



PRACTITIONER BRIEFING: CYCLING

SUPPORTING AND ENCOURAGING CYCLING IN SUSTAINABLE URBAN MOBILITY PLANNING



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Practitioner Briefings: Cycling. Supporting and encouraging cycling in Sustainable Urban Mobility Planning

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Guide to the reader

This document provides guidance on a specific topic related to *Sustainable Urban Mobility Planning (SUMP)*. It is based on the concept of SUMP, as outlined by the European Commission's Urban Mobility Package¹ and described in detail in the European SUMP Guidelines (second edition)².

Sustainable Urban Mobility Planning is a strategic and integrated approach for dealing with the complexity of urban transport. Its core goal is to improve accessibility and quality of life by achieving a shift towards sustainable mobility. SUMP advocates for fact-based decision making guided by a long-term vision for sustainable mobility. As key components, this requires a thorough

assessment of the current situation and future trends, a widely supported common vision with strategic objectives, and an integrated set of regulatory, promotional, financial, technical and infrastructure measures to deliver the objectives – whose implementation should be accompanied by reliable monitoring and evaluation. In contrast to traditional planning approaches, SUMP places particular emphasis on the involvement of citizens and stakeholders, the coordination of policies between sectors (transport, land use, environment, economic development, social policy, health, safety, energy, etc.), and a broad cooperation across different layers of government and with private actors.



¹ Annex 1 of COM(2013) 91

² Rupprecht Consult - Forschung & Beratung GmbH (editor), 2019 Guidelines for Developing and Implementing a Sustainable Urban Mobility Plan, Second Edition.



This document is part of a *compendium of guides and briefings* that complement the newly updated second edition of the SUMP Guidelines. They elaborate difficult planning aspects in more detail, provide guidance for specific contexts, or focus on important policy fields. Two types of documents exist: While ‘Topic Guides’ provide comprehensive planning recommendations on established topics, ‘Practitioner Briefings’ are less elaborate documents addressing emerging topics with a higher level of uncertainty.

Guides and briefings on how to address the following topics in a SUMP process are published together with the second edition of the SUMP Guidelines in 2019:

- **Planning process:** Participation; Monitoring and evaluation; Institutional cooperation; Measure selection; Action planning; Funding and financing; Procurement.
- **Contexts:** Metropolitan regions; Polycentric regions; Smaller cities; National support.
- **Policy fields:** Safety; Health; Energy (SECAPs); Logistics; Walking; Cycling; Parking; Shared mobility; Mobility as a Service; Intelligent Transport Systems; Electrification; Access regulation; Automation.

They are part of a growing knowledge base that will be regularly updated with new guidance. All the latest documents can always be found in the ‘Mobility Plans’ section of the European Commission’s urban mobility portal Eltis (www.eltis.org).



1. Executive summary

With 8 % of the EU population stating in a 2014 Eurobarometer survey that they use the bicycle as their primary mode of transportation, cycle use experiences huge differences across the continent. In the host city of the 2019 SUMP conference, Groningen, as many as 55 % of all trips are done by bicycle. While many cities have been rediscovering 'la petite reine' as the ideal urban mode of transportation and have gone a long way in promoting its use in recent years, its full potential is still untapped in many places.

In order to unlock its full potential, cycling must be made as easy and as safe as possible. Fearing for one's physical integrity while sharing the road with dense motorised transport is a primary reason that puts people off from cycling. Among the key measures to address this concern is investment in safe cycling infrastructure while at the same time managing car use and speed. From the European experience of promoting cycling for the past 40 years, the following recommendation cannot be stressed enough: good cycling policy must always address demand for car use, for example through parking regulations or by avoiding through-traffic in inner cities or residential neighbourhoods! It is therefore imperative to fully embed cycling policies within a wider SUMP framework that aims at the overall improvement of the mobility system of a town or city.

It speaks for itself that authorities, when providing safe cycling infrastructure, should promote their proper use through awareness-raising campaigns. Children should be trained and educated as part of their school curriculum; employers should invest in a healthy workforce by stimulating their employees to bike to work.

