Fostering cycling and walking through cycling infrastructure, bike-sharing schemes and promotion of walking

In a nutshell

SUMMARY

It is best practice to:

- adopt policy measures and strategies to foster cycling and walking; cycling and walking need to be well recognised as separate modes of transport in policy and planning documents and strategic plans of the city, with specific measures for each of them;
- establish an efficient infrastructure; walking and cycling infrastructures are needed in order to make walking and cycling safe, fast and attractive;
- apply methodological tools in order to systematically collect data on walking and cycling; following the development of walking and cycling and evaluating the effect of the measures implemented can support further decision making and choices to promote sustainable transport;
- develop effective and targeted communication tools promoting walking and cycling among residents and commuters.

Target group

Public administrations responsible for mobility and/or public transport in their territory

Applicability

This best practice is applicable to all public administrations responsible for mobility. However, some local and contextual factors (e.g. topography) may limit the applicability of specific measures supporting and promoting walking and cycling.

Environmental performance indicators

- Modal share of journeys (% of journeys made by car, motorbike, public transport, cycling and walking)
- Length of cycling infrastructure (cycle lanes, cycle tracks), in total (km) and in relation to the length of the total road network for vehicles (km of cycle lanes/km of roads)
- The city has a dedicated policy or plan for investment in walking/cycling infrastructure and measurable goals to increase walking/cycling that are politically adopted (y/n)

Benchmarks of excellence

- The city has a modal split for cycling of 20 % or higher OR the city has increased its modal split for cycling by at least 50 % during the last five years.
- At least 10 % of the city's investment in transport infrastructure and maintenance is dedicated to cycling infrastructure.

Description

The benefits of walking and cycling are well known; they provide mobility at low cost with very limited impact on the environment and have positive health impacts on the users. In addition, they contribute to the quality of life of the entire city, as by nature they create an accessible city that can be enjoyed safely by children, mobility impaired and the growing number of older people in our cities. Walking and cycling are further very space-efficient modes of travel, which is an important aspect in ever more crowded cities. Walking and cycling have many similarities, but it important to remember that they are two different modes of transport, demanding separate attention and with different infrastructure requirements.

A large proportion of trips in all cities are short. Trips of around 2 km or less lend themselves to walking, distances shorter than 10 km are ideal for cycling. However, across European cities, there are huge differences in the modal share for walking and cycling. For cycling, it can range from below 1 percent of all trips up to 40 percent or more, e.g. in the most cycle friendly cities in the Netherlands or Münster, Germany. Walking can be a very significant travel mode in cities as well, with figures as high as 30 to 50 percent of all trips in a city, e.g. in Madrid or Paris (EPOMM, 2014).

The significant differences in walking and cycling shares between cities can partly be explained by local traditions, whether the urban planning structures encourage or discourage non-motorised modes. Generally speaking, the modal share of walking and cycling is particularly high in dense cities where they are the fastest and most viable options for most trips. Whether non-motorised modes are recognised as important elements of the transport system with appropriate policies, quality infrastructure, funding and measuring is another important aspect. Topographic and climatic factors are often used to explain high or low levels of walking and cycling, but little evidence can be found that these factors are very significant.

Although cites with a high level of walking and cycling should be regarded as inspiration, in the sense of best practices it is especially cities that have achieved significant increases in the share of non-motorised modes in recent years that are relevant examples and forerunners. It is less important whether they have started from a low level or not and sometimes examples with a low starting point can be more relevant, since their situation resembles more closely the situation in the majority of other cities.

This best practice will have four thematic areas that will be illustrated by local case examples to showcase how both medium-sized and larger cities can foster cycling and walking. The thematic focus will be on appropriate policy measures, physical infrastructure, applied methodological tools and behaviour change campaigns.

1) Policy and strategy

Walking and cycling need to be recognised as separate and important modes of transport in policy and planning documents and strategic plans of the city. This can be illustrated by the City of London, U.K. which has a clearly stated policy to improve the modal share of cycling, which is strongly supported by the Mayor (Greater London Authority, no date). Also the cities of Berlin, Germany (Berlin Official Portal, no date) and Malmö, Sweden (Gatukontoret Malmö Stad, 2012) both have explicit strategies and programmes to improve conditions for walking. Several tools for cycle policy evaluation have been developed, e.g. BYPAD (no date) and within the CHAMP-project (2014). High-level political support is another important aspect for successful strategies for increasing walking and cycling.

