# Guidance structure

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| | | **Policy evaluation and development tools** | Health Economic Assessment Tool (HEAT) for cycling and walking |
| | | | Sustainable Urban Mobility Plans (SUMPs) and cycling |
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| | | | Other tools |
| | | **EU funded cycle projects** | |

# Contents

# Overview of guidance

### Background

There are many existing resources available to support the process of implementing cycling infrastructure and associated measures, which have been developed with EU co-funding, prepared at the national level or by other stakeholders within Europe. With such a choice it is often not clear where city practitioners should start, which guidance is most appropriate or most comprehensive, and what to do in the case of conflicting recommendations. See also EU Funded Cycle Projects.

### Guidance for European cities

This Commission guidance on cycling projects in the EU **binds together existing advice into single, coherent and universal online guidance resource** that enables users to identify the most relevant information for their situation.

It should be noted that there is no one-size-fits-all approach and experience and measures are not always directly transferable. For example, a best-practice example from a Western European country may not be appropriate for implementation in an Eastern European country and vice versa. The guidance attempts to address this issue through recognising the differences between city characteristics and providing clearly relatable examples from a wide range of case study cities. Guidance is also provided on the selection of cycling measures depending on a range of considerations for applicability – see Selecting cycle measures for your city - Further considerations for applicability.

### Case Study Cities

A set of city case studies support this guidance by providing illustrative real-world examples of cycling measure implementation in different contexts. As well as giving concrete examples of best practices, they also demonstrate how barriers have been overcome. An use of city case studies in the guidance was to consider the city characteristics that may influence the level and type of action needed to promote and support cycling, and potential success of selected cycling measures.

The twenty case study cities have good geographical coverage across Europe and include a range of city sizes and level of cycling development.

Cities involved in the preparation of case studies for this guidance, and a summary of their high-level characteristics, are outlined below:

| City (Member State) | EU Location | Size (population) | Level of cycling development/Cycling mode share |
|---|---|---|---|
| Agueda (PT) | Southern/Mediterranean | Small Urban Area | Starter (2%) |
| Berlin (DE) | North/North West | Metropolis | Climber (13%) |

| | | | |
|---|---|---|---|
| Bolzano (IT) | Southern/Mediterranean | Medium Urban Area | Champion (28%) |
| Bregenz (AT) | North/North West | Small Urban Area | Champion (20%) |
| Brighton (UK) | North/North West | Medium Urban Area | Starter (5%) |
| Brussels (BE) | North/North West | Larger Urban Area | Starter (3%) |
| Budapest (HU) | Baltics/Eastern/Central | Metropolis | Starter (2%) |
| Burgas (BU) | Baltics/Eastern/Central | Medium Urban Area | Climber (8%) |
| Copenhagen (DK) | North/North West | Larger Urban Area | Champion (30%) |
| Gdansk (PO) | Baltics/Eastern/Central | Larger Urban Area | Climber (6%) |
| Hradec Kralove (CZ) | Baltics/Eastern/Central | Small Urban Area | Climber (17%) |
| Košice (SK) | Baltics/Eastern/Central | Medium Urban Area | Starter (3%) |
| La Rochelle (FR) | Southern/Mediterranean | Medium Urban Area | Climber (10%) |
| Ljubljana (SL) | Southern/Mediterranean | Large Urban Area | Climber (10%) |
| Malmö (SE) | North/North West | Large Urban Area | Champion (22%) |

| | | | |
|---|---|---|---|
| Nijmegen (NL) | North/North West | Medium Urban Area | Champion (24%) |
| Seville (ES) | Southern/Mediterranean | Larger Urban Area | Climber (6%) |
| Slatina (RO) | Baltics/Eastern/Central | Small Urban Area | Starter (0.7%) |
| Tallinn (EE) | Baltics/Eastern/Central | Large Urban Area | Starter (4%) |
| Trikala (GR) | Southern/Mediterranean | Small Urban Area | Champion (20%) |

### How to use this guidance

For an overview of the full contents of this guidance, please see Guidance for Cycling Projects in the EU. The contents list on this homepage can be used to select topics of interest.

The guidance uses web-enabled links to direct the user to the most appropriate sections.

On each page the user will also find links to key guidance resources, further reading and references.

# EU Cycling Policy and Background

### Issues faced by European cities

European cities face increasing challenges to provide effective, resilient and low emission transport networks that improve the liveability and economic performance of cities while limiting environmental impacts. The reliance on private motor vehicles to move people and goods is the main source of growing problems relating to air pollution and congestion. These issues lead to health, accessibility, and quality-of-life concerns for city inhabitants and can negatively impact businesses through increased delays and reduced reliability of the road transport network.

### Cycling solutions and challenges to uptake

In response to these pressing issues, policy-makers are increasingly looking for ways to develop a more diverse and flexible transport system, and influence behaviours to encourage a shift away from the reliance on private cars. Cycling is increasingly viewed as a key part of a multi-modal and integrated transport system for several reasons:

- It is a more cost-efficient option compared to other transport modes;
- It is a convenient transport mode for the high share of short journeys that dominate urban travel; and
- It has multiple co-benefits in terms of health, the environment and city liveability.

Some cities are already reaping the benefits of cycling, and overall uptake appears to be on the rise. The European Cyclists' Federation (ECF) estimates that 160 million cycling trips were undertaken every day on European roads in 2017. With the right support, this could increase to 240 million daily trips by 2030 (ECF et al, 2017).

Despite the positive impacts that cycling in cities can bring, there are still challenges to encourage greater uptake and approaches vary significantly depending on the local context. The Eurobarometer survey published in 2014 asked which mode of transport respondents use most often daily. On average, cycling has an 8 % modal share but the results reveal that the situation differs significantly across Member States.

Even within countries, the level of cycling varies significantly between cities. This is a result of variations in the local political, cultural, economic and historical contexts, as well as different topographies and climates. These contextual variations combined with the range of challenges that cities face means that for each city, a different set of measures may need to be selected to increase the proportion of journeys carried out on bicycles.

See also Selecting cycle measures for your city - Further considerations for applicability.

While the planning and implementation of well-designed and safe cycling infrastructure measures may encourage bicycle use, other factors will also be important in determining the success of cycling infrastructure, such as the location of facilities along usable commuting routes; the overall network connectivity; the amount of publicity and promotion; and the public's perception of how safe it is to cycle.

These issues and potential solutions are explored in more detail in Challenges that cities face and how cycling can address them.

### EU Cycling Policy background

Due to the range of co-benefits that can be generated, cycling contribute to fulfilling objectives in a number of EU policy areas including transport and mobility; low carbon development; innovation and technology; air pollution; smart cities; industrial competitiveness and economic growth; environment and climate change; health; local development and cohesion.

Perhaps the most significant way that the EU supports cycling is by providing funding and financing opportunities through the European Structural and Investment Funds and via its other funding programmes, such as Horizon 2020, which will be succeeded by Horizon Europe in January 2021. See http://www.eltis.org/resources/eu-funding for full details on EU Funding opportunities and support.

However, EU-level policies are still important as they provide a framework within which local measures can be developed. This is particularly relevant for cyclists, whose safety can be enhanced when motor vehicles are fitted with state-of-the-art safety equipment to minimise the severity of collisions, and roads are safely managed.

There were two explicit mentions of cycling in the 40 initiatives set out in the Commission's 2011 Transport White Paper. These were in relation to efforts to deliver a 'zero-vision' for the number of road transport casualties, and the importance of promoting cycling as an alternative to car use. The White Paper also acknowledges the importance of cycling in delivering clean and sustainable urban mobility and of cycling becoming an integral part of the urban transport system. In the Commission's 2016 Strategy for Low Emission Mobility, cycling was referred to in the section on action by cities, underlining the importance of local action and Sustainable Urban Mobility Plans (SUMP) in enabling and encouraging cycling. Support for the development of SUMPs was one of the main elements of the Commission's 2013 urban mobility Communication. This led the Commission to set up a European platform on SUMPs, which is now part of the Commission's "Eltis" urban mobility observatory platform that facilitates the exchange of information and experience on urban mobility issues. Other elements of the urban mobility communication interact with cycling, including urban logistics, access restrictions, urban road user charging and the deployment of Intelligent Transport Systems (ITS). The Commission's earlier 'Action Plan on Urban Mobility' from 2009 also included many actions that would help to develop cycling.

The importance of cycling has been recognised by various meetings of national Ministers, both within the EU and beyond.

At the pan-European level, the promotion of cycling is an element of the Transport, Health and Environment Pan-European Programme (THE PEP). THE PEP's 2014 Paris Declaration explicitly recognised the benefits of cycling in delivering sustainable economic development, reducing transport-related emissions and promoting a more efficient transport system.

An informal Transport Council held under the Luxembourg Presidency in 2015 recognised cycling as being a climate-friendly mode of transport. The declaration called for the Commission to take action to:

- Integrate cycling into multimodal transport policy, including smart mobility, stressing the need to promote physical infrastructure and behavioural change programmes;
- Develop an EU level strategic document on cycling; and
- Set up a European focal point for cycling to serve as a one-stop-shop for relevant questions and facilitate exchange of best practices.

At the 2016 Informal Meeting of EU Ministers responsible for Urban Matters Within the EU, the 'Pact of Amsterdam' was established and noted that cycling was one of the elements to be focused on in delivering sustainable and efficient urban mobility.

In 2018, the EU's Transport and Environment Ministers met in Graz, Austria, to discuss pathways leading to clean mobility. They adopted the "Graz declaration", which includes acknowledging cycling as an equal mode of transport, developing a European strategic and supportive framework to promote active mobility, and integrating active mobility in the current and future European funding and financing schemes.

There is currently no official EU Cycling Strategy. However, the European Cyclists' Federation (ECF) developed its own strategy and set of recommendations in 2017, which is supported by several other organisations. In a supporting letter to the Commission President the same year, the ECF and its supporters called on the Commission to develop its own cycling strategy, as a result of its potential scale and effect and in order to create a level playing field between cycling and other modes across Europe. The ECF's Cycling Strategy sets out the context for EU intervention on cycling, including:

1. Development of a broader coherent policy for behavioural change.
2. Address the perception that cycling is not safe, by better managing road speeds, educating road users and enforcing rules on drink driving.
3. Include cycle-friendly infrastructure in EU funding programmes.
4. Establish guiding principles for cycling infrastructure.
5. Integrate the EuroVelo network into the TEN-T network.
6. Require relevant safety features to be fitted to motorised vehicles.
7. Recognise the full potential of cargo bicycles in its forthcoming guidelines on urban logistics.
8. Improve the conditions for bicycle carriage in the EU Passenger Rights Regulation.
9. Recognise the potential for electric power-assisted cycles (EPACs) in the development of policies for electromobility.

Many stakeholders see a need for a more strategic, EU-level approach to be taken to enable and promote cycling in the EU. This guidance is particularly relevant for the fourth bullet point of the above list, the establishment of guiding principles for cycling infrastructure.

# Challenges that cities face and how cycling can address them

The European Commission's European Urban Mobility: Policy Context (2017) information booklet provides an overview of the current issues that EU cities face relating to the transport system. These include congestion, air and noise pollution, and road safety.

Before starting to identify which cycle policies or measures to implement in a city, it is important to first understand what the specific challenges are that a city faces and how cycling-related measures may help to overcome these challenges.

An overview of these challenges, and how they may be addressed with measures related to **cycling**, is provided below.

### A focus on modal shift to cycling

Cycling infrastructure and other measures aimed at cycling will improve conditions for cyclists and are often implemented with the objective of increasing cycling levels through a modal shift from other modes of transport. Although a modal shift is the direct and easiest to monitor impact of cycle measures, it is usually the indirect impacts or 'co-benefits' achieved that address the issues faced by cities. In order to achieve a modal shift and the associated co-benefits, cycle networks and associated measure should be implemented with a consideration of core quality design principles for cycle infrastructure and networks (safety, directness, coherence, attractiveness and comfort).

The sections below on different challenges faced by cities each describe how a modal shift to cycling can contribute to reducing the issue.