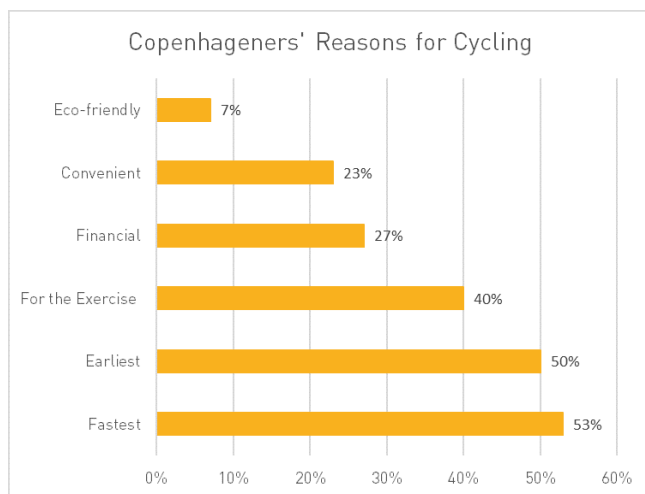
While the support of local decision-makers and the involvement of stakeholders is crucial to encourage more people to cycle more often, there is only so much a local authority can do. Many levers of governance exist at the regional, national, European and even international level. Ideally, cycling promotion is a shared vision, not only horizontally across the various policy departments, but also vertically, i.e. across various levels of governance.

With the right support and framework, it should be feasible to increase cycle use across the EU by at least 50 % in the following years (ECF, 2017). Several EU Member States have set national growth targets for cycling, including France, which in 2018 committed to triple cycling by 2024 (i.e. from 3 % to 9 %). As for the entire pan-European region consisting of 54 countries, even a doubling of cycle use until 2030 has been envisioned (THE PEP, 2019).

2. How to support cycling at the local level

2.1 Why people are (not) cycling

Most people cycle for reasons of convenience. In one of the most cycling-friendly European cities, Copenhagen, 53 % of people cycling stated that they do so because it is the fastest mode of transportation, 50 % responded that cycling is the easiest mode of transport, and 40 % preferred cycling for health reasons. Only a small minority (7 %) cycle primarily for environmental reasons (City of Copenhagen, 2017).

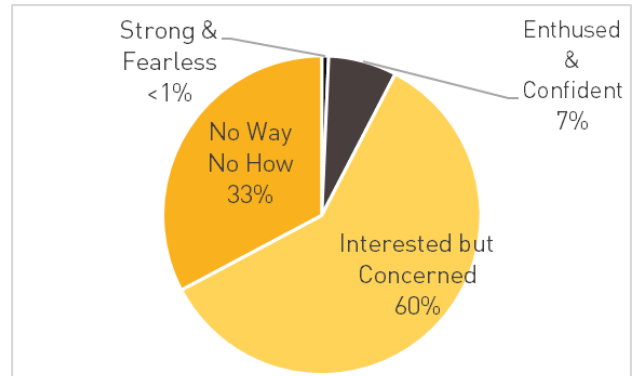


On a general note, one of the primary reasons for people to not ride a bicycle is the perceived unsafety of sharing the roadway with motorized transport. Making the bicycle a more widespread and mainstream means of transportation in European towns and cities will require substantially addressing user concerns about personal safety, particularly through the provision of safe cycling infrastructure.

2.2 The potential for more cycling

a. Interested but concerned

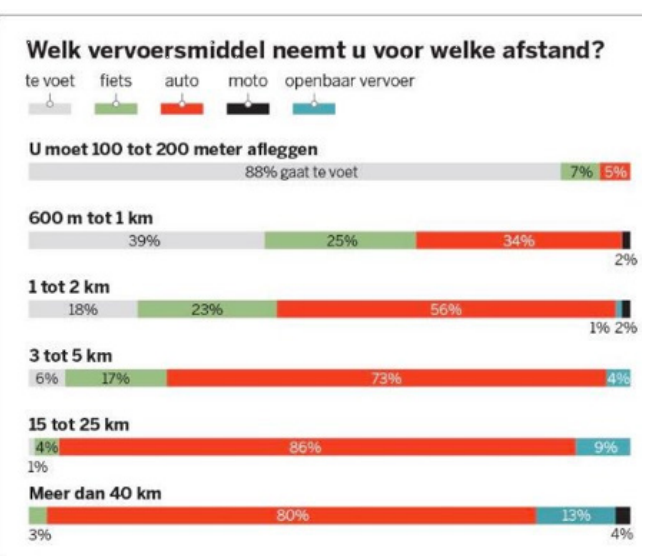
Cycling accounts for about 8 % of all passenger trips in the EU. This corresponds with the size of the first two groups of the '4 types of transportation cyclists' that were identified by Roger Geller in Portland, Oregon, USA. According to Geller, the 'Strong and Fearless' represent less than 1 % of the overall population, whereas the 'Enthusied and Confident' represent about 7 % of the population.



