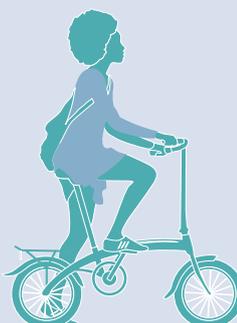


Towards More Physical Activity in Cities

Transforming public spaces to promote physical activity
— a key contributor to achieving the Sustainable Development Goals in Europe



This publication has benefited from the primary contribution of **Louise Vogel Kielgast** (Gehl), and from contributions by **Shin-pei Tsay** (Gehl Institute), **Jo Jewell**, **João Breda** and **Francesca Racioppi** (WHO Regional Office for Europe) under the supervision of **Gauden Galea** (WHO Regional Office for Europe).

Further thanks are owed to **Romeu Mendes** (Institute of Public Health, University of Porto) for his kind review, as well as to **Riley Gold** (Gehl Institute), **Helle Søholt** (Gehl), **Birgitte Svarre** (Gehl) and **Vannesa Ahuactzin** (Gehl) for review.

This publication was made possible by funding from the European Commission Directorate-General for Education and Culture. Translation into Russian was supported by the Ministry of Health of the Russian Federation.

The graphics and layout were provided by **Pernille Juul Schmidt** (Gehl).

All photos by **Gehl**, except:

P. 12: **Atkins London**

P. 31: **New York City Department of Transportation (DOT)**

PP. 32 and 33 ('after' photos): **Alexandra Kovaleva**

P. 38: **Domantasm** on Flickr.

PP. 50-51: **D. Wedam**

Contents

Foreword 2

Introduction 4

Physical activity and the built environment	8
Defining the scope	10

Public space in cities – the drivers of sustainable change 12

Sustainable development goals	16
European cities in context	18
Challenges on the agenda in european cities	21
Case study Istanbul	26
Encouraging physical activity: the case for co-benefits	28
The public space as an overlooked resource	31
Case study Moscow	32

Getting the liveable city on the agenda 34

Planning for people	37
A different approach to planning	39
Vision and pragmatism	40

Implementation 42

A human starting point for more physical activity	45
People-centred planning principles	48
Case study Ljubljana	50
From policy to implementation	52
Physical activity is not just about getting from a to b	54
Case study Barcelona	56
Equitable and responsive planning	58
Zoom in on everyday life	
The living area	60
The commute	62
Daily errands	64
Spending free time	66

Evaluation 68

Evaluations in urban planning and public health	71
Case study Copenhagen	72
New approaches to impact assessments in cities	74
Using evaluations in planning	76
Towards new metrics and tools	77

Conclusion 80

References	84
------------	----

Foreword



Gauden Galea
Director of the Division
of Noncommunicable Diseases
and Promoting Health through Life-course,
WHO Regional Office
for Europe

The troubling levels of physical inactivity observed in all Member States of the WHO European Region contribute significantly to the high rate of noncommunicable diseases, the biggest health challenge facing governments across the region. The Physical activity strategy for the WHO European Region 2016–2025 provides guidance to Member States on effective ways of increasing levels of physical activity among the population and decreasing sedentary behaviour, notably through improvements to the built environments in which we live, work, move and play.¹ In endorsing the strategy, Member States committed themselves to work with all sectors at all levels of government to ensure that all people have the opportunity to be physically active as part of their everyday lives. Towns and cities of all sizes across Europe are therefore important arenas and actors for implementing and driving change.



Shin-pei Tsay
Executive Director,
Gehl Institute

This booklet, *Towards more physical activity in cities*, is the product of collaboration between the WHO Regional Office for Europe and the Gehl Institute – world experts in research in public life and public space. It complements the vision and aims of the Physical activity strategy by discussing options for how to improve the “hardware” – the physical infrastructure and spaces in cities and towns – so as to transform the quality of public spaces and encourage more physical activity. Within Europe, there are great examples of cities that have taken the initiative to promote physical activity and to improve the built environment. For this reason, the booklet takes a case study approach with the aim of providing inspiration to others.

Levels of physical activity are strongly determined by the physical environment, and smart improvements to the design and layout of our cities can have significant benefits. Yet many people living in cities across our region currently face barriers to being physically active. Challenges include the continuing dominance of car traffic on the road, with limited provision of integrated options for active transport; issues relating to the accessibility of green spaces and other public spaces for recreation, particularly in the poorer sections of our cities; and a

lack of human scale in the design of public spaces that discourages use or makes physical activity impractical or uninviting. New approaches to urban planning and design that take such barriers into consideration offer great potential to achieve improvement in rates of physical activity.

At the same time, cities face a range of wider challenges relating to the goal of achieving sustainable development, including (to name but a few) air pollution and environmental degradation, growing inequalities within the population, threats to economic growth and affordability of housing. These are often seen as first-order urban challenges; in light of this, thought needs to be given to the importance of identifying “win-win” scenarios where solutions address multiple challenges simultaneously. For example, affordable housing redevelopments may also provide thoughtfully designed, safe green spaces for gathering and active recreation. Similarly, policy-makers may explore measures that have the effect of increasing physical activity as a means of achieving other goals, such as improving air quality.

The WHO Regional Office for Europe and the Gehl Institute have long understood that cities are settings with enormous potential for positive change. In this joint publication, our two organizations build on previous work and knowledge gained on the ground to set out guiding principles for promoting physical activity in European cities. Through better-quality urban planning and robust evaluation, our hope is that cities will become better at exploiting the potential of the physical environment to promote physical activity and health more generally.



Introduction



This publication focuses on physical activity and how it can be supported through urban planning. The focus on physical activity is explained by the fact that inactivity today accounts for an increasing proportion of deaths and disability worldwide and is associated with significant health care costs and productivity losses.² Action to increase rates of physical activity will be necessary to achieve global targets on the prevention of premature mortality from noncommunicable diseases – the leading cause of death worldwide – and to halt the rise in obesity. With more than 80% of the European population expected to live in urban areas by 2030, cities play a pivotal role in promoting and protecting health and well-being.³ As cities continue to expand in population, there is a growing need to develop ways of supporting physical activity in dense urban settings.

Governments across the WHO European Region have recognized the need to prioritize physical activity in the city context. Member States have adopted a physical activity strategy that highlights the importance of built environments in helping to promote physical activity as part of everyday life.⁴ At the same time, the Paris Declaration, “City in motion – people first”, which was adopted in 2014 by European Ministers at the Fourth High-level Meeting on Transport, Health and Environment, endorsed a commitment to incorporate transport, health and environmental objectives into urban and spatial planning policies.⁵ In addition, in 2017 the Sixth Ministerial Conference on Environment and Health adopted the Ostrava Declaration in which Member States committed to develop national portfolios for

actions on environment and health, including efforts by European cities and regions to become “healthier and more inclusive, safe, resilient and sustainable through an integrated, smart and health-promoting approach to urban and spatial planning [and] mobility management”.⁶ To achieve these goals, governments at all levels must be engaged and involved in the identification and implementation of policies.

Such commitments fully align with the United Nations Sustainable Development Goals and the New Urban Agenda.⁷ Both recognize that urbanization contributes to some of the world’s greatest development and environmental challenges, but that cities also represent an important arena for advancing sustainable development with huge opportunities for gains. For mayors and local leaders who are working to improve the quality of life in urban environments across Europe, well-planned walkable neighbourhoods, affordable housing and services with access to plenty of green and public space, as well as multimodal public transit options, will make a significant contribution not only to attainment of health goals but also to a more balanced and equitable urban development.

Based on this strong political mandate, this publication builds on and acknowledges the extensive work that WHO and other organizations have already done in the field of healthy urban planning.⁸ It aims to take stock of previous initiatives, moving these a step forward while retaining a focus on more recent case studies of urban planning initiatives that promote physical activity. It also places emphasis on the importance of collaborating and aligning with urban planners, extending our understanding of the factors beyond health that drive and motivate decisions in urban planning.

The publication acknowledges that cities have competing objectives, such as the goal of becoming carbon-neutral or more attractive to investors, or the need to address urban poverty. The aim is to explore how these motivators can be harnessed to produce “win-win” scenarios or co-benefits – in other words, to inspire urban planners in European cities to rethink their approaches, so that cities become more conducive to physical activity at the same time as achieving other politically important objectives (and vice versa).

Finally, while not claiming to be comprehensive in scope, it specifically explores city case studies from parts of our region that have been less studied and aims to demonstrate how common principles and concepts in urban planning can be used to encourage greater levels of physical activity across the European region. Through this publication, WHO wishes to provide inspiration and guidance on how different cities, in different contexts and at different stages of development, can use planning to encourage more physically active lifestyles for their residents. It will do so by focusing on different stages of the policy cycle – from government policy development to strategy implementation and design solutions – as well as on the different components of the city profile, such as the city centre, urban residential areas and suburbia, each of which may have very different needs and challenges.

Physical activity and the built environment

Physical activity is essential for health and well-being.⁹ It is a key determinant of energy expenditure, as it has a fundamentally positive influence on energy balance and weight control. Regular physical activity is therefore important in the context of high levels of overweight and obesity across the region.¹⁰

Physical activity is also a safeguard against a range of chronic diseases, such as type 2 diabetes, cardiovascular diseases and some cancers (notably breast and colon cancers); it also provides mental health benefits, helps prevent osteoporosis and maintains functionality in the elderly.¹¹ However, modern life has reduced energy expenditure through physical activity to a minimum, and sedentary behaviours now dominate.¹² Current WHO global recommendations state that young people aged 5 to 17 years should do at least 60 minutes of moderately intense physical activity every day and take part in vigorously intense activities at least three times a week, while adults (including older people) should aim for a minimum of 150 minutes of moderately intense activity throughout the week.¹³

The relationship between levels of physical activity and the physical environment in cities has been subject to many different studies, often focusing on specific subsections of cities or key aspects of the built environment that might

The WHO Regional Office for Europe's recent work on physical activity and healthy cities

In endorsing the **Physical activity strategy for the WHO European Region 2016–2025**, Member States made a commitment to work across sectors and at different levels of government to enhance levels of physical activity and reduce sedentary behaviour. Notably, they agreed to ensure enabling environments that support physical activity through **“engaging and safe built**

