and trams may take some space but public transport in urban neighbourhoods often operates in mixed traffic. Good public transport includes safe waiting areas and shelters at bus or tram stops.

Cycle lanes between the walking lane and the kerb may create conflicts at bus (or tram) stops as passengers need to cross the cycle lane. Again, it is a question of sufficient space for each user group to reduce such conflicts.

3.8   Charging infrastructure e-mobility

To realise the shift away from fossil fuel burning cars, the change to electric cars is seen as an important step for reducing the carbon footprint of motorised transport. Many European countries have ambitious plans to boost e-mobility. The provision of charging infrastructure is a key prerequisite to promote e-cars. Especially in dense historic urban neighbourhoods, we often find little private car parking but much on-street car parking. Such areas need electric charging points also on-street.

Although charging infrastructure needs to be deployed in cities to enable e-mobility, space usage conflicts might occur – especially if this infrastructure is taken from pedestrian or bicycle spaces.

As slow/normal chargers provide electricity to lower costs than fast charging, such solution might be more appropriate for urban neighbourhoods than fast charging. Fast chargers usually

need more space – especially when some transformer station is required. Often, the necessary ventilation may cause some noise problems.

It might be only a little contribution, but also public space may serve to generate some energy with PV panels or small wind turbines.

Overall charging infrastructure needs to be implemented in space dedicated to car use but only exceptionally in case of abundance of space for non-motorised modes of transport on boardwalks/walking space.

3.9 Safety (visibility of road users)

Being able to move around safely is some normal expectation in public street space. Within urban areas of the EU, pedestrians (37%) account for the largest share of victims. There is an increasing number of cyclists (14%) being killed. Including users of powered two-wheelers (18%) almost 70% of total fatalities in urban areas are vulnerable road users[10]. Speed and limited visibility between road users are two of the main risk creating parameters in urban streets.

Especially at intersection and crossings, there is the need for clear space – providing visibility between all road users.

3.10 Adaptation to climate change: 'cool streets', greening, rain water management

Urban streets in densely built up neighbourhoods are often sealed completely with asphalt and cobblestones from side to side. Such situation may cause city warming and urban heat islands in warm summers, when the heat is stored in the streets. Temperatures are significantly higher than in green surroundings.

Another risk with the sealed surface lies with rainwater management. Due to climate change, the risk of heavy rainfalls increased over the last years. In such situation, the sewage system is not able to cope with the amount of rainwater. Flooding of basements can easily happen when there is no space to store some of the rainwater in the streets.

3.11 Car parking takes a lot of the space – more and larger cars demanding more space

In most cities, parked cars consume a disproportionate share of urban street space. The growth of length and width of cars is creating additional problems – as in narrow streets the remaining lane might become too small for waste collecting vehicles or firefighters to get through. Over that last 30 years, cars have become about 50 cm longer and 20 cm wider – meaning that fewer cars can be parked in the same space. Just because of about 20 cm larger vehicles being bought over the last 20 years, the car fleet in the European Union consumes end-to-end about 50,000 kilometres additional road space.

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[10] Preliminary 2021 EU Road Safety Statistics (europa.eu)

Studies show that cars are usually parked for about 23 hours/day. Even very cycle friendly cities still may have high car ownership, but many cars are only rarely used. Studies carried out in the context of the EU SUNRISE project[11] in Bremen showed that 26% of parked cars were not moved within three consecutive 'normal' workdays in the researched neighbourhood.

Parked cars block the sidewalk forcing pedestrians with a pram on the car lane (photo: Glotz-Richter)

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4. Recommendations:
The 17 strategic modules for a better share of urban space

There are various measures that can lead to a fairer distribution of street space and to some support of sustainable mobility. Usually, they are not stand-alone modules but should be part of an integrated neighbourhood-related sustainable mobility plan. Communication and participation are necessary modules – as is looking at the needs of people with disabilities, of children and of the elderly.

4.1 Integrate Sustainable *Neighbourhood* Mobility Plans with SUMP

Some key points

- **SUMPs are an established instrument to plan sustainable mobility at a city (or regional) level**
- **The neighbourhood level requires a detailed planning instrument to manage the demands for street space – and to allocate space for various mobility needs – making it a key instrument for achieving the objectives of a SUMP.**
- **The street space in front of the doors of citizens is often the subject of various claims – and the subject of intense and conflictual debates.**
- **Integrated planning methods – including participation and conflict management – are necessary to achieve the objectives of SUMPs at the *neighbourhood* level.**
- **Neighbourhood walks and other on-street communication methods create good opportunities to discuss details and conflicting interest with and among residents.**

Reorganising street space is a key instrument for implementing the city-wide objectives of Sustainable Urban Mobility Plans (SUMPs). The development of Sustainable *Neighbourhood* Mobility Plans can follow the SUMP principle- especially looking at intense communication with residents and other stakeholders (e.g. business community). A special focus should be given to the needs of people with disabilities – to allow safe and convenient mobility for all in their neighbourhoods.

Graph: 12 steps of Sustainable Urban Mobility Planning (SUMP 2.0)
© Rupprecht Consult, 2019

The process of developing Sustainable *Neighbourhood* Mobility Plans should follow the SUMP principles. Preparing plans in a high scale allows preparing a detailed plan that integrates:

- Safe space for street life (incl. parklets, benches, etc.)
- Transport elements (space for moving and for storing all kinds of vehicles: cars, bikes, cargo bikes, etc.),
- Ecological aspects like greening or rainwater management
- Space / stations for shared mobility
- Urban logistics (delivery zones, micro-hubs / micro-depots)
- E-mobility charging points; if applicable space to generate electricity (PV, micro wind-turbine)
- Space for street cafés or other local business activities
- Public transport: incl. dedicated space / waiting areas
- Kerbside management (e.g. multiple use of street space, parking fees, residential parking….)
- Neighbourhood garages / parking space
- Requirements of fire fighters
- Implementation strategies over time
- …

The mobility pyramid sets priorities for sustainable urban mobility plans to be implemented on the neighbourhood and individual street scale.

Taking the mobility pyramid seriously would mean making walking the mode to be primarily promoted and protected, followed by cycling and public transport. Private cars take up the rear as the least sustainable, least safe, and least efficient.

Unfortunately, reality often looks very different.
Graph: Mobility Pyramid Source: Share-North project

On a neighbourhood scale, all potential conflicting demands are very visible – and call for priority setting.

The street space in front of the home is naturally of key interest for everybody. As residents are very interested in their neighbourhood, a special focus should be given in the entire planning process to participation.

Here, the different interests and demands become physical. In some cases, tough decisions may be needed to get from theory to practice - implementing the mobility pyramid principles or giving space to the needs of those who depend on sufficient and protected walkways.

Different and often contradictory interests exist – sometimes even within the same person. As pedestrians, people are annoyed about the impact of illegal parking on sidewalks or the delivery van in the car lane. As a car driver, the same person might be annoyed about problems finding a parking spot.

Public participation also entails expectation management. It must be clear that street space is a limited resource and that aspects of inclusion and safety are not negotiable. At the end of the participation process, decision-making and implementation are required.

Further recommendations for the communication process around re-organising street space are given in chapter 5 « Aspects of communications »

Who needs to act?
Cities are the players who need to organise street space and implement any re-design.
The **European SUMP guideline** revisions should make more reference to the aspects of street space and the neighbourhood level – as should any **national SUMP training programmes**.

4.2   Develop green and blue plans for street space

Some key points

- **Climate change is increasing health risks for residents and stress on urban streets space – especially in terms of overheating and rainwater management.**
- **Greening and de-sealing streets are necessary measures to reduce heat extremes and to improve rainwater management.**
- **Rainwater storage can happen both in swales and in parking lanes.**
- **Green and blue plans deal with overheating and with managing rainwater in case of events that bring the traditional infrastructure beyond its limits.**

Street space not only serves transport and social functions but is also ecological space. Green areas and trees are a precondition for a minimum of biological life in the urban context. The level of sealing and the patterns of buildings largely determine the microclimate in our neighbourhoods. The temperature in cities is often 1- 3° higher than in the surrounding areas, but in urban streets with sealed surfaces and no green, temperatures can reach even higher levels. Furthermore, in such areas, there is less cooling at night as the asphalt and buildings store the heat and ventilation is reduced.

Greening is a key measure to improve the microclimate in urban streets. It requires space to plant greenery. Due to technical infrastructure in the ground (water and gas pipes, etc.), there are limitations for planting trees.

Figure: Temperatures in city streets with and without trees (source: Greenpeace/ https://www.reddit.com/media?url=https%3A%2F%2Fi.redd.it%2Fbx vw3340ueg71.jpg)

Greening urban streets is also important for rainwater management, reducing the impact on the water cycle. The traditional grey infrastructure' (pipes and other water control devices) will more frequently reach its capacity with increasing severe weather events. Rainwater management features need to be incorporated into the design (or re-design) of urban streets, squares and living spaces. Modules of such rainwater management can be swales and other rainwater storages, all kinds of de-sealing as well as permeable paving.

The City of Vienna implemented "cool streets" with greening and rainwater management to reduce the average, but more important, the peak temperatures. New street space management was required, especially to reduce space for car parking.[12]

Cool street in Vienna (photos: Glotz-Richter)

It is also part of the Superblock strategy of the City of Barcelona to provide more greenery and to unseal paved surfaces to improve rainwater management.

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[12] https://www.wien.gv.at/umwelt/cooleswien/hitzeaktionsplan.html (in German) & https://www.wien.gv.at/umweltschutz/raum/uhi-strategieplan.html (in English)

Greening and desealing in Barcelona (photos: Glotz-Richter)

Nevertheless, existing green needs to be protected and is endangered when there is little space around trees or when cars are parked directly adjacent. With increasing summer temperatures, the stress for urban trees has increased significantly. Giving them more space is a measure to reduce the stress and to give trees a better chance to survive.

Trees are stressed by conditions with little space and with cars parked on their exposed roots (photo: Glotz-Richter)

Who needs to act?

Local authorities must communicate the needs and plan the detailed measures of climate adaptation and general greening in local streets.

Research and pilot measures should be integrated in **European and national research and implementation support** programmes.

4.3 Improve vehicle design guidelines in relation to public space design

Some key points

- **Ever bigger passenger cars consume more space and cause safety concerns for other road users by reducing visibility.**
- **Adapting street design guidelines to larger vehicles would accommodate bigger but at the same time fewer cars in the same space – thus causing more parking problems**
- **European and national legislation should de-incentivise vehicles that consume much more space per vehicles**
- **Municipalities should use new national legal frameworks to prioritise smaller cars – e.g. by designing and dedicating parking bays explicitly for smaller cars.**

Increasing sizes of passenger cars are a growing concern in European cities: new cars registered in Belgium since 2018 are on average more than 180 cm wide. Vehicles of this size do not fit into many parking spaces on and off the street, at a time when public space needs to be reallocated in favour of active transport methods and public transport. Ever-expanding cars became an obstacle to the recreational use of public space and the creation of green areas[13].

In current legislation, there is a disconnect between design guidelines for public space and vehicle design guidelines and regulations. One of the key examples of this is increasing car sizes and design guidelines for on and off-street parking. It is not possible to keep accommodating the growing size of passenger cars by increasing the width of parking spaces. This is one of the clearest examples, but other vehicle characteristics also link to public domain specification.

Physical vehicle characteristics

The following vehicle characteristics can have an important impact on how the public domain is designed and constructed. The limits might be different for different modes but there is always an impact.

Vehicle width

The width of streets in urban areas, particularly in older cities, is limited and it needs to be shared among various modes, each of which often deserves its own space. As vehicles increase in width, this has an impact on their demands on the public domain. There are currently no maximum width limits set specifically for cars. The European Weights and Dimensions Directive limits truck size, which is the only existing legal limit. That limit is 255 cm. It is clear that 255 cm is too wide for cars in most cities. The average width of cars has already increased to 180.3 cm in 2023, and SUVs are now the most popular type of private car sold in Europe. Pick-up trucks imported from the US are also increasingly being used in cities that are not designed for them. A study by VIAS[14] found a 200% higher risk of death when a pedestrian or cyclist is struck by a pick-up truck

Wheel size

The wheel size of vehicle is important in relation to the design of kerbs and materials used for the public domain. A small wheel cannot easily go over a kerb, while a large wheel can (too) easily drive over a road divider.

Spectrum of vehicles

A 1 or 2-tonne vehicle is not needed to move a person of 60, 70 or 80 kilograms.

Apart from the "usual" automobiles, there is a huge number of smaller vehicles that create a 'world of wheels between shoes and cars'[15]. There are over 700 different types of such means of movement[16]. So far, these options are only marginally considered in the mobility system.

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[13] E.g. Brussels: see Bigger vehicles, bigger problems: Half of new cars in Brussels are SUVs
[14] https://www.vias.be/fr/newsroom/des-voitures-plus-lourdes-plus-hautes-et-plus-puissantes-pour-une-securite-routiere-a-deux-vitesses-/
[15] See Konrad Otto-Zimmermann ‚Feinmobilität': https://www.theurbanidea.com/en/zwischen-schuh-und-auto
[16] Database: ecomobility-expo.net

Figure: various vehicles „between shoes and cars"

Feinmobilität – (source: Konrad Otto Zimmermann)

Diverging view of ACEA:

ACEA does not share the call for revising regulations. Instead of design guidelines and priorities for smaller cars through regulations, municipalities should focus on space management strategies that allow an optimal use of space.

Vvehicle size and weight are driven today by a variety of reasons not the least regulatory constrains (as for safety, environmental, for the shift towards electric mobility, etc.).

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4.4 Put in place traffic calming and shared space

> **Some key points**
>
> - **Traffic calming allows the reallocation of street space – extending the space for walking and offering the entire width of a (traffic calmed) street for playing.**
> - **Reducing / limiting the speed of vehicles is a core pre-requisite to give pedestrians a safe feeling when sharing street space.**
> - **The shared space approach goes beyond traffic calming to removing features such as kerbs, road surface markings, traffic signs, and traffic lights.**
> - **The same basic objectives can be found in 'complete streets' or 'living streets'.**
> - **Pure shared space without dedicated 'safe areas' for pedestrians might cause concerns for people with visual or hearing impairments.**

Speed limitation in urban areas is a prerequisite for safer streets and mixed use of street space. A core idea of both traffic-calmed zones and shared space is to allow pedestrians to use the entire width of the street and not be restricted to (narrow) sidewalks. These roads remain accessible for motor vehicles, but with reduced speeds and reduced car dominance.

Except for small alleys and pedestrian zones, the standard design of streets follows the principle of separation between modes of road users – often prioritising car traffic and speeds of 50km/h. The sidewalk, separated from the lane for moving or parked vehicles by a kerb, should be a safe space for pedestrians, for social communication etc. As many residential streets have little car traffic, the idea was born to allow pedestrians to use the lane space as well to regenerate densely built neighbourhoods or increase quality of life in newly built areas.

The conversion of streets to traffic calming and shared space follows the principle of street space serving as social spaces, allowing children to play and encouraging social interactions on a human scale, backed by national highway codes. Traffic calming has been legally established since the 1980s, following the Dutch model of the *woonerf*. In order to allow pedestrians to use the entire width of the street in a safe manner, a low speed limit (walking speed) is set and explicit indication where cars are allowed to park.

The principle of shared space goes further and addresses "capacity for socially responsible behaviour" (by creator Hans Monderman) and builds on removing features such as kerbs, road surface markings, traffic signs, and traffic lights. The concept also applies to semi-open spaces on busier roads, with an aim to "improve the road safety and vibrancy of roads and junctions, particularly ones with high levels of pedestrian traffic, by encouraging negotiation of priority in shared areas between different road users."

The concept of shared space is criticised by organisations representing the interests of blind, partially sighted, deaf or elderly people, who want to have a provision of a safe and clearly indicated space for their movement without disturbance by moving vehicles.

Temporary traffic calming

Some cities allow a closure of streets for cars and opening the space for pedestrians and especially for children as temporary measure (e.g. one day a week or for an entire season). Such approach gives a taste of how streets may look and function if there were fewer cars.

Play street in Bremen (every Friday 15:00 – 18:00) and summer street in Munich (photos: Glotz-Richter)

School streets are another approach of temporary traffic calming – usually limiting car access at the time of school start in the morning and school end in the afternoon. At these times, adjacent streets are only open for non-motorised transport to prevent of parents delivering kids directly in front of the school, causing safety risks for other children.

A neighbourhood street party or a summer festival can be the reason to convert a street temporarily, demonstrating how street space can become more liveable.

Street party for a day, giving street space to pedestrians and cyclists near a popular urban beach in Vancouver (photos: Glotz-Richter)

Traffic Circulation Plans and filtered permeability

Filtered permeability removes the possibility of driving a car directly between different roads, or even whole sectors of the city, while allowing other modes through. This can be done by
- Closing short sections of street to motorised traffic entirely;
- Introducing one-way flow for car traffic on selected sections of streets (often alternating direction between crossings), with contraflow traffic permitted for cyclists and sometimes also buses.

When used as part of a city-wide traffic circulation plan it can be used to direct motorised traffic outside the city onto surrounding larger roads, before being allowed in again, instead of being allowed free access across the city. This means that motorised traffic must use surrounding roads to get from one part of the city to another, rather than driving through the

centre. This reduces the motorised traffic in the centre of the traffic, reduces congestion, reduces air pollution, and improves safety and the use of sustainable mods such as walking, cycling, and public transport.

This concept has been successfully applied in various European towns and cities, and example can be seen in Leuven, Belgium[17], with large reductions in motor vehicle traffic and increases in cycling and walking.