### Safety

According to the latest figures from DG MOVE, people cycling made up over 8 % of the total number of fatalities on the EU's roads in 2014. Although the number of cyclists killed in road accidents has been decreasing since 2002, the rate of decline has been lower than for passenger cars, and the decline has slowed in recent years.

### How cycling can improve road safety

Since most cyclist fatalities result from a collision with a motorised vehicle, addressing the issue requires a focus on attempting to reduce the frequency and severity of incidents resulting from the interaction of cyclists with motor vehicles. This can be achieved through appropriate infrastructure selection and design that limits dangerous interactions between non-motorised and motorised traffic. Efforts can also be made to educate the population about cycling.

A modal shift to cycling can improve safety for cyclists by increasing the awareness of other road users to people cycling on the carriageway. Safety concerns are a major barrier to cycling and so improvements in the actual and perceived safety of cyclists can be effective at further increasing the modal share.

### Congestion

It is estimated that congestion costs nearly €130 billion annually, or 1 % of the EU's GDP (EC, EU Urban Mobility: Policy Context, 2017). Congestion occurs when the volume of traffic exceeds the available

capacity of the carriageway. It is a complex issue influenced by various demographic, social and economic factors, including land use patterns, car-ownership, availability of public transport, availability of parking, economic activity, urban freight transport, and goods delivery. These factors in-turn can influence where people live and work, the location of businesses, and how people access these locations - all of which should be considered when addressing congestion issues.

Reducing congestion in cities and improving traffic flow will benefit the whole urban transport system. For example, the efficiency of public transport that uses the carriageway can be increased during peak hours.

### How cycling can contribute to reduced congestion

Cycling can offer a feasible alternative to motorised transport for urban journeys of which about half are shorter than 5 km, and the use of e-bikes can be particularly effective at encouraging a modal shift to cycling for commuting to school or work. Cycling is a very space efficient mode of transport (see figure below) and so a modal shift to cycling can lead to a reduction in congestion on urban roads. A modal shift will be most effective when it reduces the number of motor vehicles at peak hours, when congestion is usually heaviest.

### Environment

Motorised vehicles are a major source of air pollution in EU cities; 46 % of NOx emissions, which contribute to the depletion of the ozone layer and the formation of acid rain; 15 % of particulate matter (PM) emissions, which can cause reduced visibility and material damage; and around 15 % of the EU's $CO_2$ emissions, which is a major greenhouse gas contributing to climate change. Noise pollution is another environmental impact of vehicles, which the European Union is tackling through Regulation (EU) No 540/2014 of the European Parliament and of the Council of 16 April 2014. Another environmental issue faced by cities is the allocation of space. Roads and supporting infrastructure demand large amounts of valuable urban space (e.g. 24 % in London), which could otherwise be used as green spaces for residents, for example.

### How cycling can contribute to improved environment

Cyclists are relatively quiet and do not emit air pollutants, and so where there is a modal shift to cycling that reduces motorised traffic, emissions and noise pollution are also reduced. As demonstrated in figure x above, bicycles are much more space efficient and so a modal shift to cycling can reduce the demand for urban land.

### Health

As highlighted in the Environment section above, motor vehicles are a major source of harmful air pollutants, including NOx, CO2 and particulate matter (PM). High levels of NOx can lead to coughing and shortness of breath, and people who have extensive exposure to $NO_2$ have a higher risk of respiratory disease. PM can also increase the risk of heart and respiratory disease, with PM of less than 10 micrometres diameter posing the greatest threat as it can enter the bloodstream (EC, EU Urban Mobility: Policy Context, 2017). A report by the World Health Organisation (WHO) in 2018 on air pollution and child health, underlines just how big the problem is. Nine out of ten people worldwide breathe polluted air, which is responsible for 7 million deaths every year, many of who are children. (WHO, Air Pollution and Child Health, 2018)

Prolonged exposure to noise from road transport in cities can also lead to health issues, including sleep disturbance, cardiovascular disease, cognitive impairment and mental health problems.

Physical inactivity amongst adults and children is leading to health concerns, including obesity and increased risk of developing noncommunicable diseases such as diabetes, heart diseases, cancer, dementia, depression and premature death. Whilst not strictly a 'transport' problem, physical inactivity has been linked to increased urbanisation and declining use of active transport modes. The WHO's Global Strategy on Diet, Physical Activity and Health (2018) states that current levels of physical inactivity are partly due to insufficient participation in physical activity during leisure time and an increase in sedentary behaviour during occupational and domestic activities[1]. A number of environmental factors relating to increased urbanisation have been identified that may discourage participation in physical activity, including violence, high-density traffic, low air quality, pollution, and a lack of green areas and parks, footpaths and sports/recreation facilities.

### How cycling can contribute to improved health

A modal shift to cycling can improve health by reducing the physical inactivity of the people who cycle. More broadly the health of urban populations can be improved from a reduction in air pollution and noise emissions from motorised transport.

### Economy

Motorised transport has several economic costs to society, including congestion, road casualties, physical inactivity, and pollution that causes damage to human health, buildings, ecosystems, agriculture.

### How cycling can contribute to the economy

A modal shift to cycling can benefit society and reduce costs through achieving improvements in mobility, congestion, environment, health and road safety – as described below:

- Improve mobility - faster and more efficient commuting;
- Reduce congestion – reduction of numbers of vehicles on the roads, more fluid traffic flow and reduction of hours spent in traffic jams;
- Improve health, saving national health services' money;
- Improve access to jobs – including increasing women's independence and flexibility;
- Create jobs – including cycle tourism, retail, manufacturing;
- Save employers money and improve productivity – fewer sick absences, increased productivity, reduction in costs associated with providing cycle parking rather than car parking;
- Inject money directly into the economy via cycle trade – cycle production;
- Boost vitality of town centres and local commerce;
- Deliver goods efficiently – use of cargo bikes; and
- Add value to neighbourhoods and communities – bikeshare schemes.

Cycling can also strengthen local economies in urban and rural areas through supporting local businesses, increasing property values, boosting economic productivity through a healthy and satisfied workforce, and enabling disadvantaged groups to gain skills and access employment opportunities.

[1] WHO, Global Strategy on Diet, Physical Activity and Health. Accessed 06/03/19. https://www.who.int/dietphysicalactivity/factsheet_inactivity/en/

Additionally, in times where finance and resourcing may be difficult for cities and local authorities, cycling, and the provision of associated infrastructure, is more cost-efficient and can cost less than other modes, while the financial benefits may be high.

### Accessibility

Accessibility can be defined as the ability of people to reach goods, services and activities - which is a key objective of most transport activities. To maximise social inclusivity in society, cities should be accessible for all. However, individuals can sometimes have difficulty accessing jobs, goods, services and activities as appropriate transport modes or routes may not be available, and running costs or ticket prices may be unaffordable.

### How cycling can contribute to improved accessibility

Cycling has the ability to improve the accessibility of a city to a greater number of people relative to other transport modes, which may lack efficiency, availability and affordability.

The buying and maintenance costs of cycling make it a relatively low-cost mode of transport, offering an alternative to other modes that are less affordable. It also provides an alternative to those who are unable to drive motor vehicles, due to age or a disability.

It is an efficient and convenient form of transport that can provide access to areas that have motorised vehicle access restrictions or do not have public transport. Cycling can be used to cycle to and from public transport nodes, acting as a first or last mile solution to complement and improve the use of public transport.

### Social / Community

The issues outlined above that can be faced by a city all contribute to reducing the liveability of a city for its residents and reducing the appeal to non-residents of visiting a city.

### How cycling can contribute to social/community issues

Cycling can contribute towards improving the liveability of cities and the quality of life for city residents. Cycle-friendly cities are often considered to be people-friendly cities, which promote social interaction and create desirable places to live. As described in the 'accessibility' section above, bicycles can increase access to key services and destinations (e.g. education, employment, social activities), which can have a positive impact on quality of life.

### Key guidance, further reading and references

EC (2017) European Urban Mobility: Policy Context european_urban_mobility_-_policy_context

CIVITAS (2016) Smart Choices for Cities: Cycling in the City smart_choices_for_the_city_cycling_in_the_city

FLOW Project (2016) The role of walking and cycling in reducing congestion: A portfolio of measures flow_project_a_portfolio_of_measures

Hitchcock, G and Vedrenne, M (2014) Cycling and Urban Air Quality, ECF ecf-cycling-and-urban-air-quality

Blondiau, T and van Zeebroeck, B (2014) Cycling works: Jobs and job creation in the cycling economy, ECF ecf_cycling-works-jobs-and-job-creation-in-the-cycling-economy

Bodor, A and Lancaster, E (2014) Cycling for growth: Using European funds for cycling, ECF ecf-cycling-for-growth-using-european-funds-for-cycling

Küster, F., and Blondel, B (2013) Calculating the economic benefits of cycling, ECF ecf_economic-benefits-of-cycling-in-eu-27

We are cycling UK (2016) Cycling and the economy: Briefing 1F cycling_and_the_economy

# Planning for cycling in cities

## Preparing city cycling strategies and plans

### Cycling Strategies and Plans

Strategies provide a structure for delivering various cycling activities and infrastructure development, typically outlining the policies that the relevant city authorities aim to follow.

Cycling strategies can be developed at the national, regional or city level, and will typically include a medium to long-term vision for cycling. Cities at the initial stage of developing a cycling strategy should consider existing national and/or regional level strategies or plans, when available.

National or regional strategies usually have an emphasis on broad policies and programmes, setting out a general direction for the development of cycling within a country or region. They often refer to the coordination of exchange of good practice, capacity building for local and regional authorities and funding that is available for pilot projects, research, and awareness raising campaigns. National cycling strategies should set out the fiscal and legislative frameworks relating to cycling that have been adopted and may include details such as taxation rates and fiscal incentives for commuting by bike. They can also refer to 'softer' aspects related to making cities more attractive to people who cycle, such as placemaking. When available, the national or regional strategy should make reference to design standards that have been adopted, although many non-governmental guidance documents are available for practitioners to refer to when designing infrastructure in the absence of regional or national standards.

Local cycling strategies should, therefore, take the national (and regional) strategy frameworks into account when developing city-level policies and proposals for specific cycling measures.

The process of developing a local level cycling strategy will vary but will typically include the following steps:

- Setting up a steering group or organisational network;
- Defining an overarching vision or strategy statement;
- Identification and understanding of target and user groups;
- Monitoring and determining the baseline situation in the city;
- Development of local design guidance based on existing regional or national guidance if available; and
- Determining the budget required for the implementation of the strategy and the potential sources of funding.

The content will typically include:

- An overarching vision or strategy statement;
- Clearly defined targets for cycling;
- The baseline level of cycling, modal share, length of cycle paths and other infrastructures;
- Policies and action plans – including a range of measures, consisting of both the provision of infrastructure and supporting promotional measures such as training and awareness campaigns;
- Local design guidance – produced in addition to these policies and action plans; and

- The costs associated with the implementation of the strategy and potential sources of funding.

Local cycling strategies should also be incorporated within other urban mobility / multi-modal strategies or plans at the city level. Sustainable Urban Mobility Plans (SUMPs) are being developed in many European cities. SUMPs are designed to tackle transport-related problems in urban areas more efficiently. They have a structured process whereby visions are created, objectives and targets are set, policies and measures are selected, and active communication, monitoring and evaluation are encouraged. Whilst SUMPs are concerned with all modes of urban transport, cycling can make a large contribution to achieving sustainable urban mobility. For further information on SUMPs, see Sustainable Urban Mobility Plans (SUMPs) and Cycling.

