

DIRECTORATE-GENERAL FOR INTERNAL POLICIES

# POLICY DEPARTMENT **B**

## STRUCTURAL AND COHESION POLICIES

Agriculture and Rural Development

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**DIRECTORATE GENERAL FOR INTERNAL POLICIES**  
**POLICY DEPARTMENT B: STRUCTURAL AND COHESION POLICIES**

**TRANSPORT AND TOURISM**

**THE PROMOTION OF CYCLING**

**NOTE**

This document was requested by the European Parliament's Committee on Transport and Tourism.

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**DIRECTORATE GENERAL FOR INTERNAL POLICIES**  
**POLICY DEPARTMENT B: STRUCTURAL AND COHESION POLICIES**

**TRANSPORT AND TOURISM**

# **THE PROMOTION OF CYCLING**

## **NOTE**

### **Abstract**

The present note aims to give an overview of the cycling problems and challenges by describing the policies of European cities to promote cycling. It presents a collection of best practices regarding road infrastructures and parking facilities, cyclists' safety and security, and intermodality. It concludes by providing recommendations concerning the EU and local authorities.



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## LIST OF ABBREVIATIONS

<b>CIVITAS</b>	City VITAlity Sustainability Initiative
<b>CO<sub>2</sub></b>	Carbon Dioxide
<b>CoR</b>	Committee of the Regions
<b>CROW</b>	The National Information and Technology Platform for Transport, Infrastructure and Public Space of the Netherlands
<b>DB</b>	Deutsche Bahn
<b>EC</b>	European Commission
<b>EEA</b>	European Environment Agency
<b>EESC</b>	European Economic and Social Committee
<b>ELTIS</b>	European Local Transport Information Service (ELTIS)
<b>EP</b>	European Parliament
<b>EPOMM</b>	The European Platform on Mobility Management
<b>EU</b>	European Union
<b>FIAB</b>	Federazione Italiana Amici della Bicicletta
<b>GDP</b>	Gross Domestic Product
<b>GIS</b>	Geographical Information System
<b>ICT</b>	Information and Communication Technologies
<b>RGUVV</b>	Rheinische Gemeindeunfallversicherungsverband
<b>SUTPs</b>	Sustainable Urban Transport Plans
<b>WHO</b>	World Health Organization



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## GLOSSARY

<b>Cycle path / Cycle track</b>	Roadside converted-footway type structure or sidepath alongside (not on) a carriageway (United Kingdom) or roadway (United States)
<b>Cycle lane</b>	A part of a road marked by painted lines and intended for use by bicycles (MacMillian dictionary)
<b>Cycle street</b>	Street on which bicycles have priority over other road users
<b>Cycle route</b>	Usually a series of cycle paths making a medium-long cycle itinerary used for cycling tourism



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## EXECUTIVE SUMMARY

### *Background*

Mobility may be regarded as the ability to travel, although its meaning could be much broader since mobility encompasses not only the activity of travel but also, more importantly, the possibility for the traveller to decide when and where to travel, by being aware and making use of an information set for optimising the journey.

Although mobility plays a crucial role in contributing to the socioeconomic growth of urban areas, its positive effects have to be weighed alongside the negative impacts which the increasing demand for mobility has generated over the last 20 years.

'More sustainable' is thus regarded as being the main goal that underpins current approaches to and solutions for future mobility. Sustainability should lie at the heart of all policies and strategies for a more sustainable transport system in environmental (CO<sub>2</sub>, air pollution, noise) and competitiveness (congestion) terms, while also addressing social concerns. This is why the concept of sustainability goes far beyond the need to respond to managing road traffic flows and their impacts, because it shall also address, for instance, the cost of mobility in relation to social exclusion, economic and social cohesion, and the demographic changes that will shape the structure of European cities in the future.

Based on the background outlined, and even if local authorities are primarily responsible for urban policies according to the principle of subsidiarity, the European Union (EU) has taken an active role since the adoption of the White paper on transport policy (EC, 2001). The purpose of the EU action is to offer local authorities specific support for promoting a new culture of urban mobility, in which sustainable and affordable urban transportation is a key to making cities dynamic and vibrant environments. This also explains why EU support has taken several forms, through a combination of policy intervention and guidance support.

### *Aim*

The present note is one of three notes dealing with urban mobility.<sup>2</sup> It aims to give an overview of cycling problems and challenges by describing the main urban policies that promote cycling, such as:

- the provision of good, and safe infrastructures in cities and neighbourhoods;
- cycling education and the promotion of safety for cyclists;
- the importance of intermodality in giving cyclists the opportunity to make medium-to-long-distance trips;
- the challenge of improving security, to prevent theft and avoid aggression towards cyclists.

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<sup>2</sup> The two other briefing notes requested by the Committee on Transport and Tourism deal with 'Sustainable Urban Transport Plans (SUTPs)' and 'Mobility Management'.

The note presents some examples of good practice with successful and effective outcomes. Some of these practices may be easily transferred to other cities within relatively short time spans since they do not require expensive budgets and construction of infrastructure or cycling facilities.

### ***Outline of contents***

There are five Chapters. Following the introductory Chapter, Chapter Two illustrates the key concepts for cycling such as its benefits and the major problems it presents. Cycling has gained popularity as an everyday means of transport and as a recreational or holiday activity. People mostly choose to use a bicycle for positive reasons: it is fun, it is a daily healthy exercise, it is environmentally friendly, it is fast (in congested urban areas) and it is inexpensive.

The major benefits can be divided into the following categories: (i) transport efficiency, (ii) environmental benefits, (iii) health and fitness issues, (iv) economic and social impacts. Despite these positive features, cycling has also negative aspects related to (i) lack of or inadequacy of road and parking infrastructures, (ii) cyclists' safety and security, (iii) weather conditions, (iv) poor intermodality.

Chapter Three analyses the current situation in European countries in terms of national policies and statistics about daily bicycle use. Despite its many advantages, cycling is still underused in many countries. Bicycle modal share is low in many cities. This is partly the result of poor policies to promote urban cycling mobility.

Chapter Four considers the main cycling-related challenges and opportunities and reviews best practice for (i) road infrastructure and parking facilities, (ii) cyclists' safety, (iii) intermodality, (iv) security, (v) soft measures. Spanish, Danish, Dutch, German, Italian, English, Belgian and French experiences have been described in order to disseminate the best policies to promote and increase urban cycling. The experiences have been divided into two types of measure: (i) 'hard measures', which imply heavy investment and require a medium to long period to be implemented, and (ii) 'soft-measures', which may be implemented within a short period and with modest investment.

Finally, Chapter Five summarises the results of the analysis and provides recommendations for the different authorities, including the EU. Indeed, promoting cycling is the responsibility of the national and local authorities, since it is an integral part of urban policy. The EU, as supranational coordinator and facilitator, should continue to fund EU initiatives and projects, in order to:

- give guidelines and measures to promote cycling that could be followed by EU cities in their local policies;
- propose targets for bicycle modal share, especially in congested urban environments;
- maintain efforts to encourage safer cycling by investing in road safety projects. Protection of vulnerable road users is the first step to promotion of cycling;
- facilitate the collection of cycling-related statistical data by financing EU studies and creating a common database in which best practices can be gathered.

In conclusion, the EU should assist national and local governments, as decision-makers, to choose the measures best suited to changing public behaviour, according to the subsidiarity principle. Certainly, cooperative efforts can help by making easier the implementation of these measures. Sustainable Urban Transport Plans (SUTP), which help transport systems meet society's economic, social and environmental needs whilst minimising their undesirable impacts on the economy, society and the environment, are one effective option. Within SUTPs, measures intended to improve cycling may play a relevant role and make a significant contribution to local authority objectives of reducing CO<sub>2</sub> emissions, improving air quality targets, etc.



# 1. INTRODUCTION

## 1.1. Urban mobility

Mobility may be regarded as the ability to travel (Giuliano, Hu, & Lee, 2003), although its meaning may be much broader since it encompasses not only travel activity but also, more importantly, the possibility for the traveller to decide when and where to travel, by being aware and making use of a set of information for optimising the journey.

Since mobility is crucial to quality of life, a significant link with the urban transport system exists. Both directly influence people's daily life and activities, and play a key role in all functions of society. They also influence opportunities to engage in social activities and interact with social communities.

However, though mobility makes a crucial contribution to the socioeconomic growth of urban areas, the positive effects have to be also weighed alongside the negative impacts which the increasing demand for mobility has rapidly generated over the last 20 years. This is particularly important when the demand for mobility is observed at local and city levels.

Cities are a critical part of the transport system, not least because, as pointed out by the recently adopted European Commission (EC) Action Plan on urban mobility, more than 72% (UN, 2007) of Europeans live in an urban area and this percentage is expected to increase.

Cities are the powerhouses of economic growth and development, since around 85% of the EU's GDP is generated in urban areas. At the same time, 40% of total CO<sub>2</sub> emissions and 70% of emissions of other pollutants are caused by urban traffic.

Challenges like road traffic congestion, road safety, environmental impacts (any discussion on the future urban mobility and urban transportation system must take account of policies aimed at reaching the EU's ambitious CO<sub>2</sub> reduction targets of '20-20-20'), urban sprawl, increasing demand for mobility (mainly satisfied by private car ownership) are common to many European cities. The need to solve these problems has become even more crucial to maintaining a high quality of life in a sustainable way, and competitive, smooth mobility of people and goods. Urban mobility is crucially embedded in the daily life of EU citizens and is thus of primary concern for them. This was shown by a survey conducted by Eurobarometer in July 2007, in which 90% of Europeans said that the traffic situation in their area should be improved (Eurobarometer, 2007).

'More sustainable' is thus the main goal that underpins current approaches to and solutions for future mobility. Sustainability should lie at the heart of all policies and strategies for a more sustainable transport system in environmental (CO<sub>2</sub>, air pollution, noise) and competitiveness (congestion) terms, while also addressing social concerns. This is why the concept of sustainability goes far beyond the need to respond by managing road traffic flows and their impacts, because it should also address, for instance, the cost of mobility in relation to social exclusion, economic and social cohesion, and the demographic changes that will shape the structure of European cities in the future.

Making urban mobility more accessible, efficient, environmentally friendly and inclusive is not easy. It has to consider all that factors that depend on how urban transport itself develops in the future, and the directions in which it will move based on technological

progress, demographic changes, socioeconomic and environmental development and the effects they will generate.

## 1.2. EU initiatives

Based on the background outlined in Section 1.1, and even if local authorities are primarily responsible for urban policies according to the principle of subsidiarity, the European Union has taken an active role since the adoption of the White paper on transport policy (EC, 2001). The purpose of EU action is to offer local authorities specific support for promoting a new culture of urban mobility, in which sustainable and affordable urban transportation is the key to making cities dynamic and vibrant. This also explains why EU support has taken several forms, through a combination of policy interventions and guidance support.

At a policy level, the Green paper 'Towards a new culture of urban mobility' (EC, 2007a) and the Action plan on urban mobility (EC, 2009) both represent a cornerstone by putting in place a comprehensive endeavour for addressing the different dimensions of urban mobility. With these two documents, the European Commission acknowledges the differences that exist between European cities – even though they all face common and similar challenges – and stresses the need to implement an approach that should be as integrated as possible and should optimise the use of all modes of transport (concept of co-modality).

The EC has been backed by the other EU institutions. The resolution on the Green paper (EP, 2008a) and the own-initiative report on the Action Plan on urban mobility (EP, 2008b) adopted by the European Parliament (EP), the two opinions adopted by the European Economic and Social Committee (EESC) (EESC, 2008) and the Committee of the Regions (CoR) (CoR, 2008) respectively, and the discussion held by the Council confirm that urban transport and urban mobility should be fully part of the European transport system, and that the EU objectives set in the cohesion, environment, health and economic policies are not achievable if urban mobility is not appropriately taken into account.

Based on existing policy developments, the EC has also undertaken a number of guidance initiatives. Of these, **CIVITAS (City VITALity Sustainability Initiative)** is probably the best-known tool for helping European cities implement better integrated sustainable urban transport strategies. Other initiatives (e.g. **EPOMM**, **ELTIS**) have come in the form of platforms for exchanging best practice, databases and guideline services. The added value of all these tools is that they provide local authorities with an opportunity to be (i) concretely and successfully involved, and (ii) financially supported when they participate in demonstration projects and campaigns.

## 1.3. This briefing note

The Committee on Transport and Tourism of the European Parliament has requested briefing notes on three policy issues that play a key role in the discussion on sustainable mobility at urban level. These three policies (sustainable urban transport plans, mobility management and the promotion of cycling) will be examined in three distinct notes, with a focus on current challenges and future opportunities. The present note covers the promotion of cycling. The analysis will be supported by the presentation and description of selected case studies. Table 1 summarises the main features of each note.