The primary target group for 'getting more people cycling more often' is within the 60 % category of the 'Interested but Concerned'. Women, the elderly and children are overrepresented in this category. About one third of the population are categorised by Geller as 'No Way No How': Regardless how attractive the offer, 33 % of the population would not choose to ride a bicycle under any circumstances.

b. Substituting short-and medium distance car trips

According to the European Commission, "[cycling] has enormous potential when we acknowledge that almost half of all car trips in cities are of less than five kilometres" (DG MOVE). A Swedish campaign in Malmö called "No ridiculous car trips" aimed at substituting such short-distance car trips with other modes of transportation. A 5km bike ride in a city takes about 15 – 20 minutes and is thought to be manageable for the vast majority of the population.



Question: What mode of transport do you use for what distance?

The results of the Malmö challenge are confirmed for example by recent transport data from Flanders, Belgium, indicating that for distances between 3-5 km people would pick the car in 73 % (red colour) of trips, compared to 17 % cycling (green), 6 % walking (grey), and only 4 % public transport (blue). The black colour represents motorcycles.

c. Cargo bikes, logistics

The growing demand for online shopping increases the number of van deliveries, contributing to congestion and air pollution. To reverse this trend, public authorities should stimulate the use of cargo bikes. The EU funded Cyclelogistics project conducted a detailed analysis as to what extent motorised trips could be shifted to cycling and concluded that this was the case for 42 % of all motorised trips. “The share of motorised trips in European urban areas is on average 60% of all trips. 40% are done by public transport, cycling or walking. Taking all motorised trips as basis for the calculation (60% = 100%), we find that 42% of all motorised trips could be potentially shifted to bicycle transport.

Because these trips are:

- Related to light goods transport (more than a handbag less than 200 kg)
- Are short enough (less than 5 km for bike, less than 7 km for e-bike)
- Are not part of a complex trip chain that involves use of a car.”

d. Pedelects are trendy – plan for it now

The electrification of bicycles is the current mega-trend in the bicycle manufacturing sector. Since e-cyclists tend to travel more often and over longer distances compared to people using conventional bicycles, the trend in growing e-bike sales is very likely to have a positive impact on overall cycle use (Kennisinstituut voor Milieubeheer, 2017).

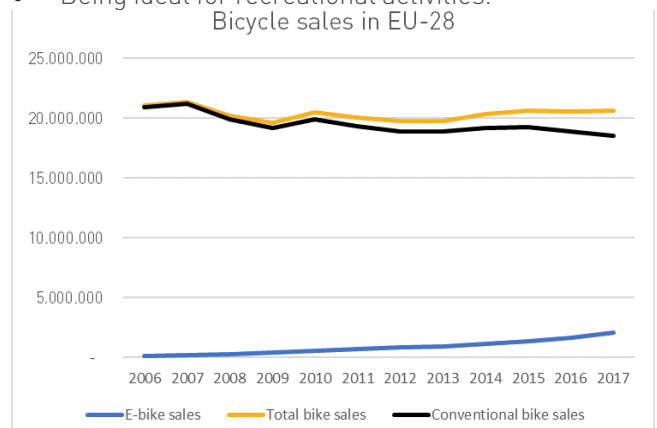
2.08 million bicycle units (about one in ten bicycles) sold in the EU in 2017 came with electric support (Conebi, 2018). Annual electric bicycle sales grew by 22 % between 2015 – 2017, up from 16 % between 2013 – 2015. Taking this acceleration in sales into account, the predicted e-bike sales forecast of 12 million units sold per year by 2030, made as part of the EU Cycling Strategy document, probably was at the lower end of the scale. If the 2015

– 2017 sales trends continue until 2030, close to 30 million electric bicycles would be sold per year by 2030.

ECF News: e-bike sales can reach 30 million units per year by 2030

The growing success of e-bikes, largely at the expense of conventional bicycle sales, is explained by different factors (UBA, 2014):

- Making it easier to travel longer distances;
- Making it possible to transport greater loads;
- Making it easier to overcome natural obstacles, such as inclines and headwinds;
- Offering an alternative to company cars, and;
- Being ideal for recreational activities.



Figures: Annual Conebi sales reports; Compilation of figures: ECF

The electrification of public bike-sharing and cargo bicycle fleets, in combination with higher average speeds of bicycles, higher volumes of ridership as well as wider (cargo) bicycles and trailers, call for an upgrade in bicycle infrastructure, such as the provision of cycle highways [See 5.1.4 Infrastructure].

e. Public Bike-Sharing

Regarding public bike-sharing, 524 schemes were said to be operating in Europe in 2017 (Metrobike, 2016). Despite the third generation of public bike-sharing schemes being around for about 15 years now, bike sharing is still undergoing significant changes in operational and business models. Notably, in 2017/18, many large European cities were swamped by thousands of free-floating bicycles that were introduced to the market by Asian e-bike sharing companies.