2) Infrastructure

Good walking and cycling infrastructure is essential for fostering these non-motorised modes. Appropriate high-quality infrastructure should make these modes of travel safe, fast and attractive. Coherent, recognisable design, appropriate width and a continuous routes without fragmentation are important quality features. Walking infrastructure should generally be separated from vehicular traffic. Cycle-infrastructure can include both shared traffic facilities such as low-speed residential roads or on-street facilities such as cycle lanes and segregated cycle tracks. Also parking facilities are an important part of cycling infrastructure. Walking and cycling should not only be made safe and fast, but also enjoyable, e.g. with attractive surroundings, the possibility to rest and low levels of noise.

An example is Aalborg, Denmark, where high quality cycle routes have encouraged commuters to shift to cycling. These routes provide direct access to the city centre on high quality cycle tracks and with as few stops as possible. Another example is the Workplace Cycle Parking Programme from London that has encouraged businesses near cycling corridors to build cycle parking infrastructure (Transport for London, 2006).

Super Cycle Highways are another example of cycling infrastructure built to encourage people to bike over longer distances and to make cycling more attractive. The Highways are designed to have high standard, green waves at

intersections, overtaking possibilities et cetera. The Copenhagen-Albertsund route in Denmark was the first in a planned network of Super Cycle Highways in the Copenhagen-region covering 300 kilometers. The network is expected to reduce public expenditure by € 40 millions annually thanks to health benefits from increased cycling (Official Website of Denmark, no date).

An example for provisions of infrastructure for walking is New York. In 2008, parts of central Manhattan, were transformed into pedestrian areas, either with car traffic limited or completely prohibited. For some places, cars were occupying 90 percent of the space but 90 percent of the people were pedestrians (Gehl Architects, 2007). With reversible and quick methods, the public space was turned over to make the city more livable and reduce the number of cars in the area. Other examples are the transformation of parts of the inner city of Nantes, France, to low-traffic zones in 2012, providing improved conditions and a more attractive surrounding for pedestrians.

3) Applied methodological tools

In many European cities data on walking and cycling is simply not being collected and therefore only little knowledge on the importance but also development of these modes exist. This often means that the importance of walking and cycling is not properly recognised, their volume and effect not quantitatively demonstratable and related policy efforts insufficient. Zürich, Switzerland, has made advances in systematically collecting data on walking and cycling, which was used as a justification to receive funding for walking and cycling. Also in Gothenurg, Sweden, efforts to measure cycle traffic have been increased, with several continuous measuring posts installed during the last years. Measuring walking and cycling traffic both makes the importance of these modes of transport more visible and makes it possible to follow its development and to evaluate the effectiveness of chosen measures. Another example of methodical tools to foster non-motorised transport is the systematic follow-up of accidents with cyclists and pedestrians by the City of Gothenburg, Sweden. All accidents that lead to hospitalisation are registred and analysed and infrastructure measures are initiated in places where accidents are frequent. This systematic approach has significantly reduced the rate of severe accidents amongst pedestrians and cyclists.

4) Communication

Communication is vital to change behavioural factors and to gain wider acceptance of walking and cycling. Creating a positive image of walking and cycling is important. A successful example is the extensive campaign *Radlhauptstadt München (Munich Cycling Capital),* which caused increased acceptance for cycling in Munich (Radl Haupstadt München, no date). Communication is also an important factor in changing the image of the city to a more bike- and pedestrian-friendly one which will encourage people to shift from car driving to alternative transport modes.

Targeted communication to specific groups has proven successful. As an example, Donostia – San Sebastian, Spain has made successful efforts in engaging with schools to encourage more walking and cycling to school. Targeting school children is particularly important as their mobility routines are still developing and they might continue with that behaviour also in their adult life. Other examples are Gothenburg, Sweden, where separate, targeted cycling campaigns aimed at men between 30-49 and at students were launched and Parma, Italy which focused on university employees (Carma 2012).