**Table 1: Main features of SUTPs, Mobility Management and Cycling**

Topic	Timing	Approach	Main features	EU role
Sustainable Urban Transport Plans (SUTPs)	- Medium and long term	- <b>Strategic</b> (long-term vision of sustainable mobility)	<ul style="list-style-type: none"> <li>- <b>Consistency</b> between SUTPs' objectives and broader national strategies in the reduction of mobility problems</li> <li>- <b>Monitoring</b> is a crucial step in all plans in order to check the progress status of the targets and the measures implemented</li> <li>- <b>Integration</b>, which is intended both horizontally (between policies) and vertically (between government levels). This is a pre-requisite, from which objectives, targets and measures are later derived</li> <li>- <b>Public involvement and acceptance</b> is the key to success.</li> </ul>	<i>(Common to all topics)</i> <ul style="list-style-type: none"> <li>- Guidance</li> <li>- Policy development</li> <li>- Financial support</li> <li>- Dissemination and exchange of best practice</li> <li>- Policy mainstreaming of sustainable mobility concepts into planning processes</li> <li>- Policy support for developing sustainable mobility targets (e.g. reduction of road accident casualties and injuries including vulnerable road users, reduction of pollutant emissions, reduction of noise levels in urban areas from road traffic)</li> </ul>
Mobility management	- Short to medium term	- <b>Operational</b> (better and more efficient coordination between existing transport modes and services)	<ul style="list-style-type: none"> <li>- Use of mainly 'soft' measures</li> <li>- Integration of 'soft' and 'hard' measures</li> <li>- Technological Innovation</li> </ul>	
Cycling	- <b>Short to medium term</b>	- <b>Operational (integration with sustainable mobility policies and demand Mobility Management)</b>	<ul style="list-style-type: none"> <li>- <b>Implementation of 'hard' measures in the medium term and of the 'soft' measures in the short term</b></li> <li>- <b>Improvement of cyclists' safety</b></li> </ul>	

This briefing note provides an overview of cycling problems and challenges by describing the urban policies that help promote cycling. It analyses the main cycling-related policies, such as:

- the provision of appropriate and safe infrastructures in cities and at neighbourhood level;
- cycling education and the promotion of safety for cyclists;
- the importance of intermodality, to give cyclists the opportunity to make medium to long-distance trips;
- the challenge of improving security, to prevent theft and avoid aggression towards cyclists.

It presents some examples of good practice, with successful and effective outcomes. Some of these practices could be easily transferred in other cities in relatively short periods of time, since they do not cost a lot and do not require the construction of infrastructure or cycling facilities.

The analysis has found that there is not a single policy that can promote cycling, but rather a set of well-integrated and coordinated policies. The latter have the potential to change people's behaviour quite dramatically. The cities which have the greatest number of bicycle trips per day have been making continuing efforts to ensure safer cycling and to provide modern, well-maintained cycling infrastructure and facilities.

#### **1.4. The structure of this note**

The present note is divided into five Chapters. Following this introductory Chapter, Chapter Two illustrates the key concepts of cycling, such as its benefits and major problems.

Chapter Three analyses the current situation in Europe in terms of national policies and statistics about daily bicycle use. Chapter Four points out the main challenges and opportunities related to cycling. It also reviews best practice for (i) road infrastructure and parking facilities, (ii) the safety of cyclists, (iii) intermodality, (iv) security, and (v) soft measures.

Chapter Five summarises the results of the analysis and provides recommendations for local authorities, as well as summarising the key areas for future developments in cycling policy.

## 2. CYCLING: CONCEPTS AND CURRENT PROBLEMS

### KEY FINDINGS

Cycling is fun, healthy, environmentally friendly, fast and inexpensive.

The major cycling-related benefits are classified into the following categories:

- transport efficiency;
- environmental protection;
- cyclists' health and fitness;
- economic and social impact.

Despite these positive features, cycling has also negative aspects related to:

- lack or inadequacy of road and parking infrastructure;
- cyclists' safety and security;
- weather conditions;
- poor intermodality.

### 2.1. Introduction

Cycling is experiencing a noticeable popularity as an everyday means of transport and as a recreational or holiday activity. People mostly choose to use a bicycle for positive reasons: it is **fun**, it is **healthy** exercise, it is **environmentally** friendly, it is **fast** (in congested urban areas) and it is **inexpensive**.

Internationally, cycling has attracted increasing attention as an environmentally sustainable means of transport, since bicycles do not create pollution or noise. More cycling in urban areas in place of cars could reduce congestion and energy consumption from travel activity. Promoting cycling also makes a significant contribution to reducing greenhouse gases and other emissions.

### 2.2. The benefits of cycling

Different European and international studies have classified these benefits in the following groups: (i) transport efficiency, (ii) environmental benefits, (iii) health and fitness issues, and (iv) economic and social impacts.

#### 2.2.1. Transport efficiency

- For short distances and especially in congested cities, cycling is the fastest and most flexible mode for 'door to door' travel.
- Bicycle parking does not use much space: 10 bicycles can be parked in the space

required for a single car. The space consumption of a parked bicycle has been calculated at only 8% of the space consumption of a car (Wittink (ed), 2001; Hérán, 2002).

- It costs more to build a typical car park than to manufacture and install a bicycle stand.

### **2.2.2. Environmental benefits**

- Short-distance trips by motor vehicles are the least fuel-efficient and generate the most pollution per kilometre compared to long-distance trips. These trips could be potentially replaced by cycling.
- Cycling is the most energy efficient means of transport. The bicycle emits nothing into the atmosphere and is virtually silent. Several studies indicate that CO<sub>2</sub> emissions from traffic can be reduced by substituting short car trips with bicycle trips.
- Reducing car trips would alleviate ozone depletion, the greenhouse effect, photochemical smog, acid rain and noise pollution.

### **2.2.3. Health and fitness issues**

Regular cycling has significant social and health benefits and can therefore help reduce health care costs for society as a whole. Cycling has the same effect on health as other types of exercise and motion. Four hours of cycling per week or approximately 10 km of cycling per day, which for many people is the equivalent of a daily cycle trip to and from work, is an adequate level of exercise. Cycling contributes to personal health by enhancing fitness and providing an enjoyable, convenient and affordable means of exercise and recreation. Box 1 shows the benefits of regular physical activity as reported by the Chief Medical Officer of the Department of Health of London.

#### **Box 1: Benefits of regular physical activity**

- Reduces the risk of premature death from heart disease
- Reduces the risk of developing diabetes
- Reduces the risk of developing high blood pressure
- Helps reduce blood pressure in people who already have high blood pressure
- Reduces the risk of developing colon and breast cancer
- Reduces feelings of depression and anxiety
- Helps control weight
- Helps build and maintain healthy bones, muscles and joints
- Helps older adults become stronger and better able to move about without falling
- Promotes psychological well-being

**Source:** Evidence on the impact of the physical activity and its relationship to health. Department of Health, London (2004)

More than a third of Europeans are not sufficiently physically active (WHO, 2002), and the obesity rate is estimated to have increased by 10-40% from the late 1980s to the late 1990s. In industrialised countries, physical inactivity is the second most important risk factor – after tobacco smoking – for poor health.

Nevertheless benefits related to cycling are not only individual; the entire society benefits by having a healthy ,fit population. Cycling saves society a considerable amount of money<sup>3</sup>

#### **2.2.4. Economic and Social impacts**

Cycling provides access and transport to segments of the population who would not otherwise be able to travel independently. These include people who:

- cannot own a motor vehicle;
- do not have access to a motor vehicle for a required period;
- cannot use public transport.

It should be considered that 21% of Europeans are children under the age of 18 who cannot drive a vehicle (because of the minimum driving age). Nevertheless, everybody has a right to mobility and to participate in outdoor activities.

Cycling makes a wider range of destinations possible for more people. As a transport mode it should be able to compete with cars for (relatively) short distances. In combination with public transport, it can even compete with the car over long distances.

Driving is also expensive, whereas cycling is an inexpensive means of transport well within the financial reach of almost everyone. For each kilometre travelled, travel costs for the bicycle are lower than those of any other means of transport, with the exception of walking. Furthermore, there are usually no parking charges levied for bicycles, which makes them even more affordable. Travel budgets can therefore be reduced considerably by cycling. Increasing bicycle use may eliminate the need for a second car, again leading to considerable savings.

A downside of this fact is that a bicycle is regularly seen as something of low status, something cheap and far inferior to cars. In several studies, there is a clear relationship between car possession and household income. However, this is a cultural attitude that would disappear if bicycles were widely used.

Still on the economic side, cyclists are often overlooked when it comes to economic development. Cars are perceived to be the drivers of economic growth. Nevertheless cycling can make city centres much more accessible and save substantial amounts of money, both for individuals and for society.

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<sup>3</sup> In one United States study, it was estimated that costs associated with inactivity are between USD 24.3 and 37.2 billion (2.4-3.7% of total health care costs) (WHO, 2002). A Swiss study estimated that insufficient levels of physical activity impose cost of SFR 1.4 billion a year (WHO, 2002). About two thirds of Canadians are physically inactive, resulting in about CAD 2.1 billion of direct health care costs in Canada (Canadian Medical Association Journal, 28 November 2000).

## **2.3. Current major problems**

Cycling is not always easy or enjoyable. Cyclists face major problems related to the lack or inadequacy of road infrastructure, scarcity of parking facilities, safety and security of cyclists and weather conditions. Finally, intermodality is still poor in many European cities.

### **2.3.1. Cyclists' safety and security**

Except from some bicycle-friendly countries (such as the Netherlands, Denmark, Germany, and Switzerland), European countries do not have a good road infrastructure network for cyclists. Most cycle paths, where they exist, are poorly maintained, dirty and not entirely safe. Cyclists are forced to share road space with other motorised vehicles or with pedestrians. This frequently causes accidents and injuries. The inadequacy of the cycle tracks makes cyclists feel unsafe and dissuades them from increasing their bicycle usage, especially in urban areas. Separate infrastructure for bicycles is essential to avoid conflicts and potentially dangerous situations. It is also important to prevent accidents involving vehicles and cyclists by providing traffic control measures and training children and adults in cycling behaviour.

### **2.3.2. Lack of bicycle parking facilities**

The scarcity of bicycle parking facilities in city centres and main attractions discourages cyclists from using their bicycles for regular trips. The major threat here is that bicycle theft is currently a big problem. Many cities are tackling this relatively successfully by introducing innovative anti-theft devices in new bicycles. Supervised or locked bicycle parking may help to prevent damage to bicycles and vandalism. Parking facilities are also required to allow users to change from bike wear into everyday clothes. Good fully-equipped bicycle parking facilities should offer services for cyclists like bicycle accessory shops, bicycles to rent, and lockers.

### **2.3.3. Weather conditions**

Even if weather conditions may seem to be a secondary issue, this is not in fact the case. It is helpful for cyclists to know the weather forecasts related to their journey. They can wear appropriate clothes and/or choose to travel using a combined means of transport (e.g. train + bicycle, or bus + bicycle). A Dutch software company developed a pilot project called 'Route Rainfall Prediction' within the ROADIDEA project in the 7th Framework Programme of the European Union, under Theme ICT – Information and Communication Technologies. The Route Rainfall Prediction pilot project provides weather forecasts for cyclists in the Netherlands. Using a GIS map that includes the Dutch bicycle network, the software provides weather forecasts up to two hours ahead for a 1km by 1km grid.<sup>4</sup>

### **2.3.4. Poor intermodality**

At present, very few cities have equipped their public transport with bicycle racks, and the carriage of bicycles is allowed only outside rush hours. Some German and Dutch railway companies are changing their rolling stock to provide commuter trains with more bicycle racks. Fortunately, thanks also to EU funded projects, more cities have started to implement bicycle sharing. The idea of offering public bicycles at the main railway or subway stations gives residents a choice of modes of travel.

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<sup>4</sup> More information, including a demonstration website, is available at: <http://rain.roadidea.eu/route>.

### 3. THE CURRENT SITUATION IN EUROPE

#### KEY FINDING

Despite its many advantages, cycling is still underused in many countries.

Bicycle modal share is low in many cities. This is also the result of inadequate policies to promote urban cycling mobility.

Support for national cycling plans and their implementation at local level would be useful.