One typical example of a filtered permeability measure is the traffic filter. It is often applied in superblocks, transforming several housing blocks into one neighbourhood.
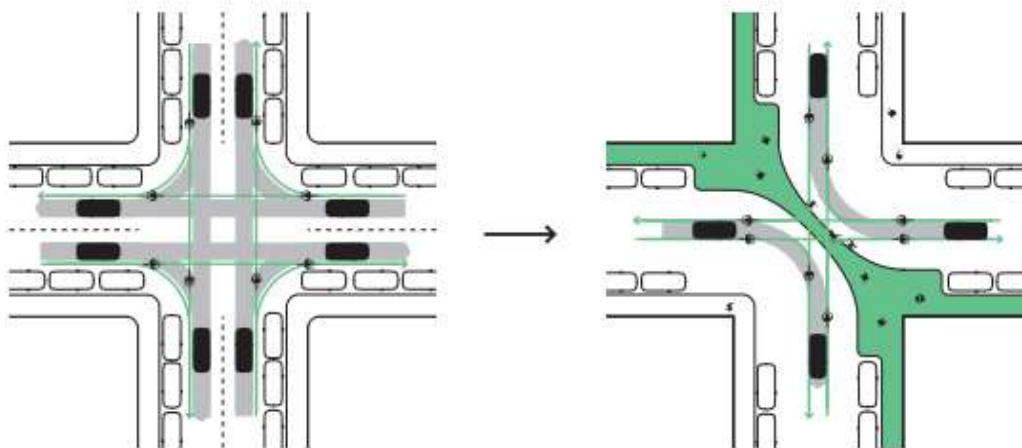
graph : traffic filter[18]

Filtered permeability reduces through traffic to either sustainable modes of transport (including a remotely controlled drop bollard allowing buses to cross) or only active mobility.

30 km/h as default in Urban Areas

In an initiative report on road safety published in October 2021, the European Parliament called on the EU Member States to implement 30 km/h in urban areas as a default. The European Commission committed to consider what action is warranted to tackle excessive speed for instance through further use of an EU recommendation, in its Sustainable and Smart Mobility Strategy. The Commission is encouraged to allow local authorities to benefit from the EU Road Safety Exchange Programme in order to learn from best practices emerging in EU cities.

Who needs to act?
National governments set the legal framework (highway codes and related guidelines), establishing how and where traffic calming and shared space can be applied. **Local authorities** implement traffic calming and shared space approaches.
The **European Commission** is encouraged to support local authorities through research and demonstration programs.

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[17] https://www.leuven.be/circulatieplan
[18]https://vlaamsbouwmeester.be/sites/default/files/uploads/Brochure%20Leefbuurten_46blz%20%2B%20cover_1012_web.pdf

4.5   Add parklets, cafés and other elements for better social interaction

Some key points

- **Such installations (sometimes temporary, sometimes permanent) help to change the perception and usability of street space**
- **Outdoor seating areas of cafés, pubs and restaurants have become very popular across Europe.**
- **There should also be non-commercial areas with seating and other communication opportunities**

It is a common human desire to sit outside when the weather allows. With the installation of parklets, street space can gain much quality. Cities in Europe discovered how to test, implement and maintain such temporary or permanent installations in urban streets.

There are various options to reclaim street space for non-commercial social communication, for simply enjoying a neighbourhood street: parklets, benches, modules to sit or play on…
A prerequisite is that people feel safe and that traffic disturbance is low. Parklets need to be managed properly, as there might be concern of noise and rubbish being left behind.

A parklet serves as protection, communication and beautification element in street space in front of a school (Barcelona / Munich) *(photos: Glotz-Richter)*

There are many variations. They might be small or part of a larger installation; they might be temporary for the warmer seasons or permanent. All have in common the idea to upgrade the quality of the street space for social communications.

A parklet and bike and cargo bike parking (on opposite side) in Vienna and a "doglet" in Vancouver (photos: Glotz-Richter)

Commercial outdoor seating areas: street cafés, bars and restaurant

As some impact from the lockdown, we see a growth of street cafés and other outdoor seating areas to enjoy a drink, food and social communications. It is another way to enjoy the street space of the neighbourhoods – often after reclaiming some space from car parking.

Improving quality of life in a neighbourhood through a parklet / street cafe (photo: Glotz-Richter)

Who needs to act?

Local authorities can test or implement such installations. Pilot measures and related evaluation should be integrated in **European and national** research and implementation support programmes.

4.6 (Re-) allocate sufficient space for walking
(Including special needs of people with disabilities)

Some key points

- **Although used for 20 – 25% of all (door-to-door) trips in European cities, walking is the most underestimated mode of transport.**
- **Walkability is an indicator of inclusiveness; the signed Convention on the Rights of Persons with Disabilities needs to be translated into inclusive street space.**
- **Vehicle parking is often an obstacle for pedestrians.**
- **The quality of urban space impacts the perception of the time spent walking; 'boring' urban space gives the impression that the journey is longer.**

Despite being a natural, least expensive and very healthy mode of transport, walking is the most underestimated mode of transport and often least supported in municipal transport strategies.

In many European cities, walking accounts for 20–25% of all (door-to-door) trips. In some very pedestrian friendly cities, the share of walking in the modal split (number of trips by citizens) accounts for more than 40%. For example, in Barcelona, 46% of all trips are made by walking[19]. Many cities that have a good ranking for quality of life also show a comparatively high level of walking – like Zürich (35%), Helsinki (32%)[20] .

"*The positive effects of more walking on urban challenges, such as noise levels, air pollution and CO_2 emissions, as well as traffic safety and societal health, have increased the interest in walking, in fields like planning, transport and the health sector.*" (Hillnhütter 2021[21])

Nevertheless, in many cities we see that the dedicated space for walking in urban streets is not equivalent to the role of walking in the mobility patterns. It should be considered that sidewalks are the space for communication among neighbours, for children playing in front of their house and for businesses to make passer-byes aware about their services and products.

Walking often has no grid, just islands – you will have to cross streets to reach the next island of sidewalks. The needs to take deviations to get to crossings and waiting time – especially at traffic lights extends the time of walking substantially.

Due to their flexibility, their low space demand and lack of emissions, pedestrians are structurally disadvantaged at traffic lights (photos: Glotz-Richter)

If statistics counted not just the "main" mode, but all the stages, the walking share would be much higher. Many intermodal chains include walking as a feeder, including to parking lots and to public transport stops. About 94% of all public transport trips have a first or last mile walking stage. The quality of walking is therefore part of the quality of a public transport trip.

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[19] https://www.pastaproject.eu/fileadmin/editor-upload/sitecontent/Publications/documents/AM_Factsheet_Barcelona_WP2.pdf
[20] Quoted in UMID: Umwelt + Mensch Informationsdienst 01/2019 (umweltbundesamt.de), p. 7
[21] Helge Hillnhütter, Stimulating urban walking environments – Can we measure the effect? In: Urban Analytics and City Science, 2021 p275 / Stimulating urban walking environments – Can we measure the effect? (ntnu.no)

The [Walk 21 charter](#) summarises: *"Design streets for people and not only for cars, recognising that streets are a social as well as a transport space and therefore, need a social design as well as engineering measures. This can include reallocating road space, implementing pedestrian priority areas and creating car-free environments to be enjoyed by all, supporting social interaction, play and recreation for both adults and children."* [22]

Sitting in a car side-by-side is the standard – walking side-by-side is often impossible

Nevertheless, it is quite normal in a car to sit side by side for being able to talk to each other – which should be as well normal for pedestrians. A fair share of street space is a prerequisite for sustainable mobility.

Sufficient space is a prerequisite for functional and safe walking routes. As normal as it is in a car to sit side-by-side, so it should be to walk side-by-side – which requires even under limited space conditions sidewalks of at least 2.00 meters – rather 2.50m. For boulevards and High Streets, much wider sidewalks are necessary to cope with the functions of business and for higher pedestrian volumes. For trees or other forms of greening, you may require additional space.

A reference for the necessary minimum width of sidewalks is to allow accompanied walk at a walking frame (rollator) and as well for visually impaired people side-by-side– which is about 1.80m.

It should be as normal as sitting in a car side-by-side.

Graph: Bräuer, Dirk / Schmitz, Andreas: Grundlagen der Fußverkehrsplanung[23]

For streets with high volumes of pedestrians or with the functions of shopping streets, much more space will be necessary to allow all functions – from walking to social interactions, as business space in front of shops or cafés or for playing of kids in front of their home.

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[22] https://walk21.com/wp-content/uploads/2020/02/walking-charter-document-2020.pdf
[23] In: *Handbuch der kommunalen Verkehrsplanung*. Heidelberg 2004 see [Breite von Gehwegen | Verkehrswende Darmstadt (verkehrswende-darmstadt.de)](#)

Impact of the European H2020 SUNRISE project in Bremen: sidewalks are free from car parking, leaving space for kindergarten groups with carts or for accompanying a person with a walking frame (photos: Glotz-Richter)

A major problem in many European cities is car parking on sidewalks – in some cases legalised, in other cases illegal. In both cases, it quickly becomes an obstacle for pedestrians.
To provide sufficient space for walking, car parking needs to be reorganised at a neighbourhood level in a mobility concept, including the necessary enforcement.

(see also 4.13 *« Use parking garages to reduce demand for on-street parking »,*)

UNITED NATIONS CONVENTION ON THE RIGHTS OF PERSONS WITH DISABILITIES[24]

Article 9
Accessibility

1. To enable persons with disabilities to live independently and participate fully in all aspects of life, States Parties **shall take appropriate measures to ensure to persons with disabilities access, on an equal basis with others, to the physical environment, to transportation**, to **information and communications**, including information and communications technologies and systems, and to other facilities and services open or provided to the public, both in urban and in rural areas. These measures, which shall include the identification and elimination of obstacles and barriers to accessibility, shall apply to, inter alia:
(a) Buildings, **roads, transportation and other indoor and outdoor facilities**, including schools, housing, medical facilities and workplaces;
(b)…

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[24] Adopted by the United Nations General Assembly on 13 December 2006, came into force on 3 May 2008.https://en.wikipedia.org/wiki/Convention_on_the_Rights_of_Persons_with_Disabilities As of June 2023, it has 164 signatories and 187 parties, 186 states and the European Union (which ratified it on 23 December 2010).

Walking and the urban environment

When walking in urban streets, you are exposed to noise and risks of accidents, especially in streets with higher level of car traffic (like bypass roads etc.). The perception of safety and social control in such streets is lower than in local streets.

But the perceived quality of walking in urban streets depends not only on the available width of the sidewalk and the potential disturbance from nearby traffic. Studies show that diversity in the built environment may stimulate pedestrians in a positive way and reduce the perceived time, in other words, extend the range of walking. "*If not crossing streets, pedestrians do not look at cars; they look at other people, non-monotonous facades and green features. .... Walking environments that do not fit with this human scale are less stimulating*"[25] The built environment as well as green are additional important factors for the pleasantness of walking.

Walking, resting and social interaction

Sidewalks serve not only for walking as transport mode but also as social space. Parklets give space for communication without being in the way of other people walking.

Who needs to act?
Local authorities can implement actions to better organise or re-design local streets.
Whereas there are European strategy papers on other sustainable modes, there is not yet a European walking strategy. Some countries have national walking strategies; these may serve as blueprints for other countries.
Research and pilot measures should be integrated in European and national research and implementation support programmes.

4.7   Integrate public transport into street space

Some key points

- **Separated infrastructure (bus lanes, tram tracks) is a prerequisite for undisturbed, efficient operation of public transport – to be prioritized over parking.**
- **Walking is the most important feeder for public transport. This means walkability is part of public transport quality; attractive walking space extends the catchment area for public transport.**
- **Waiting areas at public transport stops need space – beyond the space taken by the shelter itself. There are as well aesthetic aspects of waiting areas.**
- **Intermodal connections and transfer areas need space for a convenient change of vehicles, including the connection to other modes (Bike&Ride, Park&Ride, hubs for bike-sharing, e-scooters, carsharing, taxi, Kiss&Ride**

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[25] *Stimulating Urban Walking Environments – Can we Measure the Effect?, Hillnhütter, Helge Environment and planning. B: Urban analytics and city science. 2021, 49 (1), 275-289.   10.1177/23998083211002839*

Collective (public) transport is the most space efficient way to transport high volumes of people. It is a backbone of the mobility system of any larger city in Europe. Public transport works best when being mainly undisturbed by other modes. The high number of passengers justifies priorities at traffic lights and dedicated space for bus lanes and for own tram tracks. In dense urban neighbourhoods giving such priority for public transport may mean to reduce the number of lanes for cars (either for driving or parking).

Stops and waiting areas require space

The infrastructure at public transport stops also requires space. Shelters and waiting areas should have sufficient space and, if possible, no conflicts with cycle lanes that may bypass the stop. Extended sidewalks (bus caps) at stops serve both to reduce the conflicts with pedestrians and to give the buses priority in traffic as they don't have to leave the travel lane.

Iconic bus stop with sufficient space for waiting passengers, rain protection and real-time information in Hanover, Germany (photo: Glotz-Richter)

Walkability: part of public transport – good walkability increases catchment area

The travel chain with public transport usually also involves walking. Studies show that more than 90% of public transport users in Germany walk to or from the stop to their final destination[26].

The studies also indicate that good walkability with a stimulating and pleasant environment may increase the passenger catchment by up to 70%. But despite its function as main link to public transport in cities, walkability is not yet fully seen as part of the attractiveness of public transport.

The design of street space is an important factor of perceived travel time of pedestrians - with it the pleasantness of the walk to the public transport stop. Unattractive boring street space with high volumes of car traffic extends the perceived travel time, whereas greening and shop windows reduce the subjective time. For raising the quality of walking trip legs to public transport shade and weather protection should be taking into account. Especially exposure to sun and reflection of sun emissions from urban environments may decrease the quality of waiting periods for PT and access trips to PT. This becomes more an issue due to rising temperature caused by climate change.
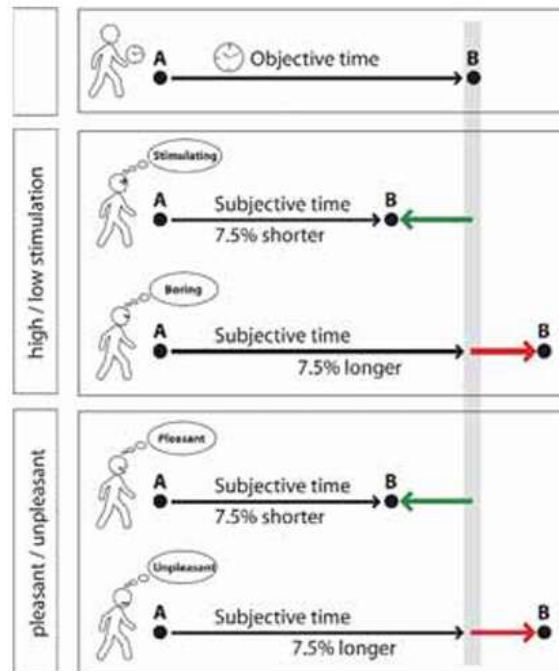
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[26] Brög, Werner (Socialdata), Wollen Sie nur von Haltestelle zu Haltestelle oder auch zum Einkaufen?, in mobilogisch, 1/2014
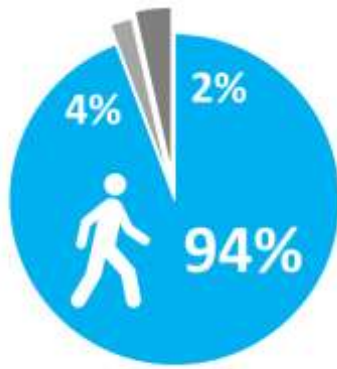
Modal split of public transport users in Germany (source: Socialdata / Brög)

Impact of stimulation and of pleasant walking conditions on perceived (subjective) time (source: Hillnhütter, H.)

It is of interest for an efficient operation to have as many people as possible being able to access the stops of public transport. Good and pleasant walking conditions, safe and easy crossings can extend the catchment area of a public transport by up to 70% more potential users. Cooperation between PT operations and street design is key in improving

It should be in the interest of cities and public transport operators to have a higher catchment area to serve the mobility needs in a more efficient way.

Who needs to act?

Cities are responsible for the design and operation of local streets.

Public transport operators need to understand that good walking conditions near stops increase the catchment area and should focus the conditions for this form of feeder transport.

The **design principles of on-street public transport stops** need to provide sufficient space for a waiting area, a shelter and relevant information, while still respecting the space of pedestrians and cyclists.

Diverging view of ACEA:

ACEA sees public transport not inherently as the most space-efficient transport as this depends on the operational system (surface), utilization rates and service frequency. Authorities cannot afford to ignore people's mobility needs, constraints and preferences of transport modes.

4.8   Plan and build cycle infrastructure, including safe bike parking

Some key points

- **Cycling is a very efficient and sustainable mode of transport – thus a key module of SUMPs in many cities.**
- **Cycling requires safe and attractive infrastructure, which is often a conflict when it comes to limited space in urban streets.**
- **Safe bike parking is a pre-requisite to promote cycling.**
- **In many densely built urban neighbourhoods, there is not enough space for safe and convenient storage of bicycles in homes. Bicycle parking on street space can make cycling more attractive**

In 2024 the European Council, the European Commission and the Parliament signed the European Declaration on Cycling[27], marking the official adoption of the first inter-institutional cycling policy at the European level.

To optimally encourage cycling, it is necessary to consider and improve the entire cycling system. This involves:

1. good safe cycling infrastructure (cycle paths, bicycle lanes, school environment);

2. sufficient high-quality bicycle parking facilities;

3. encouraging bicycle use among people who are not yet able or able to afford it.