## Key guidance, further reading and references


ECF (2018) National Cycling Policies: https://ecf.com/what-we-do/cycling-all-policies/national-cycling-policie...;

Gallagher, R and Parkin, J (2014) Planning for cycling, Chartered Institute of Highways and Transportation, UK ciht_planning_for_cycling

City of Copenhagen (2011) "Good, Better, Best - The City of Copenhagen's Bicycle Strategy 2011-2025" copenhagens_cycling_strategy

Deffner, Jutta; Hefter, Tomas; Rudolph, Christian; Ziel, Torben (Eds.) (2012) Handbook on cycling inclusive planning and promotion - Capacity development material for the multiplier training within the mobile2020 project. (also available in BG, CZ, EE, HR, LV, HU, PL, RO, SI, SK at: [see Chapter 2] m2020_handbook_en.pdf

# City Visions - What type of cycling city do I want my city to be?

## City Visions

An important element of cycling strategy development is defining a vision for a city that includes clear objectives and targets and supports the identification of cycling measures.

- Vision – What should life be like in my city?
- Objectives – What needs to be achieved to fulfil this vision?
- Targets – How much effort is necessary?
- Measures – What can be done?

Due to a range of cycling development levels (modal share and existing cycling infrastructure provision) and city sizes, the case study cities used to support this guidance have set varying levels of ambition when identifying visions, objectives, targets and measures for cycling. Examples are provided below:

## Budapest

### Vision:

"Budapest is a liveable, attractive capital city with a unique character and is a respected member of the European network of cities as the innovative economic and cultural centre of the country and the region".

### Objectives:

The transport system of Budapest should improve the competitiveness of the city and its region and contribute to a sustainable, liveable, attractive and healthy urban environment.

- Liveable urban environment: Transport development, integrated into urban development by influencing transport needs and mode selection, reducing environmental pollution and enhancing equal opportunities
- Safe, reliable and dynamic transport: The integrated development of transport modes through efficient organisation, stable financing and target-orientated development.
- Cooperation in regional connections: The city's transport system should support regional cooperation and strengthen economic competitiveness.

### Targets:

"To increase the share of sustainable modes to 80%, and to achieve a 10% share of cycling traffic by 2030" Budapest Balázs Mór Plan / Budapest Transport Development Strategy [65% in 2014, 2% cycling modal share in 2018]

### Measures:

Improving cycling interoperability; A cyclist-friendly secondary road network; Developing zones with traffic calming and traffic restrictions; More public transport vehicles suitable for carrying bicycles; Operation and development of a public bicycle-sharing system; Extension of cycling services; Active awareness raising

### Tallinn

#### Vision / Objective:

To improve the citizens' quality of life through focussing on health, mobility, safety and the living environment.

#### Targets:

- To increase the share of cycling of all transport modes to 11 % and the rate of children cycling to school up to 25%.
- To improve the accessibility of the cycling network. By year 2027, the network should be located up to 500 m from at least 75% of the residential houses and 200 m from at least 75% of the public buildings.
- To improve the cycling infrastructure within 1 km radius of schools in order to increase the safety of children travelling to school.
- To provide sufficient bicycle parking that meets local demand.
- To increase the accessibility to the recreational trails so that 80% of the paths connect the main cycling network at least from one side.

#### Measures:

- Development of a cycle track network.
- Creating cycle parking spaces around the city and encouraging private organisations/businesses to provide bicycle parking.
- Construction of public cycle parking in the city.
- Encouraging private organisations/businesses to provide outdoor and sheltered cycle parking

#### Supporting Documents:

https://www.tallinn.ee/Summary-of-the-Tallinn-Cycle-Strategy-2018-2027%20

http://www.tallinn.ee/est/g737s107308

## Gdańsk

The city has a strategy called 'Strategy Gdańsk 2030 Plus' and mobility is defined as one of its four priorities; "Mobility, and in particular active mobility, can become an important catalyst of a new attitude to the directions and factors of the city's development".

The city completed its SUMP plan in summer 2018. It is currently available on the Gdansk city website - www.gdansk.pl/strategia

#### Vision:

Development challenges reflecting the inhabitants' aspirations have been defined:

- "Increasing the share of public transport and pedestrian and bicycle traffic of local inhabitants".

#### Objectives:

An operational programme supports the strategy by defining actions that are to be implemented in Gdańsk, focusing on 2023 time horizon. Objectives include:

- Improving the conditions for pedestrian and bicycle traffic.
- Increasing the attractiveness of public transport.
- Improving transport accessibility, within the city and between Gdansk and other destinations.
- Promoting sustainable transport and active mobility

### Measures:

A selection of cycling related measures that have been listed in the operational programme (2023) include:

- Construction of bicycle paths in accordance with the Bicycle Path System in Gdańsk, including: high-speed bicycle paths according to the standards of the European Cyclists' Federation
- Creating new pedestrian and bicycle zones and extending the existing ones.
- Modernization and repair of pavements, bicycle paths, and pedestrian and bicycle areas.
- Expansion of parking infrastructure for bicycles, including: creating safe and functional bicycle parking places at interchanges.
- Creating a metropolitan public bicycle system.
- Implementation of projects to encourage employers to create conditions favourable for employees to commute to cycle to work.

The complete Operational Programme, 2020, can be found here: https://www.gdansk.pl/download/2016-08/77137.pdf

## Malmö

### Vision:

(From the SUMP)

"Walking, cycling and public transport are the first choice for all who work, live in or visit Malmö. These travel choices, together with efficient and environmentally friendly freight and car traffic, are the basis of the transport system in our dense and sustainable city - a transport system designed for the city, and for its people."

### Objectives:

A more accessible and attractive Malmö for more people. […] Malmö is to become a socially, environmentally and economically sustainable city to visit, live and work in.

- A denser city – higher concentration of people and functions in a growing city.
- An integrated city – providing service functions in a denser city
- A city with short distances – an accessible city for more people bridging barriers between different urban zones socially and physically
- A greener city for recreational purposes and pollution mitigation

### Targets:

- To increase cycling modal share for inhabitants from 22 % in 2013 to 22 % in 2020. To increase public transport modal share for inhabitants from 21 % in 2013 to 25% in 2020.
- To increase cycling modal share for commuting to Malmö from 3 % in 2013 to 5 % in 2020. To increase public transport modal share for commuting to Malmö from 33 % in 2013 to 45 % in 2020.

### Measures:

(From the local cycling strategy 2012-2019)

- Strengthen Malmö's profile as a cycling city (including campaigns, actions for different target groups like companies and schools; maps; apps and the bicycle sharing system)
- Measures to increase safety and comfort (lighting, road service, surface materials, symbols, restrictions to cars or mopeds)
- Larger infrastructural measures (cycling network classification, improvement of infrastructure, new cycling lanes, contra-flow lanes, cycling adapted roads, signposting)
- Small infrastructural measures (green light timing at traffic lights, cycling boxes and pumps, wind protection, handles)
- Actions for improved parking (Bike and Ride, parking at large transport hubs, e-charging points, event parking)

### Supporting documents:

Sustainable Urban Mobility Plan – creating a more accessible Malmö, published 2016

Cycling programme for Malmö 2012-2019

# Developing a cycle network for your city

## Cycle networks

### Overview and features

Cycle networks have been defined as *"an interconnected set of safe and direct cycling routes covering a given area or city"* (EC project, PRESTO, 2010). A cycle network is likely to comprise of the following elements:

- Cycle paths (including cycle lanes, tracks, highways, cycle streets etc.);
- Cycle parking facilities;
- Integration with public transport (including multi-modal hubs), car sharing and bike sharing/other rental solutions; and
- Support measures, including information and promotion, signage, maintenance and charging facilities for bicycles.

Therefore, when developing a cycle network, a city should expect to:

- Manage the existing roads and rights of way;
- Create new links within the existing cycling network to close any gaps; and
- Aim to create a network with an adequate level of service for cycle traffic.

It is important to note the different levels of cycle routes that are likely to be present within a cycle network:

- **Main routes: '**Connecting' function at city or intercity level – connecting villages, towns and cities with each other, either inside or outside urban areas.
- **Top local routes:** 'Distributer' function at the district level of the built-up area - providing the main cycling connections between urban districts within major urban areas.
- **Local routes:** Access function at the neighbourhood level – including every street or track that can be used by cyclists, connecting all origins and destinations to higher level routes.

There are two main types of network – utility (or functional) network and recreational network.

- **Utility network:** Connects destinations for functional trip purposes, including shopping, work, education etc. Connections should be as direct as possible as utility cyclists want to get from A to B as quickly as possible.
- **Recreational network:** Recreational routes can pass through urban areas/centres (and therefore also form part of the utility network), but the focus is on leisure cycling. They can include signed long-distance routes, signed tourist themed routes or a collection of nodes and interconnected links, enabling cyclists to determine their own trip. Recreational cyclists are typically looking for a leisurely and attractive ride, which can allow them to explore an area, exercise or socialise.

Both types of users should be considered when designing cycle networks, particularly where utility and recreational networks overlap.

### Design principles and user's needs

As originally identified by Dutch guidance (CROW, 2007), cities should aim to deliver cycle routes, and by extension cycling networks, that are **safe, direct, cohesive, comfortable** and **attractive**. (See Core quality design principles for cycle infrastructure and networks for further information). Implementing complementary measures within a network can enhance impacts of measures and contribute towards meeting the principles outlined above.

The most important aspects can be considered to be safety, directness and cohesion.

- **Safety:** Ensuring safety within a cycle network can be achieved through avoiding conflict with crossing traffic, separating different types of road users where necessary due to traffic volumes/speeds, reducing speed at points of conflict, ensuring good visibility of cyclists, and ensuring that there are recognisable road categories.
- **Directness:** Directness relates to the distance or time required to cycle between the origin and destination. In urban areas, it is desirable for cycling to be quicker than driving, which can be achieved through providing more direct routes for bicycles rather than for cars. To maximise directness there should also be minimal detours, good priority for bicycles, and the ability for cyclists to maintain constant speeds. The directness of a route in distance can be determined by a detour factor.
- **Cohesion:** A cohesive network ensures clear wayfinding and allows people cycling to reach their destination by the route of their choice with minimal interruption. There should be a consistent high quality of provision across the network and all common trip origins and destinations within a city should be accessible by bike and connected to the network. Intermodal cohesion is also desirable, enabling and encouraging cycling trips as a means of transport to and from public transport nodes. Without cohesion there cannot be a cycle network, only a collection of single cycle routes.

Cycle networks should also focus on the needs of users to encourage a growth in cycle use. The Dutch guidelines (CROW, 2007) outline cyclist's needs as:

- Keeping energy use to a minimum;
- Provision of smooth surfaces;
- Sufficient space around the bicycle to separate it from threats;
- Avoiding involuntary slow speeds;
- Shelter from wind and rain, as far as possible;
- Ability to ride side by side, allowing cycling to be a sociable activity;
- Minimising the number and complexity of tasks that cyclists have to perform.

**Planning cycle networks**

There are a number of stages involved in planning a cycle network for a city, which may or may not include modelling (see Policy Development and Evaluation Tools). These include:

- Defining objectives;
- Mapping land use and assessing cycling demand;
- Mapping existing routes, facilities, cycle volumes and cycling-related collisions;
- Identifying priority locations and constraints, that need to be treated;
- Identifying improvements to the network;

- Predicting potential demands;
- Stakeholder engagement;
- Prioritising and selecting measures;
- Implementing measures; and
- Monitoring and assessing the operation.