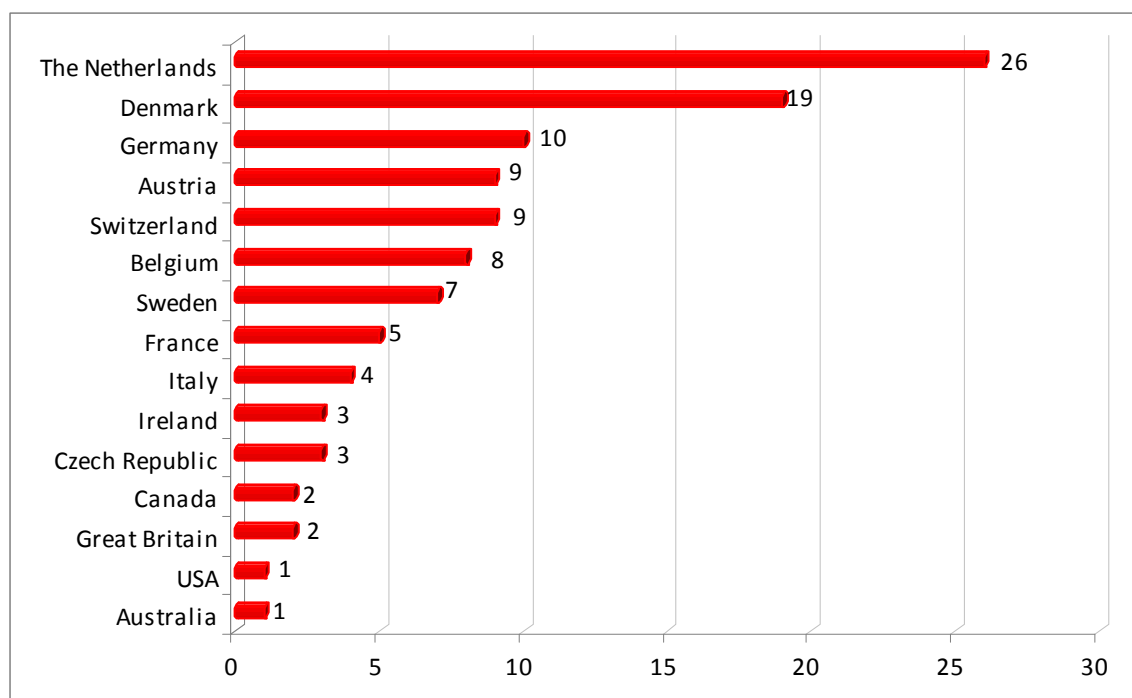
Urban and rural authorities promote cycling because it increases mobility and improves air quality and quality of life in general, as well as making cities more liveable. Organisations and businesses support these activities within the framework of work-based mobility management. Cycling is increasingly recognised as a clean, sustainable mode of transport and an essential part of intermodal plans for sustainable urban travel. More and more countries are developing national cycling plans, strategies and policies.

Despite its many advantages, cycling is still underused in many cities, and its effectiveness is too often undervalued by national and/or local transport policies. The following paragraph compares statistics for bicycle usage in EU countries with the United States, Canada, Australia and Switzerland (all non-EU countries).

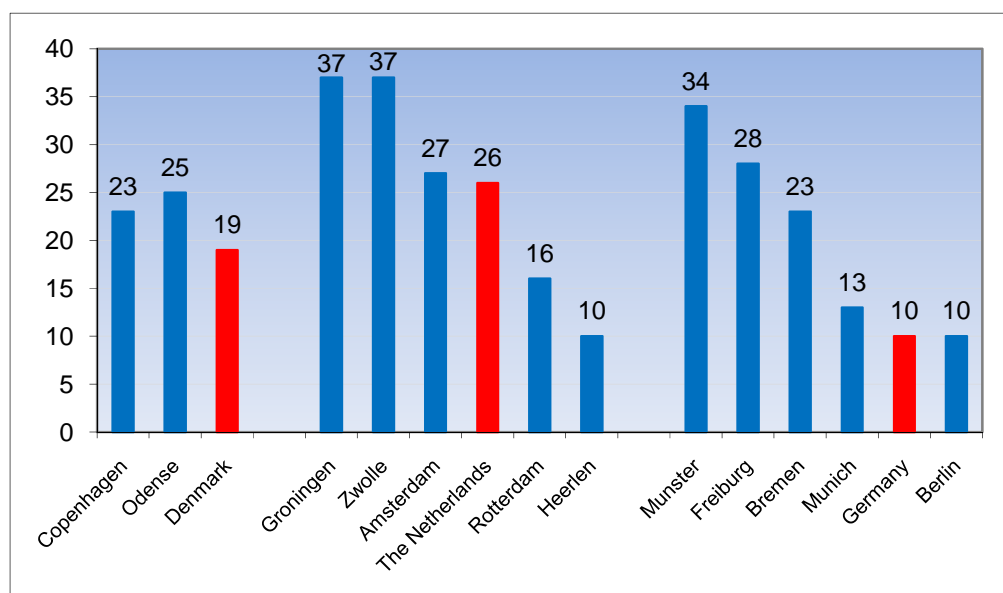
#### 3.1. Statistics on bicycle use

Unfortunately there are no reliable single international or European statistical reports showing modal share of bicycle use per country, related to all journeys. Figure 1 presents data available in each country from different sources (note that they refer to different years): the Netherlands has the highest percentage of bicycle use (26%), followed by Denmark (19%) and Germany (10%). Compared to European countries, the United States, Canada and Australia are bottom of the list. They have a very low bicycle modal share but have recently started to promote cycling mobility, trying to learn from European countries' best practice.

Figure 2, Figure 3 and Figure 4 compare the bicycle modal share in different cities to the national average bicycle modal share. As the figures indicate, cities that have embraced bicycle-friendly policies are able to achieve significant results, even if the national average bicycle use is low. On the other hand, cities that have not adopted policies to promote cycling have a modal share lower than the national one.

**Figure 1: Bicycle modal share for all journeys per country**

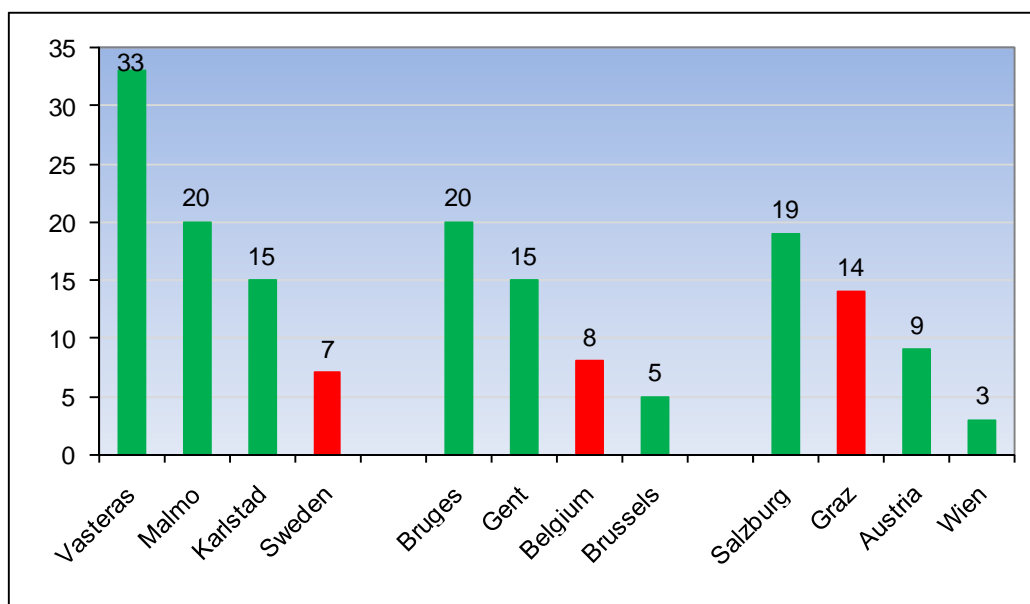
**Sources:** Australian Bureau of Statistics (2007); Netherlands Ministry of Transport (2006); United States Department of Transportation (2003); Isfort Italian survey 'Audimob' (2006); Annex I: Literature search bicycle use and influencing factors in Europe– ByPad Project (2008).

**Figure 2: Bicycle modal share in some cities of Denmark, Netherlands and Germany compared to national average modal share**

**Sources:** Fietsberaad (NL), publ. 7 (2006), Federal Ministry of Transport, Building and Housing (D) (2002)



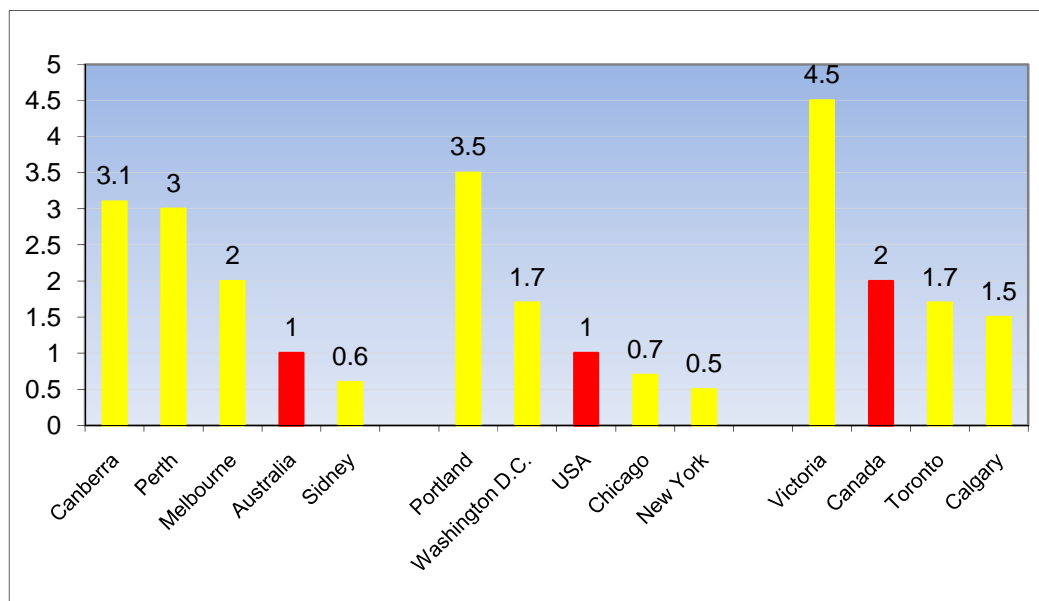
**Figure 3: Bicycle modal share in some cities of Sweden, Belgium and Austria compared to national average modal share**



**Sources:** Fietsberaad (NL), publ. 7 (2006), Bypad project, Annex II –City portraits (2008); Brussels data: Velo-City, 2009.

The percentage of bicycle use in some EU cities is considerably higher than the cycling modal share in the United States, Canada and Australia. Even the most cycling oriented cities in North America (Vancouver, Victoria, Portland and Seattle) have lower bicycle modal shares than the least bicycle oriented cities in the Netherlands, Germany and Denmark (Pucher & Buehler, 2008).

**Figure 4: Bicycle modal share in some cities of the United States, Canada and Australia compared to national average bicycle modal share**



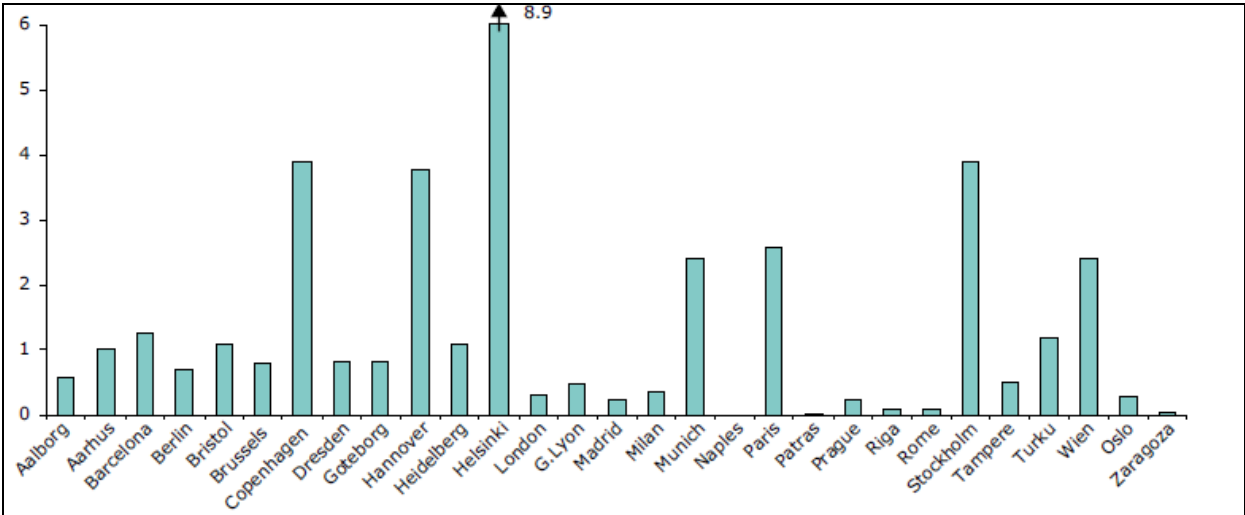
**Sources:** Pucher and Buehler, 2008.

While topography and climate are important, they do not necessarily determine the success of cycling. Government policies – transport policies, land use policies, urban development policies, housing policies, environmental policies, taxation policies and parking policies – are equally important.

In many respects, North America and Australia have endorsed the use of the private car, almost regardless of its economic, social and environmental cost. By contrast, instead of catering for ever-increasing numbers of motor vehicles by expanding roading infrastructure and parking facilities, many Dutch, German and Danish cities have focused on serving people by making their cities bicycle-friendly rather than car-friendly and thus more liveable and more sustainable.