However, its ‘success’ has been rather short-lived. Other mobility providers are filling that gap.

Notably, JUMP from UBER is rolling out its dock-less electric bike-sharing system, starting in Berlin in November 2018.

The discussion between whether to operate bike-sharing with traditional docking stations, or as a free-floating scheme, or a mix of the two, is likely to persist. Also, the question of whether to go electric, or not, or a mix of the two, must be decided on a case-by-case analysis. Higher initial operating costs of an electric bicycle scheme might be (partially) offset by a reduced need to shuffle bicycles around from full to empty docking stations, a phenomenon particularly seen in hilly cities.

f. Cycle tourism

Cycling for recreational and tourism purposes enjoys growing popularity across the continent. A study commissioned by the European Parliament in 2012 estimated that there are over 2.2 billion cycle tourism trips and 20 million overnight cycle trips made every year in Europe. These have an estimated economic impact of €44 billion. A flag-ship project to promote cycle tourism is the development of EuroVelo, the long-distance cycle route network criss-crossing the continent on 16 routes: www.eurovelo.com

2.3 Basic Organisational development

a. A vision for cycling: Part of a wider mobility vision

It is crucial to understand that cycling policies must be embedded into a wider mobility vision: a good cycling strategy is as much about promoting cycle use as it is about managing car use. Cycling strategies, therefore, should always be an integral part of a wider mobility vision such as the SUMP.

b. Cross-departmental coordination, coordination with stakeholders

To push for cycling, political leadership is essential. Political leadership should not only come from the City Councillor for Transport/ Mobility and Public Works, but also from the Mayor and Councillors working on environmental, health, housing, finance, education, etc.

Therefore, coordination across the City Council and administration is essential, in line with the SUMP principle 1 “Set up working structures”. A bicycle coordination group should be installed with regular meetings and the inclusion of all stakeholders, including the police, businesses, and users. Local authorities should systematically work with the local chapter of the bicycle advocacy group(s) in your country. An overview list of national cycling user groups in Europe can be found at the European Cyclists’ Federation website member page: ecf.com/community

c. Cycling officer

Certainly, in starter and climber cycling cities, it has proven effective to install a cycling officer (“Ms/Mr Bicycle”). A cycling officer works full-time on cycling issues, coordinates cycling policies across departments, links up with stakeholders, and is the face and first contact person for the wider general public.

d. Investing in cycling

The level of sustained investments in cycling infrastructure is a litmus test of how much cycling development is being valued. James W. Frick, former vice president for public relations at the University of Notre Dame, Florida, brought it to the point: “Don’t tell me where your priorities are. Show me where you spend your money and I’ll tell you what they are.”

In the Netherlands, Europe’s most cycling-friendly country, about 35 Euro per person is being invested annually in cycling development, with the largest share coming from local authorities.

The 2nd German National Cycling Plan 2012 – 2020 advised towns and cities to invest 8 – 18 Euro per capita annually into cycling development. The exact investment level depends on the current state and aspiration of each town and city.

		Infrastructure (refurbishment/ construction and structural maintenance)	Infrastructure (routine maintenance)	Sub-total (columns 1 + 2)	Parking facilities	Non-capital measures (incl. commu- nications)	Other measures (cycle hire schemes, cycle parking stations)	Total (columns 3 – 6) rounded
		1	2	3	4	5	6	7
Towns and cities	Starters	5 - 12	1,10	6,10 - 13,10	1,10 - 2,50	0,50	0,50 - 2	8 - 18
	Climbers	8 - 12	1,70	9,70 - 13,70	1,20 - 1,50	0,50	1 - 2	13 - 18
	Champions	12	3	15	0,10 - 0,80	1	2	18 - 19
Districts	Starters	0,20 - 4,60	0,10	0,30 - 4,70	0,50 - 1			1 - 6
	Climbers	0,30 - 4,10	0,10 - 0,40	0,40 - 4,50	0,50 - 1,50			1 - 6
	Champions	2,40 - 3,00	0,50 - 0,70	2,90 - 3,70	1 - 1,50			4 - 5

The United Nations Environmental Programme recommended that at least 20% of the whole transport budget should be dedicated to non-motorised transport, i.e. walking and cycling (UNEP, 2016).

While adequate investments in infrastructure are fundamental, several cities are also experimenting with purchase subsidies for electric bicycles. For example, the city of Munich is investing 22 million Euro until the end of 2020 into the uptake of electric two-, three- and four-wheelers. Purchase subsidies are restricted to commercial purposes only (companies, self-employed, etc.), not for private persons. The co-funding rate for e-vehicles is set at 25 % of the net price.