Good safe cycling infrastructure

Cycle infrastructure should be attractive, safe and well-dimensioned to serve current and future demands – including cargo bikes (which often are wider), bikes with trailers (which are longer) and cyclists with different speeds (for overtaking). If cycle lanes and paths are wide enough, people can ride side by side, using the same opportunity to talk to each other as a car offers.

Knowing that safety is an important concern that keep potential cyclists from using the bike, many cities all over Europe have converted (previous) car space into cycle lanes and tracks to provide safe space for cyclists.

Such processes can induce conflict, meaning good promotion and communication campaigns are important to highlight the benefits to the local community. Residents and small business owners must be brought on board and their genuine concerns addressed. Many residents' and merchants' fears are allayed when footfall into shops increases, air pollution is reduced, and streets feel safer and more liveable.

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[27] European_Declaration_on_Cycling_en_0.pdf (europa.eu) and A historic milestone for cycling: European Institutions officially adopt joint European Declaration on Cycling | ECF

Graphs: Converting car lane into a bike lane (in progress Bremen; done Barcelona); photos: Glotz-Richter

In historic urban areas, streets might be too narrow to separate cycling from car lanes. A cycle street allows for mixed traffic, but with priority for cycling, where cycling side by side is normal and legal. A network of cycle streets can then become a cycle zone, where an entire neighbourhood prioritises the bike and requires car drivers to behave as guests.

A 2.4-kilometre grid of 12 streets in Bremen became Germany's first bicycle zone in 2020 (photos: Glotz-Richter)

Bicycle streets allow convenient cycling (photos: Glotz-Richter)

Bicycle lanes marked "only" by paint need to be protected by enforcement (photos: Glotz-Richter)

Maintenance, lighting, and winter service are necessary to make cycling attractive all year long. In sunny and hot climates, trees and other means can create shade or protection against rain.

Snow-free cycle path in winter (photo: Glotz-Richter)

An urban cycle network should be part of a wider and coherent cycle network. The different levels that need to be considered are: a regional cycle network, the main urban cycle network (city), a fine-grained neighbourhood cycle network and a recreational cycle network. Each network has different infrastructure requirements including different widths, speeds and safety requirements.

In some Dutch cities, a minimum obstacle-free cycling space in each direction of two metres is used. With that width, side-by-side cycling and overtaking are possible. The surface should preferably be asphalt with a clear colour (some countries prefer red, green or blue), otherwise in comfortable stone paving.

Sufficient high-quality bicycle parking facilities

Bicycle parking is an often-neglected element of cycling infrastructure. People cycle from A to B, so bike parking is needed at houses, work locations, inner cities, shops, public transport stations and stops, schools, sport venues, etc. Locations where people stay longer require different solutions (bike parking garages, neighbourhood storages) than locations where people stay for a short time (on-street bike parking facilities). Different kinds of bikes need different solutions. Randomly parked bicycles have a negative impact on spatial quality and even on accessibility for pedestrians and emergency services. Bicycle parking facilities should be adapted to the spatial function of an area or a building, with an eye for detail and human behaviour.

For urban housing areas, the demand is decentralised, whereas at intermodal interchanges, in inner cities and at areas with a high density of workplaces and attractive destinations, there is a demand to store a large number of bicycles centrally, safely and conveniently if municipalities want resident and visitors to use bicycles.

In urban neighbourhoods with no off-street bike parking, you may need to dedicate space to install good bike racks or even small cycle parking garages on street.

Unsafe on-street bicycle parking in Bremen before re-design and getting bike racks outside the pavement / hearts for bicycles in Stuttgart (photos: Glotz-Richter)

Where no safe bike-parking options are available, bicycles are much more frequently subject to theft. Bike racks that allow the frame and at least one wheel to be locked combine efficient use of street space with good protection against theft.

On-street bicycle parking with good bike racks in Bremen's cycle zone (photos: Glotz-Richter)

Before and after: combining keeping the junction free from all parking with providing bike parking (photos: Glotz-Richter)

On-street sheltered bicycle parking in Brussels (photo : Glotz-Richter)

In addition, promotion of bike sharing is important – especially for those who do not use a bicycle as their daily means of transport.

Bike parking garages

At the intersection with public transport and rail, bike parking garages can allow for storing large numbers of bicycles for those who commute in intermodal chains – using the bicycle as feeder to rail and public transport. Such garages may be combined with bike-related services such as air pumps, repair services or bike-related tourism information.

Bicycle parking garage as part of neighbourhood-oriented mobility station, combined with a car sharing station, Wuppertal, Germany (photos: Glotz-Richter)

Huge demand for bicycle parking near a central station / bike parking boxes at a P&R in Groningen (photos: Glotz-Richter)

Bicycle parking can be made very convenient: new bike garage in the centre of Groningen and near Groningen central station (photos: Glotz-Richter)

Bicycle parking in new developments

In some European cities, local regulations have been in place for years requiring bike parking facilities in new developments, but this was rather the exception than the rule. Now, after receiving approval from the European Parliament in March 2024, Member States adopted the Energy Performance of Buildings Directive[28]. This ground-breaking legislation establishes, for the first time, minimum bicycle parking standards across various categories of residential and non-residential buildings across Europe.

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[28] See: Default of two bicycle parking spaces per apartment rubberstamped as EU law takes final legislative hurdle | ECF

Bicycle parking in new developments (photos: ECF)

Who needs to act?
Design and implementation of street-related bike infrastructure is the responsibility of road authorities. National and European design guidelines and recommendations should consider sufficient space for safe cycling and good bike-parking.
Safe and convenient off-street bike parking supplements good cycling conditions. Employers, shopkeepers and housing companies should take this seriously by providing good bike parking

4.9   Dedicate space to shared e-scooters, bikes and cargo-bikes

Some key points

- **Shared (micro-)mobility vehicles can be part of sustainable mobility strategies**
- **As e-scooters bicycles, cargo-bikes are usually to be parked on sidewalks, it may lead to unbearable obstructions for pedestrians**
- **To well integrate shared micro-mobility vehicles in sustainable mobility strategies, it requires clear regulations for operators – especially geo-referenced no parking zones – and dedicated areas to leave the vehicles behind with becoming barriers to other road users**
- **Shared cargo bikes can replace a significant share of car trips of 'private micro-logistics' – like grocery shopping, transport of children… - but need easy access**

Whereas shared bicycles became part of the urban transport system over the last decades, shared e-scooters and cargo bikes are comparatively new. In the recent years, e-scooters caused quite some controversial perception.

Bike sharing

Although some trials of bike sharing – such as the Amsterdam white bikes – go back to the 1960s, the first larger shared (rental) bicycle services were launched in European cities in the early 2000s. The systems were mainly station based and one way.

Municipalities and rail operators supported or integrated such services as feeders to public transport and rail systems – enlarging the catchment area of stops and stations. It became a

means to give access to public transport (and thus a wider area to access jobs) for people who do not have access to a car.

The technological development brought a wave of app-driven dockless bicycle sharing services to many cities worldwide. Data generation was a major part of the business concept. The waves of (usually cheap) bikes caused problems as bicycles were abandoned, obstructing the way for other road users.

Cheap free-floating shared bikes left behind (photo: Glotz-Richter)

As a reaction, municipalities started to regulate the operation of free-floating bike sharing. Based on good experience with station-based bike sharing, many municipalities prefer to support that kind of operation – also creating no-parking zones for shared bikes.

These stations require space and should be located so as not to obstruct pedestrian traffic on narrow sidewalks.

Station-based bike sharing in Paris – smart card access, 2014 (photo: Glotz-Richter)

Station-based bike-sharing in Munich – app-based access, 2021 (photo: Glotz-Richter)

Cargo bike sharing

Cargo bikes can bridge the gap between a standard bicycle and a car when it comes to transporting goods or children; they can serve as a zero-emission and space-efficient mode of transport for private micro-logistics, such as grocery shopping, transport of children to kindergarten or on a leisure trip. Given these needs and the often short distances involved, there is substantial potential for substituting car journeys with cargo bike journeys. The H2020 project ULaaDS conducted a trial in Bremen of a cargo bike sharing scheme which demonstrates a significant impact. A survey of users found that a remarkable 55% of

respondents' cargo bike trips would have otherwise been undertaken by car[29]. While the Bremen model uses local shops and community centres as handover points, other operators have dedicated cargo bike sharing stations.

Station for cargo bike sharing (model Sigo) (photo: Glotz-Richter)

Special bike rack for cargo bikes in Strasbourg (photo: Glotz-Richter)

Parking places for cargo bikes should have special bike racks – ideally designed to make it uninteresting to leave conventional bikes in these places.

E-scooter sharing

The start of shared (one-way, free-floating) e-scooter operations brought with it controversy in many cities. Either people love or hate them. The space-related reason for hating e-scooters was the vehicles being left on sidewalks. This created barriers and risks for pedestrians and led to severe accidents when people fell over scooters.

A solution to this concern has been a combination of geo-referenced no-parking zones and the provision of stations to park the e-scooters. In this way, the sidewalks can be kept free of parked (or fallen) e-scooters. Such a strategy has led to better acceptance of e-scooters – but it requires governance regulations, enforcement and space in the streets.

Well organised stations for e-scooters in combination with georeferenced no-parking zones may tame the problems of e-scooters and increase general acceptance (examples Vienna and Munich) (photos: Glotz-Richter)

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[29] See *Policy paper on the future on-demand urban logistics*, H2020 ULaaDS project (Urban Logistics as an on-demand Service) D7.8 (2023) download https://ulaads.eu/wp-content/uploads/2024/03/D7.8.pdf

4.10 Try out innovative urban logistics approaches

Some key points

- **Loading and unloading zones are an instrument to reduce conflicts caused by delivery vans – requiring the dedication of space for these and clear and consistent enforcement.**
- **Micro-hubs can be considered a new solution – facilitating a shift from vans to cargo bikes or other smaller and clean vehicles.**
- **Micro-depots and parcel lockers are effective solutions for storage of delivery goods and returns.**
- **Dealing with urban logistics should include the role of private micro-logistics, potential white-label solutions for micro-depots/parcel lockers, with strategies to local shops in order to revitalise neighbourhood and city – being integrated in Sustainable Urban Logistics Plans (SULPs)**

With the increase of e-commerce, last mile logistics has become a pressing concern for cities across Europe. Although construction related truck movements play a major role in urban heavy vehicle traffic, the increasing amount of delivery vans has caused more and more problems in urban neighbourhoods with narrow streets. The issue of delivery vans parked illegally persists, whether on cycle lanes or sidewalks or double-parked on main roads.

Delivery vans as obstacles for cycling and for public transport (photos: Glotz-Richter)

Loading zones

In historic neighbourhoods, local shops with no rear access may need on-street delivery zones. Dedicated delivery / loading and unloading zones have been helping to address this issue. However, their effectiveness hinges on clear rules and strict enforcement to safeguard their purpose.

In process from vision to reality in Germany: a dedicated delivery zone.

(source : BIEK)

Delivery zones require space, which may cause a conflict with residents who perceive the street space as their parking lane.

Legal questions may arise as to whether a loading zone should be dedicated to private or commercial loading activity, and whether there should be a time constraint. Modern digital technology may help to ensure use in compliance with the rules.

An example is Barcelona with its delivery zones (*Distribució Urbana de Mercaderies*) that clearly limit the use to trucks, delivery vans, tourist buses and two-seater cars for mixed use. The delivery zones are restricted to these vehicles from 8:00 to 20:00. Registration via an app is required and loading/unloading activities are allowed for time slot of 30 minutes.

Delivery zone in Barcelona : for commercial vehicles, georeferenced by App., maximum duration 30 minutes (photos: Glotz-Richter)

These delivery zones are rigorously monitored, backed by fines of €200 for infractions. This robust approach not only preserves these vital zones for deliveries but also minimises disruptions to other traffic.

Newly established delivery zones could function as an alternative to the current illegal practice of double parking or misusing sidewalks and cycle paths to park delivery vans. This requires a minimum density of such zones and the willingness of delivery operators to use them and to accept somewhat longer walks between delivery zones and recipients.

To optimise the overall functionality of street space, the introduction of delivery zones also requires accompanying enforcement, both to keep the delivery zones available for deliveries and to stop delivery vehicle drivers from double parking or misusing sidewalks and cycle paths.

Indoor micro-hub in Barcelona and on-street in Bremen (photos: Glotz-Richter)

In the URBANE project[30], the City of Bologna implemented three Nearby Delivery Area (NDA) as part of the local SULP. The NDAs are strategically positioned at three access points to Bologna's historic centre. Each NDA is composed of an automated and unmanned micro-hub that is remotely managed and monitored. After the shipper processes and dispatches orders to the transport operators, they select parcels suitable for storage in the NDA micro-hub based on factors like dimensions and weight. If the parcels are deemed suitable, information about them is transmitted to the intermediator, who optimises the last mile by assigning parcels to the most convenient NDA, considering factors such as proximity to the recipient and box availability. A unique code is generated, permitting only authorised couriers to access the designated boxes for parcel drop-off/pick-up. Ultimately, the last-mile operator retrieves the parcels from the boxes and distributes them to the final clients situated in Bologna's historical centre. Blockchain is used to certify the occurrence of events relating to the logistics process (i.e. Key Points), so that in cases of dispute, the transport operators/last milers have evidence to support the proof of delivery.

Unattended B2B micro-hub on public street space in Bologna (photos: URBANE project)

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[30] See https://www.urbane-horizoneurope.eu/demonstration-cities/lighthouse-living-labs/bologna-italy/

Parcel lockers / micro-depots

There is a growing demand for B2C delivery, with parcel lockers as additional or even as an alternative to home delivery, as it is more time efficient for the operators. These parcel lockers also require space. As we foresee this being a competitive market, access to public space must be given in a non-discriminatory way. To avoid having a separate parcel locker for each of the various delivery companies, white label solutions are desired – but difficult to achieve. For this reason, these parcel lockers must often be placed outside legally dedicated public street space but must remain publicly accessible.

Parcel locker: multi-operator solution outside public street space in Bremen, single operator on-street solution in Mechelen, Belgium (photos: Glotz-Richter)

Urban logistics and urban development

With the growth of e-commerce, we see a shift of revenues away from local shops – especially in city centres – to e-commerce operators. As part of wider regeneration strategies for city centres and urban neighbourhoods, urban logistics must also be considered. Innovative initiatives support fast delivery from local shops to their customers – combining stationary shopping, online shopping and quick delivery.

For municipalities, the high expectations of SULPs do not always align with the reality of dealing with a competitive commercial market. Balancing the demands of that market requires fair and unbiased interventions, e.g., when it comes to ceding public space for parcel lockers, micro-depots and micro-hubs. Frequently, white label solutions are unavailable, unprofitable or lack a neutral operator.

National regulations add another layer of complexity, for example limiting local governments' tools for managing loading zones or access regulations. These constraints have a ripple effect, influencing the relationship between city centres and suburban shopping hubs. Moreover, as e-commerce continues to grow, city centres must redefine their role, evolving beyond shopping destinations into vibrant spaces for hospitality, leisure, and urban living[2].

The demand for last-mile urban delivery services is expected to grow by 78% by 2030,[31] leading to a 36% increase of delivery vehicles in circulation and adding 11 minutes to the average daily commute. Cargo bikes can be instrumental in avoiding these negative impacts. A European Environment Agency's (EEA) report[32] on the first and last mile highlights that "walking or cycling the first, last or only mile provide the greatest societal benefits",

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[31] Source: World Econmoic Forum – quoted in Sustainable Solutions Last Mile Delivery Challenges | ZhenHub
[32] https://www.eea.europa.eu/publications/the-first-and-last-mile

recommending "a modal shift towards environmentally friendly delivery modes such as cargo bikes" as one of the strategies to relieve the environmental burden of e-commerce.

Private micro-logistics: Cargo bikes instead of cars

[33]Logistics is not only done by commercial operations. Every household engages in 'micro-logistics' regularly. In Germany, 30% of all trips are related to shopping. Within urban areas, the average shopping distance is approximately 4 km. This constitutes about 17% of the total mileage driven and contributes roughly 10% of transport-related CO_2 emissions. Given these needs and the often short distances involved, there is a substantial potential for substituting car trips with cargo bike journeys.

The ULaaDS project pilot in Bremen demonstrates the significant impact of cargo bike sharing. According to a user survey, 55% of trips taken would have otherwise been undertaken by car.

Fietje cargo bike sharing in Bremen (photo: ADFC Bremen)

Who needs to act?
On the operational level, logistics is a commercial market-based business.
Local and national authorities set the framework for operation.
The European level sets emission standards for vehicles. Pilot project and research projects should further be supported to gain more knowledge and develop innovative solutions.

Diverging view of ACEA

ACEA notes that static loading and unloading zones (like all privileged parking spaces) can lead to some inefficient use of scarce space. Therefore, dynamic & differential management should be used as the efficient way to optimize use of street space for loading and unloading and other needs- dealing with space scarcity.

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[33] Germany, data: Mobilität in Deutschland (2017) Ergebnisbericht, published by German Ministry for Transport 2018

4.11 Plan and implement e-charging hubs

> **Key Points:**
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> - **Charging infrastructure is a pre-requisite for promoting e-mobility, but it requires a business case – which may include subsidies.**
> - **E-charging infrastructure should be installed off-street rather than on-street if possible, but urban neighbourhoods with little off-street parking may require on-street charging as well.**
> - **On-street charging points require space for technical infrastructure, which should not obstruct other road users (esp. pedestrians and cyclists).**

Reduction of greenhouse gas emission by phasing out fossil fuels

A major element of reducing the climate footprint of mobility is a shift from fossil fuels to a different drivetrain. Electric mobility is a key module of European, national and local strategies to zero emission mobility (assuming renewable sources of electricity).