Environmental benefits

An increase in the modal share of walking and cycling in a city implies a decrease in the use of motor vehicles, predominately cars, mopeds and motorcycles – in some cases also of public transport. This leads to a wide range of positive environmental effects as well as benefits for public health. Walking and cycling are inherently non-polluting, quiet and space-efficient modes of transport and a shift to these modes almost always leads to environmental benefits.

Air pollution, globally and locally, will be reduced by a decrease in motorised traffic. Lower levels of NO_x, PM, SO_2 and ozone will all be achieved by shifting trips to walking and cycling, as well as a reduction in CO_2-emissions.

When walking and cycling replaces motorised traffic, it further leads to the reduction of noise emissions. Noise from motorised traffic is a significant and growing problem in most urban areas. According to the World Health Organisation (WHO Europe, 2011) noise is one of the most important environmental factors causing health problems in Europe, second only to air pollution.

Cycling and walking are highly efficient transport modes in terms of land use. Per transported person, infrastructure for cars demands approximately ten times more space than bicycle infrastructure for streets, parking spaces and feeding

areas such as ramps in parking garages, roundabouts etc (Ott, R., 2012). Increases in walking and cycling can thus free space in the city. This space can be used for additional improvements for pedestrians and cyclists, creating a virtuous circle of boosting non-motorised traffic. Alternatively, it can allow for more green areas or additional housing. For growing cities, more efficient use of traffic space can also imply that increased travel demand can be accommodated without costly expansions of road space.

Cycling and walking further increase the liveability and attractiveness of the city. The barrier effect, where heavy traffic prevents people from moving easily between different areas in the city, is lessened.

Side effects

An unwanted but possible side effect is that increases in walking and cycling are mainly fed by decreases in public transport use rather than decreases in car driving. In this case, the positive environmental effects are more limited. Measures to increase walking and cycling should therefore ideally always be accompanied by measures that aim at reducing the use of cars, e.g. parking measures, speed reductions or changes in accessibility.

Applicability

Measures to improve conditions for pedestrians and cyclists and to increase the share of non-motorised transport are applicable in almost all cities, regardless of climate and topography. An increase of these soft travel modes almost always has a positive impact on a city's liveability, transport efficiency, environmental situation and can often be achieved at comparatively low cost.

To actively shift trips from car traffic to walking and cycling is especially applicable in cities with air quality and noise problems, but also for cities that experience growth in travel demand but have only restricted financial resources available for additional road infrastructure.

To facilitate an increase in the number of cycling and walking trips, a city can choose very different approaches. It can be small changes done over a longer period of time, or a radical transformation of (parts of) the city within months.

Listed below are several conditions or goals for which efforts to increase walking and cycling are especially applicable and promising.

- **Improving the city image:** If the city wants to change its overall image to a more sustainable one, or to increase the attractiveness of the city, high walkability and good bicycle facilities are key. Cities with high modal shares of non-motorized traffic are often ranked highly in surveys on quality of life. A walkable city is also important for attracting tourists and to support visitor revenues.

- **Bicycle/walking infrastructure is intermittent:** Intermittent or fragmented infrastructure is a frequent problem for cyclists and pedestrians and it significantly reduces the attractiveness of walking or cycling. Small measures that link separate sections and fill gaps in the network can make a significant difference at low cost.
- **Densification of the city area:** When densification is hindered by noise from motor vehicles and lack of space for traffic, changing the modal split to more cycling and walking opens new possibilities.
- **Separation or speed-regulation:** To make streets more available to pedestrians, but also cyclists, space is required. If the streets are wide, the space can be redistributed to enable broad sidewalks, cycle lanes as well as reduced lanes for motorised traffic. If there is not enough space for this, low-speed-zones or shared-space areas are recommended, where cars share the space with pedestrians and cyclists, but are to give way for them.
- **Geographic conditions:** In theory, cycling is especially suitable for flat cities with favourable weather conditions. However, comparisons between modal split data of different Europena cities shows very little correlation between topography and weather conditions and the share of cycling and walking (EPOMM, 2014). Therefore, authorities should not be discouraged by hills and rain to invest in these modes.
- **Political support:** There is frequently a lot of opposition towards more cycle lanes and reduced speeds for cars, and therefore strong political backing is a success factor. If the political situation does not favour large-scale measures, a more gradual but consistent introduction of infrastructure and policy-measures is recommended.