Key guidance, further reading and references

PRESTO (2010) PRESTO - Cycling Policy Guide Infrastructure presto_cycling_policy_guide_infrastructure(see Section 2.3)

Deffner, Jutta; Hefter, Tomas; Rudolph, Christian; Ziel, Torben Eds. (2012): Handbook on cycling inclusive planning and promotion. Capacity development material for the multiplier training within the mobile2020 project. (also available in BG, CZ, EE, HR, LV, HU, PL, RO, SI, SK) m2020_handbook_en.pdf Search for available translations of the preceding link••• (see Chapter 4)

CIVITAS MIMOSA (2013) Enabling Cycling Cities: Ingredients for success mimosa_enabling_cycling_cities(see Chapter 3)

KonSULT Networks: www.konsult.leeds.ac.uk/pg/23/ (see Page 23 – Infrastructure>Networks)

Sustrans (2014) Sustrans Design Manual Chapter 1 - Principles and processes for cycle friendly design sustrans_cycle_friendly_design

Sustrans (2014) Sustrans Design Manual Chapter 2 - Network Planning for Cyclists sustrans_network_planning

Cambridge Cycling Campaign (2014) Making space for cycling, Cyclenation making_space_for_cycling

Gallagher, R and Parkin, J (2014) Planning for cycling, Chartered Institute of Highways and Transportation, UK ciht_planning_for_cycling

# Selecting cycle measures

There are a range of common cycle infrastructure measures that can be implemented across a city's cycle network, which include the following:

| | | | |
|---|---|---|---|
| 1.1 Cycle lanes | 1.4 Grade-separated crossings | 1.7 Mixed-use zones | 1.10 Recreational Cycle Routes |
| 1.2 Cycle tracks | 1.5 Intersections | 1.8 Cycle streets | 2.1 Cycle parking |
| 1.3 Cycle highways | 1.6 Contra-flow cycling | 1.9 Multimodal integration | 3.5 Signage and wayfinding |

Selecting cycle measures for your city - Further considerations for applicability includes guidance for cities on selecting cycle measures, taking into account city characteristics and other considerations for the applicability of measures. The guidance includes cycle infrastructure measures as outlined above, but also information and promotional measures, and other supporting measures aimed at fostering cycling in cities.

An important element of the cycle network development process is the selection of appropriate cycle measures that address gaps or challenges faced by your city. There is no single answer to which design solutions or measures should be implemented, but there are a number of key factors that cities should take into consideration in the decision-making process:

**What is the route's function?**

- Main route, top cycling route or local route

**What is the spatial environment?**

- Inside or outside the urban/built-up area

**What is the traffic situation?**

- Intensity and speed of motorised traffic
- Road function – connector road, distributor road, access road
- Physical characteristics – available width, number of lanes etc

### Route function

Route function (main routes, top local routes and local routes) plays an important part in determining design requirements. The EC PRESTO project identified design standards for the different route functions, which are shown in the table below.

However, the local context of a city should always be considered. For example, in smaller cities, connecting centres between 5km and 15km for utility purposes may be too far (3 to 10 km may be more appropriate). Also, ensuring a minimum of 3 m width for cycle lanes and track in built-up urban areas is unlikely to be possible in many cases where cycling facilities do not already exist.

| | |
|---|---|
| **Main route** | • High level direct long-distance cycle routes (often cycle 'highways')<br>• Range of route functions:<br>  ○ Utility use – connecting centres over 5 to 15 km; or<br>  ○ Recreational use – long distance routes between city centres (10 to 50 km)<br>• High quality design standards:<br>  ○ Maximum separation from pedestrians and motorised traffic<br>  ○ Car free routes or routes prioritising bicycles<br>  ○ Minimum number of crossings:<br>  ▪ Crossings with busy roads: preferable grade-separated using a tunnel or bridge.<br>  ▪ Crossings with quiet roads: priority for the bicycles<br>  ○ Material: asphalt or concrete<br>  ○ Minimum 3 meters width<br>  ○ Uni- or bidirectional cycle flow, depending on local conditions<br>  ○ Shallow gradients<br>• Outside urban areas these routes often make use of towpaths along canals, disused railway tracks or cycle tracks parallel to roads or railways<br>• Inside urban areas these main routes have a high volume of bicycle traffic due to a high density of attraction poles (schools, dense living areas, office districts, etc.)<br>• The main routes are integrated into the overall cycle network and do not make up a coherent network on their own. |
| **Top local route** | • The most logical (quick) connection between (sub)centres and districts – Mostly along busy roads<br>• In most cases they need separated cycle lanes due to intensity and speed of motorised traffic<br>• If possible, there should be conflict free crossings with busy roads<br>• If separation of bikes and other traffic is not possible, attention should be given to conflict prevention and speed reduction.<br>• The top local routes form a coherent cycle network on the regional or urban level |
| **Local routes** | • Routes to provide access to destinations within districts and neighbourhoods<br>• Refining the top local cycle network (reducing the detour factor)<br>• Mostly found in traffic calming zones where mixing of car traffic and bicycles is often safe and convenient.<br>• Emphasis on creating direct routes on local level: shortcuts, contra-flow cycling, cycling through pedestrianised areas etc.<br>• Local routes can provide access to top local routes (and potentially main routes), reducing barriers to use/access. |

### Spatial environment and traffic situation

Many guiding principles have been developed relating to the selection of cycle measures and the spatial environment and traffic situation. Those presented here are from the EC PRESTO project, adapted from CROW Record 85 – Design Manual for Bicycle Traffic.

Differences in speed between bicycles and motorised traffic outside the urban area means that there is a high risk of conflict and serious injury. Therefore, strict separation of bicycles and motorised traffic should be considered. The decision matrix for selecting cycle infrastructure outside the urban area is as follows:

**INSERT IMAGE**

Within the urban area, it is difficult to always separate bicycles and motorised traffic. Therefore, mixing is the default option, with separation implemented where necessary, for example, when there is high traffic speeds or volumes. Road and cycling infrastructure should be designed to visually alert all road users to potential upcoming conflict situations between different types of transport modes. The decision matrix for selecting cycle infrastructure inside the urban area is as follows:

**INSERT IMAGE**

## Key guidance, further reading and references

PRESTO (2010) PRESTO - Cycling Policy Guide Infrastructure (see Section 2.4.3) presto_policy_guide_cycling_infrastructure Search for available translations of the preceding link•••

PRESTO (2010) PRESTO - Cycling Policy Guide General Framework presto_cycling_policy_guide_general_framework

CIVITAS (2016) Smart Choices for Cities: Cycling in the City (see Page 12) smart_choices_for_the_city_cycling_in_the_city

CIVITAS MIMOSA (2013) Enabling Cycling Cities: Ingredients for success (see Chapter 3) mimosa_enabling_cycling_cities

CM Bike (2014) Developing a cycling network and general design standards for bicycle infrastructure cmb_fact_sheet_h-01_cycling_network

KonSULT Decision Makers Guidebook (see Measure Option Generator): http://www.konsult.leeds.ac.uk/dmg/

Sustrans (2014) Sustrans Design Manual Chapter 1 - Principles and processes for cycle friendly design sustrans_principles_and_processes_for_cycle-friendly_design

Sustrans (2014) Sustrans Design Manual Chapter 2 - Network Planning for Cyclists sustrans_network_planning

Cambridge Cycling Campaign (2014) Making space for cycling, Cyclenation cycle_nation_making_space_for_cycling

Deffner, Jutta; Hefter, Tomas; Rudolph, Christian; Ziel, Torben Eds. (2012): Handbook on cycling inclusive planning and promotion. Capacity development material for the multiplier training within the mobile2020 project. (also available in BG, CZ, EE, HR, LV, HU, PL, RO, SI, SK) (see Chapter 4) mobile_2020_more_biking_in_small_and_medium_sized_towns_of_central_and_eastern_europe_by_2020

# Cycling infrastructure quality design principles

## Core quality design principles for cycle infrastructure and networks

### Core Quality Design Principles

This section focusses on core quality design principles and recommendations for cycling infrastructure and networks. Design guidance and standards for cycling infrastructure have been developed in many Member States (see here) and are regularly used by local administrations. However, there are other cities and Member States that are without this type of resource. This guidance therefore presents core design principles and recommendations for cycling infrastructure that can be used by these cities and Member States. **It is intended that these principles and recommendations should complement rather than replace any existing guidance and/or standards**.

There are a number of core design principles that should be adhered to when designing and implementing cycle infrastructure.

**Safety, Directness, Coherence, Attractiveness and Comfort**

These requirements should be considered as objectives by all city types. They can also be used as criteria to assess the quality of cycling infrastructure. Where infrastructure meets these criteria, they are more likely to result in an increased use of bicycles. The principles were first identified by the Dutch design manual, CROW (2007). They have since been updated and/or incorporated in many other cycling infrastructure design standards and guidance publications. The following sections outline the recommended core quality design principles in more detail.

### Safety

Safety is a basic requirement for any cycling infrastructure, although safety concerns are a major barrier to cycling. Cyclists often feel vulnerable when moving in the same space as motorised traffic due to differences in speed, the vehicle size and the volume of traffic. There can also be a lack of understanding by people driving motor vehicles of the needs of cyclists. Therefore, core quality design principles aim to increase actual and perceived safety, and include:

- Limit conflict between cyclists and other cyclists, pedestrians or motorists:
    - Ensure low-stress mixing
    - Separate main routes for bicycles from pedestrian routes
- Reduce motor vehicle traffic volumes and speeds around cyclists, especially when road users mix
- Separate bicycles from fast/heavy motorised traffic to reduce the number of dangerous encounters – including separation on routes and/or at intersections
- Ensure conflict points at intersections and crossings are clearly presented so that users are aware of the risks and can adapt behaviour appropriately. Visibility of cyclists to motorists should be maximised at the approach to intersections
- Ensure cycling facilities are well lit
- Ensure cycling infrastructure is well maintained (see ‘attractiveness’)

### Directness

Direct cycle routes that reduce travel times and distances will increase the competitiveness of the bicycle compared with motorised transport. Core quality design principles for directness include:

- Ensure bicycle users have access to the most direct route
- Minimise overall travel time by considering factors such as detours, number of stops at crossings, traffic lights, and gradients
- Maintain constant speed of cyclists
- Provide priority for people who cycle, over motorised traffic

### Coherence and Accessibility

Routes should be coherent and accessible, enable people who cycle to easily travel between their origin and destination. The CROW manual recommends that, in urban areas, people should not have to travel more than about 250 metres to reach the bicycle network. Cycle routes should also include connections with the public transport network. Core quality design principles for coherence and accessibility include:

- Provide a continuous and recognisable network linking trip origins and destinations
- Ensure routes are well-signed throughout
- Ensure routes for cyclists are direct (see 'Directness')
- Provide consistent protection for bicycle users throughout (see 'Safety')
- Ensure intermodality with other networks/modes of transport
- Provide well-located and secure cycle parking

### Attractiveness

People will be encouraged to cycle if they feel safe and if the infrastructure and route is aesthetically attractive. Core quality design principles for attractiveness include:

- Ensure that infrastructure and route is aesthetically attractive and interesting to potential users
- Ensure that infrastructure is integrated within, and complements local surroundings
- Consider the actual and perceived personal security of users (see also 'Safety')
- Ensure infrastructure is well-maintained

### Comfort

The cycling experience should be enjoyable, smooth and relaxed to maximise the comfort of people cycling. Core quality design principles for comfort include:

- Ensure the cycling surface is smooth and well-maintained (drained and free of debris)
- Reduce discomfort through appropriate selection of materials to avoid vibrations, shocks and obstacles
- Minimise the need for interruptions in a cycling journey (see 'coherence')
- Minimise the need for complicated manoeuvres (see 'safety' and 'coherence')
- Ensure adequate width
- Avoid steep gradients
- Minimise impacts of noise, spray and headlight dazzle from other traffic

### Conflicts between principles

It is important to acknowledge potential conflicts between the requirements. As the safety of people cycling is the main concern, this will often be prioritised ahead of other design principles. For example,

the directness or coherence of a cycle route may be reduced in order to avoid a busy road or intersection. Priorities will also vary depending on whether a route is considered to be utility or recreational, but safety is always the top priority, for example:

- Priority ranking for utility cycle network/route: safety, directness, cohesion, comfort, attractiveness
- Priority ranking for recreational cycle network/route: safety, attractiveness, cohesion, comfort, directness

It is also important to note that cycle infrastructure differs from infrastructure for pedestrians (or other modes). However, in many countries with low cycle intensity designers tend to treat cyclists as another type of pedestrian, resulting in poor cycling infrastructure quality.