More info: https://www.muenchen.de/rathaus/Stadtverwaltung/Referat-fuer-Gesundheit-und-Umwelt/Klimaschutz_und_Energie/Elektromobilitaet/Foerderprogramm

2.4 Infrastructure

The decisive factor for more bicycle use is cycle-friendly infrastructure! Cycle-friendly infrastructure in the sense of providing a network of cycle routes that is based on the **5 Dutch design core design principles: coherence, directness, safety, comfort and attractiveness** (CROW, 2017).

On the question of when and where to separate cyclists from motorised transport, the overriding principle should be: Separate where necessary, mix where possible.

Mixing:

- Cyclists can be largely mixed with motorised transport if these three prerequisites concerning motorised transport are fulfilled:
 - Low-speed: Max 30 km/h
 - Low-volume: Low number of motorised vehicles per hour/day³
 - Low-weight: Virtual absence of Heavy Goods Vehicles
- Where these conditions are met, and hence no dedicated facilities for cyclists are needed, one also refers to invisible cycling infrastructure. Effective tools to manage speed are the introduction of bicycle streets, school streets, car-free neighbourhoods, etc.

Separating:

- Provide bicycle paths on streets with speed limits higher than 30km/h and on 30km/h streets with high-volume/ heavy-goods vehicles
- Always provide physically separated bicycle infrastructure on streets with speed limits higher than 50 km/h.
- Don't forget to design safe crossings / intersections!



Example of separated bicycle infrastructure: cycle highways

‘Cycle highways’, or ‘fast cycling routes’, are “high standard bicycle paths reserved for cyclists for fast and direct commuting over long distances.” At present, fast cycling route projects can be found primarily in North-Western European countries. At city level, London and Copenhagen are the best-known examples. In the Netherlands, the construction of 675 km of ‘Fietssnelwegen’ (fast cycle routes) across the country is planned by 2025. In North Rhine Westphalia, a 100 km long Ruhr fast cycle route is under development at an estimated cost of EUR 187 million. A feasibility study estimated that as much as 400,000 daily car-km could be shifted to cycling if

this cycle highway is completed.

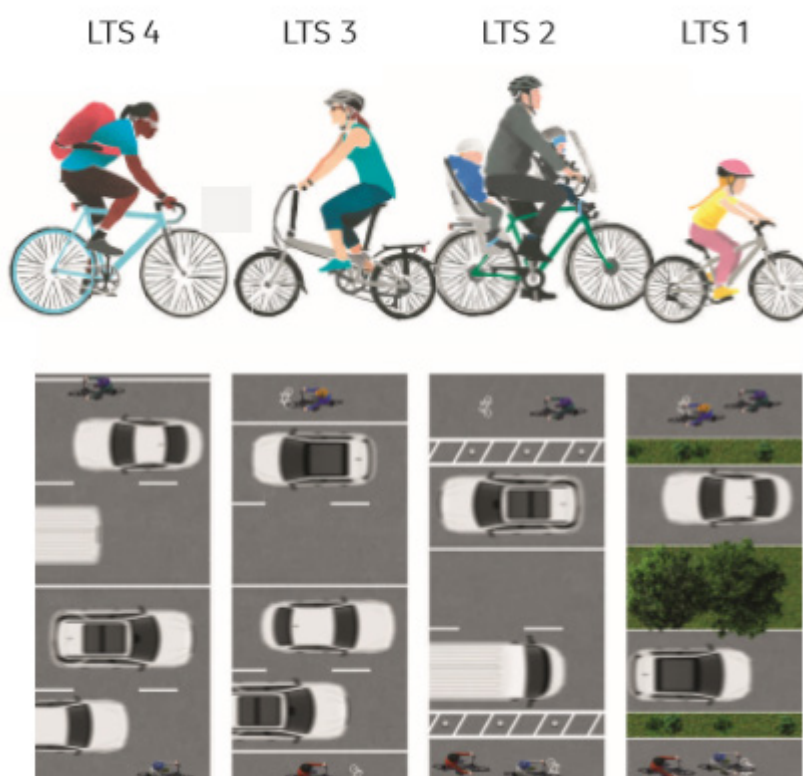
CHIPS, an EU funded North-West Interreg project, compared different cycle highways in the region, and analysed similarities and differences between the projects. www.nweurope.eu/projects/project-search/cycle-highways-innovation-for-smarter-people-transport-and-spatial-planning/

³ Transport for Greater Manchester currently applies a figure of 4,000 vehicles per day (or expressed another way, 6 per minute in the peak hour) as the threshold above which segregation for bikes would be required.