But the promotion of e-mobility requires charging infrastructure. It is preferable to have charging infrastructure mainly off street. This can be on private land at home, in parking garages, at work, at shopping centres and supermarkets, etc. Dense urban neighbourhoods often have little off-street parking, meaning charging infrastructure will be required in public street space. To make the use of street space as efficient as possible, and also to achieve a business case for charging infrastructure, the time a car is left at a charging point must be limited.

Charging infrastructure in public space should also be considered for e-bikes and other smaller electric vehicles, such as e-scooters and electric wheelchairs, which should not be too difficult to incorporate into existing e-car charging infrastructure.

On-street charging infrastructure needs a business case – requiring limited parking/charging time (example: only for e-cars during the charging process, max 3 hours parking between 8:00 and 18:00) (photos: Glotz-Richter)

On-street charging infrastructure: slow charging versus fast charging

The advantage of fast charging is the speed of the process. On the lee side there are both significantly higher costs for every kWh and a much higher space demand for the technical infrastructure, making it inappropriate for dense urban neighbourhoods.
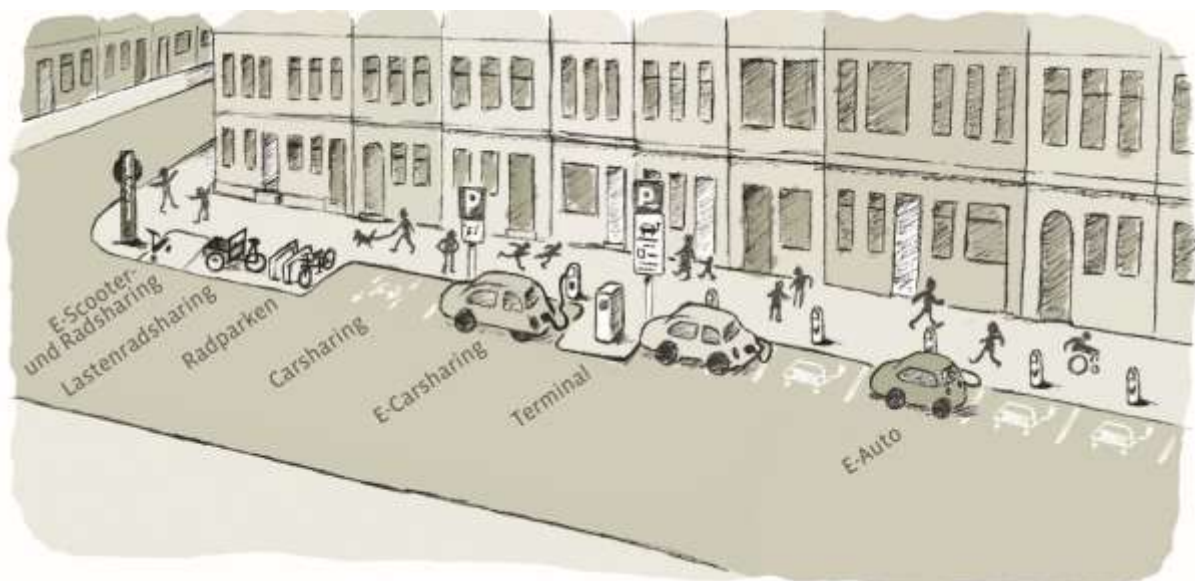
Charging hubs to reduce the cost per charging point

The installation of charging infrastructure can be an opportunity to re-organise street space. Charging hubs can provide four, six or eight charging points at one location, which can reduce the infrastructure costs per charging point. A higher number of charging points also gives a better chance to find an available one when you need it.

Charging hub in Bremen with six charging points at one grid connection (under construction and in use) (photos: Glotz-Richter)

The installation of charging infrastructure in public street space requires official signage and marking, which is only possible if parking is done in compliance with the rules of the Highway Codes. The planning of charging hubs can be done in conjunction with the reorganisation of parking so that it complies with the law, also providing car sharing spots and spots for shared e-scooters, bicycles and potentially also cargo bikes – all together as a zero-emission hub.

Model of a zero-emission hub – bringing together e-charging and shared mobility in a re-organised street space in Bremen (source: City of Bremen)

4.12   Use car sharing to reduce demand for car parking

Some key points

- **Car sharing – in conjunction with a high level of other mobility options – has the potential to be an alternative to car ownership, allowing cities to reclaim street space in an efficient way.**
- **The reliability of car sharing services is a key aspect for it to be a real alternative to car ownership.**
- **Municipal support for car sharing has its largest potential in providing space for stations and integrating car sharing with other mobility services (esp. public transport).**
- **Independent quality criteria should be set to define cities' expectations of car sharing operators, especially if car sharing is to function as alternative to car ownership**

Car sharing developed over the last 40 years to a modern mobility service that gives access to a car when you need it. Where you have good infrastructure, public transport and good conditions for walking and cycling, you can do most of your daily trips by sustainable modes. Whenever you are in need for a car, car sharing gives you access without the costs and requirements of car ownership.

The experience of integrating car sharing into sustainable urban mobility plans shows that it can reduce car ownership. A customer-oriented car sharing service can be enhanced by the provision of street space for car sharing stations in urban neighbourhoods. But car sharing is not a stand-alone measure; it needs to be integrated into urban development and with other mobility options to allow a multi-modal and, for the most part, car-independent lifestyle

The car on call : car sharing makes users happy (photos : Glotz-Richter)

It is already the case that neighbourhoods with good conditions for walking and cycling, with decent public transport service and with other mobility services have low dependence on the private car. Counts in one urban neighbourhood in Bremen showed that 26% of parked cars were not moved over three consecutive workdays, indicating that those cars are only required for occasional trips. This indicates a good potential for car sharing, which offers cost savings to the user and reduced demand for parking space. The principle, "Use it. Don't own it" applies equally to cars as to supermarket shopping trolleys, which most people, luckily, do not feel the need to own. Similarly, car sharing can provide a vehicle when you need one, without the hassle of owning it.

Car sharing is a concept of mobility that builds on day-to-day multimodality, supplemented by a car for occasional use. Here, the car is a stopgap rather than the centre of mobility patterns. Other shared modes (bike, cargo bike, e-scooter or moped sharing) can supplement the bundle of mobility services, but a full alternative to car ownership is usually only achieved when car sharing is part of the package.

Different forms of car sharing have different impacts

Europe has four main forms of car sharing:

1. **Station-based car sharing** is most widespread in Europe. With this form, you may reserve far in advance or spontaneously. The vehicle must be returned to the station you picked it up at within the reservation time (up from one hour to several weeks).
2. **Free-floating car sharing** is mainly found in larger cities and has a large user community. It allows one-way trips, usually limited to a defined operational area within the city, but sometimes also between cities. When you want to use a car, you have to check availability at your starting point. Advanced reservation is usually limited to 10 or 20 minutes[34] before travelling.
3. **Combined car sharing** offers both station-based and free-floating services from one operator with a single tariff structure.
4. **Peer-to-peer car sharing** offers cars of private individuals for use by others. Peer-to-peer car sharing is usually app-based and supported by clear agreements about insurance, etc. The main incentive for participating is the chance to reduce the costs of car ownership.

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[34] MILES allows reservation of 10 minutes free of charge; SHARE NOW 20 minutes

The EU H2020 project STARS[35] evaluated the impacts of these car sharing variants. The study confirms that pure free-floating car sharing has very limited impact of car ownership (and the related demand of street space), whereas station-based car sharing and combined offers are attractive as an alternative to owning a car. The STARS survey shows that the level of car ownership among users of pure free-floating car sharing is similar to that of non-users of car sharing. In comparison, households using station-based or combined car sharing have a much lower level of car ownership.
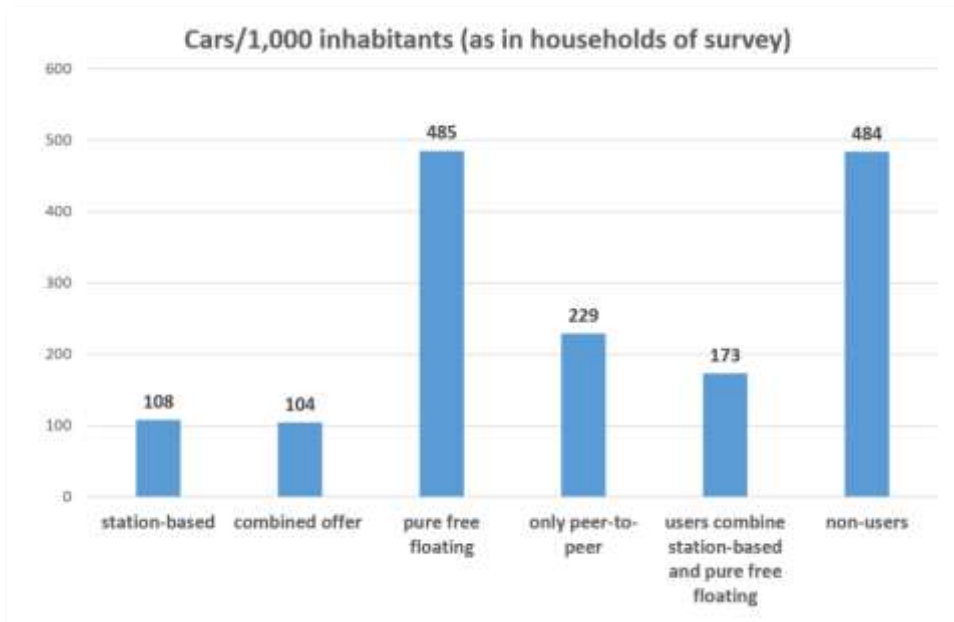
Graph: The results of STARS survey[36] show that station-based car sharing (also in combination with other forms of car sharing) has the highest impacts on car ownership *(source: Bundesverband Carsharing)*

Studies confirm the impact of reliable forms of car sharing on car ownership. In Bremen, about a third of the customers of the station-based car sharing service gave up on car ownership when they had a reliable alternative. Younger people in particular chose car sharing instead of buying a car. In total, about 16 cars are replaced in Bremen by every car sharing vehicles. The numbers vary between neighbourhoods, with inner city areas having a higher rate and peripheral areas having a lower one.

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[35] STARS = Shared mobility opporTunities And challenges foR European citieS (2017 – 2020) STARS_Factsheet2.pdf (stars-h2020.eu) Traffic reduction through car sharing - Evidence from the German experience Traffic reduction through car sharing

[36] Loose, Wille & Nehrke: Gunnar Entlastungswirkungen von Carsharing-Varianten - Vergleichende Befragung von Kunden unterschiedlicher Carsharing-Angebote – in Internationales Verkehrswesen 4/2018 – Download: https://zenodo.org/records/2620908/files/Article%20Internationales%20Verkehrswesen,%2050-53_nehrke_loose_IV201804.pdf?download=1

What can make car sharing attractive enough to function as an alternative to car ownership?

From the viewpoint of customers, the three major aspects are[37]:
1. Easy handling
2. Reliability (a car is there when you need it)
3. Proximity of the nearest car sharing station
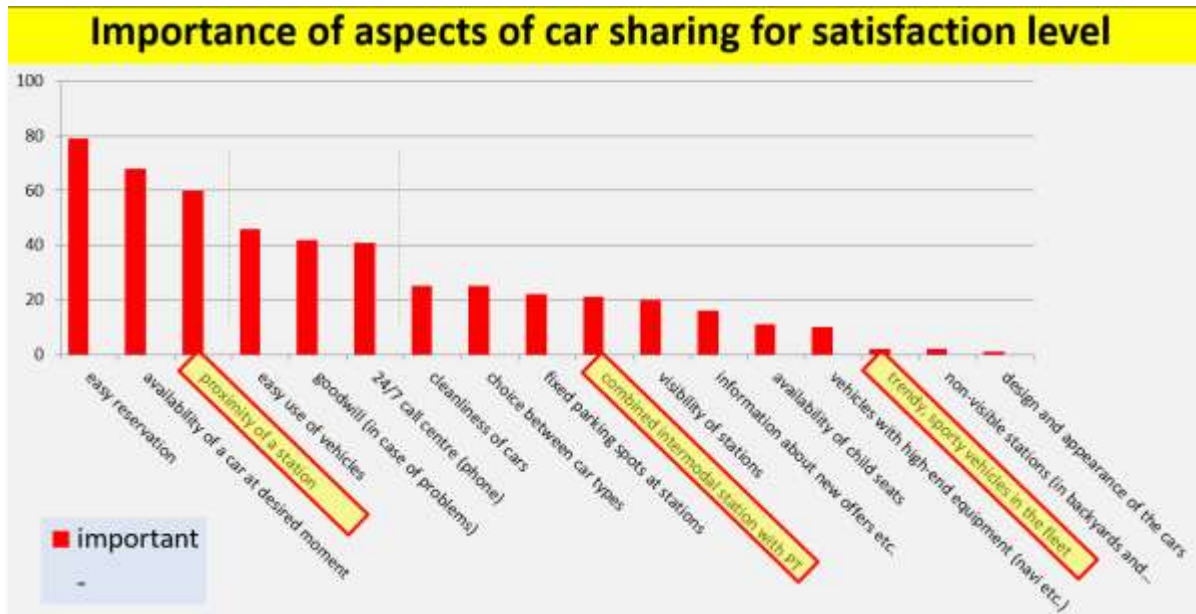
Importance of different aspects of car sharing in Bremen, Germany (source: final report by team red (2018), graphic: Glotz-Richter)

Whereas the first two aspects (handling and reliability/availability) are in the hand of the car sharing operator, the aspect of the proximity of stations in densely built-up urban neighbourhood is mainly the responsibility of local authorities as street space is the best option to provide good access and visibility of car sharing.

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[37] Survey: Analysis of the impacts of car-sharing in Bremen, Germany; Final Report by team red (2018) – download: https://northsearegion.eu/media/5724/analysis-of-the-impact-of-car-sharing-in-bremen-2018_team-red_final-report_english_compressed.pdf

Car sharing to reduce emissions and reclaim public space for people in Bremen (June 2022): 2022_CoMo_CaseStudy-Bremen_EN.pdf (europa.eu)

Satisfaction levels with different aspects of car sharing in Bremen, Germany (source: final report by team red (2018), graphic: Glotz-Richter)

If municipalities want to integrate car sharing as a strategic component of their SUMPs, they should offer street space for car sharing stations (and maybe also for other shared modes). Even if this entails a conversion of public parking space into a commercially operated car sharing station, the overall impact usually leads to a reduced need for parking space. Nevertheless, this needs proper communications. Public space/parking space made available for car sharing (preferably station-based or peer-to-peer) may serve as an in-kind discount for car sharing, e.g. by providing space for free or for a reduced parking fee to operators or peer-to-peer communities.

On-street car sharing stations at a mobil.punkt *in Bremen, also in smaller streets (photos: Glotz-Richter)*

Key objective: Alternative to car ownership – involving shift towards zero-emission

From a city's point of view, the relief of street space from cars is the main objective in promoting car sharing, thus the barrier to shifting from car ownership to car sharing should be kept as low as possible. This is one of the key reasons for continuing to offer mixed fleets of internal combustion and electric cars – with an increasing share of electric cars. Such a mix allows new car sharing users to test out electric cars while still having an ICE car at their disposal when range anxiety could otherwise lead to a return to ownership of a (probably ICE) car. Pure electric car sharing fleets should still be an objective – but for about 2030, when the proportion of electric cars in general will also be higher.

Quality criteria to ensure impacts on street space

Municipalities that want to promote car sharing with the objective of regaining street space should consider putting in place quality criteria. The City of Bremen officially set the objective of reducing the demand for parking as part of its quality criteria in its car sharing law. Concretely, the Bremen State Carsharing Act[38] requires the suitability criteria be defined with the aim of ensuring that the service offered by the respective car sharing provider is suitable to:

1. reduce the need for parking space in public and non-public areas,
2. reduce motorised private transport, in particular through networking with local public transport and other sustainable means of transport and
3. best contribute to a reduction in road traffic-related air pollutants, in particular through the provision of electrically powered or other low-emission vehicles.

The respected German eco-label *blauer Engel* (Blue Angel) requires a combination of service, tariff and vehicle aspects to ensure a good environmental performance beyond emission standards. Operator compliance for certification is monitored by an independent agency.

Extract of the basic Blue Angel criteria for car sharing (source: DE-UZ 100-201801-de-Kriterien-V5.pdf (blauer-engel.de))

- **No restriction to certain user groups**: "The car sharing operator must generally grant every person of legal age eligibility to participate in the car sharing service within the available capacities."
• **Performance of operators**: The use of the car sharing vehicle is possible on a daily basis, 24 hours a day, without the need for personal contact with the operator.
• **No free kilometres**: Allowing free journeys is not permitted, except for trips to fill the fuel tank or charge the battery, for maintenance and care of the vehicle or as a one-off offer to new customers.
• **Vehicle maintenance:** Completion of regular care and maintenance of the vehicle in accordance with the manufacturer's recommendations.
• **Customer information** about environmentally friendly and low-noise driving behaviour for drivers.