### Measure specific guidance

Overall recommendations for infrastructure quality design guidance are provided for the following cycle infrastructure measures:

- 1.1 Cycle lanes
- 1.2 Cycle tracks
- 1.3 Cycle highways
- 1.4 Grade-separated crossings
- 1.5 Intersections
- 1.6 Contra-flow cycling
- 1.7 Mixed-use zones
- 1.8 Cycle streets
- 1.9 Multimodal integration
- 2.1 Cycle parking
- 3.5 Signage and wayfinding

Where recommendations differ for each type of city (e.g. starter, climber, champion), these have been outlined within the measure factsheets guidance. Detailed technical specifications for the quality design of cycle infrastructure have not been provided at the EU level. Therefore, cities are advised to consult existing design guidance and standards that have been developed within EU Member States.

### Key guidance, further reading and references

PRESTO (2010) PRESTO - Cycling Policy Guide Infrastructure (see Section 2.2.3)
presto_policy_guide_cycling_infrastructure Search for available translations of the preceding link

CIVITAS (2016) Smart Choices for Cities: Cycling in the City (see Page 14)
smart_choices_for_the_city_cycling_in_the_city

CIVITAS MIMOSA (2013) Enabling Cycling Cities: Ingredients for success
mimosa_enabling_cycling_cities

CM Bike (2014) Developing a cycling network and general design standards for bicycle infrastructure cmb_fact_sheet_h-01_cycling_network

Cambridge Cycling Campaign (2014) Making space for cycling, Cyclenation
cycle_nation_making_space_for_cycling

Gallagher, R and Parkin, J (2014) Planning for cycling, Chartered Institute of Highways and Transportation, UK ciht_planning_for_cycling

## Existing cycle infrastructure quality design guidance (and standards)

Detailed guidance and standards for cycle infrastructure design have been developed in several Member States at the national level. Additional guidance has been prepared by non-governmental organisations (NGOs), cycle interest groups and by regional/local administrations for cities. Examples of existing quality design guidance for cycle infrastructure are provided below (list not exhaustive).

See draft page https://ec.europa.eu/transport/themes/existing-cycle-infrastructure-quality-design-guidance-and-standards_en for full drop list – includes documentation for 18 MSs and USA

# Cycling Measures

## How to use the cycle measures factsheets

### Cycle measure factsheets

The factsheets have been designed to provide a high-level overview and summarise key information on each of the cycle measures, whilst directing users to key guidance, case study examples, further reading and references. They have been developed through engagement with case study cities and a review of existing guidance and good practice examples.

Each cycle measure factsheet includes the following information:

| Section | Description |
|---|---|
| **Overview** | |
| Definition | Name of cycling measure and definition |
| Considerations for applicability | • Level of cycling<br>• Urban layout/topography<br>• Population<br>• Finance resources<br>• Time & human resources |
| Measure impact highlight | Key impact resulting from measure implementation – i.e. accessibility, safety, environment, congestion, economy, health, community/social, modal share. |
| **Detailed description of the measure** | |
| Key features | Main characteristics of measure, for example physical appearance |
| Function and objectives | Description of the way that the measure will work in practise and the desired outcome of implementation. |

| | |
|---|---|
| Range of alternatives | List of other cycle measures that could be considered as an alternative based on similar functions and objectives |
| Complementary measures | List of other cycle measures that can support and improve the performance of the selected cycle measure, when being implemented at the same time. |
| Performance | Impacts that can be expected from implementation including evidence and reference to case studies |
| Parameters of success or failure | Contextual factors of city/ circumstances required to ensure success and reference to case studies<br>Includes comments on the transferability of the measure to other cities |
| **Infrastructure quality design guidance** | |
| Overall recommendations | Quality design recommendations for cycle infrastructure* |
| **Case studies** | |
| Case study name and location | Case study examples of the cycling measure<br>Case study city characterisation details (population, location, level of cycling) |
| **Key guidance, further reading and references** | |
| Key guidance, further reading and references | Web-enabled hyperlinks and/or PDFs to the relevant EU/national guidance and literature. |

*Selected infrastructure measures only

### Transferability

While most cycle measures are transferable to a range of cities, the characteristics of the Member State and city should be considered in order to select appropriate cycle measures and be aware of

factors that may influence implementation. As the level of cycling increases in cities, priorities of the city and selection and suitability of cycle measures are likely to vary over time.

It should be acknowledged that among Member States and cities, there are differences in cycling background, institutional settings and the strength of bicycle culture. These factors can affect the level of cycling within a city and the appropriateness of measures selected. There are many countries where cycling modal share is low and cycling is not a topic in national or urban transport agendas. However, some European countries, such as the Netherlands and Denmark, have a high modal share of cycling and often use cycling embassies to disseminate best practice to other countries/cities. There can also be inconsistency between the national and city level; for example, a Member State with low cycling modal share may have a city that demonstrates 'champion' city level cycling characteristics.

Cycling is usually a part of urban or regional planning, although there is variation in the organisations and authorities responsible, the planning approaches at the national level, and the sources and availability of funding.

### EU city case studies

The city case studies developed for this guidance support the cycle measure factsheets by presenting real world examples of measures that have been implemented in range of European cities. The following key information has been provided (where available) to help users of the guidance understand the local context behind the city case study examples:

- Location (general geographic location within Europe):
    - North, North East
    - Southern, Mediterranean
    - Baltics, Central, Eastern
- City size (population):
    - Small urban area (under 0.1m)
    - Medium urban area (0.1– 0.5m)
    - Large urban area (0.5- 1m)
    - Larger urban area (1-2m)
    - Metropolis (2m+)
- Cycling modal share:
    - Starter (0-5% cycling modal share, generally poor cycling conditions)
    - Climber (5-20% cycling modal share, poor to good cycling conditions)
    - Champion (20%+ cycling modal share, good cycling conditions)

See Overview of the guidance for further details of the case study cities involved in the preparation of this guidance.

# Selecting cycle measures for your city - Further considerations for applicability

The process of planning for cycling in cities, including the preparation of a cycling strategy, development of a cycle network and selecting cycle measures, is discussed at a high level in Planning for Cycling in Cities.

Each of the cycle measure factsheets contains a section on 'considerations for applicability', which are discussed in more detail below. When selecting cycle measures, practitioners should review these considerations within the context of their own cities.

Guidance is also provided below on potential measures that could be implemented within your city, depending on your city's characteristics. Further details on each of the potential cycling measures can subsequently be found in the respective cycling measure factsheets.

### Level of cycling and cycling development

The cycling conditions and number of people who cycle determine the level of cycling development of a city. Typically, the cycling rate (modal share) increases as cycling conditions improve. Three types of city cycling development levels, based on modal share, are widely recognised and have been used in this study:

- Starter (0-5% bicycle modal share)
- Climber (5-20%)
- Champion (20%+)

***Levels of cycling development – Starter, Climber and Champion cities***

A city's level of cycling development is likely to influence the actions that can be taken and the cycle measures that are considered for potential implementation. The PRESTO (2010) PRESTO - Cycling Policy Guide Infrastructure Search for available translations of the preceding link••• provides a comprehensive overview of considerations for starter, climber and champion cities. A summary of the characteristics of cities at each level of cycling development and the recommended actions and cycle measures for each level, are outlined below:

| Cycling development level | Characteristics | Actions to take | Potential cycle measures |
|---|---|---|---|
| Starter | • Low cycling modal share<br>• Little or no cycling provision, poor conditions for cycling<br>• Heavy/fast traffic<br>• Road design may be car orientated | • Focus on cycling **safety** to improve actual and perceived safety of cyclists<br>• Focus on **directness** of cycle infrastructure to attract people who do not currently cycle<br>• Begin to provide for cyclists, increasing acceptance and uptake (e.g. fair treatment at traffic lights / retaining street space for bicycles)<br>• Publicise any new infrastructure or improvements that are made | • 4.1 Traffic management and ITS(speed limits and traffic calming)<br>• 4.2 Traffic restrictions and charges<br>• 2.1 Cycle parking<br>• 5.3 Data collection, evaluation, documentation and communication<br>• 5.1 Bicycle steering group<br>• 3.1 Cycle information and awareness raising |
| Climber | • Medium cycling modal share<br>• Varying levels of provision and conditions for cycling | • Focus on improving cycle network **cohesion**<br>• Continue to expand and diversify cycling infrastructure<br>• Support traffic management (priority for bicycles, restrictions for motorised vehicles) systems and online information | • Cycling infrastructure and1.5 Intersections<br>• 6.1 Bicycle sharing schemes, including rental<br>• 1.7 Mixed-use zones<br>• 2.2 Provision of facilities at workplaces<br>• 1.6 Contra-flow cycling<br>• 3.5 Signage and wayfinding |

| | | | |
|---|---|---|---|
| | | • Focus on cycling and network promotion to attract new cyclists | • 3.1 Cycle information and awareness raising<br>• 3.2 Cycle events<br>• 3.3 Cycle training<br>• 5.2 Cycling subsidies |
| Champion | • High cycling modal share<br>• Good levels of provision and conditions for cycling<br>• Cyclists expect high quality infrastructure supporting measures | • Focus on **comfort** and **attractiveness** of cycle network<br>• Upgrade existing infrastructure to improve quality<br>• Reward cyclists for their cycling efforts (gamification, innovative measures) | • 1.3 Cycle highways<br>• Cycle infrastructure improvements and maintenance<br>• 2.3 Bicycle maintenance and repair facilities<br>• 3.1 Cycle information and awareness raising<br>• 3.2 Cycle events |

**CASE STUDY HIGHLIGHTS**

- **Brussels, Belgium (starter city)** has taken steps to improve cycling in the city by commissioning a profiling study to identify the needs of local communities in the city with the aim to facilitate cycling and encourage people to cycle. The city has also started to introduce dedicated facilities for cyclists and pedestrians on the inner-city ring road (including parking and infrastructure). This has been at the expense of car traffic space and the development of car parking facilities, specifically at the city's main train and metro stations.
- **Seville, Spain (climber city)** has focussed on improving **cohesion** through developing a network of fully segregated bicycle paths, which connect the city's main trip attractors and residential areas within the city.
- **Malmö, Sweden (champion city)** continues to improve cycling infrastructure and facilities in the city. For example, there has been a focus on improving the comfort and attractiveness of the cycling network through the provision of cycling priority passages (Cykelöverfart) that safeguard the right of way for cyclists and other bicycle lane users, where bicycle lanes cross roads. Streets adapted for cycling using the principles of cycle streets have also been implemented to increase directness of cycle journeys and offer priority for cyclists.

The EU project CHAMP (Cycling Heroes Advancing sustainable Mobility Practice) has also identified a set of **'quick wins'** (see page 18) for cities on their journey to becoming a champion cycling city, learning from case study experiences.

### Urban layout / topography

The physical features of a city, including the urban layout and topography, can act as barriers for cycling and influence which measures are suitable for implementation. Historic city centres often have narrow, one-way streets with restrictions in place for some transport modes. In these situations, less space intensive cycle infrastructure such as a cycle lane may be more suitable than a cycle track, which requires more space. Physical features such as rivers may also obstruct access and disrupt the directness and coherence of a cycling network. Except for electric bicycle users, people who cycle must provide the energy required to propel the bicycle forward. Therefore, hilly terrain that is tiring and slow to cycle across is likely to act as a barrier to cycling.

**Urban layout/topography** considerations for applicability and suggested cycle measures are outlined below:

| **Considerations for applicability** | **Potential cycle measures** |
|---|---|
| Rivers and railway lines | 1.4 Grade-separated crossings |
| Stretches of the major road network | High quality 1.2 Cycle tracks and 1.5 Intersections |
| | 1.4 Grade-separated crossings |

| | |
|---|---|
| Network of one-way streets | 1.6 Contra-flow cycling |
| Historic centre with narrow streets | 1.1 Cycle lanes (including suggestion lane) |
| | 1.7 Mixed-use zones |
| | 3.4 Cycle maps |
| | 3.5 Signage and wayfinding |
| | 6.2 Cycle logistics |
| Traffic access restrictions | 1.7 Mixed-use zones |
| | 1.8 Cycle streets |
| | 1.9 Multimodal integration |
| | 3.5 Signage and wayfinding |
| | 6.2 Cycle logistics |
| Hilly terrain | 1.9 Multimodal integration |
| | Promotion of the use of electric bicycles, including:<br>• 6.1 Bicycle sharing schemes, including rental<br>• 2.2 Provision of facilities at workplaces/public places (E-bike charging points) |
| | 3.4 Cycle maps |

| | |
|---|---|
| | 3.5 Signage and wayfinding |
| | Implementation of bicycle lifts |

**CASE STUDY HIGHLIGHT**

- **Agueda (Portugal**) implemented the BeAgueda electric bike-sharing scheme, which helped to address issues relating to hilly terrain in the city.