Level of stress:

In transport planning, the theory of 'level of stress' has found wide traction: **"For a bicycling network to attract the widest possible segment of the population, its most fundamental attribute should be low-stress connectivity, that is, providing routes between people's origins and destinations that do not require cyclists to use links that exceed their tolerance for traffic stress, and that do not involve an undue level of detour."**

The 4 types of cyclists	Level of stress and type of cycle infrastructure
'No way no how': 33 %	n/a
Interested but concerned: 60 %	LS 1 – Is suitable for children; cycling infrastructure is separated to a high degree from motorised transport; mixed traffic only on roads with low speed limits and low volumes LS 2 – Is suitable for most adults; Cyclists have their designated space but mainly through road marking only
Enthused and confident: 7 %	LS 3: includes the usage of un-protected bicycle infrastructure on roads with maximum speed limit of 50km/h; Intersections can be stressful but are still acceptable
Strong and fearless: < 1 %	LS 4: Cycling in mixed traffic without any cycling infrastructure, also on roads with speed limits in excess of 50 km/h and dangerous intersections; unacceptable stress-level for most people



Other design principles include:

- Bicycle infrastructure must be wide enough to cope with (growing) demand and must accommodate non-standard bicycles, e.g. cargo bicycles, bicycle trailers, tricycles. Cyclists need to be able to pass other cyclists and cycle next to each other, as is legally permitted in many Member States. If available, apply the national cycling minimum quality standards or go beyond them.
- In an urban context, new bicycle infrastructure should be provided at the expense of infrastructure for individual motorised transport, e.g. by reallocating space from moving or stationary vehicles, i.e. parking lanes. Conflicts with pedestrians should be avoided.
- Signposting must be continuous and uniform. It is important to get cycling routes / corridors into the 'mental map' of the population.
- Multi-/Inter-modality is to be encouraged by providing adequate bike parking facilities at public transport stations, through allowing bicycle carriage on rolling stock, and by offering integrated route planning, reservation and payment solutions. Public bike-sharing must be an integral part of Mobility as a Service.
- Bicycle parking facilities in public spaces, apartments, houses, offices, commercial centres, etc. should be coping with demand, be easily accessible and be sufficiently theft- and weather protected. All relevant authorities should introduce minimum requirements for off-street bicycle parking. (ECF, 2019)

For further reading regarding basic quality design principles for cycle infrastructure and guidance for

cycling projects in general, please see a 2019 DG MOVE study: https://ec.europa.eu/transport/themes/urban/cycling/guidance-cycling-projects-eu_en.

2.5. Awareness-raising, training and education of cyclists

Providing safe and comfortable cycle infrastructure while managing demand for car use is the best way to promote cycle use, following the principle "Built it and they will come." Implementing awareness-raising campaigns only without any incremental changes such as new cycle infrastructure will only have limited impact in the long-run.

However, to increase and optimize the use of cycle provisions, effective campaigns, training and education directed at relevant target groups should be launched.

a) Awareness-raising campaigns

In many European towns and cities, the European Mobility Week is the annual highlight for campaigning for more people to walk, cycle and use public transport. The theme of European Mobility Week 2019 was "walk with us". 3117 cities in 50 countries participated. The European Mobility Week ideally culminates in a car-free day. Perhaps the largest of these car-free zones is in the Brussels Capital Region, where all individual motorised traffic is banned between 9 am and 7 pm within the entire territory during one Sunday in September. As a result, not only do hundreds of thousands of people hit the streets, but also noise levels and air pollution are significantly reduced (<http://www.irceline.be/fr/nouvelles>). In place since 2002, there have been calls to engage in further car-free days, including on weekdays.



b) Training and education of cyclist

Cycling to school

There is enormous potential for more children to cycle to school. For example, in the UK 48 % of children would like to cycle to school, but only 2 % actually do so (www.theguardian.com/environment/riding-bikes-to-school-were-creating-a-cycling-culture-here) The central-government funded Bikeability scheme aims at closing that gap: <https://bikeability.org.uk/>

Mobility education in general, and cycle training in particular, should be an integral part of the curriculum of all primary schools in Europe! .

Safety concerns of parents are among the key reasons for kids not cycling to school. These concerns cannot be addressed only through cycle training, but also by introducing **‘school streets’**, a concept that was first introduced in Bolzano, Italy. The basic idea of the school street is that all motorised traffic is closed for about 30 minutes at the beginning and end of the school day. The school street concept has been introduced in other countries, and in 2018 it found its way into the Belgian highway code.

Another concept to increase the safety of children cycling to school is through ‘school trains’. Following the ‘safety in numbers’ principle, the safety of cyclists increases when individuals cycle together in a group, as it improves visibility. A successful campaign to motivate more children to cycle to school was the TrafficSnake in Denmark.