For the purpose of promoting multimodal transport, car sharing operators with a fleet of more than 50 vehicles must obligate themselves to **provide publicly accessible data** to car sharing users on the status of the car sharing vehicles (location, size of the vehicle, availability for use) that can be directly displayed in multimodal mobility platforms run by the municipality and locally based transport companies
3.2.1 Ensuring the **traffic and operational safety** of the vehicles
3.2.2 **Reduction in air pollutant emissions** – fleet composition requirements (according to vehicle classes and increasing requirements over time)
3.2.5 **Promotion of electromobility** – new vehicle quota for electric vehicles in order to promote electromobility for car sharing operators with more than 50 vehicles

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[38] See: GBl_2019_04_05_Nr_0033 (bremen.de)

Carsharing and new real estate developments[39]

Traditional parking requirements pose a challenge for sustainable, resource-efficient housing developments. Progressive policies, including integrating shared mobility into new housing developments, can help create equitable cities of the future and free up space for other purposes.

Policies for integrating shared mobility into parking standards for new real estate developments have impacts on car parking demand and car use. in the past, developers were required to build parking spaces with new developments or pay a fee to the city if they did not provide the required number of parking spaces. Modified parking requirements for new developments can induce behaviour change because people are most willing to develop new mobility habits when they are in a transition period in their life. A recent study has shown that these mobility management offers are effective in reducing car use and car ownership among tenants[40]. By providing access to mobility alternatives at a transition point in life (like moving), residents are more likely to switch to more sustainable transport modes, reducing car ownership and demand for parking space. As an additional benefit, reducing the number of required parking places and investing in mobility management also reduces the overall building costs per housing unit, an important equity aspect.

Shared mobility station as part of a new development for reduced car parking in Bremen (photo: Glotz-Richter)

Who needs to act?

Car sharing operators are usually private commercial businesses.
Cities should provide space for on-street car sharing stations and should maintain independent quality criteria focussing on the role of car sharing as an alternative to car ownership.
Car sharing operators should provide a service level that satisfies customers' needs. These include easy handling, reliability and an attractive fare structure.

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[39] (from *A planners guide to the shared mobility galaxy*, © Advier, 2021 for the SHARE-North Project, Interreg North Sea – download share-north.eu/wp-content/uploads/2022/05/Shared-Mobility-Guide_ENGLISH.pdf (share-north.eu)

[40] Tam red, Evaluation von Mobilitätsmaßnahmen im Rahmen des Bremer Stellplatzortsgesetzes, download: 210215 Team Red Abschlussbericht Methodik und Datenband zur Studie.pdf

4.13 Use parking garages and car parks to reduce demand for on-street parking

> **Some key points**
>
> - **Neighbourhood parking garages and car parks are tools to shift from on-street parking to off-street parking.**
> - **The investment cost for parking garages is high and requires appropriate parking fees to cover the investment and operating costs.**
> - **Free on-street parking close to parking garages undermines the potential business case.**
> - **Multi-use of parking spots of supermarkets, etc. may relieve the overnight parking situation.**

Many urban neighbourhoods suffer under the high demand for car parking space. One option to reduce the number of cars in neighbourhood streets is to shift the vehicles into neighbourhood garages or car parks. When such parking facilities are in the periphery of a neighbourhood, the volume of car traffic in neighbourhood streets will also be reduced.

For integration into existing neighbourhoods, a key problem is finding appropriate space for a neighbourhood garage or car park. A multi-storey building uses space most efficiently, while underground parking is less visible but much more expensive and on-ground car parks consume much space. Unoccupied urban space is difficult to find; empty space is rare and may serve ecological functions. Residents may also be concerned about concentrated traffic at access points. The garage itself needs to be designed to comply with noise emission limits.

Figures : Urban integration of neighbourhood garages in Stuttgart and Edinburgh (photos: Glotz-Richter)

A business model for neighbourhood garages must consider:
- land costs,
- construction costs and depreciation, and
- operating costs and maintenance.

Depending on the local situation and expected scope, construction costs for overground garages can be estimated at €15,000 – €30,000/parking spot and for underground €40,000 – €60,000/parking spot. A business model depends on the availability of potential grants. A purely market-based business model would mean monthly fees of at least 75€ in an overground garage and 120€ for underground parking.

Planning and operation of neighbourhood garages need to be co-ordinated with neighbourhood street space management. If there is free or cheap on-street parking in the neighbourhood, it will be difficult to develop a business case for the garage.

Neighbourhood parking garage for the Sonnenwendviertel in Vienna, a large new inner-city development (photo: Glotz-Richter)

Who needs to act?

Usually, **cities** set the framework through spatial planning and the management street space. The operation of parking garages can be done by a **market-based private company** or through a **municipal parking management company**. A city should implement pay parking on streets around parking garages to create a business case for such garages.

4.14 Ensure compliance with the given rules

Some key points

- **A key objective of a Highway Code is to ensure the safety of all road users.**
- **Compliance with the rules is a pre-requisite to ensure a well working and efficient mobility systems; this may require strict enforcement.**
- **The implementation of transport measures should not disadvantage certain groups of road users.**
- **Where enforcement is not sufficient, other measures may be needed (e.g., bollards), but these are usually costly and also take up space.**

Fair share and safe use of street space for all street users is related not only to the regulatory framework but as well to what extend the rules are kept – or whether some user groups are disadvantaged or discriminated. The Highway Code is usually set on the National level and contains information, advice, guidelines and mandatory rules for all

road users. A major objective is to ensure safe conditions for all road users, to minimise risks and negative impacts – and to ensure some efficient functioning of the transport systems.

Whereas slow-moving pedestrian traffic needed no formal regulations, the increase of motorised traffic was the impetus for establishing mandatory rules in Highway Codes – generally in the 1930s.

Regarding use of urban street space, the most important aspects concern the regulation of respectful and risk-reducing behaviour in traffic. This includes speed restrictions and legal and non-discriminating parking of vehicles in street space. There may be additional safety concern when illegally parked cars block hydrants on sidewalks or when parked cars block junctions or narrow streets, meaning firefighting vehicles cannot get through.

Illegally parked cars block passage for larger vehicles, car parked illegally on the sidewalk, blocking a hydrant (photos: Glotz-Richter)

Traffic calmed areas / shared space

Following the Dutch *Woonerf* model of the 1970s, many countries followed the idea of traffic calmed zones in residential streets where car traffic volumes are low. In such cases, the principle of mode separation is not followed, but rather mixed zones, where vehicle speeds are low (walking pace). In traffic calmed areas, pedestrians are formally allowed to use the entire width of the road for walking (or for playing). Car parking is legally restricted to explicitly marked areas. The more recent development of shared space follows similar principles for roads with somewhat higher traffic volumes. (see also 4.4 « *Put in place traffic calming and shared space* »)

Traffic calmed areas are a model to reallocate street space – enlarging the area of pedestrians, ensuring safety through very low speed limits and the call for more respectful behaviour.

Mixed traffic lanes in residential streets

In narrow urban streets, we often see separation of pedestrians from other road users by sidewalks, with all other modes – including cycling – sharing the road lane. A speed limit of 30 km/h is intended to address both road safety and traffic noise limitation, while the kerb should physically and legally separate the modes and protect pedestrians.

Major streets – separating modes

In streets with higher car traffic volumes, you will find more separation, which also requires more space (e.g., for cycle lanes). Where space for separated cycle lanes is not available, a speed reduction might be appropriate to reduce risks.

Enforcement

When road users do not follow the rules, it adds risks and disturbance for others. Key problems are speeding and illegal parking on sidewalks. Enforcement of the given rules is necessary so that all citizens take the rules seriously. E-charging hubs or delivery zones may also require enforcement so they remain available for their intended purposes.

The system of enforcement (often by local police and/or enforcement units) and fines (usually defined by national regulations) and the use of modern technology can help with compliance. When fines are very low, they not only have no deterring effect on traffic offenders but they may cause a deficit for the local authority (i.e., it costs more to enforce the rules than the amount collected in fines, which leads to a tendency not to enforce).

Speed controls are usually carried out in streets with higher traffic volumes or where there are vulnerable groups (e.g., schools), whereas parking enforcement is necessary in all areas with high demand for parking. Additional sidewalk-related enforcement focus might be needed for shared e-scooters, for which sufficient and clearly marked dedicated parking space needs to be allocated. Some shared micro-mobility operators have drawn up good practices to play an active role in avoiding non-compliance. (see 4.9, « Dedicate space to shared e-scooters, bikes and cargo-bikes »)

Enforcement in Bremen and Malmö (photos: Glotz-Richter)

In some cities, there has been no or limited enforcement of illegal parking for decades. People have got used to the "wild west" of parking, which is formally illegal but taken for granted due to lack of enforcement.

But clear rules, combined with strict enforcement, can lead to a reduction of misbehaviour and to a reduction of fines. For example, the City of Vienna introduced a citywide parking management, *Parkpickerl*. With strict enforcement, the number of fines decreased from €46

million in 2018 to €37 million in 2021[41]. The main purpose of enforcement is not to generate income but to organise safe streets.

Digital tools can help with enforcement, but national frameworks to exploit the potential of digitalised enforcement are quite different across Europe. Sensors and scan cars increase the efficiency of enforcement, but raise concerns of data protection in some countries. Digital enforcement is also related to kerbside management (see 3.17).

Autonomous / automated (self-driving) vehicles

It is to be expected that automated or autonomous vehicles are programmed to follow the given rules for using road space – both for driving and for parking (see also 4.17) and that they will be able to share the existing space within the current traffic, i.e., they won't require extra street space.

Overall, the working group expects and strongly support autonomous vehicles being deployed only as shared vehicles including public transport – thereby taking pressure off public space – rather than exacerbating replacing privately owned cars with privately owned autonomous cars.

Who needs to act?

The responsible level (national, local, …) is called upon setting the framework of parking regulations, setting the rates and ensuring enforcement. The responsible authorities – especially enforcement departments – must take action when the rules are not obeyed.
The national level must provide a functional framework to allow for applying digital technologies – including for enforcement.


4.15 Improve visibility and other safety aspects

Some key points

- **Being able to move around safely is a prerequisite of sustainable mobility.**
- **Main aspects of increasing road safety in relation to space are speed reduction and visibility between road users and distance between road users moving with very different speeds**
- **Keeping zones clear from parking (and other obstacles) is a way to ensure visibility between road users – especially at intersections and areas of pedestrian crossings**
- **The implementation of transport measures should not disadvantage certain groups of road users**
- **Where enforcement is not sufficiently done, other measures might be implemented (e.g. bollards) – usually costly and also taking space**
- **A further safety aspect is related to accessibility for fire fighters – including to keep hydrants and other technical safety installation free from parked vehicles.**

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[41] https://www.derstandard.at/story/2000143948859/ein-jahr-wiener-parkpickerl-viele-freie-parkplaetze-aber-noch-wenige

Motor vehicles are becoming safer and safer – but this only applies to their occupants. It does not consider the damage and injury caused to others. 83% of cyclist fatalities and 99% of pedestrian fatalities come about in crashes involving a motor vehicle[42].
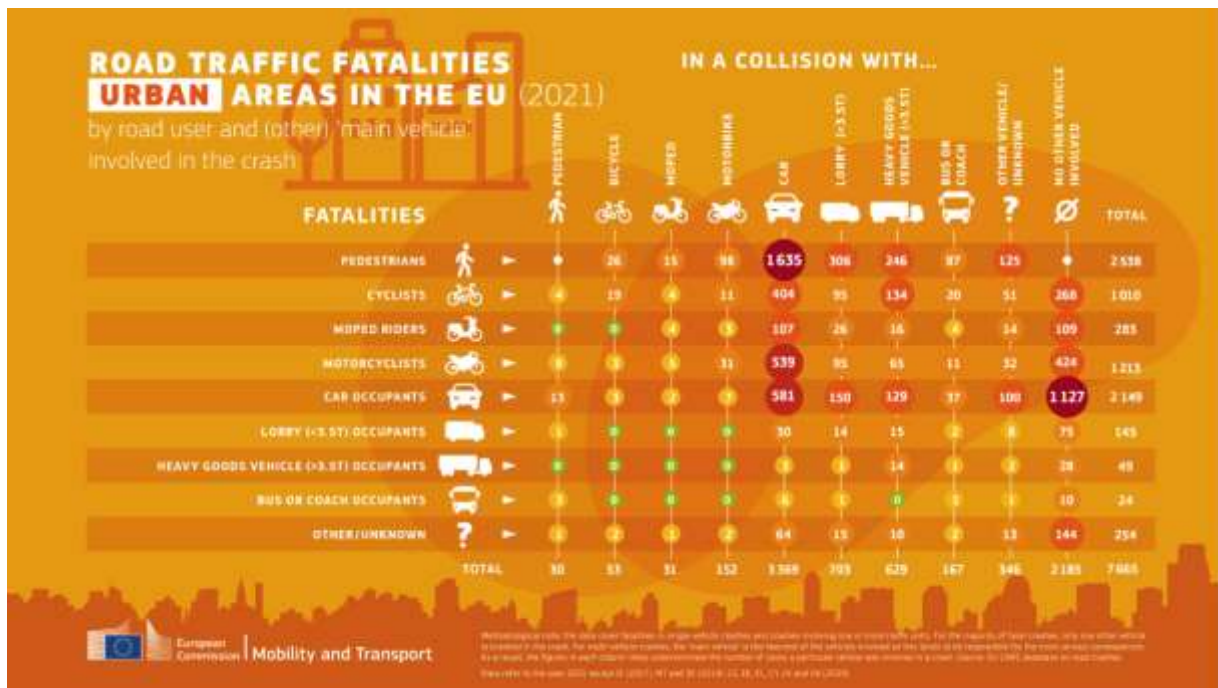
Road Traffic Fatalities in urban areas in the EU (2021)
(source: https://road-safety.transport.ec.europa.eu/document/download/ea3c0e09-2808-4035-b03c-
48bde9304c9a_en?filename=Collision%20matrix%20URBAN%202021.pdf)

The graph shows the impacts of motorised vehicles on road fatalities across the European Union. It represents fatalities per mode and the 'other vehicle' that was involved in each crash. 83 fatalities occurred in crashes with cyclists and pedestrians, while over 5,051 fatalities occurring in crashes with motorised vehicles (not including single vehicle crashes) in urban areas in 2021.

Feeling safe on urban streets

Speed is one of the main risk factors, which is why speed reduction to 20-30 km/h is a common approach in cities to improve safety in urban neighbourhoods. Visual and physical elements should encourage drivers to keep a slow pace. Narrowing lanes is an instrument not only to reclaim street space for pedestrians, bike-parking, parklets, etc., but also to reduce speeds. As noted in TheCityFix, "wide sidewalks, layered planting of trees and shrubs, and appropriate street lighting improve overall pedestrian comfort, walkability and safety."[43]

In addition to slowing speeds, visual contact between drivers, pedestrians and cyclists is key for road safety. Wherever pedestrians may be expected to cross the street, the sight lines need to be kept clear. This aspect becomes even more important where schoolchildren cross the street. Here, extended sight lines may be appropriate. Extended kerbs with parking restrictions

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[42] https://etsc.eu/wp-content/uploads/PIN-Flash-38_FINAL.pdf
[43] Low-Speed Zones Save Lives. How Do You Design an Effective One? | TheCityFix

near the crossing, clear markings and good lighting are the cornerstones of crossings with good visibility (see graph below).

Crosswalk visibility enhancement / safe transportation for every pedestrian

(source: [Crosswalk Visibility Enhancements Safe Transportation for Every Pedestrian Countermeasure Tech Sheet (dot.gov)](#))

Markings and bollards keeping the intersection free from illegal parking in Brussels (photos: Glotz-Richter)

For safety at junctions, street space and crossing locations should be clearly designated for each transport mode.

Example of low-speed zone features in a shared street. (source: TheCityFix)

Strict liability

Most EU countries have some form of strict liability[44], which assumes the driver is liable for damages (not criminal guilt) if there is a crash with a pedestrian or cyclist. This avoids victim blaming and gives cyclists additional legal defence, with the argument being that the cyclist is not the party in the crash that brought a multi-tonne vehicle, powered by a several-hundred-horsepower engine to the incident. Strict liability can also resolve issues around insurance in vehicle collisions, as it means there is always insurance available to pay for any damages that result from a crash.

Some laws are quite weak in this regard, while others are very strong. In France, for example, the Badinter Law deems the driver liable for all harm caused by their vehicle without any fault, and without any defence of *force majeure* and with significant restrictions if the defence of contributory negligence is applied. All European countries should apply some form of strict liability within their legal systems.

Speed management

Motor vehicle speed is an important part of the safe system approach. Exceeding speed limits is very common, and speed is an essential contributing factor in around 30% of fatal crashes. Typically, 40 to 50 percent of drivers travel faster than the speed limit, and 10 to 20 percent exceed the speed limit by more than 10 km/h. The European Transport Safety Council claims that 2,100 lives could be saved each year if the average speed dropped by only 1 km/h on all roads across the EU[45].

But speed management should also be looked at through the lens of health, the environment, and modal shift. In an initiative report on road safety published in October 2021, the European Parliament called on the EU Member States to implement 30 km/h as a default. The European Commission should go beyond this and issue a formal recommendation to national, regional and local governments and eventually an EU-wide 30 km/h speed limit for motor vehicles in urban areas. Many cities are already implementing 30 km/h limits as a default and the results have been very good. The Stockholm Declaration, the final outcome document of the Third UN Global Ministerial Conference on Road Safety, called for "a maximum road travel speed limit of 30 km/h in areas where [you find] vulnerable road users and vehicles".

This attempt to reduce urban speed limits should also be seen through the lens of modal shift. In other words, lower speeds will mean more welcoming roads for cyclists and pedestrians. Fewer vehicles is also important. Very busy roads – even at slow speeds – are not attractive for walking or cycling. Again, the road safety aim implies a reduction in the use of private cars in urban areas – making cycling and walking more attractive.