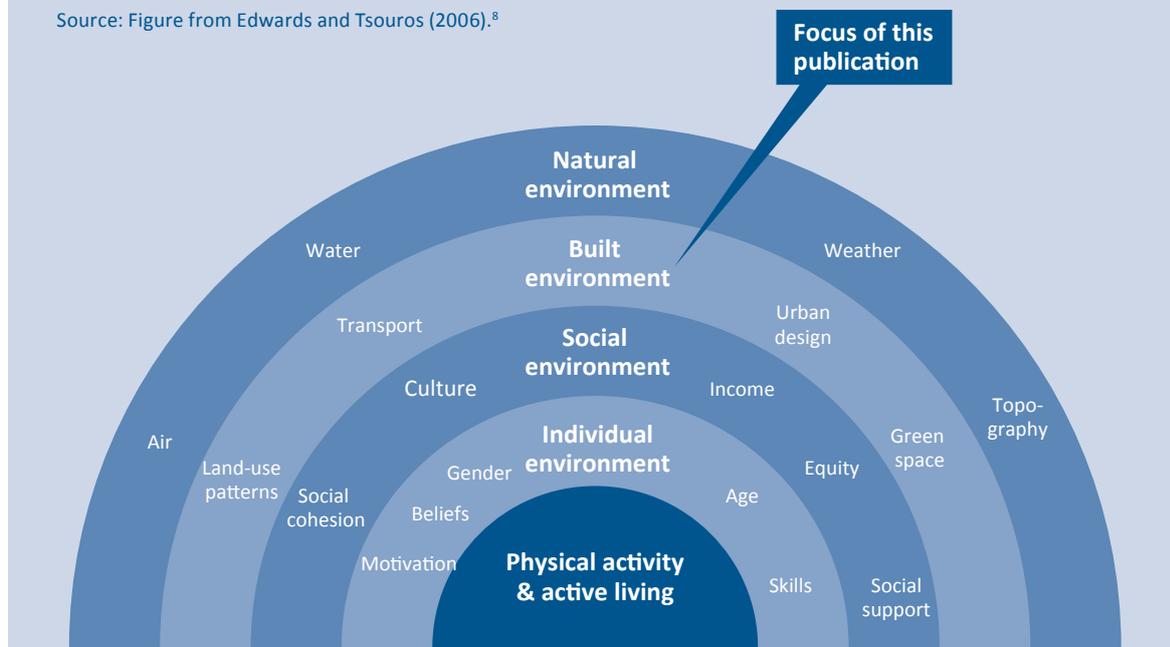
environments, accessible public spaces and infrastructure”. A clear role was highlighted for transformative policies in the areas of urban design, land use and transportation/mobility planning, with cities identified as particularly important actors.

Such commitments built on previous statements by governments, including the Parma Declaration on Environment and Health (2010), in which Member States agreed **“to provide each child by 2020 with access to healthy and safe environments and settings of daily life in which they can walk and cycle to kindergartens and schools, and to green spaces in which to play**

and undertake physical activity”. More recently, the 2017 Healthy Cities Pécs Declaration restated the role of cities in creating places that empower and enable all people to enjoy improved health and well-being. Improving the built environment in cities is also included in United Nations Sustainable Development Goal 11, which calls for inclusive, safe, resilient and sustainable cities. Specifically, it aims to achieve **“universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities”**.¹⁶

Figure 1 **Factors influencing physical activity in communities**

Source: Figure from Edwards and Tsouros (2006).⁸



influence levels of activity, such as parks, cycle paths and public transportation systems.¹⁴ In these studies, the built environment has consistently been shown to affect the level of physical activity among the population; thus, there is much scope to use the setting of the city to increase opportunities for physical activity. In light of this, WHO and other bodies have recommended that the discipline of urban planning should consider the needs of the population in terms of physical activity,¹⁵ and this has been strongly reflected in the well-defined concept of a “healthy city”.

This publication will draw not only on the aforementioned studies, but also on research into people’s behaviours in cities,¹⁷ such as their motivations for moving on foot or by bicycle and for spending time in outdoor spaces in cities. While acknowledging that there are many different determinants of physical activity, this publication focuses on the built environment (figure 1). It examines the challenges cities face in integrating public health goals alongside many competing agendas, but will also identify clear opportunities to align objectives and maximize the potential of land-use planning, public transportation systems and urban design to benefit physical activity.

As health inequalities are prevalent in many cities of the WHO European Region, social determinants will also be addressed as an important and indispensable consideration in urban planning initiatives.

Defining the scope

Two concepts are central to this publication: physical activity as part of everyday life and the built environment. Both of these concepts are broad in nature and have many different aspects, so this publication focuses primarily on specific aspects as they relate to European cities.

Physical activity

Physical activity is limited to a focus on **moderate-intensity physical activity**, which includes walking, cycling, playing and various forms of light exercise. As part of everyday life, such activity has proved to have a substantial impact on people's health. However, recent trends suggest that it has been reduced to a bare minimum: people are sedentary most of the time and increasingly use motorized transportation.¹⁸

The emphasis on moderate-intensity physical activity is also relevant in light of recent trends in travel and recreation patterns. Urban spaces that allow for informal physical activity can provide opportunities for spontaneous and self-organizing exercise. They can also enable people to choose when and where to engage in active recreation. Furthermore, evidence indicates that walking and active play can contribute significantly to the overall level of physical activity and energy expenditure, not least among children, with consequent implications for health.¹⁹ In spite of this, trends indicate that both children and adults are reducing their physical activity levels with respect to active transport and recreation.²⁰ Thus there are likely to be significant benefits from promoting active recreation and play in public spaces, as well as from encouraging utilitarian walking and cycling "with a purpose", such as when going shopping or to school or work.

Built environment

Consideration of the built environment is limited to a focus on open, **outdoor, public spaces**, such as public meeting places (squares, marketplaces), and **connecting/traffic spaces and thoroughfares**, such as roads, pavements and building edges. This publication will not look at the way individual buildings are designed to support physical activity, nor will it consider

the design of indoor spaces such as workspaces, schools and sports facilities.

This focus on the physical design and planning of the built environment directs our attention to the **infrastructure, or “hardware”, that underlies the city**, rather than the “software”, or non-infrastructure measures, such as parking policies, congestion charges and public-awareness campaigns.²¹ While such measures are extremely important and may encourage physical activity, modifying modal splits or creating more favourable conditions for active mobility, they lie beyond the scope of this publication.

European cities

Over the course of history, European cities have brought prosperity and progress – political, social, cultural and educational – and city-living has generally been beneficial for health and well-being.²² In the 21st century, however, various new economic, social and environmental drivers mean that cities and towns are faced with a range of new health and environmental challenges. These include air and noise pollution, waste management, water and sanitation, affordable housing and access to green space, congestion, changing demographics and adaptation to climate change. The term “city” is used generically in this document. It refers to urban settlements of various sizes found in Europe, including towns, cities, metropolitan areas and city regions. It is important to note that cities in the WHO European Region vary greatly not only in terms of factors such as size, structure, climate, orography, economic prosperity, transport systems and modal splits, but also in a range of more complex factors, including: planning traditions; attention and approach to building in ways that are conducive to health; social norms and attitudes towards physical activity, cyclists and pedestrians; and legal frameworks applicable to cycling.

Consideration of these many variables will suggest how best to address physical inactivity in each case. This publication will highlight and provide examples from a variety of urban settings across Europe, in the hope of inspiring as many different cities as possible, regardless of where they are currently placed in this diverse landscape.



Sofia, Bulgaria has one of the oldest city centres in Europe. The city has in recent years shown an interest for change with new investments and architectural competitions.



Malmö, Sweden is an example of a city which has undergone a huge transformation process - from many industries closing down to a young, innovative and liveable city with new city areas like the Western Harbour.



**Public spaces
in cities
—
the drivers
of sustainable
change**



The high levels of physical inactivity observed across the WHO European Region today present an enormous challenge for both national governments and city authorities faced with the task of tackling issues of health.

Globally, one third of adults do not achieve the recommended levels of physical activity. In Europe, estimates suggest that more than one third of adults are insufficiently active; 23.1 million deaths (about 10% of the total) and 8.3 million disability-adjusted life years lost each year in the European Region are attributable to physical inactivity. It is estimated that 5% of the burden of coronary heart disease, 7% of type 2 diabetes, 9% of breast cancer and 10% of colon cancer can be attributed to physical inactivity.²⁴

While the picture may seem bleak, there is strong evidence to suggest that efforts to increase physical activity as part of daily life will have a beneficial effect. A systematic review and meta-analysis of studies concluded that walking and cycling reduce all-cause mortality and that public health approaches would have the biggest impact if they managed to increase walking and cycling levels in groups that currently show the lowest levels of these activities.²⁵ Considered in a broader context, however, the issue of physical inactivity represents only one of the many challenges facing cities worldwide. This is why there is a strong need for more integrated solutions that allow cities to simultaneously achieve multiple objectives, such as those relating to sustainable transportation and equitable housing policies.

Sustainable development is very high on the agenda of both nations and cities in the WHO European Region. With the adoption in 2015 of the United Nations Sustainable Development Goals (SDGs) (see next page), there is a clear recognition of the need for more joined-up thinking around some of the more complex and intractable challenges. The SDGs consider, for the first time, development priorities such as poverty eradication, education, health and food security alongside a wide range of economic, social and environmental objectives; they set goals and targets that are interconnected, indivisible and universally applicable to all countries, regardless of their level of affluence.

While the SDGs express the wish for a shared agenda and action at a global scale, there is a growing understanding that cities are important arenas for action to meet these goals. Indeed, cities may be one of the most important places, as the challenges are concentrated there and at their most visible. Accordingly, cities are places where new solutions can have a significant impact and show the path towards a more liveable, just, healthy, safe and sustainable world for all.²⁶

Sustainable Development Goals!

#1

End poverty in all its forms everywhere

Ensuring access to environments and facilities that support physical activity across social gradients could contribute to addressing inequities observed in many European cities.

#2

End hunger, achieve food security and improved nutrition, and promote sustainable agriculture

Densification of urban areas could help ensure that all communities have easier access to retailers selling a diverse range of foods required for a healthy diet.

#3

Ensure healthy lives and promote well-being for all at all ages

Public spaces that encourage active outdoor life and active mobility are important means towards healthy lives and well-being for all, and it is important that the needs of different age groups are considered in this endeavour.

#4

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

Physical activity has proved to be important for the ability to learn and concentrate among schoolchildren. Safe roads that allow for children to walk or bike to school form part of a more inclusive and equitable quality education.

#5

Achieve gender equality and empower all women and girls

Public spaces are important places for self-expression, and providing urban environments that consider and support the special concerns and needs of women and girls in relation to active mobility and other physical activities is one aspect of achieving gender equality.

#6

Ensure availability and sustainable management of water and sanitation for all

In the planning of public spaces for physical activity there are great opportunities to also plan for more sustainable management of water.