A collection of good practice examples is found in the EU funded project Safe4Cycle: www.safe4cycle.com

Cycling to work

Commuting to work accounts for about one in five of all trips. In several countries, national and/or regional bike-to-work campaigns have been running for many years, including in Austria, Belgium, Denmark, Ireland, Germany, Slovakia and the UK. The European Commission is conducting its very own campaign: VeloMai.

As regular cyclists have fewer sick days and reduce the operating costs through lower demand on car parking space, it should be in the interest of every employer and

health insurance company to encourage a higher share of the workforce to cycle to work. The German bike-to-work scheme is co-funded by a national public health insurance company.

Adequate parking spaces, changing rooms, showers and lockers should be provided within the context of these schemes.

A legacy of the EU-funded Bike2Work project is the set-up of the Cycle-Friendly Employer Certification Scheme: <http://www.bike2work-project.eu/en/Cycle-friendly-employers/Guidelines-for-employers/Useful-guidelines/>

Several Member States fiscally support cycling to work, most notably through company bicycle schemes and cycle allowances: <http://www.bike2work-project.eu/en/Cycle-friendly-employers/Grants-and-tax-breaks/Overview/>

Belgium’s ProVelo has developed the bike-buddy project ‘Bike Experience’, matching experienced with inexperienced cyclists: <https://bikeexperience.brussels/nl/home>

2.6. Enforcement

Car parking on bike paths, speeding, low-distance while overtaking cyclists etc. contribute to the perception of unsafe cycling. Proper law enforcement is crucial to address these concerns. Installing police bike brigades increases awareness among police forces concerning road safety issues regarding pedestrians and cyclists, and have proven to be a very successful tool in many Member States.



Source: Nieuwsblad.be

2.7. Monitoring and Evaluation

Collecting data about cycle use on a regular basis is essential for planning, implementing and evaluating cycling interventions. For further reference, please see SUMP step 3.1. “Identify data sources and planning documents” and step 11.2 “Monitor progress and adapt”.

The collected data often serves as proof for the implementation of new cycling policies and infrastructure. They make municipalities aware of existing practices in their cities; **preferred routes** (commute or school runs during the week/ recreational rides during the weekend), **number and type of cyclists** (on sunny/rainy days), **average and top speed** (rush hour or not), **waiting times and delays at crossroads or strategic nodes, top destinations** (useful for parking policies), specific problems on the bike path (e.g. Brussels fix my street app ensures direct communication with cyclists), etc.

Moreover, it gives cities great **feedback on cycling** policies. For example, if new infrastructure is built thanks to various methods of data collection, the city will know if the new infrastructure is used, how and when, and to what purpose. Therefore, it will enable the transport department to calculate the effective impact of its policies. A precisely calculated increase in bike practice can actually be measured on the whole area of interest.

Until recently, the main methods of collecting this information are **human or mechanical counts and labour-intensive surveys**, automatic bicycle counters to estimate the total amount of users on a portion of a route (e.g. pneumatic tubes laid across the roadway, piezo-electric sensors embedded in the roadway, inductive loops cut into the roadway, devices using some sort of transmitting energy such as radar waves or infrared beams to detect vehicles passing over the roadway). Just like the monitoring system for car traffic, there are also camera systems that count cyclists, some even with automatic user recognition.

However, the newest technology to capture big amounts of cycling data is to use a GPS tracking device (eg. smartphone). Checking our surroundings, it seems like

every city has or is developing an application for bicycle use. To name a few: Bike your City (Athens / Greece), RingRide (Vienna/ Austria), Cykelstaden (Gothenburg), Bike citizen, GéoVélo (France), Strava Metro, Bikes vs. Cars (Malmö/Skåne and Cykelfrämjandet), BikePrint (Netherlands), etc.

Cities that don't have a big budget to develop their own app can join the European Cycling Challenge, a competition to motivate citizens to cycle more combined with an app to collect cycling data and the necessary Heatmaps to analyse the collected data. Initiated in Bologna in 2012, over 30 EU-cities have joined the annual Challenge.

2.8. Demand management for individual motorised transport

A forward-looking cycling strategy not only promotes cycling, but also must include demand-management measures for using individual motorised transport. At a minimum, there needs to be a level-playing field for cycling with car use. However, due to the many benefits associated with cycling and disadvantages associated with car use, allocating the priority to cycling is justified. The European Commission estimates the external costs of motorised transport to sum up to about 1.000 billion Euro annually⁴, or 7 % of the EU's GDP. A significant share of this cost is not borne by the polluter, but by third parties. Introducing user and polluter pay schemes are therefore one way of reducing car use, for example through congestion charges, higher parking fees or a universal pay-as-you drive fee. Latter could be a powerful tool to reduce CO2 emissions, pollution and traffic congestion, for example through charging higher fees during rush-hours.