Economics

Many studies demonstrate the economic benefits of investing in increased cycling and walking, the former being more extensively investigated than the latter. The costs of establishing walking and bicycle facilities vary greatly with different preconditions, but some general examples of the economic benefit to society at large are available. The initial investments for changing the infrastructure do not necessarily need to be high – as shown by New York, cheap and reversible changes in the street environment can be sufficient to begin with.

A change towards more cycling and walking leads to general positive effects on public health by improvements in air quality and noise-reduction. Furthermore, increased walking and cycling has a significant effect on public health due to increased physical activity.

For example, the predicted health-cost savings due to the planned network of Super Cycle Highways around Copenhagen are estimated to be €40 millions annually thanks to health benefits from increased cycling (Official Website of Denmark, no date). A recommended tool to assess what health impacts can be achieved by increases in walking and cycling is the *Health economic assessment tool (HEAT) for walking and cycling*, developed by the World Health Organisation (WHO, 2014 b).

For the Stockholm Region, a socio-economic assessment of the benefits of implementing the regional cycle plan, including added infrastructure, showed the return of every invested Swedish crown to be 13-22 crowns, which is a large return compared to other assessed projects (WSP Sverige AB, 2013).

A model commissioned by Cycling England, shows that a small number of additional cyclists will pay for investment in new infrastructure. Regular cycling is defined as three times a week and over a 30 year time frame, an investment of 10 000 pounds requires only one additional cyclist to break even (SQW Conculting, 2008).

For three Norwegian cities, a cost-benefit analysis of walking and cycling track networks has been carried out. The analysis included improved safety and health benefits, as well as external costs such as reduced air pollution and noise, reduced parking costs for employees and cuttings in the cost for school bus transports. The estimated benefit was at least 4-5 times the investment costs and thus more beneficial to society than many other transport investments (Saelensminde, K., 2004).

There is a certain risk that accident numbers can grow with increasing rates of walking and cycling, if they are not supported by improvements in safety infrastructure. However, several studies (ECF, no date) suggest that increased levels of walking and cycling actually can reduce the risk of injury when measured per walked or cycled kilometre, improving the *relative* safety of these modes. This effect is often called the “safety in numbers” effect.

Driving forces for implementation

The driving forces for aiming to increase walking and cycling are the strong, positive effects it has on the environment, public health, accessibility, liveability and attractiveness of the city as well as the large economic savings that can be made from it.

For both local and global environmental issues, sustainable transport is a key factor. Motorized traffic is the main source of air and noise pollution in the city areas around the world, the levels often exceeding air quality norms. This leads to enormous heatlh impacts, lower house prices and reduced quality of life for citizens. For cities deciding to improve the situation, investing in cycling and walking is a fast and cost-efficient way to do it. Many cities have ambitious goals for overall energy savings. By keeping the motorized modal share on today’s levels, these goals are often unobtainable. Expanded walking and cycling is an effective way for the city to reduce its energy use within the transport sector.

Public health issues are a growing economic and emotional burden in both developed and developing countries. Obesity in children is rising alarmingly and physical activity is a vital part of the solution (WHO, 2014 c). By reducing the modal share for car trips in favour of cycling and walking, a lot of positive effects on health are created. Apart from lessening the consequences from air pollution and noise, increased physical activity is a key motivator for fostering cycling and walking.

The majority of big cities have accessibility and congestion problems. Increasing the proportions of walking and cycling can be a tool to relieve the situation, since these travel modes are very space-efficient (Ott, R., 2012) and flexible. Increases in walking and cycling can offer improved accessibility and capacity within the restrictions of accessible space and road capacity in cities. By transferring a larger proportion of shorter trips (under 10 km) to walking and cycling, capacity is freed

on overcrowded roads and in public transport. This leads to reduced congestion and waiting times, improved accessibility, comfort and travel times for all travellers, especially in rush hours.

High accident numbers among pedestrians and cyclists can be a strong driving force when investing in these modes. In Paris, pedestrians injuries and fatalities due to motor vehicles were a driving force for the extensive efforts the local authorities have made to change the city's traffic situation with speed limits and pedestrian priority as some of its measures (Razemon, O., 2013).