The last report by the European Environment Agency on the quality of life in Europe's towns and cities,<sup>5</sup> published in May 2009, highlighted the importance of sustainable development of urban areas. The provision of cycling and pedestrian spaces and green spaces improves quality of life, which residents appreciate. The report provides statistical data about the cycling paths and lanes in each city area, expressed in km/km<sup>2</sup> and shown in Figure 5.

**Figure 5: Cycle paths and lanes in European cities (km/km<sup>2</sup>)**



Source: Ambiente Italia(2007), quoted in 'Quality of life in Europe's cities and towns', EEA 2009

### 3.2. National cycling policies

Currently it is not compulsory for EU Member States to adopt a national bicycle plan and there are no compulsory legal or financial frameworks. Nevertheless, an increasing number of countries are voluntarily developing national cycling plans and strategic policies. The handbook for urban cycling policies is 'Cycling: the way ahead for towns and cities' published by the European Commission in 1999.<sup>6</sup> This handbook promotes bicycle use in cities to decrease transport-related pollutant emissions.

<sup>5</sup> 'Ensuring quality of life in Europe's cities and towns', EEA report no 5/2009.

<sup>6</sup> 'Cycling: the way ahead for towns and cities', DG XI – Environment, nuclear safety and civil protection, Luxembourg, 1999.

The approach to cycling differs from country to country. In some cases, it is regulated in a specific plan for cycling promotion at national level; in others, cycling policies are included in more general national transport, environmental or health plans. In many other countries, cycling remains the exclusive responsibility of regional and local authorities, with limited commitment at a national level. In the Netherlands and Denmark, cycling is one of the principal means of travel in cities, thanks in part to vigorous long-term support for cycling from their governments.

National governments can help implement cycling policies in local areas in a variety of ways, including the establishment of a national policy framework or strategy that sets out the legal and regulatory instruments for safe and efficient bicycle use and the provision of adequate financial support – especially for cycling infrastructure facilities and development.

Table 2 presents the most important cycling plans and programs in some European countries and summarises their main objectives.

**Table 2: National Bicycle Plans**

Country	National Plan	Description	Objectives
Finland	Yes	<b>Part of 'Transport policy guidelines and transport network investment and financing programme until 2020' (2008)</b>	<ul style="list-style-type: none"> <li>– encourage investment by local government in cycle routes</li> <li>– promote cycling along with public transport</li> <li>– increase quality standards for bicycle routes</li> </ul>
Sweden	Yes	<b>Swedish National Strategy for More and Safer Cycle Traffic (2000)</b>	<ul style="list-style-type: none"> <li>– increase the safety for cyclists</li> <li>– increase the modal share of cycling</li> </ul>
Austria	Yes	<b>Masterplan Radfahren ,Strategie zur Förderung des Radverkehrs in Österreich' (2006)</b>	<ul style="list-style-type: none"> <li>– provide national co-ordination, general traffic management, mobility management</li> <li>– promote public transport + bike and education</li> <li>– provide a legal framework</li> </ul>
Denmark	Yes	<b>'Cycling into the 21st century' 'Promoting safer cycling – a strategy' 'Collection of cycle concepts'</b>	The National Bicycle Action Plan consists of the three documents mentioned in the centre column.
Netherlands	Yes	<b>Dutch Bicycle Master Plan (1990-1997)</b>	
France	Partially	<b>Plan pluriannuel d'actions de l'Etat en faveur du vélo proposé en 2007 par le Coordonnateur Interministériel pour le Développement de l'Usage du Vélo</b>	<ul style="list-style-type: none"> <li>– promote cycling</li> <li>– promote intermodality train+bike</li> <li>– increase cyclists' safety</li> <li>– prevent cycle theft</li> <li>– provide training for school children</li> <li>– promote cycling as a healthy and green means of transport</li> <li>– promote cycling in tourism, leisure and sport issues</li> <li>– support cycling services industries</li> </ul>

**Source:** 'National Policies to Promote Cycling', ECMT (2004)

**Table 2: National Bicycle Plans** *(continued)*

Country	National Plan	Description	Objectives
Germany	yes	<b>National Cycling Plan 'Ride your bike!' 2002-2012</b>	<ul style="list-style-type: none"> <li>– initiate new methods and implementation strategies for the promotion of cycling in Germany</li> <li>– supply recommendations for actions</li> <li>– make a contribution towards creating a bicycle-friendly environment</li> </ul>
United Kingdom	yes	<b>National Cycling Strategy (1996)</b>	<ul style="list-style-type: none"> <li>– increase cycle use</li> <li>– achieve convenient cycle access to key destinations</li> <li>– improve cycle safety</li> <li>– provide traffic management schemes and cycle parking facilities, available at all major destinations (town centre, shopping development, educational establishments, hospital and leisure facilities)</li> <li>– reduce cycle theft</li> </ul>
Switzerland	partially	<b>Part of 'Stratégie pour le développement durable: lignes directrices et plan d'action 2008–2011'</b>	<ul style="list-style-type: none"> <li>– promote sustainable transport</li> <li>– increase bicycle modal share</li> </ul> <p>and to assure urban development balanced with a transport system that guarantees reduction of negative impacts of traffic on the population and on the environment. By the end of 2009 the Swiss Federal Department of Transport will provide an action plan specifically for 'slow traffic'.</p>

**Source:** 'National Policies to Promote Cycling', ECMT (2004)

### 3.3. Promoting cycling as tourism and leisure

Cycling as tourism and leisure is quite common and is gaining in popularity among young people and adults. The northern European countries are building and extending their long-distance network. Denmark, Netherlands, Belgium, Switzerland, United Kingdom and Austria have long-distance cycle routes. Germany has a huge cycle network implemented state by state but well connected between states and to the national network.

#### Box 2: The EuroVelo project

- EuroVelo is a European cycle route network that aims to offer a sustainable trans-European Network. It comprises 12 long-distance cycle routes which cover 66 000 km of which approximately 45 000 km has already been created.
- The network is managed by the European Cyclists' Federation, which is seeking to ensure that all routes offer high standards of design, signage and promotion. This goal is to offer a good opportunity to visit countries by bike. It targets long-distance cycle tourists.



Source: Website of European Cyclists' Federation

France and the Czech Republic have both initiated projects to build national greenways. In Italy, FIAB<sup>7</sup> proposes the Bicalia project to extend the present cycle network (1 800 km) to a total of 16 500 km, and introduce 15 bicycle paths crossing the Italian landscape, from the mountains to the sea, including historical towns.<sup>8</sup>

The European Parliament has recently published a study requested by its Committee on Transport and Tourism,<sup>9</sup> which analyses the challenges and opportunities for developing a

<sup>7</sup> FIAB: Federazione Italiana Amici della Bicicletta, is the Italian association that promotes cycling.

<sup>8</sup> More information can be found on the Bicalia's website ([www.bicalia.org](http://www.bicalia.org)).

<sup>9</sup> 'The European Cycle route Network Eurovelo – Challenges and opportunities for sustainable tourism', Brussels (2009).

European tourist cycling network. Box 2 and Box 3 describe two of the above-mentioned experiences of cycle tourism.

### Box 3: Switzerland Mobility network

- Switzerland Mobility is the Swiss national network for non-motorised traffic that integrates non-motorised traffic (e.g. hiking, skating, biking and canoeing) with public transport (train and bus), providing the best opportunities to combine leisure and tourism.
- The routes throughout Switzerland are linked to a wide range of services including reservations for overnight accommodation, rental of bicycles, etc. and bookable offers with transport of luggage on national and several regional routes. It is a good opportunity to plan a cycle holiday throughout Switzerland, choosing between several routes at different difficulty levels or different kinds of accommodation.
- Every route is well signposted and there are maps along the way, as the photo below shows.
- Switzerland Mobility is an excellent example of public-private partnership because it integrates public infrastructures with transport which is offered with private accommodation and delivery of luggage.



Source: website Switzerland Mobility, photo: Paola Raganato





## 4. MAIN CHALLENGES AND OPPORTUNITIES

### KEY FINDINGS

The key levers to promote cycling are:

- **road infrastructure** and facilities and services for cyclists;
- **intermodality** for medium range trips that combine cycling with public transport;
- cyclists' **safety**;
- **security** and theft prevention.

As well as reviewing the main challenges for the further development of cycling, this chapter illustrates best practice examples implemented in 'cycle-friendly' cities. As explained above, local administrations can operate in two ways to promote cycling in urban areas. The first consists of implementing 'hard measures' as described in paragraphs 4.1 to 4.4. It should be noted that this kind of measure implies the allocation of expensive budgets by public administrations and requires a medium to long implementation period. The second consists of applying the 'soft measures' described in paragraph 4.5. These can be started much more quickly and easily.

### 4.1. Road infrastructure and parking facilities

Creating well-designed cycle path infrastructure supports the potential development of urban cycling. Many factors are important in a bicycle-friendly infrastructure, including: the development of junctions, roundabouts and traffic lights and the safety of bicycle lanes, including good signage.

In 1993, the Dutch National Information and Technology Platform for Transport, Infrastructure and Public space (CROW) produced the first version of a Design Manual for bicycle facilities, which described all the steps, from the decision to promote cycling through to the actual physical implementation. It introduced the five main requirements for bicycle-friendly infrastructures:

- **improved traffic safety**;
- **directness**: short, fast routes from origin to destination;
- **comfort**: good surfaces, generous space and little hindrance from other road users;
- **attractiveness**: a pleasant, socially safe environment, without smell or noise nuisance;
- **cohesion**: logical, cohesive routes.

The cycling network cannot be considered independently of other facilities for cyclists, such as parking areas:

- linked with public transport;
- at home and at workplaces;

- at shops and shopping centres;
- at public offices and on streets.

The availability of safe and convenient parking is as critical for cyclists as it is for motorists and yet it is frequently overlooked in the design and operation of shops, offices, schools, and other buildings. Bicycle parking needs to be **visible**, **accessible**, **easy to use**, **convenient**, and **spacious**. Racks need to support the whole bike (not just one wheel) and enable the user to lock the frame and wheels of the bike with a cable or U-shaped lock. Parking should preferably be covered, well lit, and in open view without obstructing pedestrians or motor vehicles. Finally, parking should also provide cycle services, especially for long-term parking, where greater security and protection are needed than for short-term parking. Long-term parking facilities are usually monitored by security cameras.

Good road infrastructure for cyclists goes hand in hand with car traffic restrictions in city centres and residential areas. When main cycling routes coincide with traffic arteries for vehicular traffic, there are often negative effects for cyclists. The cities of Seville and Copenhagen provide good examples of how the combined implementation of different measures, urban planning and vehicular traffic-related, as well as improved road infrastructure, might bring about an excellent bicycle modal share. Some Dutch examples of infrastructure are also provided in the annex.

#### **4.1.1. Positive trends in cycling in Seville**

The city of Seville in southern Spain, with a population of around 700 000, is a good example of a sudden change in modal share urban trips. In three years, from 2006 to 2009, the percentage of cyclists in the city more than tripled. According to the last data published by the bicycle association 'A Contramano', there were 6 000 cyclists in 2006. This number grew to 13 800 in 2007 and reached 50 000 in 2009. The municipality achieved this exceptional result by implementing a strong bicycle policy. In March 2007, the city published the 'Plan de la bicicleta de Sevilla', with the aim of building eight urban cycle paths, a total length of 77 km, to cover the entire city centre and link it with the peripheral areas. By September 2009, 70 km had been built and the rest was due for completion by the end of the year. The administration's current goal is to provide 114 km of cycle lanes by 2010, thus surpassing Barcelona in terms of bicycle trips per day (more than 80 000 daily). The provision of bicycle infrastructure has been supported by other policies such as closure of the city centre to motorised traffic and funding school projects to create safe school paths and provide traffic calming measures in school districts.

The city of Seville also offers the bike sharing system 'Sevici', as other major European cities have done in recent years. 'Consorcio de Transporte Metropolitano' also offers the 'Bus+Bici' service to its own public transport ticket holders. Ticket holders can rent a bicycle for free for a whole day (7.30-20.30) and return it by midnight. The bicycle can be rented at the bus terminal in the city, which is a good incentive to promote intermodality.

These are positive results, but the challenge for the future is to tackle bicycle theft and, above all, vandalism. For instance, many public bicycles of the bicycle sharing service are damaged at the pick-up stations. A public register of bicycles has been activated to reduce bicycles theft, but the registration costs EUR 20 and the service has been underused: only 1 270 bicycles have been registered since October 2007.