Filtered permeability can contribute to the introduction of car-free/low-traffic city centres or neighbourhoods. As a general principle, cars would still be allowed to enter a neighbourhood but not be allowed to drive through it. To get to the other side of town, cars would be redirected to ring-roads. The city of Ghent introduced such a circulation plan in 2018, resulting in a significant modal shift and improved air quality within just one year: <https://stad.gent/mobiliteitsplan/het-circulatieplan>

⁴ https://ec.europa.eu/transport/themes/sustainable-transport/internalisation-transport-external-costs_en

Another powerful tool to achieve a modal shift is through progressive on-street and off-street **car parking** policies. The use of public spaces should be properly managed and priced, for example through annual residential parking fees or metres. Studies have shown that on-street parking consumes a too high a share of road space. In Berlin, on-street parking accounts for 19 % of all road space (on top of 39 % for circulating motorised transport), compared to just 3 % for bicycles. Compared to Europe, Japan historically has a very progressive on-street parking policy in place: enforced by law since 1962, motorists can only register a car when they are able to prove they have access to a local parking space ("garage certificate"): <https://www.reinventingparking.org/2014/06/japans-proof-of-parking-rule-has.html>

European lawmakers have taken a different approach. Here, housing developers historically were required to provide off-street car parking space, typically one parking spot per housing unit. While the initial intention of minimum off-street parking norms was perhaps to reduce demand for on-street parking, experience shows that such policies only created additional parking space. According to Donald Shoup, minimum parking norms do increase car ownership and car use (Shoup, 1997). A recent report the European Cyclists' Federation analysed regional and national off-street bicycle and car parking policies in 31 countries. As for building regulations, the ECF recommends replacing minimum car parking norms by maximum norms, whereas for cycling, minimum norms should be introduced to stimulate bicycle use (ECF, 2019). Especially with more expensive bikes (like e-bikes), secure and convenient parking is necessary to make cycling attractive. More info: <https://ecf.com/what-we-do/bicycle-parking>

For existing neighbourhoods, good bicycle parking is essential too. The Bremen cycle friendly model neighbourhood implemented about 600 bike-parking facilities in the Neustadt neighbourhood – often converting sections of the parking lane into bicycle parking. (see photo before/after). Before, bikes were parked at the few signposts or blocking the sidewalks. Needless to say, the provision of good cycle parking is also helpful to create better walking conditions.



2.9. Beyond the urban context: Support from the national and European level

There is only so much a city can do to promote cycling and reduce demand for individual motorised transport; it needs the right framework from the regional, national and European level.

This is a non-exhaustive list of measures to be taken at those levels:

- Provide regional and/or central government funding for local cycle projects. Make cycling a priority in EU-funded transport projects, in particular in the European Regional Development Fund (ERDF), Connecting Europe Facility, Horizon Europe, etc. <https://ecf.com/what-we-do/european-funding/eu-funds-observatory-cycling>. Within the 2014 – 2020 Multiannual Financial Framework, about 2 billion Euro is invested into walking and cycling from the ERDF only. For the next Funding Period, it should be at least 3 billion Euro (ECF ed., 2017).
- Develop and implement minimum cycling infrastructure standards at the national and European level. In all big infrastructure projects (road, rail, waterways), cycling should be included from the very beginning, and not as an afterthought.
- Make your highway code cycle-friendly, e.g. through allowing contra-flow cycling in one-way streets as the default solution, allowing turning right/straight/left at red lights, simultaneous green traffic light junctions, introducing bicycle streets where safety allows, making 30 km/h the default speed limit in urban areas, introducing a 1.5m minimum passing-distance of cyclists by car drivers, etc.
- Deploy safer motorised vehicles through better design and equipment of active safety systems, including Intelligent Speed Assistance, Automated Emergency Braking, etc. (European, UNECE)
- Introduce fiscal incentives, e.g. for commuting to work allowances, company bicycle schemes (national); Purchase subsidies for electric vehicles, e.g. electric bicycles, e-cargo bikes, etc. (Local, regional, national); Reduced or Zero-VAT for the sales of bicycles (national, European) (ECF, Fiscal incentives).

- Foster multi-modal and shared mobility services (regional, national, European), for example through building adequate bike parking facilities at public transport hubs and allowing for bicycle carriage on rolling stock.

Local authorities should actively advocate these measures with their national and European authorities!

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