- **Bregenz (Austria**) installed two grade separated crossings to address physical obstructions in the cycle network. The first was a cycling bridge across a river and the second was the repurposing of a disused railway tunnel for cycling, in order to avoid a steep climb and increase directness between two city districts.

### Population

Understanding the local population and its needs is important in identifying problems or challenges that require addressing and that may influence the applicability of cycle measures. Considerations include whether a city has seasonal population fluctuations due to tourism; whether there is a large population share of student; and a consideration of the city demographics, including children, working population, elderly and level of deprivation and affluence.

Population considerations for applicability and suggested cycle measures are outlined below:

| **Considerations for applicability** | **Potential cycle measures** |
|---|---|
| Tourist destination | Cycle paths -1.1 Cycle lanes and 1.2 Cycle tracks (to popular destinations) |
| | 1.9 Multimodal integration |
| | 3.4 Cycle maps |
| | 3.5 Signage and wayfinding |
| | 6.1 Bicycle sharing schemes, including rental |

| | |
|---|---|
| Student population | Cycle routes (to schools/universities) (1.1 Cycle lanes 1.2 Cycle tracks) |
| | 2.1 Cycle parking at universities |
| | Facilities at educational establishments (see also 2.2 Provision of facilities at workplaces) |
| | 3.1 Cycle information and awareness raising |
| | 6.1 Bicycle sharing schemes, including rental |
| Children | 2.1 Cycle parking at schools |
| | 3.1 Cycle information and awareness raising |
| | 3.2 Cycle events |
| | 3.3 Cycle training |
| | 3.4 Cycle maps (for children) |
| | 3.5 Signage and wayfinding (for children) |
| | Speed limits and 4.2 Traffic restrictions and charges |
| Working population | 1.3 Cycle highways(for commuting) |
| | 1.9 Multimodal integration |
| | 2.1 Cycle parking at workplaces |

| | |
|---|---|
| | 2.2 Provision of facilities at workplaces |
| | 3.1 Cycle information and awareness raising |
| | 4.2 Traffic restrictions and charges , including parking |
| | 5.2 Cycling subsidies |
| Elderly | 1.2 Cycle tracks and 1.3 Cycle highways (for the safety issue) |
| | 2.1 Cycle parking |
| | 3.4 Cycle maps (for elderly) |
| | 3.5 Signage and wayfinding (for elderly) |
| General public | 3.1 Cycle information and awareness raising |
| | 3.2 Cycle events |
| | 3.3 Cycle training |
| | 3.4 Cycle maps |

**CASE STUDY HIGHLIGHT**

- A **cycling track** was implemented at Lake Constance in Bregenz, Austria, partially in relation to its high tourist population.

- A range of **promotional and educational measures** aimed at different population demographics were implemented in Malmö, Sweden, including 'Bicycling without age' (aimed at the elderly) and cycle training for adults.
- The MOl Bubi **bike-sharing scheme** was implemented in Budapest, Hungary. Approximate 10% of its users are tourists.

- The Old Shoreham Road **cycle track** in Brighton, UK, provides a safe route for young people to travel to school on foot or by bike.

### Finance, time and human resources

Identifying and securing finance and dedicating time and human resources (which also incur a cost) to plan, design, implement and maintain cycling measures can be a significant factor in the decision-making process for cities. Compared to other transport infrastructure such as major highways and public transport projects, cycling is relatively inexpensive. However, depending on the scale of infrastructure required or the scope of the measure being implemented, it can still incur substantial costs. Therefore, when considering the applicability of cycling measures the finance, time and human resources involved should also be considered. Both capital funding for the implementation of infrastructure/measures and revenue funding for the ongoing running/maintenance of measures are required. Sometimes there are methods of capitalising revenue costs, such as staff time, although these methods differ across Europe.

The cycle measure factsheets give an indication of the finance and time and human resources required for implementation and ongoing maintenance of the measures, although this is likely to vary significantly depending on city context and scale of the project.

### Key guidance, further reading and references

PRESTO (2010) PRESTO - Cycling Policy Guide General Framework
presto_cycling_policy_guide_general_framework(see Chapter 3)

Deffner, Jutta; Hefter, Tomas; Rudolph, Christian; Ziel, Torben Eds. (2012): Handbook on cycling inclusive planning and promotion. Capacity development material for the multiplier training within the mobile2020 project.
mobile_2020_more_biking_in_small_and_medium_sized_towns_of_central_and_eastern_europe_by_2020(also available in BG, CZ, EE, HR, LV, HU, PL, RO, SI, SK)

PRESTO (2010) PRESTO - Cycling Policy Guide Infrastructure
presto_cycling_policy_guide_infrastructure

CIVITAS MIMOSA (2013) Enabling Cycling Cities: Ingredients for success
mimosa_enabling_cycling_cities

KonSULT Decision Makers Guidebook

KonSULT Measure Option Generator

FLOW Project (2016) The role of walking and cycling in reducing congestion: A portfolio of measures flow_project_a_portfolio_of_measures

Sustainable Urban Mobility Plan (SUMP) guidelines

## CYCLE MEASURES – see draft pages online

# Summary of successful implementation of cycling measures

Through the preparation of city case studies and review of existing studies, key factors for successful implementation of cycling measures in cities have been identified. Those that are considered important include the following:

- Undertaking appropriate planning;
- Achieving political support;
- Engaging with stakeholders and the public;
- Understanding target groups and populations;
- Identifying and securing finance;
- Maintenance and management;
- Effective collection, evaluation, documentation and communication of data; and
- Delivering quality cycling infrastructure that is fit for purpose.

An overview of the key factors related to successful implementation and relevant key references and literature is provided in the sections below.

### Undertaking appropriate planning

Cities stressed that the planning stages are instrumental in the success of cycle measure implementation. See Preparing city cycling strategies and plans and Developing a cycle network for your city for further details.

### Achieving political support

Political support and institutional buy-in to city strategies, visions and infrastructure developments have been identified as helping to drive implementation of cycle measures and contribute to wider public acceptance.

- **CASE STUDY HIGHLIGHT** – In Seville (Spain), a network of fully-segregated cycle paths in the city centre was advocated through clear political support, which facilitated quick implementation and increased acceptance.

See also:

CM Bike (2014) Factsheet T-01 Incorporate cycling into city administration cmb_fact_sheet_t-01_city_administration

CIVITAS MIMOSA (2013) Enabling Cycling Cities: Ingredients for success (See Chapter 1) mimosa_enabling_cycling_cities

CIVITAS (2010) Policy Advice Notes: Cycle-friendly cities - How cities can stimulate the use of bicycles (see Page 8) civitas_cycle_friendly_cities

### Engaging with stakeholders and the public

Stakeholders are those individuals or organisations who may be affected by (primary stakeholders) or have a specific interest in or influence over an activity (secondary stakeholders). They can include transport experts, politicians, academics, the media, residents, and public or private organisations. Through engaging with stakeholders, cities can hope to:

- Overcome uncertainties and fears, and clarify misunderstandings of those affected;
- Increase the transparency of an action or measure etc.;
- Ensure that the public has a stake in the outcome and success of an action or measure; and
- Enable a method of obtaining feedback, including ideas and critique from a user perspective.

Stakeholders should be engaged with during all stages of the planning, design and implementation process, from cycling strategies to cycling infrastructure measures.

- **CASE STUDY HIGHLIGHT** – During the planning stages for the Old Shoreham Road cycle track in Brighton (United Kingdom), extensive stakeholder consultation was undertaken on the details of the scheme, which helped to ensure that approval from local residents and potential users was achieved.

See also:

CM Bike (2014) Factsheet T-02 Stakeholder involvement cmb_fact_sheet_t-02_stakeholder_involvment

Sustrans (2015) Sustrans Design Manual Chapter 13: Community and stakeholder engagement for infrastructure projects sustrans_community_and_stakeholders

CIVITAS (2016) Smart Choices for Cities: Cycling in the City (see Page 20) smart_choices_for_the_city_cycling_in_the_city

CIVITAS (2010) Policy Advice Notes: Cycle-friendly cities - How cities can stimulate the use of bicycles (see Page 10) civitas_cycle_friendly_cities

CIVITAS MIMOSA (2013) Enabling Cycling Cities: Ingredients for success (See Chapters 4, 5) mimosa_enabling_cycling_cities

Tapestry (2005) Making Campaigning for Smarter Choices Work - Guidelines for Local Authorities tapestry-final-report

### Understanding target groups/population

Identifying and understanding the challenges and needs of targets groups and the local population can assist in selecting and designing the most appropriate measures, with the best results. This requirement is closely linked to 'engaging with stakeholders and the public' and 'effective collection, evaluation, documenting and communication of data'. Through gathering of data and subsequent knowledge on challenges and needs, measures can be implemented with clearly defined target groups in mind, catering for different types of cycle users.

- **CASE STUDY HIGHLIGHT** – Malmö (Sweden) implemented a range of promotional and educational measures aimed at different target groups in the city, including 'Bicycling without

age' (elderly), cycle training for adults, and 'safari park / Cykelsafari' which provides space for children to learn and improve cycling skills.

See also:

CIVITAS MIMOSA (2013) Enabling Cycling Cities: Ingredients for success (see Chapter 8) mimosa_enabling_cycling_cities

CIVITAS (2010) Policy Advice Notes: Cycle-friendly cities - How cities can stimulate the use of bicycles (see Page 10) civitas_cycle_friendly_cities

### Identifying and securing finance

It is important that well-planned and consistently financed cycling measures are implemented to enable the uptake and continued use of cycling in a city. Before a cycling project can begin, the financial implications and requirements must be understood. Whilst cycling measures are typically low-cost compared to other transport measures, cities must still secure funding. Long-term funding is required to retrofit, build, maintain, improve, promote and grow cycling networks in cities.

The EC's CIVITAS MIMOSA study identified four stages to developing a strong sustainable cycling funding base, which included the following:

1. **Demonstration projects**: Implementing trial projects as a way of addressing inertia and fear of change through establishing initial success and laying the groundwork for permanent implementation.
2. **Policy-driven funding**: Creating a plan/strategy [SUMPs] and adopting policies to modify the existing transport planning and design process so that cycling is considered in all transport projects.
3. **Routine funding:** Identifying a series of independent retrofit projects prioritised in a cycling plan or strategy.
4. **Accelerated success**: Following on from initial funding for a bike programme, it is often easier to push for the next level. External competition with other cities may also drive ambition, fuelling increases in funding.

A possible source of funding for cycling infrastructure and cycle projects is revenue from other transport related measures, such as parking or access charges.

- **CASE STUDY HIGHLIGHT** – Amsterdam's (Netherlands) 'Mobility Fund' uses a proportion of the revenue from paid parking spaces in the city to fund investments in walking and cycling development, public transport services and Park & Ride measures (after administration and maintenance of the parking system).

See also:

ECF - EU Funding Observatory for Cycling

Eltis - EU Funding Sources

CM Bike (2014) Factsheet T-03 Options for financing measures for cycling cmb_fact_sheet_t-03_financing_cycling

CIVITAS (2010) Policy Advice Notes: Cycle-friendly cities - How cities can stimulate the use of bicycles (see Page 7) civitas_cycle_friendly_cities

CIVITAS MIMOSA (2013) Enabling Cycling Cities: Ingredients for success (See Chapter 2) mimosa_enabling_cycling_cities

### Maintenance and management

In addition to the implementation of cycling infrastructure and associated facilities, the ongoing maintenance and management of the measures is essential to ensure continued use. This should be accounted for and planned during the planning and design stages, through the selection of appropriate materials and identification of ongoing funding sources. A maintenance plan needs to be developed to ensure that features are regularly checked, updated and/or replaced, ensuring an ongoing high-quality provision of facilities. Funding for maintenance and management of cycling infrastructure/facilities may need to be identified from an alternative source to that used for implementation. See also Identifying and securing finance.