> **Who needs to act?**
> **Local authorities** have to consider the spatial organisation of street space with good visibility between road users as a pre-condition of safety – from design, regulations to enforcement.
> The **national authorities** should apply some form of strict liability within their legal systems.

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[44] Ireland, Romania, Cyprus and Malta do not have strict liability
[45] ETSC: Reducing Speeding in Europe (PIN Flash 36) https://etsc.eu/reducing-speeding-in-europe-pin-flash-36/

4.16 Use kerbside management for multi-use of street space, flexible demand-based fees and incentives for smaller cars through graduated parking fees

Some key points

- **Kerbside management is the multi-use of street space -also allowing flexible parking fees according to demand, with incentives for smaller cars through parking fees according to the size of the vehicle.**
- **Parking fees set according to the size of cars would create market-based incentives for smaller cars in urban areas to achieve a more efficient use of street space.**
- **Digital tools allow a more flexible fee calculation and invoicing – but the technical and legal framework still needs to be defined.**
- **For some demands, street space can be used flexibly over time, e.g. as a delivery zone over the day, and a parking zone during the night. Digital tools and variable message signs can allow for more flexibility in the use of street space.**

Over the last decades, cars have become both longer and wider, consuming more and more space. Whereas in the beginning of the 1960s, cars on the German market were, on average, less the 4 metres long and 1.60m wide, in 2019 they needed on average 4.6 m by 1.9 m[46]. The size of cars produced in Europe increased between 2000 and 2022 from 4.16 m to 4.36 m in length and from 1.71 m to 1.81 m in width[47].

Volkswagen Golf became 50 cm longer and almost 20 cm wider than 20 years ago
Golf 1: 3705 x 1610 x 1390 mm
Golf 7: 4255 x 1799 x 1452 mm
(graph: *Süddeutsche Zeitung*)

For the current 250 million cars in the EU[48], the increased length over the last 20 years means an additional end-to-end space consumption of 50,000 kilometres – purely through the increased size of cars. In the year 2000, you could park 10 cars in a 50 m parking lane. That is reduced to currently rather eight cars.

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[46] https://www.rnd.de/wirtschaft/datenanalyse-autos-werden-nicht-erst-seit-dem-suv-boom-grosser-6GTM66RRNJEC7EYHR3FQS7Y24Y.html

[47] https://www.firmenauto.de/laengenwachstum-bei-pkw-laenger-breiter-hoeher-11223592.html#:~:text=Zwischen%202000%20und%202022%20ist,von%20einem%20Zentimeter%20pro%20Jahr

[48]This figure includes all types of passenger cars and does not account for other types of vehicles such as commercial vehicles or buses.

How can municipalities give incentives for smaller cars?

On the national level, fiscal instruments exist to influence consumer priorities when purchasing a car. In many countries, there is emission-related taxation, but the size of cars rarely matters. There are currently almost no incentives set by local authorities for smaller cars (except the fact that it might be easier to find an available parking spot).

Providing more but smaller parking spaces for more but smaller cars

(photo: Glotz-Richter)

Operators of parking garages have started to provide decks with different sized parking spots – and related different fee levels. As such a parking deck can serve fewer cars, higher fees are required to generate the same revenue per m².

It could be considered a normal market economy approach to pay more for consuming more space – and would provide an incentive to reduce space consumption, but we rarely find such an approach on public streets. As street space is a limited resource, lower parking fees for smaller cars would be a sensible approach within a market-based economy. In such way, cities have indirect impact on car design of manufacturers by facilitating space-efficient car models.

In the near future, digital tools will allow a change from the current static payment per vehicle – independent of space consumption – to flexible fee levels that consider the space consumption of each car. Such a system could also take into account the demand at certain times and in certain areas – creating dynamic and flexible kerbside management.

A VW Polo requires 4.05 m in a parking lane and a total of 7.1 m² street space[49]. In comparison, a BMW 7 series needs 5.39 m in a parking lane and a total of 10.5 m² street space[50]. An equitable approach would be to charge a lower parking fee for a car taking up significantly less public space. Such fee generation can be automated in vehicles-to-infrastructure communications or with a digital twin when paying by app.

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[49] 4,05m x 1,75 m
[50] 5,39 x 1,95 m (mirrors folded)

Diverging view of ACEA

Demand-responsive or dynamic pricing (peak load pricing) is not only about space consumption but also a reaction to search traffic. Both elements should apply to all modes. This also implies digital enforcement.

4.17 Intelligent Parking Assistant (IPA) – Exploit upcoming technology of tomorrow already today

Some key points

- **Like ISA for speed, IPA could support drivers in finding a legal parking spot and avoiding disturbing or endangering others.**
- **Automated cars will be required to follow the rules of the Highway Code.**
- **Automated transport under conditions of mixed traffic works better when all players in the street space play according to the same rules.**
- **When the car itself "insists" on parking according to the rules, this will greatly ease enforcement efforts.**

The technological development towards autonomous cars will require cars to park themselves according to the given legal rules. Geo-referencing and sign recognition are already in use for speed keeping. A similar tool could be used for parking. In combination with information about available parking spots, such a tool could help with compliance with rules to ensure street space is used for the intended purposes.

A significant benefit of autonomous vehicles would be the observance of highway codes regulations and compliance with speed limits. Vehicle speed limiters are a necessary technology for autonomous vehicles that will significantly reduce speeding if AVs become more commonplace on the roads. This technology should be prioritised for all motorised vehicles.

Currently all new motor vehicles must be fitted with an Intelligent Speed Assistance system which warns the driver when he/she is driving above the speed limit. A speed limiter, by contrast, would mean that the vehicle would automatically keep to the speed limit. Mandatory use of this technology would mean that all motor vehicles would respect the speed limit. Since it is a necessary technology for autonomous vehicles, it should be mandated for all motor vehicles.

Although it has negative impacts on other road users, illegal parking is quite common in many European cities. The technological tools of automation may help to avoid illegal parking. As sensor technology has become a standard element of new cars, it is only a small step from Intelligent Speed Assistance (ISA) to Intelligent Parking Assistance (IPA). To achieve a fair share of using street space in real life application, such Intelligent Parking Assistant could widely avoid illegal and obstructive parking. This upcoming technology should be put in place as soon as possible to improve parking behaviour.

Illegally parked cars cause many problems for other car and truck drivers, for pedestrians and cyclists and for the environment. Intelligent Parking Assistance would inform drivers that parking is not legal at the given spot. The vehicle might even refuse to be left on such a spot. As some guidance tools already do today, the system could guide the driver to a legal parking space, where the car could be left without obstructing other road users.

How IPA could show that no parking is allowed on a given spot (source: Glotz-Richter adapted from TomTom)

Sensors detect location and road signs, understanding where a car can be legally parked. Information about available parking spots could also be provided.

From the perspective of European cities, an Intelligent Parking Assistance system would be very supportive of sustainable mobility and road safety but, unlike ISA, there is currently no formal requirement for such a system to address parking.

5. Aspects of communications

Participation

Groups that will benefit from the envisaged reorganisation of street space should be explicitly addressed. Unfortunately, many of the currently disadvantaged groups do not raise their voice in the same way strong groups are doing it.

Some basic principles for communications with citizens:

- Use visuals and some easy-to-understand language

- Use also online participation tools – it involves more younger people.

- Involve the business community and other local stakeholders that may be concerned

- Address explicitly needs of handicapped

- Consider on-street participation in comparison to assemblies

- Make clear that requirements of fire fighters, road safety, needs of handicapped are not subject of discussion. Make clear that car parking is just *one* of the demands for street space

For preparing a sustainable neighbourhood mobility plan (as described in module 1), some regular contact of planners and decision-makers with the citizens and stakeholders of the neighbourhood –e.g. through events, meetings, presentations and other exchange formats- may improve the quality of the plan and support the acceptance of the measures.

Temporary intervention / tactical urbanism

Temporary interventions may serve to raise awareness and test the planned re-design of street space. It may allow as well to test variants of plans. Make sure to provide temporary interventions a decent amount of (testing) time in order to see the real long-term consequences. New situations need time to settle.

Risks: Improvised infrastructure does not look and does not work in the same way as it will be with construction does (e.g. kerbs as barriers).

Implementation phase

- Send out information to residents and those being concerned before the re-design/re-organisation starts – explain the rationale of the plan / concept – present the variety of mobility solution for the street and neighbourhood

- Consider needs of local business to remain access, contact person during construction phase

- Be aware that phases of construction and of changes in general are always difficult.

Evaluation after re-organising street space

It is helpful to evaluate the impacts of the re-organisation when the changes got settled. How did the road safety develop, what do people with disabilities say, how is the street space used? Can you see some shift to sustainable modes? To what extend did car sharing developed to replace car ownership?

How does the street look like – (e.g. with more street greening)?

You may compare the re-organised street space with other streets that are (not yet) re-organised.

6. Conclusions

Street space is a limited resource and subject of increasing competing demands. All cities in Europe face conflicts between different uses and users of street space.

It is time to get into solutions that combine traditional insights of sustainable mobility, of recent needs for climate adaptation with methods to reduce the needs for on-street parking.

Being aware, that a re-organisation of street space may cause conflicts and is politically sensitive but at the same time necessary, communications are crucial. But it requires also clear and brave decision-making to keep existing rules, to prepare for the future and to serve mobility needs of all – including those who often remain unheard.

Essential messages are:

- An essential part of the SUMP approach should be the application of its principles at the neighbourhood level.
- Street space serves not only transport and social functions but is also needed as ecological space. Greening and de-sealing are necessary to improve the microclimate and to better prepare for stormwater incidents

- Re-organising street space is as necessary as politically sensitive and requires good communications – but at the end as well clear and brave decision-making in controversial situations e.g. when aspects of safety or for people with disabilities

- Ever bigger cars are causing problems for cities, their growth needs to be curtailed

- Over the last decades, it became clear that efficient mobility requires alternatives to using a car. For the next decades, we have to extend alternatives to owning a car in the same pragmatic way.

- The potential of carsharing (use it – don't own it) is by far not exploited in European cities. Car sharing supplements all improvements of sustainable modes – if you are able to do your daily trips by sustainable modes, car sharing bridges the gap to having a car available when you need one.

- In general, shared mobility (including bike sharing, cargobike sharing, e-scooter sharing etc.) is an important part of space-efficient and sustainable mobility solutions

- Compliance with the rules is a pre-requisite to ensure a well working and efficient mobility systems; this may require strict enforcement. The implementation of transport measures should not disadvantage certain groups of road users.

- Seeing each other is one of the key aspects of safety in mixed-use urban streets. The organisation of urban street space defines the visibility conditions. This includes (but is not limited to) car parking

- Use market instruments of pricing to make off-street parking (parking garages) compatible with on-street parking. Free on-street parking gives no incentives for investing in off-street parking

- Traffic calming is important in improving the reallocation of street space – extending the space for walking and offering the entire width of a (traffic calmed) street for playing

- The installation of parklets, mobile cafes, and other such installations can give street space more quality and provide spaces where people can sit, meet, etc

- Walkability is an indicator of inclusiveness; the signed Convention on the Rights of Persons with Disabilities needs to be translated into inclusive street space.

- Public transport should be fully integrated into street space

- To optimally encourage cycling, it is necessary to improve the entire cycling system – involving plentiful safe cycling infrastructure, sufficient high-quality bicycle parking facilities and measures to encourage bicycle use among people who do not cycle or who cannot afford it

- Cities should promote and improve the conditions for innovative urban logistics approaches and services

- Frameworks for electric vehicle charging infrastructure needs to be clearly formulated to provide charging without inconveniencing other modes

- Modern kerbside management and parking enforcement should use existing digital technologies.

- Autonomous cars will be programmed to keep traffic rules for the sake of efficient and safe operation – we can call for assistant systems to keep parking rules already today (IPA = Intelligent Parking Assistant as equivalent to ISA Intelligent Speed Assistant).

All 17 modules have their importance, interaction and a huge potential to develop synergy.

ANNEXES

7. Diverging view on this report

Statement of ACEA

The European Automobile Manufacturers' Association (ACEA) recognises the challenges in cities with limited street space and welcomes an open exchange about appropriate strategies dealing with the challenges and at the same maintaining mobility requirements.

ACEA highlights that this report suggests that the characteristic "sustainable" is solely a question of modes and resource consumption is the only criterion. However, sustainable mobility shall be defined as (i) serving mobility needs (ii) under the condition that economic, environmental, and social constraints are met. Sustainability in transport shall be understood as decoupling mobility from its negative effects, not as shifting modes. Shifting can be a result, reflecting mobility preferences and constraints. The full costs of <u>all</u> modes should be considered. It is about framework conditions, not about modes. Therefore, all criteria such as user financing, dynamic & differential pricing, and competition for innovation should apply to all modes, including public transport, bike riding, and micro-mobility.

ACEA calls for all modes being treated equally - meaning no privileges and discrimination.

In ACEA's opinion, the best way to achieve sustainable mobility is through a standard price approach (dynamic & differential pricing – applying all externalities, like environmental and social). That includes parking and traffic flow for all modes. Equal access implies that the use of road space for other purposes should bear the same costs (opportunity cost principle). This enables residents, visitors and other public and private stakeholders to decide how they want to use and manage scarce spaces.

ACEA suggests that these points should be subject of further in-depth discussions and exchange. For ACEA, this report represents rather the beginning of the debate – not an end.

8. Case studies

Examples of street space strategies in European cities

The sub-group's work touched upon a very important aspect when street space allocation for various cities is concerned: the necessity of a strategic approach in understanding the public spaces in both the movement and place context. For example, in London, the Mayor established a Road Task Force, which had the above in min mind and delivered a report: "London's street family: Theory and case studies" [11]. Similarly, the City of Stockholm published its "Strategy for Public Spaces" [2], as a part of its flagship "Urban Mobility Strategy" [3]. Within the sub-group another reference was mentioned, the City of Groningen in the Netherlands, with its "New Space for living: Design guideline - quality of public space" document.[4]

What we can learn from these reports? In the first instance, if we define accordingly both the **movement** and the **place** axis (as in London's example), we can use this concept to define all public urban spaces into categories. We see different examples how **data management** and **technology** is used, **logistics concepts** are integrated and how representatives of the German auto industry and representatives of cities jointly developed **scenarios for a climate friendly city** with sustainable, efficient and affordable mobility.

8.1 **Impact equivalent to €200 mio invest in parking garages! Relief by 10,000 private cars: reclaiming street space through promotion of car sharing in Bremen**	
City of Bremen, Germany	Author: Michael Glotz-Richter
Reference to modules 12, 1, 9, 16	Contact :Glotz-richter@gloricon.de

The Northern German city of Bremen (570,000 inhabitants) is known as cycling city and as well as a leading city to promote car sharing. Already as early as 1995, the first joint pilot promotion of public transport and car sharing took place under the title 'a neighbourhood with fewer cars'. With on-street car sharing station ('mobil.punkt'), Bremen took the initiative to integrate car sharing on-street into densely built up urban neighbourhoods and their narrow streets. The 2009 unanimously adopted car sharing action plan became a blueprint for many other cities. It set the target of quadrupling the number of car sharing users in Bremen to 20,000 by the year 2020 – but more important to having replaced at least 6,000 private cars by using the service of car sharing: use it – don't own it.

Key measures of the car sharing action plan were

- Dense network of car sharing stations -where necessary on public street space
- Integration in new developments – revision of the old-fashioned parking requirements towards mobility management
- Joint offer and promotion with public transport
- Integration into fleet management of companies and administration
- Information and awareness.

As it was quite advanced and a world-leading example of urban sustainability the City of Bremen was selected to present its sharing approach in an own pavilion in the 2010 World Exposition in Shanghai/China – which had the theme "Better City – Better Life".

The network of stations in Bremen grew to about 150 over the city. A 2017 survey presented some key insights of the success of the (privately operated) Bremen car sharing scheme. From the viewpoint of users, there are the three most important aspects of car sharing:

1. Easy handling (which is in ´the hands of car sharing operators – modern technology provides convenient access, efficiency and billing)
2. Reliability (which shows the advantages of station-based car sharing vs pure free floating: the option of making reservations in advance gives a level of reliability. Still, spontaneous use is also possible)
3. Short distance to the stations as access points (Here, the municipalities play a crucial role -as they can create dedicated car sharing stations in the neighbourhoods).

For cities like Bremen, the location of (larger) car sharing stations at public transport stops was not perceived as really important – but also here, the satisfaction level of users was very high – as it is with the top expectations.

Graphs: integration into the urban neighbourhoods, also new developments (photos: Glotz-Richter)

By spring 2021, the number of 20,000 users was achieved – but more important, the number of cars being replaced by using car sharing was about 8,000. Every car sharing car in Bremen replaces about 16 private cars – either being given up or not being purchased.

By 2024, the impact of car sharing in Bremen is equivalent to having 10,000 cars being taken from the streets – end to end more than 50 kilometres street space. If you wanted to achieve the same impact by neighbourhood parking garages, it would request an investment of about €200 million. Over the last 25 years, the City of Bremen has spent a good million Euro for car sharing stations and promotional activities – which shows the extreme high efficiency of investing in car sharing – and of understanding customers' needs.