#### 4.1.2. Cycle infrastructure in Copenhagen

The Copenhagen cycle track network consists of cycle tracks on both sides of the major roads with a total network cycle length of more than 300 km. Normally cycle tracks are at least two metres across. In Copenhagen, bicycle traffic is considered a distinct traffic category with its own separate road area. In 2002, for the first time, the city published 'The cycle Plan 2002-2012' whose goals were to:

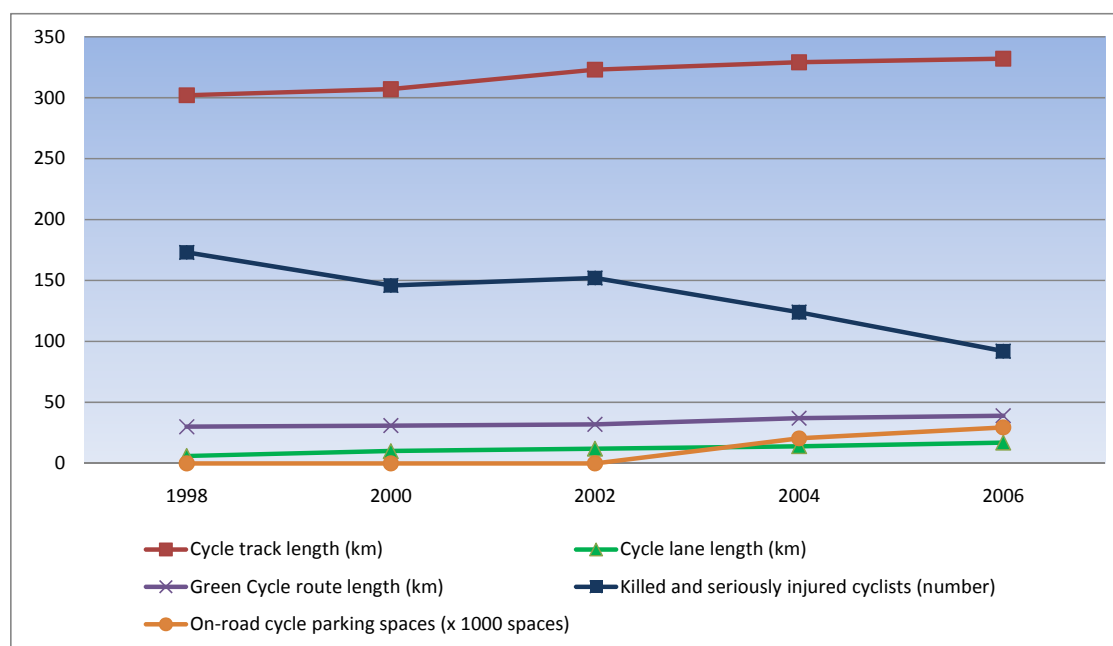
- increase the proportion of people cycling to workplaces to 40%,
- decrease by 50% the risk to cyclists of serious injury or death,
- increase the share of cyclists who feel safe cycling in town from 57% to 80%,
- increase travel speed on cycling trips by 10%,
- make cycling more comfortable by enhancing cycle tracks maintenance.

In order to achieve the established objectives, Danish planners have worked continuously on perfecting the designs of cycle paths and parking facilities. Their innovative measures are reported in Table 3. Figure 6 shows the impact of the bicycle policies implemented so far on infrastructures and cyclists' safety from 1998 to 2006.

**Table 3: Measures for cycling safety infrastructures in Copenhagen**

Measure	Actions implemented
Creation of an extensive system of separate cycling facilities	<ul style="list-style-type: none"> <li>• Well maintained, fully integrated paths, lanes and bicycle streets in the city and surrounding regions</li> <li>• Fully coordinated system of colour-coded signs for bicyclists</li> </ul>
Intersection modifications and priority traffic signals	<ul style="list-style-type: none"> <li>• Advanced green lights for cyclists at most intersections</li> <li>• Advanced cyclist waiting positions (ahead of cars) fed by special bicycle lanes make crossing and turning safer and quicker</li> <li>• Cyclist short cuts to make right-hand turns before intersections and exemption from red traffic signals at T-intersections</li> <li>• Bicycle paths become brightly-coloured bicycle lanes when crossing intersections</li> </ul>
Bike parking enhancement	<ul style="list-style-type: none"> <li>• Plenty of good bicycle parking throughout the city</li> <li>• Improved lighting and security of bike parking facilities often featuring guards, video surveillance and priority parking for women</li> </ul>

**Source:** 'Collection of cycle concepts', Danish Road Directorate (2000)

**Figure 6: The positive results of the Copenhagen bicycle policy (1998-2006)**

Source: Technical and Environmental Administration,  
City of Copenhagen Bicycle Account 2006

As the graph shows, cycle tracks and cycle lanes and the total kilometres of green cycle routes and parking facilities have increased since 1998. Another good result was the reduction in the number of cyclists killed or seriously injured in road accidents. The Danish bicycle policy has also increased bicycle modal share, cyclists' comfort and travelling speed, as highlighted in Table 4.

**Table 4: Cycle policy targets achieved in Copenhagen (1998-2006)**

Cycle Policy target figures	1998	2000	2002	2004	2006
People who cycle to work (%)	30	34	32	36	36
Cycling risk (serious casualties per million km cycled)	0.52	0.38	0.38	0.3	0.22
Cyclists' travel speed (km/h)	-	-	-	15.3	16


Source: The Technical and Environmental Administration,  
City of Copenhagen Bicycle Account 2006

#### 4.1.3. Bicycle parking facilities in Münster

Since 1999 the city of Münster has provided cyclists with a huge bicycle parking facility very close to the main railway station. Cyclists can park their bicycles in a roofed, dry area and reach the platforms in less than five minutes. The facility is fully equipped with cyclists' facilities and trip-end services.

It provides 3 300 bicycle parking spaces and provides private parking for annual and monthly ticket holders, for a small surcharge. Table 5 summarises the main information for bicycle parking in Münster.

**Table 5: Bicycle parking in Münster**

Opening hours	Mon-Fri 5.30-23.00 Sat-Sun 7.00-23.00	
Bicycle hire	Available for different prices and times	
Cycle service	Garage available for cycle repair and maintenance, bicycle cleaning service, second-hand bicycle shop	

Source: [www.radstation-ms.de](http://www.radstation-ms.de)

#### 4.1.4. Suggested measures

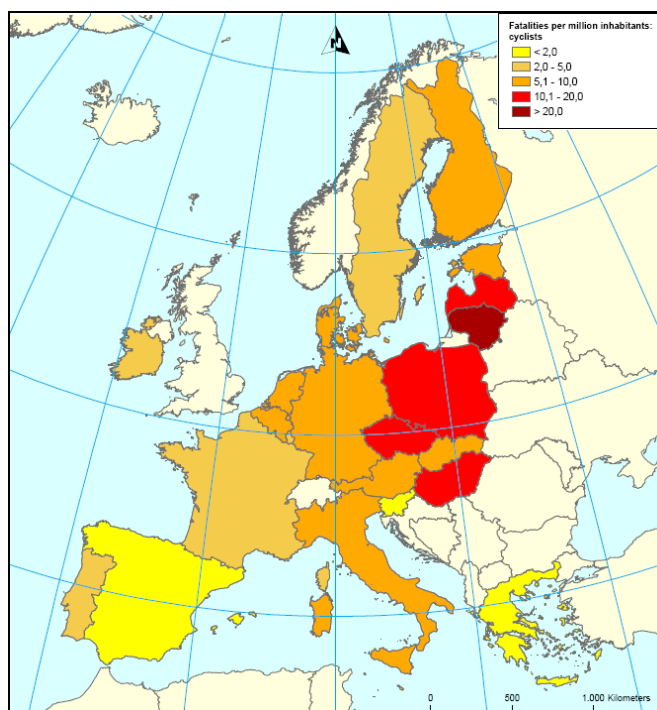
Following good practice in the Netherlands and Denmark, future policies will need to focus on the following measures to increase the cycling share, especially in urban areas:

- Implementing an urban spatial policy that considers cycling as a means of alternative transport which therefore requires structured planning. It is important to link bicycle traffic in the city with suburbs and towns.
- Improving safe parking facilities in city centres and providing end-of-trip facilities and services at the main urban locations (e.g. train stations, bus terminals, exchange car parking).
- Trying to make cyclists feel safer by maintaining cycle track surfaces properly and providing good signage.
- Providing a link between the existing bicycle network and recreational bicycle lanes, including long-distance bicycle routes and cycle paths alongside the main arterial roads.

#### 4.2. Safety

Cyclists are vulnerable to motorised vehicles and they may feel more at risk under poor cycling conditions due to insufficient cycle path infrastructure. Safety and a sense of security are significant factors in making cycling a better option. A sense of security is the cyclists' subjective perception of the risk of being run over. This perception may be based on direct experience of dangerous situations in traffic or merely a purely subjective emotion.

It is vital that cyclists are visible to motorists at junctions and also that cyclists are aware of cars. One means of increasing road users' awareness of each other is to bring them physically closer together. Figure 7 reports the number of cyclists fatalities per million citizens from an EU 25 survey in 2005.

**Figure 7: Number of cyclists' fatalities in EU 25 (2005)**

Source: CARE database, EU DG-TREN

Latvia is the country with the highest number of cyclists' fatalities, followed by other eastern EU countries. It should be noted that Germany, the Netherlands, Denmark and Finland have a higher number of cyclists than Spain and Greece, for example, but have the fewest reported fatalities. The following paragraphs report some examples of policies which could promote cycling safety. The possible measures are related both to infrastructure design and traffic calming and to cyclists' training and behaviour.

The Danish Ministry of Transport published the strategic document '*Promotion of safe cycling*', to provide local bodies with guidelines and a list of possible measures to improve road safety (see Table 6).

#### **4.2.1. Training and education at schools in Germany and England**

The current trend to improve cycling safety is to teach cycling techniques as a part of the school curriculum. Both in Germany and England there are organisations which are giving children instruction in the classroom and 'on the road' lessons (see Box 4 and Box 5).

Table 7 gives sample of precautions and suggestions that a cyclist can adopt to reduce the risk of accident or injury, related to bicycle maintenance and personal behaviour.

**Table 6: Possible measures for cyclists' safety – Danish Ministry of Transport**

Topic	Example of measure
Restrictions on car use	Removal of car parking spaces Road closures Stopping and parking prohibitions for cars Reduction of car speed limits One-way streets
Road safety	Black spot treatments Road safety audits Integrated safety management
Safer road layout	Traffic calming of major roads Fewer fixed roadside objects Bridges and tunnels at major barriers Cycle crossings Staggered stop lines Advanced stop lines Pre-green lights for cyclists Speed reducing junction treatments Humps Mini roundabouts Cycle tracks on rural roads

**Source:** 'Collection of cycle concepts', Danish Ministry of Transport (2000)



#### Box 4: The 'Bicyclepooling' project

In the Cologne region, the Rhein-Sieg Transport Association runs an education campaign about cycling for school children. The '**Bicyclepooling**' project is funded by the Ministry of Transport of North Rhine-Westphalia and an insurance company (RGUVV), and involves local administrations, police departments, schools, non-profit organisations (where they exist) and bicycle dealers. It introduces the innovative concept of '**Bicyclepooling**', which is similar to car pooling but involves students with bicycles. Students of a district get together in groups of four to six at a meeting point and cycle to school in the morning and to home in the afternoon. The project runs for the first two weeks of the school year and the target group is first-year secondary school students. Cycling in a group accompanied by an adult is an excellent way to familiarise students with the most suitable bike routes and the risks involved. At the end of the training, a police officer tests the children, who receive official certificates, pennants and stickers for their bikes.



Source: Verkehrsverbund Rhein-Sieg GmbH (Rhein-Sieg Transport Association), Köln

#### Box 5: The 'Bikeability' project

Established in 2005 by the Department for Transport, Cycling England is an independent expert body, working to promote the growth of cycling. **Bikeability**, an accredited on-road cycle training scheme, gives children the opportunity to learn to cycle safely and responsibly. Launched in March 2007, the programme was created in consultation with leading road safety campaigners and cycling experts. It takes learners through three different levels:

- Level One – basic skills and bicycle handling
- Level Two – skills needed to cycle safely to school on quiet roads
- Level Three – covers more complex traffic environments

Children typically start **Bikeability** lessons once they have learnt to ride a bike, with years 5 and 6 progressing to Level Two at 10-11 years old. Level Three follows at secondary school. However, many adults are also keen to prove their **Bikeability** – either to learn the basics or refresh their skills.

From its early days in 2006, **Bikeability** has now been adopted by half the local authorities in England, with 40 000 badges awarded in its first year. 500 000 children are expected to have taken part in Bikeability training by 2012. Regular media campaigns like Bike to School Week have maintained the high public profile created by the national and regional launches in 2007, creating powerful marketing opportunities at the grassroots level.