#7

Ensure access to affordable, reliable, sustainable and modern energy for all

#8

Promote sustained, inclusive and sustainable economic growth, full and productive employment, and decent work for all



The 17 Sustainable Development Goals (SDGs) are diverse, but interconnected and indivisible. A stronger focus on making cities more conducive to physical activity could help achieve many of the SDGs in rich and complex ways. Below, we highlight some examples of how urban planning strategies and improvements to the public space could contribute to achieving the goals.

#9

Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

#10

Reduce inequality within and among countries

Different cities and countries provide very different conditions for being physically active; to address and promote physical activity for all is one aspect of reducing inequality.

#11

Make cities and human settlements inclusive, safe, resilient and sustainable

Promotion of physical activity can help bring about shifts away from heavy car traffic and promote the expansion of better-quality green spaces, thereby contributing to more inclusive, safe and sustainable cities.

#12

Ensure sustainable consumption and production patterns

#13

Take urgent action to combat climate change and its impacts

Reducing car traffic and promoting active mobility instead is one step towards combatting climate change; climate adaptation projects in public spaces can easily be integrated with and supplemented by measures that promote physical activity.

#14

Conserve and sustainably use the oceans, seas and marine resources for sustainable development

#15

Protect, restore, and promote sustainable use of terrestrial ecosystems.

#16

Promote peaceful and inclusive societies for sustainable development, provide access to justice for all, and build effective, accountable and inclusive institutions at all levels

#17

Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development



European Cities in context

While European cities share a number of the broad challenges facing cities worldwide as expressed in the Sustainable Development Goals, they stand apart in terms of population size and population density. These two factors play an important role when it comes to creating opportunities for more physical activity in cities.

Population size

The population size of European cities is markedly different from the patterns seen in most other regions of the globe. Europe is characterized by having the largest proportion (65%) of the urban population living in cities with fewer than 500 000 inhabitants, and close to 95% living in cities with fewer than 5 million inhabitants.²⁷ Only London, Moscow, Paris and Istanbul can be considered megacities, normally defined as cities with over 10 million inhabitants.²⁸ In Asia and Africa, a number of cities exceed 15 million inhabitants and some have up to 30 million, while the number of megacities worldwide has increased from 10 to 28 in the past 25 years. In this context, cities in the WHO European Region, being relatively compact, are generally in an advantageous position when it comes to promoting physical activity (for instance, cycling) as a way of commuting from A to B.

Smaller cities can encourage active travel as an attractive and convenient alternative to journeys by motorized transport. In larger-scale megacities, this becomes more difficult, and it is not generally realistic to make round trips by bicycle. In the case of these larger cities, any cycling strategy is likely to require intermodality, or mixed-mode commuting, involving (for instance) a connection between metro stations and cycling hubs. But this is also true for some of Europe's cities if they want to integrate cycling within joint city–regional transport plans, providing a combined cycling–public transport system that meets the needs of commuters from outside the city centre. Such areas of intervention will often call for intergovernmental collaboration between cities, regions and national governments and are not issues that can generally be dealt with by individual city governments acting alone.

Population density

Closely related to population size is the question of population density. In a global context, European cities lie somewhere between North America and Africa, on the one hand, and Asia and Latin America, on the other. European cities average 3000 inhabitants per km², whereas the average for a North American city is 1500 and between 4000 and 8000 in the rest of the world (excluding Oceania).²⁹

The population density of a city is important for several reasons. First, a population density of 3000 per km² is normally considered a minimum to sustain a public transport system,³³ and a good public transport system may increase daily physical activity as people are encouraged to either walk or cycle to a station rather than use personal motorized transport – though other factors, such as social context (for example, desirability of car ownership) and perceptions of safety, may play a role that is equal to or more important than convenience and health. Second, population density is an important prerequisite for sustaining a variety of urban functions (shops, community centres, etc.) that can – if planned in the right way – have a positive impact on people’s physical activity patterns (for more on this, see Chapter 5). For these reasons density remains an important consideration for European cities, especially those with a lower-than-average population density that wish to increase levels of physical activity.

The urbanization trend

In addition to population size and density, it is important to consider the urbanization trend. Many cities in the WHO European Region are witnessing a change in which the rate of urbanization is higher in the areas surrounding cities (suburbs and commuter towns) than in the city centres themselves.³⁴ This poses a challenge in encouraging people to be more physically active as these surrounding areas are generally not as inviting for walking and cycling, as bigger roads (for cars) and greater distances between urban functions serve to discourage physical activity as part of daily life.

Another important characteristic shared by many European cities is that they have a history that can be traced back several centuries, if not millennia, and need to match the needs of contemporary urban life with preservation of their important historical and cultural heritage. This often presents special challenges for urban planning in historic city centres that can lead to conflict in the use, allocation and redevelopment of public spaces and other urban functions.³⁵

Modal split

Figures on modal split reveal great variety in people’s movement patterns in different European cities. While it



The convenience of bringing the bike on the regional train is an important means towards increasing the level of cycling at a regional scale in Copenhagen, Denmark.

Putting the bike first

Copenhagen has been highly successful in creating a very bikeable city centre. The City of Copenhagen now has explicit strategies for regional cycling, including initiatives such as cycle superhighways, green ways for cyclists, and promoting and adapting the cycle infrastructure for electric bicycles (e-bikes).³⁰ Copenhagen has set itself the ambitious goal of becoming carbon-neutral by 2025, and cycling is one of the key sustainable transport strategies that is expected to help achieve this.³¹

It may be that the main motivation for Copenhagen’s politicians in promoting cycling is that achieving a 75% cycling/walking modal split is essential to reaching the city’s sustainable transport goals, but the co-benefits for health are also an important consideration.

The strategy adopted in Copenhagen recognizes the need to look beyond the city centre and integrate wider transport systems. Similarly, in Dresden, it now is permitted to take bicycles onto trams and even onto buses. On a working day, 6000 (1.5%) passengers take their bikes onto a tram or bus.³²



Above: In Bern, Switzerland, the paving has been changed to make it more bike-friendly while still respecting the city centre as a world heritage site. Many old city centres across Europe face similar challenges.

should be remembered that these figures may sometimes be calculated in different ways, they nevertheless indicate that cities do not start from the same place when it comes to promoting physical activity. A high percentage of car usage is likely to correspond with a low level of physical activity as part of the daily commute, while the other modes – public transport, walking and cycling – all include some amount of physical activity.

Looking across Europe as a whole, it is interesting to note that the percentage of people walking is generally high. In 25 European cities, walking accounts for more than 40% of the total modal split, and the majority of these are in southern Europe.³⁶ This is a significant point for urban planners to take into account in promoting physical activity, as it suggests that some cities may be better suited to (say) walking than cycling. What these figures do not tell, however, is how much walking takes place, and by whom (their age, for instance). Such questions are important and will be explored further in Chapter 6.

Facts

Ninety-eight per cent of people using public transport in Scandinavian cities begin their journey on foot or by bicycle. Even in the countryside, 90% reach their destination as pedestrians or by bicycle.³⁷

Challenges on the agenda in European cities

While the various factors mentioned above are often regarded as the most important contextual considerations when it comes to promoting physical activity through infrastructural changes, European cities also face a wide range of additional challenges that may not be directly associated with physical activity but are highly relevant nevertheless.

The task of encouraging more physical activity requires consideration and understanding of these challenges, some of the most important of which are discussed below.³⁸

Deindustrialization and changing patterns of urbanization

The problem of dealing with rapid deindustrialization and the declining city centre population numbers that accompany it has been – and still is – a concern for many cities as the working-age population moves out of the city in search of employment. Some cities, such as Glasgow in Scotland, Tampere in Finland, Budapest in Hungary and Malmö in Sweden, have been successful in managing this transition, while others, such as Leipzig in Germany and Kaunas in Lithuania, are struggling with shrinking population numbers.³⁹ Cities that are suffering from declining populations are found, for the most part, in the eastern and southern parts of the WHO European Region.⁴⁰

The industrial era and shrinking population sizes have left clear traces in the fabric of cities, resulting in large, often centrally located areas that need to be redeveloped. While there are many economic and social challenges to overcome relating to deindustrialization, these areas do have huge potential for densification, allowing new city centre functions and workplaces to evolve. As such areas are redeveloped and become new neighbourhoods, they open up opportunities for barriers between urban areas to be removed and a more integrated urban environment to be created, for instance by the installation of attractive paths for walking and cycling.

Shortage of (affordable) housing

Conversely, some European cities are witnessing an increase in the number of inhabitants (from urban migration, immigration, etc.), which can put great pressure on housing provision. The current situation echoes previous periods of housing shortage which led to extensive public housing programmes, such as the so-called “Million Homes Programme” in Sweden between 1965 and 1974.⁴¹ Many of these housing projects built in the 1960s were designed according to modernist planning principles, which are often not conducive to walking and cycling.⁴² As cities face the challenge of building significant amounts of new housing in short periods of time, it is important to learn from previous experience; the provision of adequate housing in new areas should take into account the quality of the urban environment (in terms of public and green spaces, accessibility, transport, multifunctionality, etc.) and how it can support physical activity.

Another equally important housing challenge across Europe is related to cost. In comparison to non-urban areas, city dwellings typically impose higher costs on residents, some of whom may be forced out of central urban areas, thereby increasing urban inequality. The degree of this problem varies between cities, even within the same country. In Finland, for example, only 10% of people in Helsinki thought it was easy to find good housing at a reasonable price, while in Oulu the figure was 75%.⁴³ For those who can no longer afford to live in the city centres, relocation elsewhere makes integration of active transport in their daily lives more difficult, so the problem only gets worse.

Growing inequality

Growing inequality is a problem worldwide, notably in relation to health. Inequalities are found at many levels – at country level, at city level and not least at neighbourhood level. In some cities, health inequality between different neighbourhoods is alarming and getting worse. In Copenhagen, the difference in life expectancy across neighbourhoods has reached six to seven years.⁴⁴ In cities from different parts of the WHO European Region, we see similar trends in health inequality: lower life expectancy linked to education and income level.⁴⁵

Inequalities in health are also related to the quality of the urban environment. In many cases there is a correlation between low income and poor health, on the one hand, and lack of attractive green spaces for recreation, good-quality pavements for walking and suitable infrastructure for cycling, on the other.⁴⁶

Urban green space is essential in order to create healthy, sustainable and liveable cities and can encourage physical

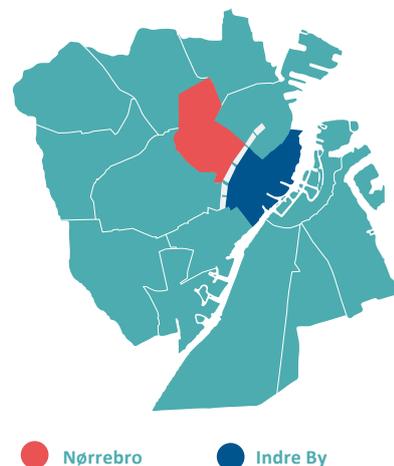


Big, wide roads do not provide attractive walking environments. Rosengården, Malmö, Sweden.