Some lessons learnt:

- Car sharing is not an experiment but needs to be provided as reliable service
- It is more important to have a network of smaller car sharing stations being spread over the urban neighbourhoods than having some few large stations
- Station-based car sharing offers a higher level of (requested) reliability – some free-floating car sharing may be added. But the reliability of station-based car sharing comes first if you want to offer a real alternative to owning a car
- Electrification of car sharing is a challenge but necessary. Currently, you need mixed fleets of conventional cars and e-cars if you want to convince car owners to give up their conventional car. In that way, car sharing is a learning field to get more and more used to e-cars. If these potential car sharing customers hesitate because of pure e-car fleets, you may have lost them for the next 8 – 10 years and they go around only with a fossil fuel burning car.
- Integration of mobility management in new developments and reducing individual car parking is a major tool of affordable housing – when dependence on a car for daily trips is low

Links	https://share-north.eu/2021/05/mission-accomplished-20000-people-in-bremen-are-using-car-sharing-over-6000-cars-replaced-goals-of-the-carsharing-action-plan-achieved/ 2022_CoMo_CaseStudy-Bremen_EN.pdf (europa.eu) Bremen's fight for car sharing - Eurocities

8.2 Exhibition Road London: Shared Space revolution in early 2000's

City of London, UK	Author: Vladimir Vorotovic
Reference to modules 1,6,7,8	Contact: v.vorotovic@mail.ertico.com

Exhibition Road is one of the most visited streets in London, with several key cultural and educational landmarks dotted around the road and its vicinity in South Kensington neighbourhood, in Southwest London, the capital of the United Kingdom. It's a home to the Victoria & Albert, Science and Natural History Museums, the Imperial College, one of the UK top universities and the Royal Geographical Society. In its vicinity is a legendary concert and event venue, an iconic Royal Albert Hall. All of the above venues, on annual basis have more than 20 million visitors[5]. In its near past, i.e. prior to the transformation project, the Exhibition Road had all of the elements of fairly typical dual carriageway inner city road, with the pavements on each side and fairly restricted options for movement of large group of pedestrians and visitors from all around the world, unfamiliar with the area and not able to easily explore the area and visit the aforementioned landmarks on both side of the road.

Graph Exhibition Road before and after (source: BBC News portal[6])

One of the issues plaguing the free movement of people at the time was coaches parking on the road and its vicinity, to bring the large number of tourists closer to the attractions. In addition to those important public buildings, the street is well known for its architectural beauty and some of the prettiest private homes with a very distinctive style built in the 19th century attracting additional attention from

the London's guest whole year round. The below image depicts the "before and "after" views of the Exhibition Road.

In early 2000's the Royal Borough of Kensington & Chelsea, which in large part operated the road, decided to incept a transportational project and convert the whole street, from its start just off South Kensington Underground Station all the way to the junction with Kensington Gore (A315) to a shared space area, with a number of traffic calming measures across the street. Part of the redesign idea was very innovative approach with the change of the top layer of the road from a standard carriageway paving into a visual and ambiental unified space, which would *provide an equitable and inclusive public space* for all of its users, irrespective if they are in motorised private or public vehicles, on bicycles or walking and enjoying the environment.

The competition for the project was won by Dixon Jones architects, who worked with a number of partners to redesign, redevelop and implement the solution that is now enjoyed by high number of visitors to London and this specific micro-area. London's Project Centre consultancy and its team, including Vlad Vorotovic, co-lead of the subgroup 6 in EGUM, were responsible for the design, traffic modelling and engineering and consultation of the proposed solutions creating digital models of the winning solution, which has been widely adopted and implemented.[7]

The RIBA (the Royal Institute of British Architects) awarded project was delivered several years later and it included a fundamental change in its design and spatial identity, well recognised by its: "…*Yorkstone paving and granite setts banded in black and pink, which create the diagrid crisscross paving pattern giving the street its unique visual identity.*"[8]. The Exhibition Road project was completed on 8 December 2011.

Further Information / Links	For more information and reading about this novel idea and project, please visit: • https://www.rbkc.gov.uk/parking-transport-and-streets/roads-and-pavements/exhibition-road-project • https://www.ajbuildingslibrary.co.uk/projects/display/id/5107 • https://www.publicspace.org/works/-/project/g069-exhibition-road Exhibition Road an 'exemplar' of how to make a city liveable | London Evening Standard | Evening Standard

8.3 National walking strategy Austria 2030

Republic of Austria	Author: BMK Austria[9]
Reference to modules 6, also 1, 2, 4, 5, 7, 8 ,15	Contact: Bundesministerium für Klimaschutz, Umwelt, Energie, Mobilität, Innovation und Technologie (BMK), Austria

Austria was the first country to deliver a national walking strategy – already with the 2015 Master Plan Walking. The Austrian Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK) has launched a broad offensive to promote walking. The current Master Plan Walking 2030 describes the many benefits of walking and underlines the substantial relevance of pedestrian mobility for climate action and health promotion, for the quality of live in cities and municipalities, for the support of the local economy and for an inclusive barrier-free mobility system for everyone.

Besides the pedestrian-friendly amendment of the Austrian Road Traffic Code, the Federal Ministry has established a special funding focus on the upgrade of infrastructure for walking for the first time ever at federal level.

The Master Plan Walking 2030 defines pedestrian mobility as an equal and equivalent form of mobility within the transport system and therefore provides for the promotion of walking at all levels with the following goals:
• an attractive climate-friendly and energy-efficient overall transport system,
• a high-quality living space, particularly in our cities and municipalities,
• a high level of environmental quality and an important contribution to climate action,
• promotion of public health and of an inclusive society,
• a boost to the local economy, especially local amenities,
• increased road safety and increased security of attractive public spaces,
• integrative and collaborative spatial, settlement and transport planning.

The Masterplan Walking 2030 sets targets for the first time for a trend reversal and thus for an increase in the share of pedestrian mobility towards 20% of routes in Austria as a national average. A total of 50 recommended actions to promote pedestrian mobility nationwide by 2030 have been defined for all relevant service providers and stakeholders in the following 10 action areas:
1. Coordination of pedestrian mobility on federal, provincial and municipal governments
2. Pedestrian mobility offensive – funding and investment
3. Pedestrian infrastructure and road safety – planning and upgrade
4. Pedestrian-friendly spatial and settlement planning
5. Mobility management in pedestrian traffic and multimodality
6. Legal framework for pedestrian mobility
7. Information, digitisation and awareness-raising
8. Impact of pedestrian mobility on health
9. Impact of pedestrian mobility on the economy
10. Database, statistics, education and research

The content of the Master Plan Walking 2030 can be used directly in the preparation of the Sustainable Urban Mobility Plans (SUMP) recommended by the EU. With the Master Plan Walking 2030, Austria is also a role model at European level and is making a major contribution to the implementation of the resolutions of the 5th High-Level Ministerial Meeting of the Transport, Health and Environment Pan European Programme (THE PEP), jointly serviced by the World Health Organization (WHO) and UNECE, especially to the Vienna Ministerial Declaration: "Building forward better by transforming to new, clean, safe, healthy and inclusive mobility and transport."".

THE PEP is a platform for cooperation between the transport, environment and health ministries as well as other important international organisations at a Pan-European level for the promotion of climate-friendly and health-enhancing mobility in Europe. In particular, Austria is leading the way with other European countries on the preparation of the first Pan-European master plan for the promotion of pedestrian mobility within the framework of the new THE PEP Partnership on Active Mobility.
The Master Plan Walking 2030 also provides an overview of the numerous examples and initiatives for the promotion of pedestrian mobility in Austria at federal, provincial, city and municipal level.

Further Information/ Links	The National Walking Strategy can be downloaded (in German with summary in English):
	• Version 2015: https://www.klimaaktiv.at/dam/jcr:de62856d-6fc9-434c-b67c-9a21d0de4253/MP-Gehen_final_forWeb.pdf
	• Version 2030: https://www.klimaaktiv.at/dam/jcr:4ee966d5-ea82-43c0-8a0f-a042da9d0117/BMK_Masterplan_Gehen_UA.pdf
	• The PEP Pan European Programme: Transport, Health and Environment Pan-European Programme (THE PEP) (who.int)

8.4 The 2030 climate friendly city – as a joint scenario developed between auto industry and cities (Platform Urban Mobility)

Germany	Author: Michael Glotz-Richter
Reference to modules: all	Contact: Michael.niedenthal@vda.de

Established as initiative of the Association of the German Auto industry (VDA) in 2017, the platform urban mobility (Plattform Urbane Mobilität – PUM) brought together 9 members of the VDA and 9 cities – to jointly develop strategies and projects.

The efficient use of street space was one of the key topics. The platform saw price signals as one of the strategic elements towards environmentally friendly, user-oriented and also affordable mobility. Further elements were new mobility services, the use of data for better organisation of mobility systems, organisation of urban logistics and of course the transformation to e-mobility.

With the development of a 'model city', the platform urban mobility integrated various approaches to a picture of six types of urban fabric (city centre; mixed urban quarter; peripheral housing areas; suburban settlements, commercial areas).

The most conflictual area in terms of competing demand for street space is the mixed-use quarter close to city centre. The platform urban mobility (PUM) presents a mixed strategic approach – bringing together integrated urban planning (e.g. short distances, decentralised co-working space, green and rainwater management), price signals and parking management (public parking and road space is charged; car parks for locals; parking places for cargo bikes and bike sharing) with the result of 'transforming parking space into green areas' and gaining 'additional space due to reduction of parking space'. Shared mobility concepts with mobility hubs and high-quality public transport are necessary ingredients of the strategy as well as the use of technology (e.g. automated valet parking).

Source: Verband Deutscher Auto Industrie (VDA)

Further Information/ Links	Website of the Platform Urban Mobility (in German) https://www.plattform-urbane-mobilitaet.de/ The entire presentation of the model city can be found (in German): https://www.plattform-urbane-mobilitaet.de/files/content/mobilitaet/20230629_PUM-Modellstadt.pdf

8.5 Democratically driven and inclusive street space solutions

City of Rotterdam, The Netherlands	Author: Kevin van der Linden
Reference to modules 8, 4, 5, 6, 15	Contact : k.vanderlinden@rotterdam.nl

The City of Rotterdam - with a growing and diverse population of currently 655.000 people - used to be very car-centric (much to do with the city's reconstruction post WWII). In tackling its mobility transition challenges and to improve liveability on a street-by-street level, it's managed to also engage with stakeholders in new and innovative ways.

The scheme "*Fietsvlonders*" (bicycle platforms) is one such example, shown in Figure 1. Through this scheme, car parking spaces in the city can be converted into parking for bicycles, only after a simple request signed by 4 residents. When a request is received, the city introduces one of its temporary bicycle parking platforms on the car parking space in question. After 6 months of no-objections, the space is converted into permanent parking on the footway, and the temporary platform can move to the next site. This scheme not only accommodates the 3% annual growth of cycling in the city, it also provides more space on the footway, making it more attractive to walk through the city. Rotterdam won the "Tour de Force" innovation award for this scheme in 2018, thanks to its simplicity and democratic approach.

Another example which influences street space in Rotterdam, is through its efforts to democratise cycling. As a melting pot of cultures and with over 170 nationalities living in the city, not every citizen grew up with the Dutch love for cycling. The city actively supports cycling as a mode of transport by investing in cycling lessons, both for adults and children, and particularly in neighbourhoods with "transportation poverty". The city also promotes the cycling culture through the "*Fietsalliantie*", a collective of over 60 partners involved with cycling in the city, and manages the "Fietsbank", a scheme where citizens who would otherwise not be able to afford a bicycle are given a second-hand bicycle for free.

Figure 1 - Before and after introducing the bicycle platform

To accommodate this growth in active travel, the city is investing in interventions to its highway infrastructure, so that more space is allocated to pedestrians and cyclists as opposed to motorists.

Of course, all these examples have to be seen in the wider context of the Netherlands. Cycling is embedded as a fully-fledged mode of transport, with a coherent cycle network in place on a national, regional and urban level. Additionally, low car parking provision standards for new urban developments (combined with more than ample parking provision for bicycles and shared mobility), provides further opportunities to support this modal shift.

Further Information/ Links	How this Dutch design convinces residents to swap car parking for bike racks - Fast Company rotterdam.raadsinformatie.nl/document/7829652/1/

8.6 Kerb management: City of Basel introduces on-street parking fees according to the length of vehicles and also demand-responsive

City of Basel, Switzerland	Author: City of Basel edited by Michael Glotz-Richter
Reference to modules: 16, 10	Contact : City of Basel

In Basel, up from 1 January 2025, on-street parking fees are demand responsive and work as incentive for smaller cars. For small vehicles, residents' parking cards will cost only a little more than they did

before, but for long vehicles, the price increase was substantial. Parking meter tariffs also are set more flexibly: Heavily used parking spaces became more expensive, while less demanded parking spaces costing less.

With the corresponding revision of the Parking Management Regulation, the City of Basel wants to make a contribution to achieving the mobility and climate targets. The new tariffs come into force in stages: a first tariff increase took place on 1 January 2025; the second increase step will take place on 1 January 2027.

Basel is the first Swiss city to scale the fees for *the residential parking card* according to the length of the vehicle: from 1 January 2025, the residents' parking card for vehicles shorter than 3.90 metres costs 332 CHF per year (equivalent to about € 350), slightly more than before. Fees for medium-length vehicles rose from 284 CHF to 422 CHF per year (equivalent to about € 300 to € 450). For vehicles longer than 4.90 metres, the parking card now costs 512 CHF per year (about € 550). Size-based tariffs also apply to *commuter parking cards*: for short vehicles, the parking card costs 860 CHF per year (about € 920), as it did before. The fee for medium-long vehicles rose to 950 CHF per year (about € 1,012) and to 1,040 CHF per year for long vehicles (about € 1,110).

In the medium term, the government council wants to raise parking fees to the level of comparable Swiss cities. A second round of collective bargaining will therefore take place on January 1, 2027. The *residents' parking card* for medium-length vehicles will then cost 560 CHF per year (about € 600). The fee for short vehicles remains significantly lower at 380 CHF per year (about € 405). Parking tickets for long vehicles will then cost 740 francs per year from the beginning of 2027 (about € 790).

The revision of the Parking Management Regulation is intended to lead to a shift in the demand for parking from public road space to private underground car parks. This frees up above-ground areas for other uses, such as cycle paths and urban greening, which in turn contributes to achieving climate targets. The fact that such a shift is necessary is shown by the fact that resident parking cards are sold for 41% of registered passenger cars in Basel.

Due to the length-dependent staggering, the implementation is also based on the polluter pays principle. As the canton's recently published traffic figures for 2023 show, the number of large cars on Basel's roads continues to increase. With the polluter-pays pricing, the Government Council is implementing a demand of the Grand Council. In July 2021, with the revision of the Environmental Protection Act, the Council had determined that the amount of parking fees should be based on true costs and the polluter-pays principle.

Parking meter tariffs will also be made more flexible in the future. The maximum possible parking meter rate will increase from 3 to 4 francs per hour (equivalent to € 4.30). The government council plans to implement this new top tariff only in a few centrally located and heavily used parking lots.

| **Further Information/ Links** | Further details can be found:

 https://www.bluewin.ch/en/news/switzerland/many-commuters-will-soon-have-to-pay-more-for-parking-in-basel-2497263.html

 https://www.bs.ch/medienmitteilungen/2024-basel-fuehrt-groessenabhaengige-gebuehren-fuer-parkkarten-ein
 (Media information by the City of Basel from 18.06.2024 – in German |

8.7 Kerb management: RAPTOR project

City of Tel Aviv, Israel	Author: Giacomo Lozzi (EIT Urban Mobility)
Reference to modules: 16, 10	Contact : giacomo.lozzi.ext@eiturbanmobility.eu

In Tel Aviv, Israel, an innovative kerb management project has been launched to address the challenges associated with urban logistics, parking, and public space allocation. By utilising smart technology and data analytics, the project aims to optimize kerb space usage, reduce congestion, and improve overall street efficiency and safety. This is particularly significant in Tel Aviv's densely populated and highly active urban areas. The initiative represents a pioneering approach to modern urban kerb management.

Further Information/ Links	Further details can be found: https://raptorproject.eu/tel-aviv-Curb-management/

8.8 Strategic (re-) design of street space and community engagement: CLEAR project

Several cities	Author: Giacomo Lozzi (EIT Urban Mobility)
Reference to modules: 1, 2,5	Contact: giacomo.lozzi.ext@eiturbanmobility.eu

CLEAR: City LivEAbility by Redesign: The CLEAR project aims to enhance urban liveability through strategic redesign and community engagement. By conducting street experiments in various European cities, such as Milan (Italy), Amsterdam (Netherlands) and Munich (Germany), the initiative explores how temporary changes to urban spaces can improve the quality of life for residents. These interventions range from creating pedestrian zones to enhancing public green spaces. The project combines design innovation with public feedback to create more liveable, sustainable, and inclusive urban environments.

graph: CLEAR project

Further Information/ Links	Learn more about CLEAR and its street experiments at EIT Urban Mobility and Street Experiments.

8.9 Summer Streets pave the way towards permanent change

City of Helsinki, Finland	Author: Giacomo Lozzi (EIT Urban Mobility)
Reference to modules: 5, 1,2	Contact : giacomo.lozzi.ext@eiturbanmobility.eu

Helsinki's Summer Streets initiative describes the conversion of Kasarmikatu and Pohjoinen Makasiinikatu into vibrant, pedestrian-centric spaces. This temporary transformation during the summer months included street furniture, greenery, and spaces for local restaurants, enhancing the city's social and commercial life. The popularity of this pilot led to considerations for making these changes permanent, underscoring the public's support for more pedestrian-friendly and lively urban areas.