City of Copenhagen (2013) Focus on cycling: Copenhagen Guidelines for the Design of Road Projects (see Chapter 4) copenhagen_focus_on_cyling

Sustrans (2014) Sustrans Design Manual Chapter 15 - Maintenance and management of routes for cyclists sustrans_maintenance

### Effective collection, evaluation, documentation and communication of data

The collection, evaluation, documentation and communication of information on cycling and views on cycling in a city is vital. These activities can support evidence-based policy decision making, support engagement and communication with stakeholders, and strengthen funding applications and business plans. City authorities can make informed decisions and are able to better target investments in a way that engages residents, politicians and other stakeholders. It also makes it easier to defend and promote a decision when there is supporting quantitative evidence.

- **CASE STUDY HIGHLIGHT –** Tallinn (Estonia) is currently undertaking data collection exercise to identify the state of its cycling infrastructure, including any bottlenecks, shortcomings and quality. Data relating to cycling accidents is also being collected to identify safety issues. Data will be used as a basis for the assessment of the implementation of the city's cycling strategy.

See also:

5.3 Data collection, evaluation, documentation and communication

CIVITAS (2016) Smart Choices for Cities: Cycling in the City (see Page 21) smart_choices_for_the_city_cycling_in_the_city

Sustrans (2014) Sustrans design manual chapter 16: Monitoring and evaluation of walking and cycling sustrans_monitoring_and_evaluation

Technopolis (2016) "Evaluating the economic and social impacts of cycling infrastructure: considerations for an evaluation framework", a report for the Department of Transport (UK)[2]

Urban Systems (2013), "Bicycle Account Guidelines", a report for The League of American Cyclists[3]

UK guidance on monitoring and evaluating transport investments

City of Copenhagen (2016) Copenhagen's Bicycle Accounts copenhagen_bicycle-account-2016

Sustrans (2017) Bike Life reports 'Bike Life' reports for some UK cities

### Delivering quality cycling infrastructure that is fit for purpose

This final point reiterates the need to ensure that cities have undertaken the necessary steps to select and design cycle infrastructure meeting high quality standards and that meets the needs of users.

- **CASE STUDY HIGHLIGHT** - Seville, Spain has developed a network of fully segregated bicycle paths, connecting the main trip attractors and residential areas within the city. It addresses the core design principles, including safety (segregated from traffic), cohesion and attractiveness (similar recognisable design throughout the network), directness (avoiding detours and multiple street crossings), comfort (including bicycle parking facilities, uniform pavement, etc).

See also:

Selecting cycle measures for your city - Further considerations for applicability

Core quality design principles for cycle infrastructure and networks

CM Bike (2014) Developing a cycling network and general design standards for bicycle infrastructure cmb_fact_sheet_h-01_cycling_network

KonSULT Decision Makers Guidebook

CIVITAS (2016) Smart Choices for Cities: Cycling in the City (see Page 14) smart_choices_for_the_city_cycling_in_the_city

Cambridge Cycling Campaign (2014) Making space for cycling, Cyclenation cycle_nation_making_space_for_cycling

# Policy evaluation and development tools

## Health Economic Assessment Tool (HEAT) for cycling and walking

### Overview and Key features

The Health Economic Assessment Tool (HEAT) for cycling (and walking) enables policy makers at the local, regional and national levels to estimate the economic value of the health benefits that occur as a result of a reduction in mortality from increases in the amount of cycling (and/or walking).

### Function and objectives

Increasing levels of physical activity, e.g. as a direct result of a specific policy intervention, improve the health of those concerned. This is an important benefit from policies that aim to, and result in, higher levels of physical activity, specifically cycling and walking. HEAT assists policy-makers quantify the associated health benefits in order to subsequently be included in any economic assessment of the benefits of a specific measure or set of measures.

### Range of alternatives

In addition to estimating the economic value of the health benefits associated with increases in cycling and/or walking, HEAT can also be used to estimate the way in which air pollution and road crashes affect these results. The tool estimates the effects of air pollution and crashes on those people who increase their physical activity. It effectively estimates the impact on these people as a result of their increased exposure to air pollution and risk of accidents. HEAT can also be used to estimate the reductions in carbon emissions resulting from any reduction in motorised transport that occurs as a result of the increased amount of cycling (and/or walking).

When applying the tool, users are able to change some default values, e.g. uptake period, trip or step length, speeds, mortality rate and air pollution concentration. These can be changed according to the measure on which the user is focusing. If, for example, a measure will largely affect university students or young people (or similarly, mainly affect older people), the default mortality rate can be amended to reflect that this age group will have a lower (or higher) mortality rate than the average population.

### Links with other measures

The functioning of HEAT requires information. To this extent, there is a link to 'Monitoring and Evaluation', which is also information-based. Indeed, the results of previous monitoring activities can be used as inputs to the tool, while later monitoring can be used to identify inputs for the future use of the tool. More generally, HEAT can be used to estimate the economic benefits resulting from improved human health from the implementation of any measure that increases cycling, so there is a potential link to most cycling measures.

### Performance

The tool itself has no direct impacts; instead it helps policy-makers to estimate the economic benefits of increased levels of cycling (and/or walking). This can be done with or without consideration of the increased exposure to air pollution and the increased risk of crashes. It also estimates the economic benefits of any subsequent carbon savings.

The tool has been designed to facilitate its use by professional users, including those with no previous experience of impact assessment. It is based on transparent assumptions and the best available evidence. It effectively enables users to answer the following question:

*If X people regularly walk or cycle an amount of Y, what is the economic value of the health benefits that occur as a result of the reduction in mortality due to their physical activity?*

The tool can be used to estimate the economic value of existing levels of cycling, the economic value of changes over time and to support the economic evaluation of new or existing projects, including the estimation of benefit-cost ratios. It has been designed to complement existing economic tools that are used to estimate the economic values of transport interventions, e.g. those that estimate the effect on emissions or congestion. HEAT can be used as part of a comprehensive cost-benefit analysis, or as a stand-alone tool.

### Parameters of success or failure

HEAT can be used to estimate the health benefits resulting from increased levels of cycling and walking in any city. The one requirement is that the necessary data are available, or can be estimated.

Users need to input a range of information, including the population size affected, their current levels of cycling (and/or walking), existing modal shares and the anticipated change in activity resulting from the specific measure. The latter in particular would need to take account of the topography of the city, whether or not the city is a tourist destination and the potential impact of the measure given the level of the city's student population.

As the tool already exists, it is made available online and is free to use, there is little need for finance. The main time and human resources needed are to bring together the necessary information, to understand the tool and to use it. If the necessary data do not already exist, it will need to be estimated, e.g. from surveys, which will require some additional finance, time and human resources.

### Further Information

- The HEAT tool is available online at: http://www.heatwalkingcycling.org/#homepage
- HEAT has been already been applied by many public authorities. A list of case studies can be found at: http://www.euro.who.int/en/health-topics/environment-and-health/Transpor...;
- WHO (2017) "Health economic assessment tool (HEAT) for walking and for cycling: Methods and user guide on physical activity, air pollution, injuries and carbon impact assessments"; accessible at http://www.euro.who.int/en/publications/abstracts/health-economic-assessment-tool-heat-for-walking-and-for-cycling.-methods-and-user-guide-on-physical-activity,-air-pollution,-injuries-and-carbon-impact-assessments-2017
- ECF (2016) Turn up the HEAT: Recommendations to increase the use of the World Health Organisation's Health Economic Assessment Tool for cycling across Europe: https://ecf.com/sites/ecf.com/files/Heat%20Report%20SUMMARY.pdf
- Contact: heat@euro.who.int

# Sustainable Urban Mobility Plans (SUMPs) and Cycling

### Overview and key features

A Sustainable Urban Mobility Plan (SUMP) is "*a strategic plan designed to satisfy the mobility needs of people and businesses in cities and their surroundings for a better quality of life. It builds on existing planning practices and takes due consideration of integration, participation and evaluation principles*".

SUMPs have been designed to tackle transport-related problems in urban areas more efficiently. SUMPs are a structured process whereby visions are created, objectives and targets are set, policies and measures are selected and active communication, monitoring and evaluation all take place.

SUMPs contribute to reaching the European climate and energy targets set by EU leaders. SUMPs have been promoted by the Commission as a new planning concept able to address transport-related challenges and problems of urban areas in a more sustainable and integrative way via the Action Plan on Urban Mobility (2009) and Transport White Paper (2011).

### Function and objectives

The recent European SUMP guidelines outline the objects as follows:

- Ensure all residents are offered transport options that enable access to key destinations and services;
- Improve safety and security;
- Reduce air and noise pollution, greenhouse gas emissions and energy consumption;
- Improve the efficiency and cost-effectiveness of the transportation of persons and goods;
- Contribute to enhancing the attractiveness and quality of the urban environment for the benefits of residents, the economy and society as a whole.

The SUMP process aims to achieve these benefits through:

- Defining mobility policies in the context of a clear vision
- Identifying measurable targets to address long-term challenges of urban mobility
- Ensuring the involvement of stakeholders at appropriate stages
- Achieving collaboration between relevant policy areas and authorities

As SUMPs are concerned with all modes of urban transport, cycling is one element of the plans. Cycling measures are included in those recommended in a SUMP, and those cycling are also likely to benefit from other measures implemented as a result of the SUMP process (not-necessarily aimed at cycling – including traffic calming, traffic and parking restrictions etc.). Cyclists and cycling organisations can also be important stakeholders/contributors in the SUMP process when identifying problems, objectives and measures.

### Performance

It is anticipated that a number of benefits of using the SUMP process can be achieved. These include:

- Improving quality of life;
- Saving costs – creating economic benefits;
- Contributing to better health and environment;
- Making mobility seamless and improving access;
- Making more effective use of limited resources;

- Winning public support;
- Preparing better plans;
- Fulfilling legal obligations effectively;
- Using synergies, increasing relevance; and
- Moving towards a new mobility culture.

SUMP guidelines were developed and published in 2013 and are aimed at urban transport and mobility practitioners and other stakeholders involved in the development and implementation of SUMPs. SUMP guidelines are currently being revised to incorporate current and future developments in urban mobility. The revised draft guidelines are expected to be presented at the SUMP Conference in June 2019.

**Further Information**

Sustainable Urban Mobility Plan (SUMP) guidelines

Eltis website (Urban Mobility Observatory)

# Bicycle Policy Audit (BYPAD)

### Overview and key features

BYPAD stands for Bicycle Policy Audit and is a process enabling towns, cities and regions to evaluate and improve the quality of their cycling policy. It is an instrument paving the way for developing a detailed cycling strategy or plan. BYPAD is a quality process based on international best practice of applied measures, structures and policies in local cycling development policy.

BYPAD assesses the quality of a cycling development policy based on a strength and weakness approach. It brings together politicians, planners and users – cyclists - to jointly define the state of play of their city's cycling situation. Moreover, towns, cities or regions receive concrete advice on how to improve their cycling policies. The two main outputs are detailed knowledge on the state of play of cycling as well as an action plan dedicated to improving cycling policies.

BYPAD looks back at more than 200 cases across cities EU-wide, with audits taking place each year.

### Function and objectives - the BYPAD approach

BYPAD makes use of the idea of total quality management[1] being a well-established concept for economic operators. It transfers the approach to cycling policy to strengthen the use and conditions for cycling. One of the strengths of BYPAD is its user-centric approach and consensus building.

Stakeholders from political, administrative and private sector engage in the process to contribute towards the improvement of the cycling policy quality. BYPAD looks at local and regional cycling policy as a dynamic process. It investigates the results of cycling policy and how the actual process of developing and delivering cycling policies is at work in the specific political and administrative structures. For this, BYPAD makes use of nine cycling policy modules and assesses their quality one by one. Each module is reviewed and scored using a four-stage development scale starting with "ad-hoc-oriented approaches" to cycling policy towards "integrated approaches". The results of all nine modules establish the quality level of the local or regional cycling policy. Using the four-stage development scale, development goals for each module are set to perform improvements to cycling policy and its delivery in the BYPAD action plan.