**Table 7: Precautions and suggestions for cyclists' safety**

	Suggestions and advice
<b>Bike-related</b>	<ul style="list-style-type: none"> <li>• Have the bicycle serviced regularly</li> <li>• Look after the bicycle; check moving parts regularly and give special attention to tyres, brakes and lights</li> <li>• Put on the bicycle front and rear lights and red reflector to travel at night. Keep them clean and if they are battery-operated, check the batteries before each journey</li> </ul>
<b>Cyclist-related</b>	<ul style="list-style-type: none"> <li>• Wear a helmet, even on short journeys.</li> <li>• Buy a CE marked helmet that meets normal safety standards</li> <li>• Always wear reflective bands, day and night, to increase visibility</li> <li>• To improve cycling skills, take part in one of the courses available to young people and adults</li> </ul>

Source: TRT elaboration

#### 4.2.2. Suggested measures

Apart from England and Germany, other countries (like Belgium and Italy) have launched projects to promote safe cycling to school in recent years. Experience in these countries has shown that the most relevant measures are:

- information and education campaigns about safe cycling;
- training children in cycling rules and appropriate cycling behaviour;
- promoting stronger enforcement of traffic rules and laws by cyclists,
- training motorists and pedestrians to use spaces shared with cyclists responsibly.

#### 4.3. Increasing intermodality

Many journeys cannot be undertaken by cycling or by public transport alone, since neither offers sufficient flexibility. Public transport systems and city planners in northern Europe are increasingly recognising the key role that cycling plays as a feeder and distributor service for public transport. There are some important measures that could be adopted to improve intermodality:

- implementing bicycle sharing schemes;
- providing parking and service facilities at main transport terminals in the city centre (train stations, bus terminals, car parking areas, subway stations, etc.);
- allowing the carriage of bicycles on commuter trains and providing bicycle racks on buses.

Bicycle sharing is a popular measure to promote cycling in urban areas. More and more cities, including some where attitudes to cycling are unfavourable, are implementing bicycle

sharing in different ways and via different schemes. Among the main European cities, apart from Dutch and Danish cities, are Paris, Milan, Munich, Berlin, Seville, Lyon, Strasbourg, Brussels and Barcelona. The idea is simple: identify enough pick-up stations near the most attractive points in the city (including subway stations, railway stations, public offices and commercial districts) to give commuters different options to travel to and from work.

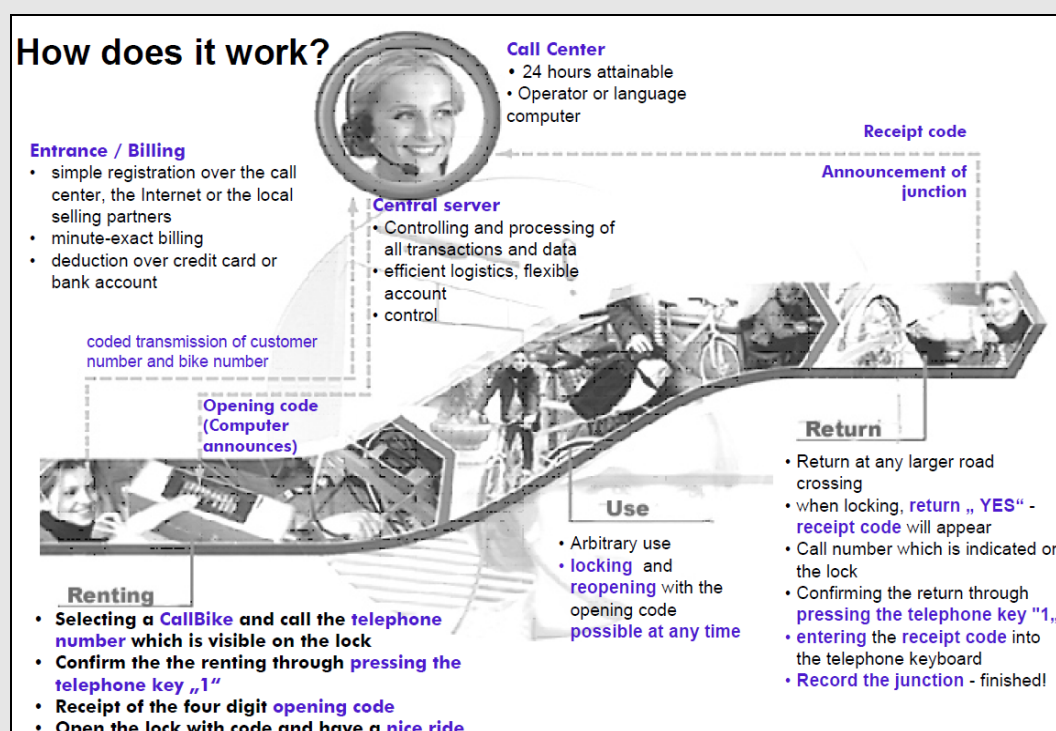
Box 6 describes Deutsche Bahn bicycle sharing, which is completely flexible, without a fixed return point in the city and it is currently offered in many German cities including Berlin, Frankfurt am Main, Stuttgart, Cologne, Karlsruhe and Munich. The Call a Bike scheme allows the user to take a break within the rental period, during which no cost will be charged. This means that customers pay for the cycling time only.

### Box 6: *Call a Bike*, the flexible German bicycle sharing scheme

*Call a Bike* is based on a system to control the renting and return of spatially distributed rented units. The system is protected worldwide by patent and its main features are:

- Availability: bicycles can be found at all major intersections;
- Flexibility: borrowing 24/7, no waiting time, no schedules;
- No installation of bicycle stations in public spaces required;
- Automated process for borrowing and returning bicycles.

The *Call a Bike* flat rate consists of an annual subscription of EUR 99 and includes the first 30 minutes per day for free. For the subsequent time, a fare of 8 cents per minute is charged. Daily hire is allowed at a cost of EUR 9. Special discounts are available to DB's season ticket holders.



Source: DB Rent GmbH, 'Call a Bike' – intermodal mobility service of DB AG

### 4.3.1. The Italian experience of Ferrara, the “City for Cyclists”

Despite the low national bicycle modal share (only 4%) in Italy, the city of Ferrara in Northern Italy boasts a 30% bicycle use for all daily trips, comparable with a Dutch city. Since 1995, the Municipality of Ferrara has been voluntarily implementing measures and policies to promote cycling (see Table 8); as an example the city instituted the first “Bike Office”, which now coordinates a network of 25 Bike Offices in different Italian cities.

**Table 8: Ferrara’s policies to promote cycling**

Year	Description of the measures	Target
1995	<ul style="list-style-type: none"> <li>BICICARD</li> </ul>	<ul style="list-style-type: none"> <li>Allows tourists and visitors to park the car outside the inner centre and rent a bike. The card also provides discounts in shops, restaurants, museum and hotels</li> </ul>
1996	<ul style="list-style-type: none"> <li>BIKE OFFICE</li> </ul>	<ul style="list-style-type: none"> <li>Establishment of the public bicycle office to promote cycling in the city</li> </ul>
1997-2002	<ul style="list-style-type: none"> <li>INCENTIVES FOR BICYCLE USE</li> </ul>	<ul style="list-style-type: none"> <li>Measures and action to facilitate cycling: cycle parking facilities, theft prevention, Bicitaxi, BiciBus, bicycles for the use of employees of public authorities</li> </ul>
1998	<ul style="list-style-type: none"> <li>BICIPLAN</li> <li>BICIBLU</li> </ul>	<ul style="list-style-type: none"> <li>Innovative Bicycle Plan included in the Urban Traffic Plan that describes the future actions to plan cycling mobility in the city</li> <li>The mayor and councillors are provided with bicycles so that they can set a good example</li> </ul>
2004	<ul style="list-style-type: none"> <li>PUBLIC BICYCLE</li> </ul>	<ul style="list-style-type: none"> <li>Start of the ‘C’entro in bici’ project that provides commuters with free bicycles. This project covers 37 Italian cities where it is possible to use the same key card to pick up a bicycle</li> </ul>
2005	<ul style="list-style-type: none"> <li>THE RICICLETTA</li> </ul>	<ul style="list-style-type: none"> <li>Start the project whose aim is to recycle the abandoned bicycles in the city by renovating them and putting them in circulation again</li> </ul>

**Source:** Municipality of Ferrara website

### 4.3.2. Suggested measures

There some areas where measures to improve intermodality for cyclists can be particularly effective:

- Public transport stops: increase accessibility for cyclists creating suitable, secure and sheltered bicycle parking facilities near to public transport stops;
- Cycle carriage/cycle despatch: local and regional passenger transport by rail usually imposes time-related restrictions on the carriage of bicycles. Except for some European cities where public transport (trains subway and buses) are equipped with bicycle racks, it is difficult to transport a bicycle on board the vehicle. Allowing the carriage of bicycles would go a long way towards facilitating medium and longer journeys in the cities and suburban areas.

- Bicycle sharing: every year more and more cities are implementing bicycle sharing schemes, with increasing success, especially amongst commuters.

#### **4.4. Security**

The main security related problems for cyclists are fear of theft or damage when bicycle parking facilities are inadequate and fear of personal aggression when travelling at night. Local governments and police departments have adopted a range of measures; again, the most relevant examples are from Dutch and Danish cities.

##### **4.4.1. Supervised parking in the Netherlands**

In 1997 Utrecht, population 270 000, established a funding system in which bicycle parking facilities are partly financed by car parking fees, to an annual total of EUR 750 000. This fund, supplemented by other municipal budgets, covers the costs of administration and security of bicycle parking facilities. The city of Apeldoorn (population: 155 000) funds the 2 800 free supervised bicycle parking spaces from its car parking revenues.<sup>10</sup> Eighteen per cent of supervised storage users said they had travelled to the centre by car or bus before free supervised bicycle parking was introduced.

##### **4.4.2. Registered bicycles in Amsterdam**

In Amsterdam, bicycle theft has been tackled structurally through the successful 'Integrated bicycle theft prevention programme' (2002-2006). This programme focused on (i) monitoring sites with the highest incidence of bicycle theft and (ii) breaking the chains of unregistered bicycles. Within five years the risk of bicycle theft in the Amsterdam-Amstelland fell from 16% to 10%.

In 2007, the approach was extended nationwide by introducing the National Bicycle Register at the Government Road Transport Agency, in which all bicycle thefts are recorded. Since January 2008, this register has been accessible to the public: by entering a frame or chip number, users can see whether a bicycle is registered as stolen.

##### **4.4.3. Radio Frequency Identification Scheme in Copenhagen**

The city of Copenhagen (where 20 000 bikes were stolen in 2008), in collaboration with the Danish Technical Institute, is to implant Radio Frequency Identification (RFID) chips in bicycles and track their whereabouts when stolen. The campaign called 'Kun en hykler stjæler cykler' ('Only a hypocrite steals bikes') is a pilot project that started in May 2009; by the end of September 2009, 5 000 chips were to be distributed to volunteer cyclists willing to participate to the project. The aim is to monitor the bikes and if they are stolen, to know their exact location.

##### **4.4.4. Suggested measures**

The following measures will increase security in the future:

- buildings supervised and possibly covered parking;
- promoting anti-theft devices and information campaigns about avoiding theft and vandalism (in the United Kingdom there are some effective campaigns about how to

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<sup>10</sup> The city of Apeldoorn car parking revenues yield approximately EUR 2 to 2.5 million annually, a quarter of which is earmarked for public transport and free bicycle storage.

lock bicycles safely and which are the hazardous parking places to avoid (see [www.designagainstcrime.com](http://www.designagainstcrime.com));

- coordination between police departments, citizens and governmental policies;
- promoting new technologies such as RFID to counter bicycle theft, as in many United States cities for several years;
- promoting a public register of stolen bicycles in which all thefts or acts of vandalism are recorded so as to identify and then monitor the most dangerous sites.

**Figure 8: 'Fly parking' in Dublin and Amsterdam**



Photo: Paola Raganato

## 4.5. Soft measures

The main aim of 'soft-measures' is to moderate the impact of motorised traffic in the inner city and residential or school districts. This kind of measure gives priority to cyclists in urban traffic by reducing travel time and distance. This is a good way to make cycling more attractive and competitive.

### 4.5.1. Opening one way streets for car traffic to bicycle transit

Opening one way streets to bicycle transit is a way of promoting urban cycling that many European cities have already adopted. In Strasbourg, more than 358 one-way streets (64 km of cycle paths) are currently equipped with two-way cycle lanes. Similar measures have been implemented in Belgium (in Brussels since 2005). Experience demonstrates that in this mixed traffic circulation, accidents are decreasing year by year. The 'limited one-way streets' allow cyclists to avoid longer detours or dangerous roads with heavy vehicular traffic and high car speeds. In a limited one-way street cyclists and motorists can see each other, so visibility is better. This means that cyclists can avoid unexpected manoeuvres by motorists.

On the other hand, this measure is frequently criticised in terms of cyclists' safety. 'Cycle contraflows', as they are called in the UK, where they are also implemented, require extensive changes to the road markings. Car speeds must be limited to a maximum of 50 km/h, but more often as low as 30 km/h. Furthermore the road must be more than 3 m wide to allow a safe passage for both cyclists and motorists. Finally, vigorous information



campaigns must be launched by local bodies to minimise the impact of changing the road rules.