Facts

Difference in life expectancy between Copenhagen’s Indre By and Nørrebro districts: 7 years

In 2013 the life expectancy for men in Nørrebro was 71.3 years; in Indre By, 78.3 years. For women, the difference was 6.4 years.



activity. Interventions to increase or improve urban green space can deliver positive health, social and environmental outcomes for all population groups, particularly among lower socioeconomic groups.⁴⁷ Evidence suggests that for every 10% increase in green space, there is a reduction in disease equivalent to five years' life expectancy; at the same time, such measures help to combat the effects of climate change (extreme urban temperatures) and improve air quality.

Congestion

Congestion has become a major challenge in many cities around the world, including those in the WHO European Region. In addition to the negative impact on the quality of people's everyday lives (for instance, from noise and air pollution), there are huge socioeconomic costs related to congestion. This sometimes leads to investment in more road space for cars, but potential solutions to the congestion problem represent an opportunity to promote physical activity. As well as investing in public transport and new, innovative car-sharing programmes, many cities acknowledge the need to improve conditions for active mobility as an element in addressing congestion.⁴⁸

Air pollution

Air pollution is the single greatest environmental health risk facing European cities and a major focus of policy attention at the urban level, with emissions from transport, heating and industrial activities representing the main sources of exposure. Over the last two decades, concentration of air pollutants such as lead, sulfur dioxide and carbon monoxide has been significantly reduced through combinations of European Union, national and local action, but many cities are still struggling to reduce air pollution below EU thresholds.⁵⁰ The economic cost of deaths and diseases due to air pollution in the European Region amounts to US\$ 1.6 trillion, according to a study in 2015 by the WHO Regional Office for Europe and the Organisation for Economic Co-operation and Development.⁵¹ Sustainable transport strategies such as increased cycling could obviously play a part here, at the same time as encouraging more physical activity.

A growing elderly population

Although most cities have a larger share of young people than areas outside cities, the need to accommodate ageing populations and to promote the concept of "active ageing" is sure to grow in the future. Indeed, demographic changes mean that many European cities already have high old-age dependency ratios.⁵² Cities must therefore be designed to take into consideration the needs of people with more limited mobility. This might include a more integrated public

Combating congestion

In the WHO European Region, some cities face high levels of congestion. According to the Tom Tom international rankings, the most congested city in the world, Mexico City, has a congestion level of 66%. In Europe, the highest level is around 50%, found in Bucharest and Istanbul, while a few other big cities, such as Moscow, Saint Petersburg, Marseille and London, are at a level between 40% and 45%. In most of these cities the levels of congestion are rising, making it a major concern. Possible explanations for the congestion levels observed vary from city to city and may include a variety of factors, such as extensive use of cars for short trips, free parking and unattractive, inefficient or inaccessible public transport.

Congestion in these rankings is defined as a percentage increase in overall travel times when compared to a free-flow situation, using speed measurements from a historical traffic database. These speed measurements are used to calculate the travel times on individual road segments and entire networks. Busier and more important roads in the network have more weighting in the outcome than quieter, less important roads.⁴⁹



Many cities face heavy congestion. In London, a congestion charge was introduced in 2003 to reduce car traffic.



transport system or greater attention to accessibility (such as ramps and lifts); such an approach could, in turn, bring the co-benefit of encouraging active mobility among other groups, including young families.

Security and safety

From a global perspective, European cities are safe, with very low homicide rates. Homicides in the European Union dropped by 40% between 2002 and 2014.⁵³ Nevertheless, people living in cities have a greater perception of insecurity: three times as many people in cities say they live in an area with crime, violence or vandalism compared to those living in rural areas. Despite a positive trend, improving safety and feelings of security remains a priority in many cities. Feeling safe in a city is likely to have an influence on levels of activity; for instance, people are more likely to walk from A to B at night or to encourage active recreation among children in residential neighbourhoods.

Opposite: Most people - regardless of age - prefer ramps from even small steps. Planning for elderly with walking disabilities will thus benefit many more people than the elderly.

Case study



Istanbul

Progress towards a more walkable city

In Istanbul traffic is one of the most pressing concerns for urban planners. It is estimated that the population of the city increases fivefold every day, as students, business owners, shoppers and tourists pour into the city. With over 2 million daily commuters, Istanbul faces some of the biggest congestion challenges worldwide. This has prompted the city to look at innovative ways to improve the quality of urban public life and to address existing obstacles to moving around the city on foot or by bicycle.



With ever more economic activity centred in and around Istanbul, pressure on the city's transport system is only expected to intensify.⁵⁴ The percentage of car trips has increased tremendously over recent decades (from 19.3% in 1987 to 26.3% in 2006), while the percentage of walking trips fell from approximately 50% to 16% over the same period.⁵⁵ Cycling in Istanbul is often seen as a recreational activity and currently accounts for only 0.05% of urban traffic. As is the case in many historic cities across the WHO European Region, walking environments were previously characterized by very narrow pavements, high levels of noise and air pollution, and a growing need for pedestrian crossings.



More walking in the historic peninsula

In 2010, the first steps were taken to make Istanbul more walkable. Focusing on the historic peninsula, a group of stakeholders including the sustainable transport initiative EMBARQ and the architectural practice Gehl Architects, along with Istanbul's Fatih Municipality and UNESCO, proposed a pedestrianization project to expand sustainable mobility and create a more accessible area.

The project resulted in a strategy to redress the balance between people and cars by means of traffic-calming measures, improved walking conditions and public transport, and better connections to the waterfront; in practice this initiative led to changes in a total of 295 streets

over a period of two years from 2011 to 2013, which included repavement, updated signage and reorganized waste management.⁵⁶ Work was carried out by the Fatih Municipality and Istanbul Metropolitan Municipality. Within the terms of the pedestrianization project, there are a number of general rules to manage and control use of the new streets:⁵⁷

- during daytime hours (10:00–18:00), the streets and roads are accessible to pedestrians only (outside these hours vehicular traffic is limited);
- only official vehicles, such as embassy, police, postal service, bank, fire service and hospital vehicles, are allowed access during daytime hours;
- vehicles with commercial licenses are allowed access for loading and unloading outside daytime hours;
- street vendors are prohibited from accessing certain streets and roads;
- inspections and enforcement are conducted by the municipal police forces of Fatih Municipality;
- tourist buses are restricted to specially designated routes and stops.

Moving Forward

Following implementation of the project, EMBARQ conducted an assessment survey looking at some of the impacts of pedestrianization.⁵⁸ The report looks at various issues such as:

- user satisfaction;
- safety (both perceived safety and actual accident numbers);
- economy/trade of local businesses.

The assessment shows, among other things, an improvement in perceptions of safety among users of the area. However, there are still some perceived issues with accessibility in some areas, as well as reports of the streets being used by cars and motorcycles.

This type of assessment is an important tool for informing adjustments and redesigns that may be needed in due course. It should also feed into future planning across the city – not only on the historic peninsula itself but more generally across Istanbul, to help the city achieve its aim of becoming more walkable and bikeable.

Encouraging physical activity: the case for co-benefits

Given the serious challenges facing cities today, it is increasingly important to understand how interventions in one area can also have a very positive effect on other issues. Competing demands mean that, while physical activity may be a desirable outcome of urban planning, it is unlikely to be the single or major selling point for city administrators when making policy decisions. Indeed, promoting physical activity may be regarded as a means to achieving some given objective, such as reducing air pollution, rather than as a goal in itself.

In recent years, concepts such as liveability, urban sustainability and urban resilience have moved near the top of the urban agenda. The concept of the “healthy city” might not always be at the forefront of city visions, but it is embedded in the concept of the liveable city, and a study of zoning policies suggests that physical activity as a motivation appears to be becoming more prominent in recent years and is associated with higher levels of policy innovation.⁵⁹ To get physical activity on the agenda, the same study calls for the importance of physical activity to be framed in terms of other dominant concerns, such as liveability, dynamic centres and economic development. Health agencies are encouraged to work in coalitions to focus arguments on behalf of physical activity.

A central concern for many cities today is to plan for improving people’s quality of life and to create urban environments that are responsive to the everyday lives of their citizens. For decades, urban planning was dominated and driven by a strong focus on cars, but this is now changing to a focus on creating cities for people that have balanced mobility systems and in which active mobility is encouraged.⁶⁰

This shift offers a huge potential for co-benefits. For example, encouraging more people to walk has a number of other positive benefits:

- **Safety and security**

Pedestrians are legitimate road users, but they are frequently overlooked in transportation systems. Considering the needs of walkers through transport planning (e.g. reduced traffic speed; traffic calming

Distribution of Space

Streets make up
25 – 35% of the city

Streets
25 – 35%



Everything else
65 – 75%

Streets often account
for 80% of open space

Parks
20%



Streets
80%

measures) can encourage more pedestrians and impact traffic safety⁶¹. At the same time more people walking also provide more eyes on the street, which enhances the sense of safety and may also contribute to crime reduction.⁶²

- **Social cohesion**

More people walking in cities create more activity and opportunity for social interaction, which helps to prevent loneliness and stimulate social cohesion.

- **Equality**

Improved conditions for active mobility are one way of addressing inequality, as walking and cycling are both affordable mobility modes, whereas driving in a private car and even public transport can be too expensive for some low-income groups in cities.

- **Economic vibrancy and development**

Walkable environments, encouraging more people to walk, appear to boost economic prosperity, in terms of value of local services and goods, creation of more job opportunities and increase in retail sales.⁶³

- **Benefits created by opportunities for new jobs related to healthy transport**

Active mobility can help reduce traffic congestion, which is associated with great costs, both at the individual household level and for businesses and society as a whole. At the same time, it has been estimated that up to 435 000 additional jobs might be created if 56 major cities in Europe had the same modal share for cycling as Copenhagen.⁶⁴ Jobs created include cycling-related jobs in retail, wholesale and design, but also various roles in administration, construction and tourism.