Figure - A map over Helsinki summer streets, graphic by Helsinki Municipality

Further Information/ Links	pub.norden.org/nord2023-015/nord2023-015.pdf

8.10 Street space design - from car focus to society focus

City of Vilnius, Lithuania	Author: Giacomo Lozzi (EIT Urban Mobility)
Reference to modules 6, 1,9	Contact : giacomo.lozzi.ext@eiturbanmobility.eu

This case study from Vilnius tells the story of how Vingriu square and Pylimo street were reimagined from car-centric areas to community-focused spaces. The project uncovered historic natural springs and established pedestrian zones, fostering an environment where people can enjoy art and nature in the city. The initiative not only improved pedestrian experience but also bolstered the city's cultural offering by integrating the adjacent Modern Art Museum into the urban landscape.

Figure - A car street opened up for pedestrians and micro mobility in Vilnius, photo by Saulius Žiūra, Vilnius City Municipality

Further Information/ Links	Further details can be found: https://pub.norden.org/nord2023-015/nord2023-015.pdf

8.11 Car traffic loops as steps towards Low-Pollution Zones

City of Vilnius, Lithuania	Author: Giacomo Lozzi (EIT Urban Mobility)
Reference to modules: 1,5,6	Contact : giacomo.lozzi.ext@eiturbanmobility.eu

In another Vilnius project, the city's Old Town—a UNESCO World Heritage Site—was the focus of an innovative traffic management plan to reduce pollution and traffic congestion. By creating one-way traffic loops with controlled access and intelligent traffic systems, the project has effectively diminished transit traffic, enhancing the quality of life in the historic centre while preserving its cultural heritage.

Figure - Citizens exploring the new loop traffic map in Vilnius, photo by Saulius Žiūra

Further Information/ Links	https://pub.norden.org/nord2023-015/nord2023-015.pdf

8.12
Data Platform for Traffic Management in Urban Public Spaces

Various cities	Author: Giacomo Lozzi (EIT Urban Mobility)
Reference to modules: 9, 1,12	Contact : giacomo.lozzi.ext@eiturbanmobility.eu

A data platform offers a solution for cities to manage traffic more efficiently in urban public spaces. By leveraging data analytics, the platform helps city planners and administrators understand and optimise traffic patterns, pedestrian flows, and micromobility usage. This technology has been particularly effective in managing urban spaces to enhance safety, efficiency, and sustainability. The platform's application in various cities demonstrates its utility in fostering smarter, data-driven urban mobility strategies: Vianova joined a Dutch innovation consortium to improve public space management. In the US, Vianova aimed to reduce road fatalities with its mobility data and road safety dashboard. Berlin embraced a data-driven strategy with Vianova to tackle micro-mobility challenges, while Brussels renewed its partnership to better manage micro-mobility fleets through connected data. Collaborations in Paris focus on logistics management and kerb usage optimisation.
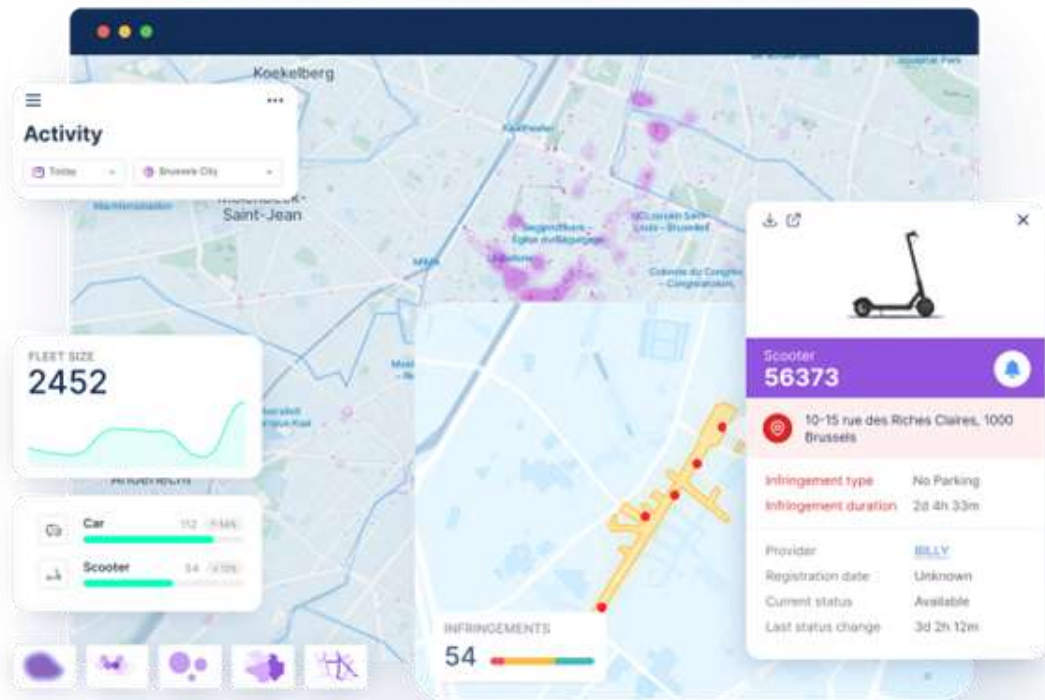
Figure 4 - Vianova's Data Platform for Traffic Management in Urban Public Spaces (https://www.vianova.io/use-cases/shared-mobility-management)

Further Information / Links	https://press.vianova.io/ (Vianova) https://www.eiturbanmobility.eu/impact-story/google-maps-government/

8.13
Data modelling to prioritise investments (BitaGreen)

Various cities	Author: Giacomo Lozzi (EIT Urban Mobility)
Reference to modules: 2, 1	Contact : giacomo.lozzi.ext@eiturbanmobility.eu

BitaGreen focuses on leveraging nature-based solutions to make cities more climate-resilient and healthier. Their tools, like the BGI Builder, help urban planners integrate green infrastructure effectively. They aim to provide data and models to prioritise investments in green infrastructure, enhancing urban spaces' climate resilience and liveability. BitaGreen has actively applied their nature-based solutions in cities like Brussels (Belgium) and Valletta (Malta) through the "Bit-a-Green for Better Health" project. The initiative employs digital tools to monitor and analyse the impact of green infrastructure and sustainable transportation on urban health. In Bratislava (Slovakia), the platform facilitated the city's new zoning plan development, enabling access to climate-related data and simulations. This helped identify strategies to combat climate-related risks, such as extreme weather and pollution, and to promote green infrastructure. BitaGreen's tools allowed Bratislava to map out green assurance solutions, assess urban plans under climate change, and monitor infrastructure performance, shaping a resilient, liveable public realm.

Further Information/ Links	To understand more about the approach and case studies, visit the [BitaGreen](#) on EIT Urban Mobility, check their [BGI Builder for climate-resilient cities](#), and review details on the [BGI-Actionable project](#).

8.14 Urban climate adaptation and neighbourhood transformation

City of Copenhagen, Denmark	Author: Giacomo Lozzi (EIT Urban Mobility)
Reference to modules 2	Contact : giacomo.lozzi.ext@eiturbanmobility.eu

The Copenhagen case study showcases an ambitious urban transformation project to manage heavy rainfall and reduce vulnerability to climate change. It details the creation of stormwater infrastructure and the conversion of urban spaces into green and blue areas for recreation and biodiversity. The project emphasizes a balance between nature and urban traffic, transforming Sankt Kjelds Square and Bryggervangen into a 'green heart' for the neighbourhood and exemplifies comprehensive climate adaptation measures.

Figure - Tsing Plads, photo by David Buchmann

Further Information/ Links	https://pub.norden.org/nord2023-015/nord2023-015.pdf

8.15 Efficiently managing temporary parking for logistics vehicles

Various cities	Author: Giacomo Lozzi (EIT Urban Mobility)
Reference to modules: 10	Contact : giacomo.lozzi.ext@eiturbanmobility.eu

This project Urban logistics S+Loadz aims to streamline urban logistics by creating digital loading and delivery zones to manage temporary parking for logistics vehicles effectively. It has implemented its digital loading and delivery zone management solutions in various European cities, including Paris (France), Ankara, Istanbul (Turkey), and Vic (Spain). These pilot projects have aimed at improving parking rotation, reducing illegal parking, and enhancing kerbside space utilisation to foster more liveable and safer urban areas.

Figure - https://www.eiturbanmobility.eu/sloadz-accelerating-intelligent-and-sustainable-city-logistics/

Further Information/ Links	Detailed outcomes of these implementations are available on the EIT Urban Mobility's Salads page.

8.16
Kerbside management – supported by a digital tool (FlexCurb)

Various cities	Author: Giacomo Lozzi (EIT Urban Mobility)
Reference to modules: 16	Contact : giacomo.lozzi.ext@eiturbanmobility.eu

FlexCurb offers digital tools for flexible and efficient kerb space management, aiding cities and companies in managing kerb space dynamically. The project involves APIs for creating digital inventories of kerb regulations and has been piloted in European cities such as Leuven (Belgium), Funchal (Portugal), Strasbourg (France), and Toulouse (France). These pilots have showcased how FlexCurb's digital tools can aid cities and companies in managing kerb space flexibly, demonstrating administrative, environmental, and commercial benefits.
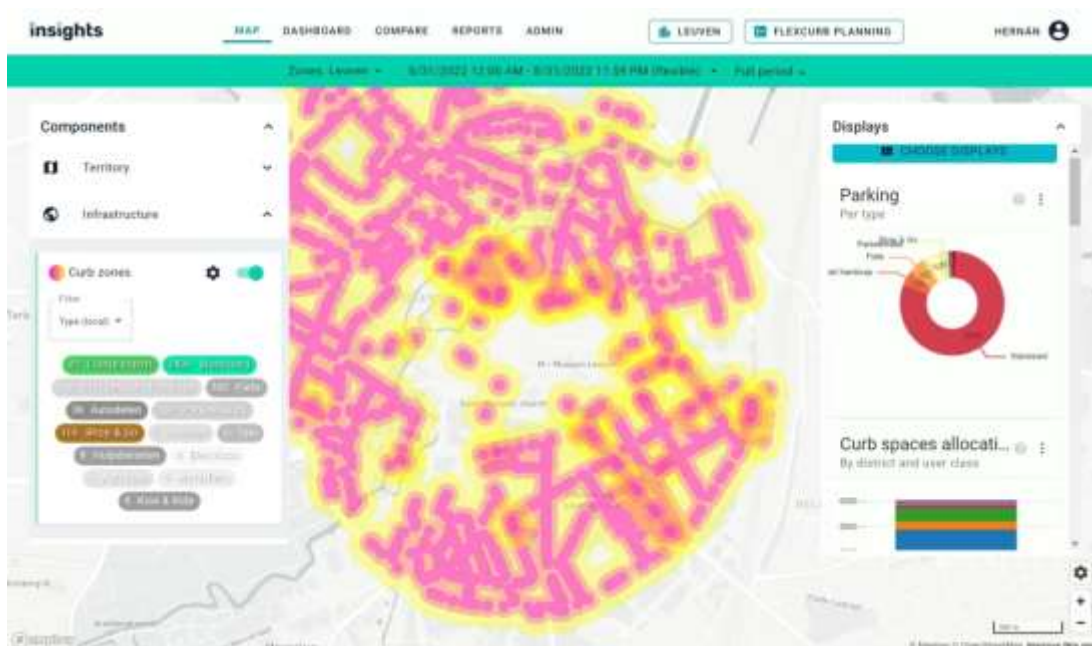

Figure: - https://urbanradar.io/flex-Curb/

Further Information/ Links	For more in-depth information, you can learn about FlexKerb on the EIT Urban Mobility's FlexCurb page and about their specific planning tool on FlexCurb Planning by Urban Radar.

8.17
Data integration for urban logistics (project TACTIC)

Various cities	Author: Giacomo Lozzi (EIT Urban Mobility)
Reference to modules: 10	Contact: giacomo.lozzi.ext@eiturbanmobility.eu

The project aims to transform urban mobility by fostering connections between local commerce, green logistics services, and end users. It develops and integrates innovative solutions such as an e-vehicle sharing app, green logistics operations using cargo bikes and e-vans, and a marketplace platform for

local commerce. These initiatives are piloted in collaboration with entities such as the Barcelona City Council and the Métropole du Grand Paris to promote sustainable, greener, and safer last-mile logistics. TACTIC's approach enhances the efficiency of urban deliveries and supports economic and environmental sustainability by reducing emissions and improving traffic flow in dense urban areas.

Figure: - https://www.eiturbanmobility.eu/tactic-the-last-mile-logistic-solution-takes-flight-with-pilot-launch-at-metropole-du-grand-paris/

Further Information/ Links	More information can be found on the EIT Urban Mobility's TACTIC page

8.18 Managing freight and delivery parking zones	
City of Torrelavega, Spain (Cantabria)	Author: Giacomo Lozzi (EIT Urban Mobility)
Reference to modules: 10, 14	Contact : giacomo.lozzi.ext@eiturbanmobility.eu

In Torrelavega, Parkunload's solution offers an innovative approach to managing freight and delivery parking zones. The system adapts to the city's specific needs, introducing variable parking conditions based on real-time data such as vehicle type, user profiles, and even current environmental conditions. Enhanced with a smart control pack, it introduces a system of rewards and penalties managed through mobile applications, aiming to optimise compliance and efficiency. The success of this project is evident

in improved space availability and reduced violations, marking a significant step towards sustainable city logistics.

Figure: - https://www.parkunload.com/es/torrelavega-carga-descarga/

Further Information/ Links	For more in-depth information, you can learn about FlexCurb on the More information on the EIT Urban Mobility's Parkunload page.

8.19
Promoting micromobility through infrastructure

City of Riga, Latvia	Author: Giacomo Lozzi (EIT Urban Mobility)
Reference to modules: 9	Contact: giacomo.lozzi.ext@eiturbanmobility.eu

In Riga, aiming for a greener city with less CO_2 emissions and promoting micro-mobility, RAPTOR introduced Novality's solar-powered parking stations. These stations come with secure lockers that provide users with charging ports and storage for personal items, optimizing space and enhancing user convenience. The integration of Novality's facilities with public transport networks and provision of data to city authorities illustrates an innovative approach to scaling micro-mobility infrastructure and promoting its adoption among residents.

Figure: - https://marketplace.eiturbanmobility.eu/products/novality-smart-parking-solutions-for-bikes-scooters/ Inizio moduloFine modulo

Further Information/ Links	https://raptorproject.eu/riga-promoting-micro-mobility/

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9. LISTS

9a List of acronyms and abbreviations

B2B	Business to business (e.g. delivery)
B2C	Business to customer (e.g. delivery)
CO2	Carbon dioxide
IPA	Intelligent Parking Assistant
ISA	Intelligent Speed Assistant
EGUM	Expert Group on Urban Mobility
EU	European Union
H2020	Horizon 2020 (European Program)
NDA	Nearby Delivery Area
SULP	Sustainable Urban Logistics Plan
SUMP	Sustainable Urban Mobility Plan
THE PEP	Health and Environment Pan European Programme (THE PEP)
UVAR	Urban Vehicle Access Regulations

9b List of organisations participating in the subgroup

Expert group on urban mobility – nominated representatives for the sub-groups			
6. Future of urban mobility and inclusive and sustainable urban space			
Sub-group leaders : Bremen and ERTICO			
Nominated representatives of EGUM members			
Sam Pierce (Project Manager)	Cycling industries	ORG	
Ceri Woolsgrove (Senior Policy Officer)	ECF	ORG	
Per Elvingson	Orebro	Ci/Re	
Alexia Spyridonidou	Karditsa	Ci/Re	
Yan Steil	Luxembourg	MS	
Claudio Goetzinger (alt)	Luxembourg	MS	
Gregor Beiner	T4SM	ORG	
Gianluca Di Nuzzo (alt)	T4SM	ORG	
Sagar Singamsetty	IRU	ORG	
Suzanne Hoadley	IRU	ORG	
Philip Broeksma	Groningen	Ci/Re	
Magdalena Ogonowska	Poland	MS	
Juan Carlos Escudero	Vitoria Gasteiz	Ci/Re	
Ida Nelson	CEMR	ORG	
Karen Vancluysen	Polis	ORG	
Peter Staelens	Eurocities	ORG	
Eyblová Dita	Czechia	MS	
Krištofíková Olga (alt)	Czechia	MS	
Paul Fenton	Stockholm (Sweden)	Ci/Re	
Julia Löfvenberg (alt)	Stockholm (Sweden)	Ci/Re	
Vincent Neumayer	CER aisbl	ORG	
Clement Gaultier (alt)	CER aisbl	ORG	
Juan Cristellys	Micro-Mobility for Europe	ORG	
Irene Cobian Martin (alt)	Micro-Mobility for Europe	ORG	
Florian Steuerer (alt)	Micro-Mobility for Europe	ORG	
Paola Cossu	Alice	ORG	
Cristina Tilling	ETF-Europe	ORG	
Kevin van der Linden	Rotterdam	Ci/Re	
TBD	LEVA-EU	ORG	
Michael Glotz-Richter	Bremen / ad hoc expert	Ci/Re	
Rebecca Karbaumer	Bremen	Ci/Re	
Giacomo Lozzi	EIT Urban Mobility	ORG	
Luana Bidasca	EIT Urban Mobility	ORG	

TBD	Budapest	Ci/Re	
Leena Sirkjärvi	Helsinki City	Ci/Re	
Hélène Wiedemann	ACEA	ORG	
Jakob Spranger	ACEA	ORG	
Massimo Marciani	Italy	MS	
Stijn Vernaillen	Antwerp	Ci/Re	
Thijs de Jong	The Netherlands	MS	
Fons Verhelst	Belgium	MS	
Damien Tobie (alt)	Belgium	MS	