All in all, there are many driving forces that support efforts to increase walking and cycling in cities – air quality, noise, traffic safety, public health issues, liveability and quality of life in cities. Especially for growing cities, a key driving force, however, is the space efficiency and cost-effectiveness of non-motorised travel modes. If space is scarce and budgets are tight, increasing walking and cycling offer high capacity potential at far lower costs than car traffic infrastructure or even public transport.

Reference organisations

Many European cities have successfully worked on increasing the modal shares of walking and cycling, some starting from a very low level and some with already high levels of non-motorised transport.

For inspiration and to better understand the potential of non-motorised transport, champion cities which already have achieved very high levels of modal share for walking or cycling are recommended as reference and study visits. Examples are:

Copenhagen, Denmark: Copenhagen is one of the leading cycling cities in Europe with very high levels of cycling. For further information, the Copenhagen cycling strategy and the cities' bicycle account, visit:

http://subsite.kk.dk/sitecore/content/subsites/cityofcopenhagen/subsitefrontpage/livingincopenhagen/cityandtraffic/cityofcyclists.asp

Münster, Germany: Münster calls itself the bicycle capital of Germany, with twice as many bicycles than inhabitants and extensive bicycle infrastructure. For more information, visit:

http://www.muenster.de/stadt/tourismus/en/city-of-bikes.html

Groningen, Netherlands: In Groningen the bicycle is the dominant mode of transport and the city has extensive cycle infrastructure and world-class cycle parking facilities. For a visual impression on cycling in Groningen, visit:

http://www.citylab.com/commute/2013/10/city-where-bicycles-rule-road/7202/

Further information can be found on:

http://www.champ-cycling.eu/en/The-Champs/Groningen/Groningen/

Malmö, Sweden: Malmö is a leading cycling city in Sweden and has in the recent years expanded its cycling network and parking facilities considerably, attracting even more cyclists.

For further information, visit:

http://www.malmo.se/English/Sustainable-City-Development/Mobility.html

Madrid, Spain: Madrid has already achieved very high levels of walking for transport in the city, but strives to further improve the conditions for walking in the city. For further information, visit:

http://www.eltis.org/index.php?id=13&lang1=en&study_id=4015

But also cities with currently low levels of walking or cycling but ambitious strategies and measures to increase these levels are valuable references. Examples are:

London, U.K.: London has a very ambitious strategy to dramatically increase cycling in the city and has taken a wide range of measures to achieve its goals. For further information, visit:

https://www.london.gov.uk/priorities/transport/cycling-revolution

Szolnok, Hungary: The east Hungarian city of Szolnok has invested heaviliy in improving accessibility for pedestrians by investing in a new pedestrian bridge rather than a car bridge. For further information, visit:

http://www.eltis.org/index.php?id=13&lang1=en&study_id=4015

Toronto, Canada: Toronto has lower walking levels than many European cities, but has an ambitious strategy to increase pedestrian traffic. For further information, visit:

http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=380f7e5921f02410VgnVCM10000071d60f89RCRD

Many more examples on walking and cycling measures and strategies are provided by the following organisations:

ELTIS: The urban mobility portal supported by Intellingen Energy Europe provides a huge, searchable database with case studies and examples of implemented measures for walking and cycling in European cities. See: http://www.eltis.org

Bicycle Portal: The German bicycle portal by the Federal Ministry of Transport and Digital Infrastructure collects information and good practice examples on cycling from Germany and beyond – not only in German. See: http://www.nationaler-radverkehrsplan.de/en/

ECF, Europea Cyclists' Federation: The ECF is the European umbrella organisation of national cyclist organisations and provides resources but also contacts to national cyclist organisations. See:

http://www.ecf.com

Fietsberrad CROW: Fietsberaad CROW is the Dutch knowledge bank on cycling, filled with cycling related examples from the Netherlands. See: http://www.fietsberaad.nl/?lang=en

Walk21: Walk21 is an organisation with a focus on pedestrian traffic. It is a resource for best practice examples and research papers on pedestrian traffic and organises the international Walk21-conferences. See: http://www.walk21.com

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