- **Environmental benefits**

Encouraging active mobility and reducing motorized transport has a big positive impact on pollution and carbon dioxide emissions, as well as reducing travel times in congested cities. As part of its strategy to address air pollution, in September 2015 Paris introduced a ban on the most polluting trucks and heavy-duty vehicles. Since 1 July 2016, the ban has been extended to exclude cars registered before 1 January 1997 between 08:00 and 20:00 on working days. The legal basis for this measure is provided by a law on energy transition enacted in 2015, which allows municipalities to restrict the circulation of vehicles to improve air quality as a public health measure. The measure is accompanied by an offer of a 50% reduction on a subscription to the Autolib' electric car-sharing scheme and a prepaid bonus of €50, together with a one-year subscription to the Vélib' bicycle-sharing scheme and to the Navigo payment system for public transport. Alternatively, individuals may choose to receive €400 towards the cost of a bicycle (including electric bicycles).⁶⁵



Cyclists have the possibility to do impulsive stops for shopping, thus making bikeable environments good for local businesses in many cases.

What is a healthy city?

A healthy city is not one that has achieved a particular health status – it is defined not by an outcome but by a process. A healthy city:

- is conscious of health and strives to improve it (thus any city can be a healthy city, regardless of its current health status);
- is committed to health and to a process and structure set up to achieve it;
- is one that continually creates and improves its physical and social environments and expands the community resources that enable people to mutually support each other in performing all the functions of life and developing to their maximum potential.⁶⁶

The public space as an overlooked resource

In our attempts to address the pressing issues mentioned above, the overarching challenge in most cities is that the public space is often an overlooked resource.

As planning for cars has dominated cities all over the world, including Europe, many public spaces have been reduced to little more than transport corridors or parking spaces. Their potential to serve many other needs has thus been overlooked.

The ways in which many public spaces are planned and designed have resulted in them becoming “anti-spaces” for people: spaces that do not contribute positively to city life and whose recreational, economic and democratic value to society has been squandered.

Better planning: more effective use of space

Rethinking the planning and design of public space in cities is often met with resistance based on the assumption that scarcity of available space makes it simply impossible to reduce road space for cars and to introduce other functions and services. However, while it is true that open space is a scarce resource in some cities, it is in fact possible to redesign many public spaces in ways that serve a range of needs and purposes.

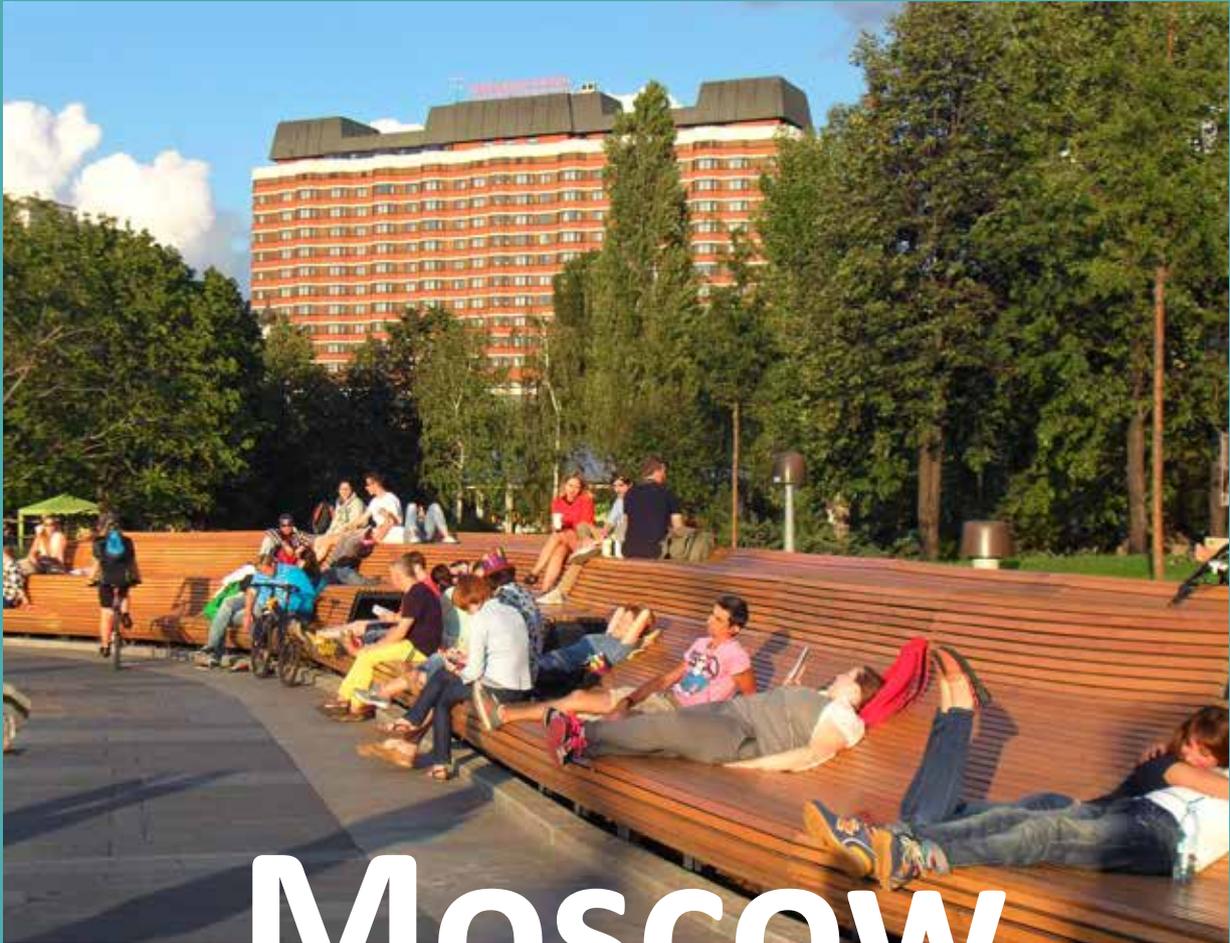
This became evident in New York when the Department of Transport (DOT) started rolling out its “greater and greener New York City” with a number of high-profile street and public plaza upgrades. Surveys have demonstrated that these interventions, such as pedestrianizing parts of Broadway, have both benefited pedestrians and improved travel times for taxis, the economy of local shops and overall traffic safety.⁶⁷



“ It’s a streetfight everywhere, but I think the victory of this fight in New York has implications everywhere and shows how, if you can change the street, you can change the world.”

Janette Sadik-Khan,
former commissioner of New York City DOT⁶⁸

Case study



Moscow

From large scale and planning for cars to planning for people

Like many cities around the world, Moscow has realized that the rules of the game have changed and it needs to compete on new terms. In 2012, the city launched a new masterplan which set out a number of strategic directions for the development of the city; one of these was a plan to upgrade the city centre and to make the streets and public spaces more attractive for pedestrians.

Two challenges stood out for Moscow in 2012: large-scale streets with multiple car lanes and the overwhelming dominance of cars. The result of these two factors, combined with generally poor walking conditions, such as few pedestrian crossings, was that few people were willing to walk. Even for short trips, residents typically chose to take the metro rather than walk. More recently, the city has begun a process of change, focusing not only on cars but on people. Some of the city's most important initiatives include:

- restricting parking in the city centre (adding paid parking, enforcing parking regulations, etc.);
- improving pedestrian crossings;
- providing better connections to the riverfront.

Introducing a human scale in areas of high-rise housing

The importance of public space and of people's needs in relation to public space is not just a city centre phenomenon. In the outskirts of Moscow, private developers recognize that introducing a human scale and creating spaces for people to spend time and play is an effective means of attracting customers to the housing blocks.

Most housing areas are still dominated by high-rise blocks, but in between the buildings attempts are being made to introduce a more human scale, giving people stronger incentives to spend time in public spaces. This involves, among other things, having playgrounds or different types of outdoor community spaces located in between the apartment blocks.



Parking

In a very short time streets and public spaces formerly dominated by cars have been transformed into places for people.



Riverfront

Previously, most of the waterfront near the city centre was surrounded by heavy traffic, with 93% of the space allocated to cars, which created a barrier between the city and the river. This is now changing.

Krymskaya Embankment has been transformed into an attractive and vibrant public space, commissioned by Mosgorpark, the city's parks authority, and designed by the Moscow-based architects Wowhouse. The design aims to create many different options for an active city life in all seasons. Artificial hills and slopes are used for cycling, skating, skiing and sledging. This design offers great opportunities for a wide range of seasonal activities – not least over the long, cold Russian winter – and attracts diverse visitor groups into the one-kilometre stretch of urban park.

Getting the liveable city on the agenda



Encouraging more physical activity through city-making requires that such efforts are part of, or aligned with, the city's strategic political priorities. A thorough understanding of the current state of each individual city is required: what are currently the most significant barriers to promoting physical activity? What other priority challenges could be effectively coupled with efforts to promote physical activity? In which areas would interventions have the biggest impact?

More focused questions then follow. What part of the population should new policies and strategies target or benefit? Which aspects of people's everyday life should be prioritized? Which areas of the city are most in need?

While acknowledging that cities are at different stages of development or face different challenges, there is often a need to prioritize according to local context. However, even in cases where promotion of physical activity is an explicit objective or a recognized means to achieve another related goal, planners and administrators still face valid questions about where and how best to start. Some suggested first steps are considered in this chapter.

Planning for people

While good aesthetics may have a great impact on the attractiveness of new buildings and public spaces, and of the city as a whole, it is important to consider people's most basic needs first.

Start with the basic needs of safety

Safety encompasses a range of aspects, from traffic issues to crime and perceived danger from strangers. Research suggests that if people believe their neighbourhoods are unsafe, children are less likely to play outside and adults are more cautious about walking or taking part in other physical activities,⁶⁹ with a consequent negative impact on body-mass index (BMI) levels.⁷⁰ Furthermore, high crime levels seem to affect women and young children disproportionately.⁷¹ Vulnerable road users are particularly exposed in urban areas, where they mix with motorized vehicles moving at higher speeds. Of the 85 000 people killed in road traffic accidents in Europe in 2013, 26% were pedestrians and 4% were cyclists.⁷² The safety of these users is a fundamental priority. In traffic planning, safety concerns often lead to a separation of road users and pedestrians by means of pedestrian bridges or underpasses, but most people do not find these attractive, and they will attempt to cross at street level. Planning thus needs to consider these human behavior patterns.

Safe routes

If pavements and cycle lanes/paths are not seen as safe, the chances are you will only attract those who are brave enough to risk exposure to dangerous situations, and not those who are most in need. Evidence that women, children and older adults are using them is a good indication that safe routes for cycling have been created.