### Performance – BYPAD in action

At the centre of the BYPAD process is an evaluation group supported and guided by an external supervisor – the BYPAD auditor. The group performs the assessment of the status quo and jointly identifies the modules where improvement is most necessary and possible. Group members include those with political responsibilities, administrative staff and other stakeholders, such as cycling interest groups, other traffic interests or individuals representing the user's point of view.

The audit process is as follows:

1. Individual questionnaire-based assessment of the local situation by each group member and local site visit of group members and the BYPAD auditor
2. Discussion on the respective views of the group members in the first meeting (called confrontation and consensus meeting) resulting in a joint assessment for each module and the global quality of cycling policy by the four-stage development scale.
3. Elaboration of an interim report by the external supervisor concentrating on the results of the first meeting and giving input to strengths and weaknesses of the current cycling policy.
4. Creation of the BYPAD action plan by the evaluation group in a second meeting defining the objectives for cycling policy in the coming years, based on the interim report.

5. Finalisation of the BYPAD Quality Plan by the external supervisor for integration to the current cycling policy.

The external supervisor's role is to moderate the process, provide input on examples where necessary and to produce the two main results in report format. Right at the start, the supervisor collects inputs on the existing situation and requires the respective local or regional administration to build a good understanding of the audit case. BYPAD provides a list of certified supervisors, the BYPAD auditors, at its website covering countries EU-wide and beyond. Cities and regions completing a BYPAD audit receive a certificate and label from the supervisor on their endeavours to improve their cycling policy quality.

Examples from city case studies involved in the preparation of this guidance showcase the structural impact BYPAD can take: In the case of Gdansk, the active mobility department of the City of Gdansk was established as a result of a BYPAD audit. Similarly, the Bicycle Officer of Bregenz was installed as an objective from a BYPAD audit.

### Complementary measures

As a policy audit integrating evaluation and action planning, BYPAD is a bicycle development strategy at a global level integrating a bicycle steering group. It is of less concrete nature than classical bicycle development strategies though more directed at systematic improvements and setting "obvious" needed or positive measures. As a policy tool, it refers to all cycling measures presented.

### Parameters of success or failure

Several issues need to be considered by a town, city or region during a BYPAD process:

- **Site Visit**: It is beneficial to be realistic in the choice of situations and to include both problems and challenges related to cycle traffic, as well as good solutions. The site visit should be undertaken by the BYPAD auditor and three members of the evaluation group to safeguard including views from the different members already before the confrontation and consensus meeting.
- **Questionnaire**: Authorities should be realistic when completing the self-assessment, avoiding overestimating the quality of their bicycle policy. This eases the work to get to a joint assessment result of the nine modules and the overall cycling policy.
- **Evaluation group**: High level staff involvement is crucial for both, the political responsible person as well as responsible administrative unit. From the user group side, a good mix of users representing not only bicycle associations, but as well other traffic providers or interest groups and individual users is beneficial. However, this group needs to be small enough to ensure good working conditions.
- **Meetings**: Albeit the process template plans for two larger meetings, cities can deviate from this structure and tailor the process to their needs. Some cities prefer to have more, but shorter meetings.

Overall, the expectations of a town, city or region regarding the results of the BYPAD audit need to be clear. BYPAD results in an assessment of the current quality of cycling policy and the BYPAD action plan. The latter should not be regarded as a full and detailed bicycle development strategy, rather it directs the city to systematic and structural improvements for cycling policy as well as to directly necessary, obvious or easy to implement actions, not needing previous detailed assessments to point out their benefits.

### Further information

To engage with BYPAD, simply contact an auditor or the BYPAD Secretariat.

The BYPAD website www.bypad.org provides further information alongside the development of the BYPAD history since its creation.

Specifically interesting reading is provided by the brochure "BYPAD Cycling – the European approach" describing the audit process and choice of the methodology used as well as reviewing BYPAD achievements and lessons learnt from the year 2008. A documentation on bicycle use and influencing factors as well as a choice of portraits if BYPAD cities is annexed to the brochure

# Other Tools

### FLOW Multimodal Calculation Procedures and Impact Assessment Tool

The FLOW project was a European Commission study focusing on congestion reduction benefits of cycling and walking. The project aimed to address the specific challenges of helping cities better assess the transport impacts of walking and cycling improvement projects so that the full benefits of such projects in reducing congestion could be understood.

The FLOW Multimodal Calculation Procedure was developed to provide an analysis technique that better accounts for the transport impacts of walking and cycling improvements than the standard practices currently used. Transport facility quality is assessed using three key performance indicators: density, delay and level of service. The FLOW multimodal calculation procedures include a multimodal performance index (MPI) for each of the three key performance indicators to address the issue of standard techniques not being able to combine mode-specific results.

The FLOW Impact Assessment Tool is a holistic technique for evaluating transport improvements. The tool has been designed to provide decision-makers with more information on transport improvement projects' impacts and benefits compared with simply facility-based multimodal transport analysis. The FLOW impact Assessment tool considers mobility, environmental, societal and economic impacts. It also recognises that transport is not the only consideration when decisions are made about improving the transport system.

The FLOW multimodal calculation procedures and FLOW Impact Assessment Tool are designed to be used together to provide a clear understanding of the benefits and costs of transport improvement projects, and especially to help evaluate the congestion reduction benefits of walking and cycling projects.

A guide of using the FLOW Tools for Multimodal Assessments can be accessed here.

### TRACE Walking and Cycling Tracking Service

TRACE is a European research project with funding through Horizon 2020. It assessed the ability of tracking services to optimise the planning and promotion of measures that support walking and cycling in cities. TRACE tools addressing (1) Behaviour change and (2) Mobility planning were piloted in eight sites around Europe and then evaluated before being prepared for full commercial use.

Three behaviour change tools have been developed that aim to improve certain elements of cycling and walking promotion campaigns. The three tools are summarised in the below:

**Biklio**

- Biklio encourages citizens to ride their bikes near checkpoints positioned at urban local shops, assigning a score (cycle-and-score scheme) to each participant to reward him. TRACE created an open paradigm to promote the involvement of local businesses as checkpoint providers, making it more appealing to join for both citizens as well as local businesses.

**Positive Drive**

- Positive Drive is based on "doing and rewarding the right transport choice". It uses only positive incentives, such as coaching, prizes, social status, achievements. TRACE extended and improved Positive Drive to offer users better feedback on walking and public transport, in addition to bikes and cars.

**Traffic Snake Game**

- The Traffic Snake Game encourages primary school pupils to travel more sustainably to school. TRACE developed a Traffic Snake Game tracking app, in order to digitalise the campaign and therefore improve the campaign's ambitions and impact.

**TAToo** is a tracking tool for mobility planning. It was developed to support planners and policy makers to interpret information produced by tracking systems, allowing them to identify and rank issues and monitor specific space and time frames.

To read more about these tools and information on how to use them, click here.

### The Urban Transport Roadmaps tool

The Urban Transport Roadmaps tool is an initiative of the European Commission that helps cities develop the first scenarios of their SUMP. With an easy-to-use interface and simplified approach, the tool allows people with non-specialist knowledge to:

a. explore and identify appropriate sustainable transport policy measures;
b. quantify the transport, environmental and economic impacts of these measures;
c. consider an implementation pathway (roadmap) for the policy scenario.

To access a quick start guide or detailed user guide and launch the tool, click here.

### CLoS - Cycling Level of Service tools

CLoS is an assessment tool for use by planners and cycle campaigners. It sets a common standard for the performance of cycling infrastructure for routes and schemes, and for individual junctions.

CLoS is based on six core design outcomes (safety, directness, coherence, comfort, attractiveness and adaptability), which are then broken down each into specific factors. For example, 'safety' consists of three factors: collision risk, feeling of safety and social safety. For each factor a set of indicators with score values can then be used to measure the performance of the factor itself.

Clients and designers are able to identify aspects that should be addressed as a priority, and the tool is exceptionally useful for activists, who are able to identify and highlight poor cycling infrastructure provision.

To read more about CloS and access the assessment spreadsheet, click here.

# EU Funded Cycle Projects

The following is a list of ongoing and completed cycle-related EU-funded projects and their websites.

| | | | |
|---|---|---|---|
| **Ongoing:** | | | |
| HANDSHAKE | Supporting the take-up and transfer of successful cycling measures | Coming soon | 2018-2022 |
| DEPICT | Designing and Policy Implementation for encouraging cycling and walking trips | http://depictmobilis.org/ | 2016-2019 |
| CHIPS | Cycle Highways Innovation for smarter People Transport and Spatial Planning | http://www.nweurope.eu/projects/project-search/cycle-highways-innovation-for-smarter-people-transport-and-spatial-planning/ | 2016-2019 |
| **Completed:** | | | |
| FLOW | Furthering Less Congestion by Creating Opportunities for More Walking and Cycling | http://h2020-flow.eu/# | 2015-2018 |

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| TRACE | Walking and cycling tracking services | http://h2020-trace.eu/ | 2015-2018 |
| PASTA | Physical Activity Through Sustainable Transport Approaches | http://pastaproject.eu/home/ | 2014-2017 |
| Cyclelogistics Ahead | Cyclelogistics ahead – A key step towards zero emission logistics in cities | | 2014-2017 |
| BIKE2WORK | Smart choices for commuters | http://www.bike2work-project.eu/en/ | 2014-2017 |
| VeloCitta | VeloCitta – Better use of Bicycle Share Systems | http://velo-citta.eu/ | 2014-2017 |
| SWITCH | Encouraging a SWITCH from car-based to active mobility using personalised information and communication technology approaches | https://www.switchtravel.eu/ | 2014-2016 |

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| PTP-CYCLE | Personalised Travel Planning for Cycling | http://ptpcycle-europe.eu/ | 2013-2016 |
| STARS | Sustainable Travel Recognition and Accreditation for schools | http://starseurope.org/index.php | 2013-2016 |
| MOBILE2020 | More biking in small and medium sized towns of Central and Eastern Europe by 2020 | http://www.mobile2020.eu/home.html | 2011-2014 |
| CYCLELOGISTICS | Move goods by cycle | http://cyclelogistics.eu/ | 2011-2014 |
| CHAMP | Cycling Heroes Advancing sustainable Mobility Practice | http://www.champ-cycling.eu/en | 2011-2014 |
| Cycle cities | | www.cyclecities.eu | 2012-2014 |
| CARMA | Cycling Awareness Raising and MArketing | | 2010-2013 |
| BICY | Cities and Regions of Bicycles | http://www.bicy.it/index.php?id=11&ID1=11 | 2010-2013 |

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| PRESTO | Promoting cycling for everyone as a daily transport mode | https://ec.europa.eu/energy/intelligent/projects/en/projects/presto | 2009-2012 |
| Active Access | Encouraging Active Travel for Short Trips to Improve Health and the Local Economy | http://www.active-access.eu/index.phtml?ID1=2498&id=2498 | 2009-2012 |
| OBIS | Optimising Bike Sharing in European Cities | https://ec.europa.eu/energy/intelligent/projects/sites/iee-projects/files/projects/documents/obis_handbook_en.pdf Search for available translations of the preceding link••• | 2008-2011 |
| Life Cycling | | | 2008-2011 |
| Trendy Travel | Trendy Travel: Emotions for sustainable transport | | 2008-2010 |
| SpiCycles | Sustainable Planning and Innovation for Bicycles (SPICYCLES) | https://ec.europa.eu/energy/intelligent/projects/sites/iee-projects/files/projects/documents | 2006-2008 |

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|---|---|---|---|
| | | /spicycles_key_findings_and_recommendations.pdf | |
| BYPAD | Bicycle policy audits | http://bypad.org/cms_site.phtml?id=552&sprache=en | 2006-2008 |