**Figure 9: 'Cycle contraflow' in a Swiss city and in the UK**

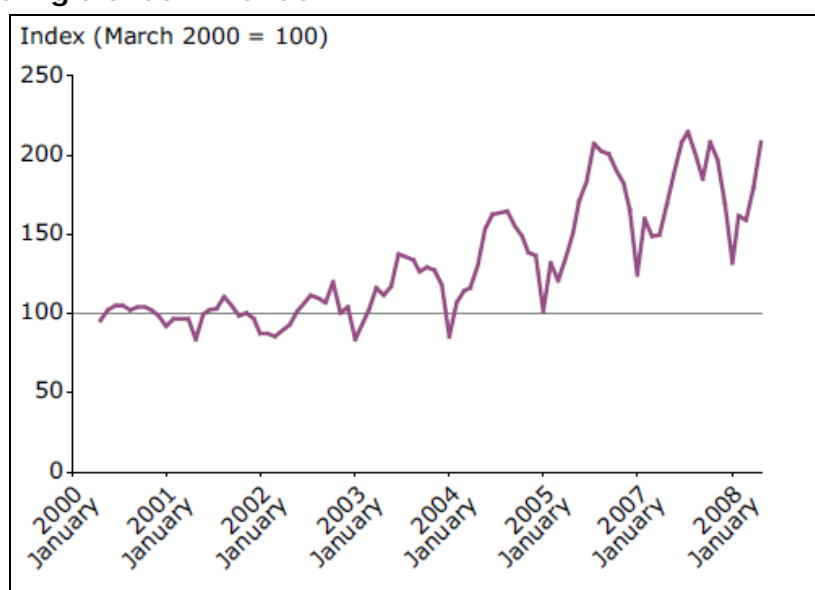


**Photo:** Paola Raganato

#### **4.5.2. Allowing bicycle transit in bus lanes**

In London, from 5 January 2009, an 18-month trial allowed motorcycles, mopeds, scooters and tricycles – but not those with sidecars – to travel in most red route bus lanes, currently also used by cyclists and taxis. This trial measure has been contested as dangerous by cyclists' and pedestrians' associations. The Cycling London Campaign, a volunteer association, has mounted a monitoring campaign whose aim is to denounce dangerous behaviour by the motorists and register any accidents which have occurred. This will help local administrations to analyse the most critical locations and to determine whether this rule will be permanent or not.

However the City of London increased the use of bicycles since the introduction of the congestion charge measure in 2003. Figure 10 shows London cycling trends, starting from January 2000. The reference point of March 2000 is allocated an index value of 100. Obviously during the winter, cycling is not the favourite means of transport, but the results achieved in 2008 demonstrate that more Londoners are now travelling by bicycle.

**Figure 10: Cycling trends in London**

Source: TfL, 2008, quoted in 'Transport at a crossroads', EEA (2009)

#### 4.5.3. Reducing speed limit of cars to 30 km/h

The current trend in many European cities is to reduce maximum car speeds to 30km/h, since the traffic flow almost never exceeds this figure in congested urban areas anyway. This measure helps to control vehicular traffic in residential and school districts and places without a bicycle track. Reducing car speeds makes road humps or other kinds of barriers between cyclists and motorists, which require significant investment, unnecessary. In Freiburg, cyclists and pedestrians benefit from these traffic calming measures and 90% of residents live within a 30km/h area.

#### 4.5.4. Allowing right-hand turns at red traffic lights for cyclists

The city of Strasbourg has started a pilot scheme concerning right-hand turns only for cyclists who have dedicated traffic lights and who are allowed to turn right at red traffic lights (without committing an offence), taking account of other road users (vehicles and pedestrians) that have priority anyway. This measure allows cyclists to reduce their travel times, avoiding the need for them to stop at red traffic lights when it is not necessary. Especially in the cold North European countries, it is important to reduce the time spent waiting for green traffic lights. An interesting experiment was conducted in 2007 in the province of Brabant, in the south of the Netherlands. The idea of this green light scheme was that, in rain, temperatures below 10 degrees Celsius or with minimal car traffic, cyclists would receive a green light two or three times per cycle, instead of once only. In order to ascertain weather conditions, a rain sensor and a thermometer were linked to the traffic light system. Provincial authorities decided to implement the positive results of the experiment in Grave and in the future years many traffic lights will be modified.

#### 4.5.5. Cycle Streets in Kiel

The city of Kiel, in northern Germany, started to promote a bicycle policy in 1987. Soft urban measures have been progressively introduced, such as (i) the 30 zones (districts where car speeds are limited to 30 km/h); (ii) the opening of one-way streets to cyclists; (iii) the construction of *Velorouten* (cycle routes), and (iv) the institution of *Fahrradstraßen*

(cycle streets). The cycle streets represent an innovative way to promote cycling: in these streets, bicycles have priority. Bicycles are allowed to travel on the whole width of the roadway and cars are not allowed to overtake them. Furthermore, cars must reduce their speeds to 30 km/h or less to adequately adjust themselves to the speed of bicycles. Kiel now has 7.8 km of cycle streets on which cars are allowed as an exception (e.g. residents or deliveries).

From 1988 to 2003 the bicycle modal share in Kiel doubled to 17%. This important result is due to the extensive urban cycle network, which allows cyclists to reach the main destinations easily. The network of cycle routes comprises 11 routes which together make a total of 25 km, including cycle streets, cycle lanes, cycle tracks and one-way streets. However, the *Velorouten* are part of a greater urban cycle network that extends over 190 km. Clear signage at major intersections gives cyclists directions to the most important destinations and their respective distances.

**Figure 11: Velorouten and Cycle Streets in the city of Kiel**



Source: City of Kiel website



## **5. CONCLUSIONS AND RECOMMENDATIONS**

### **5.1. Foreword**

As pointed out in the previous chapter, there are many ways to increase the number of cyclists. Nevertheless, some of these measures need medium to long time frames to be implemented. Obviously, building up a separate infrastructure for cyclists in a city can be a good policy to assure safer cycling and encourage urban cycling, but it is not feasible in the short term. Some European cities, especially those where there was no tradition of or interest in cycling, implemented types of 'soft-measures' aiming to change people's behaviour in relation to cycling. The following paragraphs report what has already been done by local administrations.

### **5.2. The importance of policy integration**

The most important results have been achieved in those cities where infrastructure planning has been followed by (i) training and education for both motorists and non-motorist road users, (ii) information and promotion campaigns, and (iii) careful spatial policies.

To reduce cycling injuries and accidents, it is very important to enforce safety oriented behaviour (e.g. wearing of helmets and reflector clothes compulsory) and provide safety oriented infrastructures (e.g. good signposting, dedicated cyclists' lanes or tracks, continuous cycle track maintenance, safe design of bicycle paths).

Promotion of cycling should be supported by a global vision with regard to city planning.

First of all, the urban development of a city should take into consideration accessibility not only by car or public transport, but also by bicycle. Bicycle parking facilities should be compulsory for new districts, both commercial and residential.

Secondly, Transport Demand Management could encourage changes in residents' behaviour. Major employers should start by promoting workplace travel plans that include the bicycle as a means of transport. Every year, many cities worldwide celebrate 'Cycle to Work' week, whose aim is to promote the idea of travelling to work by bicycle. Companies should also provide facilities for cyclists (such as changing rooms, lockers and showers). Measures like pricing in the largest cities can automatically improve the conditions favourable to cycling, since they limit the number of cars in city centre. As shown in

Figure 10, the number of people who cycle has doubled since the introduction of congestion charging.

In relation to mobility management, appreciable initiatives already exist. Some Swiss, German, Dutch and Danish companies reward their employees who have chosen to go to work by bicycle by raising their salaries. Some other companies decided to buy a bicycle fleet to give employees the opportunity to cycle to work and have also built bicycle parking facilities near offices instead of car parking areas.

### 5.3. Key areas for future intervention

According to the analysis carried out in the previous chapter, Table 9 presents suggested hard and soft measures to promote cycling. As reported in Chapter Four, these measures represent two different approaches that local bodies can follow (or combine) to achieve their targets.

Soft measures are not applicable to improving intermodality and security, since these require a package of policies and coordination between different stakeholders. Therefore, the table suggests only hard measures for these areas.

**Table 9: Suggested hard and soft measures**

Key area	Hard measure	Soft measure
<b>Road infrastructure and parking facilities</b>	<ul style="list-style-type: none"> <li>• Build separate and safer cycle tracks</li> <li>• Provide well-maintained cycle tracks</li> <li>• Improve safety of parking facilities</li> <li>• Implement an urban spatial policy to link urban areas with their neighbourhoods</li> <li>• Provide connections between urban cycle tracks and recreational cycle paths, including long distance routes</li> </ul>	<ul style="list-style-type: none"> <li>• Give cyclists priority in urban traffic, making traffic lights more cycle-friendly</li> <li>• Open one-way streets to cyclists</li> </ul>
<b>Safety</b>	<ul style="list-style-type: none"> <li>• Promote information and education campaigns about safe cycling</li> <li>• Promote training for children about cycling rules and appropriate behaviour</li> <li>• Promote stronger enforcement of traffic rules and laws to be applied to cyclists</li> <li>• Train motorists and pedestrians in order to promote responsibility for shared spaces with cyclists</li> </ul>	<ul style="list-style-type: none"> <li>• Allow cyclists to use bus lanes</li> <li>• Reduce the speed limit for cars to 30 km/h</li> </ul>
<b>Intermodality</b>	<ul style="list-style-type: none"> <li>• Create spacious secure and sheltered bicycle parking facilities near public transport stops</li> <li>• Allow carriage of bicycles on trains and public transport</li> <li>• Equip public transport vehicles/carriages with bicycle racks</li> <li>• Implement bicycle sharing schemes</li> </ul>	Not applicable
<b>Security</b>	<ul style="list-style-type: none"> <li>• Build supervised and, if possible, covered parking facilities</li> <li>• Promote anti-theft devices and information campaigns about avoiding theft and damage from vandalism</li> <li>• Promote coordination between police departments, the public and government policies</li> <li>• Promote new technologies (RFID) to counter bicycle theft</li> <li>• Promote public registers of stolen bicycles</li> </ul>	Not applicable

**Source:** TRT's elaboration

## 5.4. The role of the authorities

Paragraph 4.5 has presented some examples of possible soft measures which cities may implement to enhance the role of cycling within the urban modal split. Moreover, the importance of an integrated approach has been stressed, as this will lead to a balanced package of measures, instead of single and potentially less effective actions. However, shaping a balanced package of measures requires the involvement of various public and private stakeholders at different levels. Five categories of intervention may be proposed, each of which includes a set of specific measures as illustrated in Table 10. These categories are called the '**Five Es**': **Engineering**, **Enforcement**, **Encouragement**, **Evaluation** and **Education**. For each category, the group of stakeholders of greatest interest is hypothesised, as well as the scope of implementation.

**Table 10: The *Five Es* concepts**

Topic	Description of the measures	Stakeholders	Scope
<b>Engineering</b>	<ul style="list-style-type: none"> <li>Bicycle infrastructure (lanes, bridges, route signage, safety signals)</li> <li>Frequent road maintenance</li> <li>Bike friendly traffic calming</li> <li>End-use facilities (bike racks, parking)</li> <li>Integrating cycling with other modes (bike racks on buses and trains)</li> </ul>	<ul style="list-style-type: none"> <li>National governments</li> <li>Municipalities</li> <li>Consultancy companies</li> </ul>	National Local
<b>Education</b>	<ul style="list-style-type: none"> <li>Educating motorists to share the road</li> <li>Safety programs for children and adults</li> <li>Safety campaign</li> <li>Bicycle instructors</li> <li>Bicycle route maps</li> <li>Bicycle websites</li> <li>Government partnerships to promote safe cycling</li> </ul>	<ul style="list-style-type: none"> <li>Private associations or communication companies</li> <li>Volunteer charities</li> <li>Municipalities</li> </ul>	Local
<b>Encouragement</b>	<ul style="list-style-type: none"> <li>Incentives to enhance the use of cycling (community incentive programs, marketing advertisements and public relations, bicycle events, on-line trip planning, safe routes to schools, commercial centres, and employment areas)</li> </ul>	<ul style="list-style-type: none"> <li>Private associations or communication companies</li> <li>Volunteer charities</li> </ul>	Local
<b>Enforcement</b>	Establish rules for cyclists and motorists on all type of routes. These include: <ul style="list-style-type: none"> <li>Policies for supporting cycling</li> <li>Local police department liaison</li> <li>Police enforcement of traffic laws that apply to cyclists</li> <li>Police enforcement to encourage motorists to share the road and drive safely near cyclists</li> <li>Public safety officials on bikes</li> <li>Law on mandatory wearing of helmets</li> </ul>	<ul style="list-style-type: none"> <li>National departments of transport</li> <li>Local police department</li> </ul>	National Local
<b>Evaluation</b>	<ul style="list-style-type: none"> <li>Change in percentage modal share</li> <li>Number of accidents, injuries, thefts</li> <li>Kilometres of bicycle path, signed routes and lanes in the network</li> <li>Comprehensive bicycle master plan</li> <li>Evaluation of interconnecting bicycle routes to provide seamless transport options</li> </ul>	<ul style="list-style-type: none"> <li>EU Commission</li> <li>National government</li> <li>Local government</li> </ul>	European National Local

**Source:** TRT's elaborations based on data available at [www.bikeleague.org](http://www.bikeleague.org)

## 5.5. The role of the EU

Promoting cycling is the responsibility of the national and local authorities, since it is an integral part of urban policy. It depends very much on local political will and the allocation of financial resources.