Focus on where people are

Many cities have focused on making city centres more walkable and bikeable. Such interventions carry high symbolic value, generally attracting a great deal of attention and helping to build political momentum, but it is just as important that planning initiatives focus on local neighbourhoods – on people's immediate living environment. Such a shift will help cities direct their attention to how physical activity can more easily and conveniently be integrated into people's everyday lives.

Provide freedom of choice

In many city areas, there is little real alternative to driving. Encouraging more physical activity is not a question of completely abandoning the car; rather, it is about providing people with the freedom to choose. It should be possible to use whatever mode of transport (or combination of modes)

is best suited to the purpose of a trip, whether it is driving, walking, cycling or using public transport. Planning for citizens to have a genuine freedom to choose also means ensuring that they have a high degree of participation in, and control over, decisions that affect their lives, health and well-being.

Prioritize where it is most needed: securing equity in health

Numerous studies have shown that citizens who already have high levels of physical activity tend to live in walkable urban neighbourhoods. If this issue is not addressed, it is almost inevitable that health inequalities in cities will grow even greater.



A different approach to planning

Working with the routine of urban planning

Planning to encourage more physical activity in cities does not mean starting from zero and creating a new vision overnight. As we saw in the earlier discussion of co-benefits (see pages 28-30), promoting physical activity can be worked in with other policies, plans and interventions in the urban planning domain and can take a stepwise approach. One obvious area of intervention is abandoned industrial spaces in need of redevelopment, where the creation of recreational paths and activities can act as a catalyst for a larger transformation. One example is Tempelhof in Berlin, where a former airport area has been transformed into a giant recreational park. In this park, there are many opportunities and facilities for physical activity such as ball games, roller-blading, walking and cycling; these exist alongside more passive recreational areas, such as spaces for barbecues, all of which make the park attractive to lots of different people. This kind of intervention is appropriate for any city but is especially relevant where resources are limited and effective use of finances is crucial.

Identify areas of concrete co-benefits and develop new funding streams

Many policies are developed within their own sector (health, urban planning, education, etc.), thus missing the opportunity to reap cross-sector benefits in policies, strategies and projects. More integrated policies can help pave the way for long-term investments in the built environment of cities, and this is likely to increase levels of physical activity.

Long-term commitment

While large flagship projects such as “bikeathons” and bicycle-sharing schemes attract attention and publicity, on their own they cannot bring about high-impact and sustained change. For this reason, it is important to secure long-term commitment to changing the “hardware”, where interventions to promote physical activity are implemented continuously and result in structural changes to the urban fabric that encourage behavioural change. This will then amplify the long term impact of other projects.

Vision and pragmatism

Processes of change rely on vision. History shows how strong vision often helps pave the way for more concrete strategies and actions.

A vision is often formulated in positive terms: for instance, “achieving sustainable and healthy transport for all”, “making the city a good place to live and invest”, or “making the city carbon-neutral” or “more competitive”. Cities may also have ambitions, such as to become a “green capital” or similar. A good example is the Sustainable Edinburgh 2020 vision, which states that in 2020 Edinburgh will be “a low-carbon, resource-efficient city, delivering a resilient local economy and vibrant flourishing communities in a rich natural setting”.⁷³ As such, focused efforts to reduce motorized transport and increase active transport are likely to be **means to achieve** a wider vision or goal, and increased physical activity can be a by-product of specific measures taken to achieve that goal. In implementing action to achieve their goals, cities need to develop strategies and policies that recognize the need for a stepwise approach; they need to ask: what are possible first steps and how might they lead to desirable change in the long term?

For example, it is not possible to convince all citizens, in all different circumstances, to change their travel behaviour overnight. An important first step is to introduce more attractive options and to carefully consider which kinds of behaviour might be easier to modify. An example is targeting short journeys made in cars. In Europe, more than 30% of car journeys cover distances of less than 3 km, and 50% less than 5 km.⁷⁴ If the process of travelling is made comfortable and convenient, such distances can easily be covered by walking or cycling.

Thus, strategies and interventions are more likely to succeed if they are targeted at these short journeys rather than at every journey made in a city. At the same time, by reducing the frequency of short journeys, such interventions could help reduce emissions of air pollutants, which are particularly high in the first few minutes after a car engine is started (the so-called “cold start”).⁷⁵



Pilot projects

Testing the vision

The trend towards launching more pilot projects represents a huge opportunity for cities to adopt both a visionary and a pragmatic approach to building more liveable cities – an approach which is likely to have a positive effect on citizens’ physical activity.

Many cities have had great success using pilot projects as a strategic tool to test new solutions on a small scale. This has allowed them to build a political case for longer-term change and more radical interventions, such as permanently closing streets to car traffic.



1. The City of Prague has adopted a transformation strategy for Magistrála street cutting through the city center, which involves taking both small, medium and long-term steps towards a future transformation. These include e.g. safer street-level pedestrian crossings and connections to adjacent streets and squares.

2 & 3. Many small changes can have a great impact. In Almaty, Kazakstan the picture to the left is an example of cycle paths often being disconnected by barriers and the simple removal of a piece of railing (picture 3) has made the cycle path more direct and connected.



Implementation





To plan for physical activity in cities is a way of putting people – its citizens – at the centre of planning. To do so, it requires a fundamental understanding of human needs and behaviours. This chapter discusses in more detail the practical implementation of strategies and concrete design solutions for urban environments that are more conducive to physical activity.

A human starting point for more physical activity

Regardless of where they are located in the world, urban citizens share a number of human characteristics:

Size: the human scale

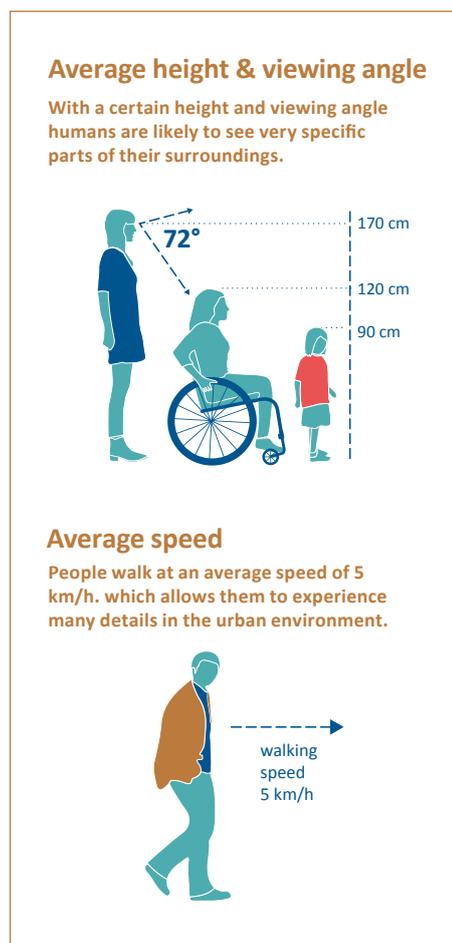
Human proportions are an important starting point in the pursuit of human-centred planning. The size of the human body makes some spaces feel out of scale and intimidating. The dimensions of public spaces have a considerable impact on a person's level of comfort, as well as on the perception of distance, which in turn may motivate or discourage people from engaging in physical activities such as walking, cycling and playing.

Speed

Humans are slow, forward-moving beings who travel at approximately 5 km per hour, and slightly faster when cycling. However, with the introduction of the car, many city areas have been planned for different speeds, with an architecture designed for 50 km per hour (or more). The results are big signs and few details in the urban environment, all of which make for little stimulation and variation for people walking or cycling. Moreover, high urban speeds represent a real challenge in terms of encouraging more walking and cycling. Reducing speed does not only influence the chance of survival in case of an accident,⁷⁶ but it generally affects the perceived sense of safety. Rather than separating different users it is important to adapt traffic calming measures to suit the needs of different urban contexts - from high streets to residential streets.

Senses

Planning that looks to stimulate the human senses will have a big impact on the experience of walking, playing and cycling in a city. About 75% of all stimuli are received through our vision, and on the basis of physiological studies that show that humans need sensory stimuli at short time intervals, the architectural pioneer Jan Gehl has argued that the most active and attractive streetscapes are those that offer fresh visual details every four or five seconds.⁷⁷ In addition to visual cues, people are affected – both negatively and positively – by the smells and the materiality of surfaces, as well as by the sounds and sound levels in public spaces. Sound levels in excess of 65 decibels do not allow conversation, and such conditions are generally not considered to be comfortable environments in which to walk and cycle.





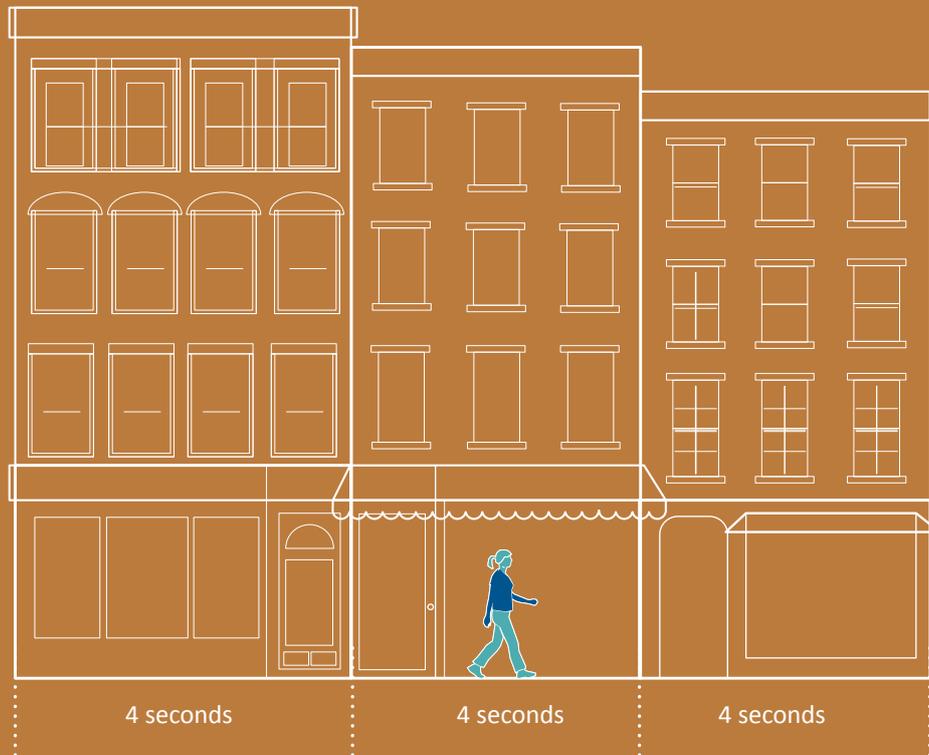
Convenience and flexibility

In addition to information gained through the human senses, a number of other factors affect people's behaviours and general motivation towards physical activity. One such factor is the busy lifestyles that are now so prevalent and the consequent lack of time, which makes it difficult for many people to fit daily exercise into their everyday lives. Convenience and flexibility of choice should therefore feature prominently in plans to promote physical activity in cities, so that it can be accommodated without too much effort in people's daily routines. This means ensuring that the necessary infrastructure is accessible, that people do not have to go out of their way to get where they need to go, etc.

Photo left: Street planting speaks to the senses.

Photo right: Many street signs are made for cars and not for people walking.

Need for Stimuli



1000 stimulus
per hour

1 every
4 seconds

People-centred planning principles

To increase physical activity through the planning and design of the urban environment requires action at many levels, ranging from overarching policies and large-scale interventions to interventions that are on a small scale and highly detailed. Some of the policy areas that are particularly relevant to efforts to support physical activity in cities are now considered.

Land use policies

Two trends within land use policy have proved to be especially counterproductive when it comes to encouraging physical activity in cities: urban sprawl that leads to increased car dependency and mono-functional zoning that increases the need for transport. In fact, physical activity is best supported through densification and mixed-use land policies, as these make it more possible to keep homes, workplaces, schools, shops and recreational facilities within walking or cycling distance. Recent research has suggested that population density, in particular, has a significant impact on physical activity.⁷⁸ In spite of this evidence, a recent examination of zoning provisions has shown that health and physical activity are not among the major drivers of land use policies and interventions.⁷⁹

Public transport

Policies in support of public transport are likely to have a positive effect on levels of physical activity, as most people either walk or cycle to and from their train, bus, etc. In Scandinavian cities, 98% of people using public transport begin their journey on foot or by bicycle. Even in the countryside, 90% arrive as pedestrians or by bicycle. In the USA, an estimated 90% of journeys on public transport involve walking at the start or end of the trip.⁸⁰ For this reason it is important to make public transport an attractive choice – by offering reduced fares, for instance, and providing improved service, as well as by the design of the physical environment itself.⁸¹

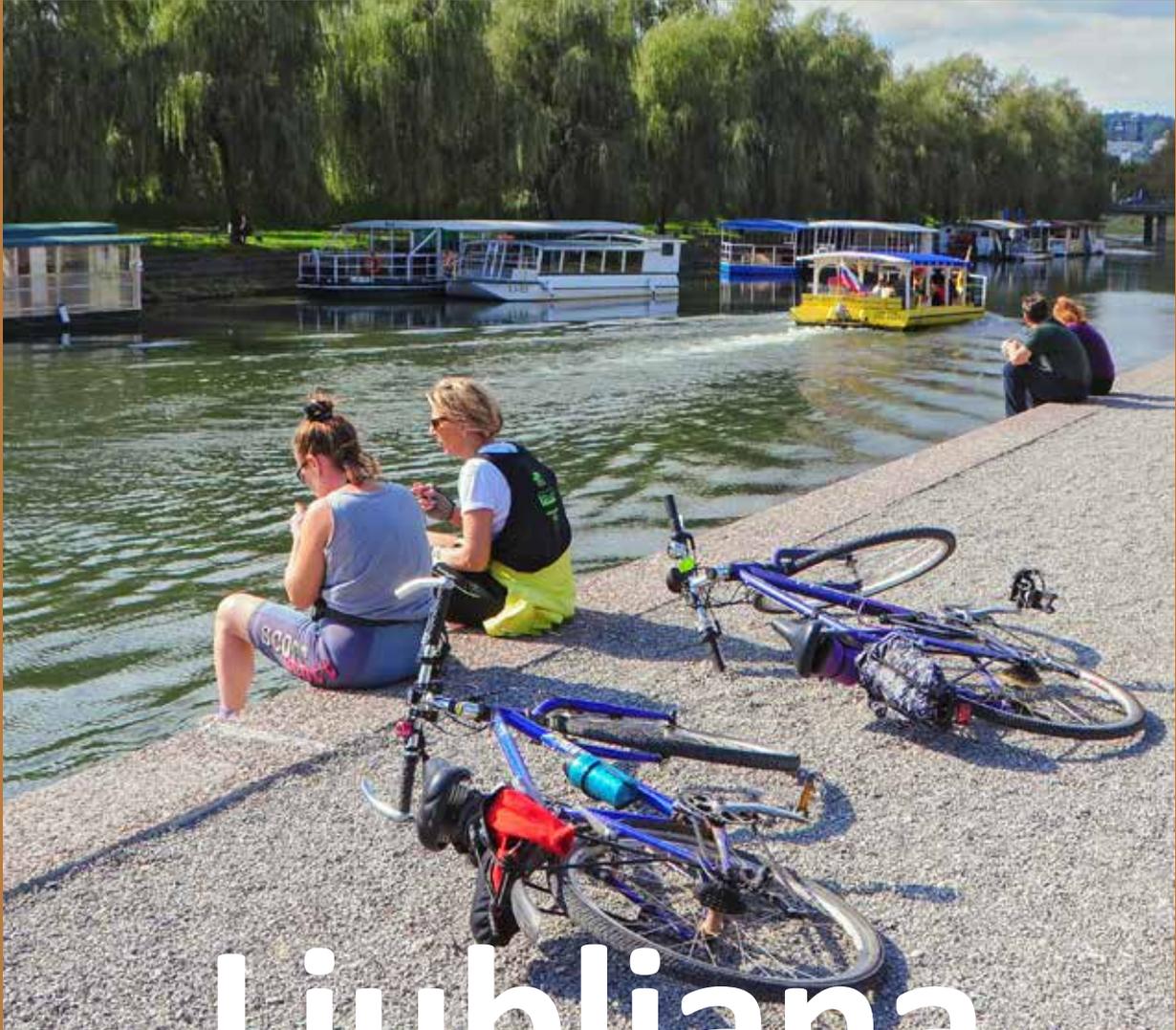


Bicycle- and pedestrian-friendly policies

Bicycle- and pedestrian-friendly policies involve mechanisms that encourage more journeys on foot or by bicycle. In Europe, there are great variations in the levels of walking and cycling. Cities with the highest numbers of cyclists are typically found in Denmark, the Netherlands and Germany, while the percentage of people walking is notably high, representing more than 50% of the total modal split, in cities in southern and eastern Europe.⁸² Exploring ways to increase walking and cycling should build on this knowledge of existing local trends. Policies for more active transport, which aim to improve the conditions for walking and cycling, may involve both infrastructural and non-infrastructural changes. These include measures such as speeding regulations and various incentives to leave cars at home, such as congestion charging and parking policies.

Above: Removal of snow on the bike lanes first is an example of a policy which prioritizes cyclists.

Case study



Ljubljana

Reintroducing cycling

Along with Amsterdam, Copenhagen and Berlin, Ljubljana has become one of the top cycling cities in Europe, in terms of the cycling percentage in the total modal split.⁸³ Today in Ljubljana, 12% of all journeys are made by bicycle.

This is the story of retrieving a lost culture of moving by bicycle.

Cycling in Ljubljana is not a new phenomenon. In the 1950s and 1960s cycling clubs were on the rise, and the city looked for inspiration elsewhere on how to build a good cycling infrastructure.⁸⁴ However, with the influx of cars throughout the 1970s, the city witnessed a strong decline in cycling, and the percentage of car use, at almost 60%, is amongst the highest in all European cities.

Since the beginning of the 2000s, Ljubljana has again been working strategically towards more cycling in the city, with local NGOs acting as important advocates and pushing the cycling agenda. In addition, a number of EU projects have been catalysts for this change:

- CIVITAS Mobilis (2004–2008): a project which resulted in an increased number of bicycle racks in the centre of the city.
- CIVITAS Elan (2008–2012): a project which, among other things, limited and penalized illegal parking and introduced a coordinator for cycling within the municipality. In addition, a multi-stakeholder cycling platform was established and the Comprehensive Cycling Strategy was discussed and drafted.⁸⁵

Being part of such EU projects often provides the necessary seed funding to jumpstart projects. It also helps to get cycling on the agenda of various agencies at national, regional and local levels.

Cyclists and pedestrians

Like many other European cities, not least in southern Europe, Ljubljana has a high percentage of people walking (about 20%). As strategies to promote cycling are developed, the relationship between cyclists and pedestrians is critical, as has been demonstrated by an extensive citizen-engagement process for developing a cycling strategy for Ljubljana. In the historic centre, redesigns of public spaces and new infrastructure projects have made integrated spaces for both cyclists and pedestrians. Among these is the redesign of many bridges, where car traffic has been restricted to make room for both pedestrians and cyclists; this is an acknowledgement that if both modes can coexist, it will be to the benefit

of a more liveable city with more sustainable modes of transport.

Major cycling initiatives

- A new bicycle scheme, set up in 2011, is now widely used.
- One of the main avenues, Slovenska Street, has been partly closed off to motor traffic.
- Since 2012, it has been permitted to bring small, folding bicycles on buses.



The Triple Bridge **BEFORE**



The Triple Bridge **AFTER** the redesign - with integrated spaces for both cyclists and pedestrians

From policy to implementation

In the translation of overall policies to concrete implementation, while retaining a human-centred focus, it may be useful to reconsider some contemporary planning principles.

Urban density – or proximity

Many cities are concerned with densification, involving both population and building density, as a tool to achieve more sustainable development. However, solutions may look (and feel) very different on the ground than on paper. Density is a highly contested concept. High density is often associated with tall buildings, but it can be achieved in quite different ways.

Taking a more human-centred approach to planning, it might be more useful to talk instead about proximity, as this term stresses the human experience. A city area may have a high density of shops or public transport options, but this information does not necessarily reflect how things are experienced at ground level. Are facilities and functions easy to get to, or do various kinds of barrier make them difficult to access? Are facilities and functions clearly visible, or are they hidden at split levels or behind closed facades?

Planning for more – but also better – urban green

Planning for more urban green makes sense for many different reasons, quite apart from stimulating physical activity. It is an important part of interventions aimed at climate change adaptation, and it is an integral part of making cities more liveable, as study after study has suggested that green areas have a huge impact on our mental health and sense of well-being.⁸⁶ Urban green is, however, far from equally distributed in cities, and some of the most disadvantaged and socially deprived urban areas often suffer from a lack of green areas.⁸⁷ Introducing more urban green is now part of many city plans across the world, but often the focus is on quantity, not quality.