The EU, as supranational coordinator and facilitator member, should continue to fund EU initiatives and projects whose aim is to divulge the best practices and their transferability among EU cities. Beginning with the brochure 'Cycling: the way ahead for towns and cities', published in 1999, the EU still continues to promote cycling initiatives through the annual European Mobility Week. The CIVITAS Initiative, which introduces and tests packages of innovative measures to improve local transport systems, should not be forgotten. In addition, important co-financed projects, including BYPAD and SPICYCLE, have helped many cities implement bicycle sharing schemes, provide cycling infrastructure and promote safety-related information campaigns.

As indicated in Table 10: , the EU should have a determining role in the evaluation phase in order to:

- Provide guidelines and measures to promote cycling that could be followed by EU cities in their local policies;
- Propose targets for bicycle modal share, especially in congested urban environments;
- Maintain efforts to encourage safer cycling, by investing in road safety projects. Protection of vulnerable road users is the first step to promotion of cycling;
- Facilitate the collection of cycling-related statistical data by financing EU studies and creating a common database of best practices.

In conclusion, according to the subsidiarity principle, the EU should support national and local governments, as decision-makers, to help them choose the best measures for changing people's behaviour.<sup>11</sup> Certainly, synergy based efforts can make it easier to implement these measures.

Sustainable Urban Transport Plans (SUTP) are a good way to ensure that transport systems meet society's economic, social and environmental needs whilst minimising their undesirable impacts on the economy, society and the environment. Within SUTPs, measures intended to improve cycling may play a relevant role and make a significant contribution to local authorities' objectives of reducing CO2 emissions, improving air quality targets, etc..

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<sup>11</sup> The principle of subsidiarity is intended to ensure that decisions are taken as closely as possible to the citizen and that constant checks are made as to whether action at Community level is justified in the light of the possibilities available at national, regional or local level. Specifically, it is the principle whereby the Union does not take action (except in the areas that fall within its exclusive competence) unless it is more effective than action taken at national, regional or local level. It is closely linked to the principles of proportionality and necessity, which require that any action by the Union should not go beyond what is necessary to achieve the objectives of the Treaty (source: [http://europa.eu/scadplus/glossary/subsidiarity\\_en.htm](http://europa.eu/scadplus/glossary/subsidiarity_en.htm)).



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## ANNEX

### A.1 Cycle infrastructure in the Netherlands<sup>12</sup>

Many Dutch cities have been working for years to produce a cycle network segregated from the busiest flows of car traffic. The advantage for cyclists in having a separate road facility is the possibility of travelling on a virtually barrier-free network with fewer traffic lights at crossings. The major cycle-friendly cities have already implemented urban spatial planning policies to make public services for their residents accessible easily by bicycle.

The province of Gelderland ([www.gelderland.nl](http://www.gelderland.nl)) is implementing a vigorous bicycle policy to determine where comfort improvements are needed. Over a two-year period, Gelderland will spend EUR 21 million on laying down and improving provincial cycle paths. Bicycle parking facilities at bus stops are being expanded, and the Public Transport Bicycle scheme (the Dutch bike sharing scheme) extended to small stations and bus terminals. Apart from these measures, new development also involves the long distance bicycle routes, which have been incorporated into regional planning. These routes will be protected by spatial policy: if the routes are infringed by new spatial developments, the province will only agree if the national cycling platform (the organisation behind the long distance routes) agrees to an alternative route.

Traffic lights in the Netherlands generally have separate indicators for bicycles. Facilities that have been developed to increase the safety and flow of bicycles include:

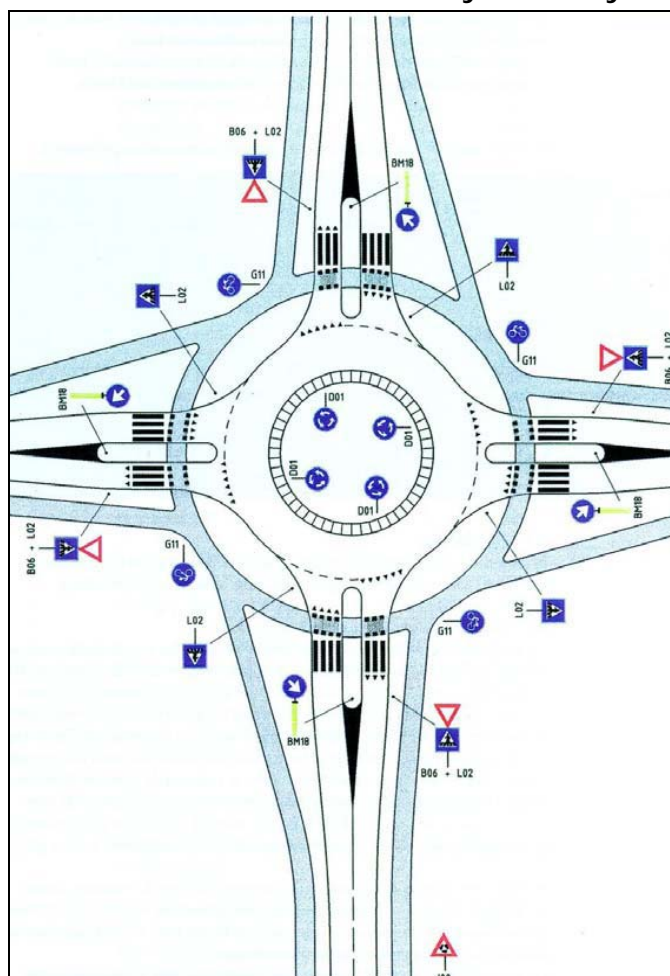
- detection sensors at a distance, to register the approach of cyclists in advance;
- two green sequences for cyclists;
- simultaneous green lights for cyclists in all directions (particularly useful for cyclists turning left, enabling them to cross the intersection diagonally);
- display timers that give cyclists an indication of how long they need to wait for a green light.

Despite all the facilities, traffic lights are the major irritation for cyclists, who ignore red lights, often causing accidents involving motorised vehicles. The main alternative to traffic lights is roundabouts.

The Municipality of Enschede was the first to experiment with separate bicycle tracks just outside a roundabout with priority for cyclists, in the built-up areas. Ideally, the bicycle track takes the form of a perfect circle and the distance between the car lane and the bicycle path is 5 m. Outside the built-up area, cyclists do not have priority and bicycle crossing places are at a considerable distance from the car lane (at least 10 m). These recommendations have been adopted by most road administrators but many cities and provinces currently do not accord priority to cyclists in the built-up area. Figure 12 gives an example of a roundabout with the bicycle lanes coloured in blue.

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<sup>12</sup> All information is provided by Ministry of Transport, Public Works and Water Management, Fietsberaad 'Cycling in the Netherlands', 2009.

**Figure 12: Example of Dutch roundabout with bicycle safety tracks**

**Source:** Geometric design for a roundabout that gives cyclists the right of way (CROW, 1998) quoted in 'Pedestrian and Bicycle-Friendly Roundabouts; Dilemma of Comfort and Safety', L.G. H. Fortuijn, Delft (2003)

## A.2 The Sustrans Links to Schools and Bike It projects

In England, Sustrans' **Links to Schools project** began in October 2004 with the majority of projects being completed between spring and autumn 2005, creating 147 links connecting more than 300 schools to their communities and enabling up to 200 000 children to walk or cycle to school.

The primary aim of **Links to Schools** is to connect young people to their schools with traffic-free and traffic-calmed walking and cycling routes, creating a safe and attractive environment to give parents the confidence to allow their children to walk or bike to school. Apart from safety, there are of course other direct benefits to the community. Fewer cars taking children to and from school means less congestion and pollution and less potential for accidents outside school gates.

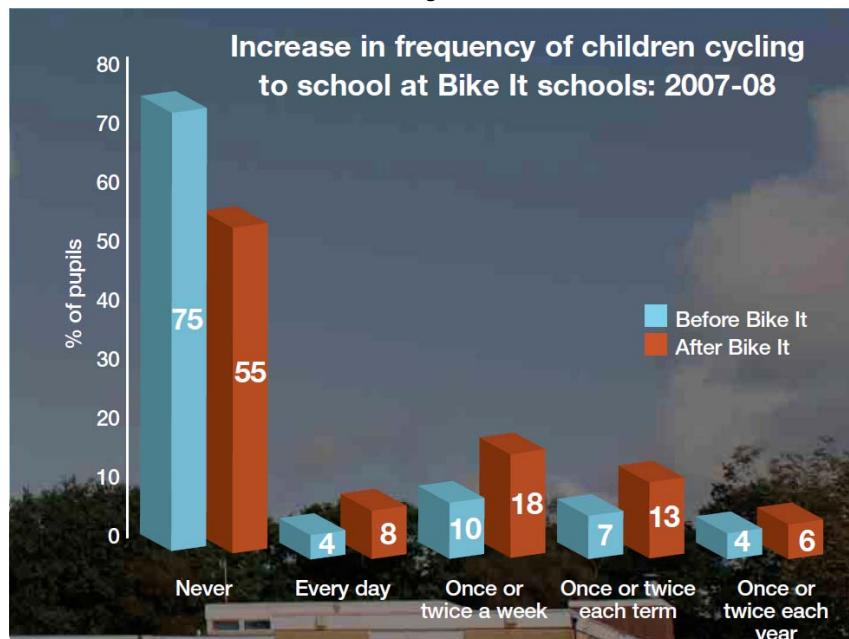
Another important project in the United Kingdom, **Bike It**, is still successful five years after its first implementation. The aim of the project is to enable young people to cycle to school. **Bike It** is designed to give children the skills and confidence to travel by themselves, and parents the peace of mind to let them travel alone. It's success is due to the participation of a range of organisations that funded the pilot project in England and Wales (e.g. Bike

Hub<sup>13</sup>), the schools and teachers who are willing to participate in the project, and the local bicycle retailers who help with bike maintenance sessions.

In 2008, approximately 89 000 children from 443 schools and 55 local authorities were involved in the project.

The Figure 13 shows the results of a 2008 Sustrans survey of around 19 000 primary and secondary school pupils that asked: 'Do you cycle to school?'.

**Figure 13: Annual Sustrans Bike It survey**



Source: Bike It, Project Review 2009

As the figure indicates, the percentage of children who said they never cycle to school dropped from 75% to 55% and the frequency of pupils cycling to school increased after Bike It.

As reported in the Bike It project 2009 review, the role of Bike It officers is to work with schools by:

- explaining the benefits of cycling,
- contributing to classroom work,
- addressing safety concerns with help of the local authority,
- sharing good practice with school management teams,
- organising practical cycling activities,
- generating positive publicity.

Each Bike It officer works with 12 schools every year and benefits from the knowledge and experience of the Sustrans team. Sustrans also provides Bike It staff with full training, risk assessment, cycle safety instruction, outdoor activities and child protection.

<sup>13</sup> **Bike Hub** is an industry wide initiative developed by The Bicycle Association of Great Britain and the Association of Cycle Traders. The objective of Bike Hub is to generate funds from within the cycle industry to support the future of cycling in the United Kingdom.

### **A.3 Vélib' bike sharing scheme in Paris**

This started in July 2007 with 10 648 bicycles and 750 pick-up and drop-off stations in the city of Paris. After only a few months (December 2007), the number of bicycles and stations was doubled. Vélib', the bike sharing scheme of Paris, extended the service to 30 municipalities in the metropolitan area, making a total of 300 additional stations by the end of 2009.

Vélib' is available 365 days a year. Stations are located every 300 m and the bicycles can be hired by residents aged 14 years or over (and 1.50 m minimum height). Paris has more than 350 km of bicycle paths, and started the experimental measure of 'Contraflow' for cyclists in one-way streets in 2005. Many types of subscriptions are available: (i) a long term subscription costs EUR 29 and (ii) a short term subscription is available for a week EUR 5 or day EUR 1).

The first 30 minutes per day are free of charge; additional hours follow the rates below:

- EUR 1 for the first additional half hour;
- EUR 2 for the second additional half hour;
- EUR 4 for the third additional half hour.

Payment can be made by credit card and a security deposit of EUR 150 is required.





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