Planning documents might have guidelines such as “everyone should have a park within 500 metres of their home” or “everyone should live within a 15-minute walk of a local park” – the kind of statements given in a 2008 planning document,



Green and Blue Copenhagen.⁸⁸ Rarely will such documents have guidelines on “how to get to the park” or “the quality and experience offered once in the park”.

Research shows that more qualitative factors influence the use of green areas. These factors include aesthetic qualities, practical features such as water fountains and toilets, things to watch in the park (other people and activities, natural elements) and park maintenance.⁸⁹ Also of great importance is the route to the green area.

Photo left: Usce Park, Belgrade is today a big, green island. A new strategy for the park sets out to improve connections through the park as well as integrating the park into the surrounding street network.

Photo right: Not all bike paths can run through green environments, but, if possible, they provide an important supplement and an attractive alternative to the street network. The Green Route, Frederiksberg & Copenhagen, Denmark.

More qualitative planning principles

Supporting physical activity through more human-centred planning in general requires more qualitative planning principles. While quantitative measures such as extent of pavements or cycle tracks are important, it is equally important to consider qualitative measures, such as:

- for pavements: width of pavement, lack of barriers, even surface, level of protection from motorized traffic, noise levels, good lighting, presence of trees to protect against heat and sunlight.
- for cycle tracks: level of protection and separation from car traffic, even surface, good lighting, continuity of network.

Physical activity is not just about getting from A to B

To promote physical activity, there should be more integrated approaches to implementation in which different kinds of need are considered at the same time. In other words, more physical activity is not brought about simply by focusing on walking, cycling or playing. Crucially, it is about making cities more appealing to spend time in and to attract people to get out and use the city.

The street as a public space

Open space in cities is generally perceived as a scarce resource. Streets typically make up 25–30% of all city land and 80% of all open space. This makes streets important places for both investment and intervention, but it also shows that streets need to serve many needs at the same time. They need to function as transport corridors for different traffic modes, not just cars, as well as providing an open space where citizens can meet. For this reason, a holistic approach is essential.

A good street for walking is also a good street for stopping, standing and sitting. Bollards that can be perched on provide opportunities for walkers to stop and rest, while sitting options provide the basic conditions for social life. People sitting are evidently not engaged in physical activity, but they provide a social ambience and an informal kind of surveillance, and such streets are likely to feel safer and more pleasant to walk along than those that offer few opportunities for social interaction. An inviting and attractive walking environment also depends on the buildings along the street. Planning with the human senses as a starting point entails close attention to the quality of facades. The number of entrances, the level of detail and dynamic use of ground floor space in buildings (e.g. public functions, transparency) all have an impact on the attractiveness of the walking environment as well as the perceived distance to walk.

Overlap of programmes and facilities

Physical activity can also be encouraged through more joined-up thinking – for instance, by adding a physical activity feature to spaces and functions that otherwise serve different purposes, as well as by making use of resources that already

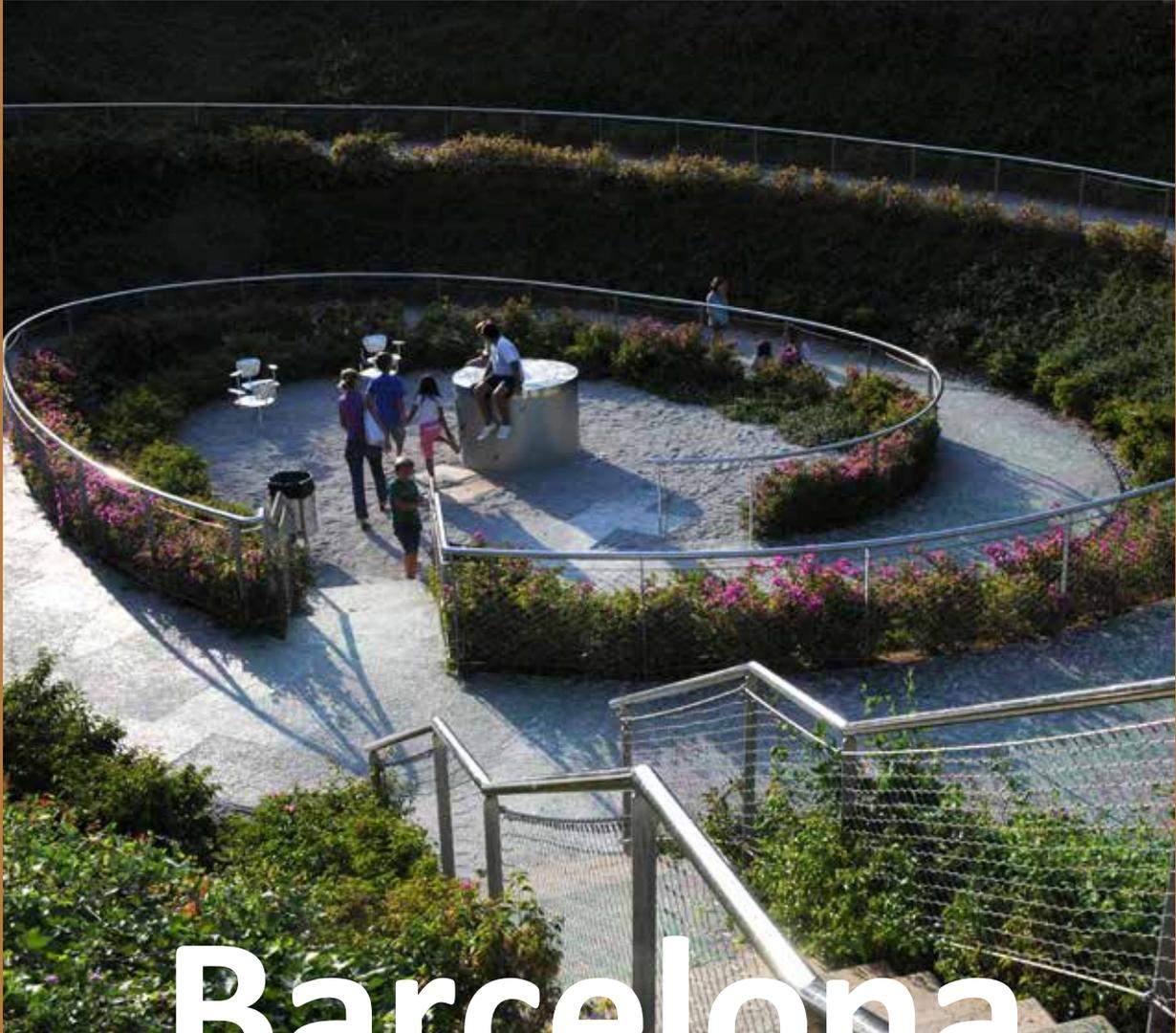


exist but may currently be closed off from the public. Opening up schoolyards to the public outside school hours or simply integrating schoolyards into the public space is a good example of using facilities more effectively and making resources available to more people. Going to a playground might not be a conscious decision, but moving around the city will suddenly allow people – both children and adults – to engage in spontaneous play. One example of this is trampolines in public spaces. Again, it speaks to many urban dwellers' need for convenience and flexibility.

Another way to create attractions for those who are not seeking to be physically active is by having more overlap of programmes in the same spaces or in the same buildings. This includes, for instance, combining cultural activities with physical activities.

Above: Israels Plads in Copenhagen, Denmark combines a food market, an occasional flea market and sports facilities in the same public space. During the day time it functions as a school yard, but it is open for informal play during the rest of the day and week.

Case study



Barcelona

Reconquering public space for the public

Barcelona is one of the most renowned examples of how to focus on public space as a catalyst for city change. It all started with a strong desire to build a new culture in the city.

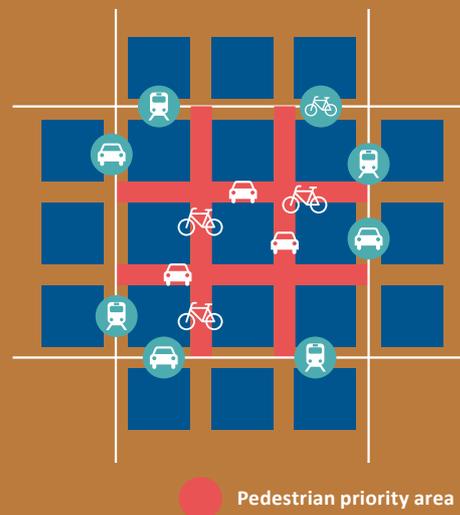
In 1982 the leading architect Oriol Bohigas initiated a new urban policy, which highlighted the need for visible improvements for the citizens of Barcelona. The tool was not a comprehensive plan but a commitment to implement a number of public space projects throughout the city, including the more deprived neighbourhoods. According to the policy, every neighbourhood should have its own “urban living room” and every district its local park, where citizens can meet and children play. It is characteristic of Barcelona’s urban space policy that public spaces arose from the historical need for community meeting places rather than from general traffic considerations. Public spaces were thus created mostly by tearing down old worn-out housing and industrial buildings.

During the period 1980–2000, the city’s image underwent a veritable transformation. Thus the foundations were laid for an attractive city where people choose to spend time outside and where the function of public space is widely recognized.⁹⁰

“ We want these public spaces to be areas where one can exercise all citizen rights: exchange, expression and participation, culture and knowledge, the right to leisure. ”

Salvador Rueda, director of the city’s urban ecology agency⁹²

Opposite – Parc Central del Poblenou. Barcelona’s public space policy resulted in a broad range of public spaces: from Plaza Soller, a simple plaza in a very dense neighbourhood, to all the new public spaces and parks along the waterfront.



The superblock

The long tradition of developing public spaces in Barcelona laid the foundation for new initiatives which address more recent and pressing issues in the city, including traffic, noise and pollution. As part of a new mobility plan, the City of Barcelona has introduced the “superblock” concept, where a nine-block area is converted into a unified mega-block neighbourhood. The aim is to decrease urban traffic by 21% and free up close to 60% of road areas for reuse as “citizen spaces” – everything from cycle paths, widened pavements and small public spaces for various activities (for example, markets, children playing) to more urban green. Most traffic will be limited to the boundaries of the superblocks, while within them motorized transport is restricted to local residents and deliveries.⁹¹

Equitable and responsive planning

Securing more equity in health and physical activity requires, first and foremost, that the issue of health inequality is understood and acknowledged. Many of the social determinants of health are closely linked to conditions in the urban environment, such as residential segregation, transport options and public safety. Consequently, the social determinants of physical inactivity can be effectively addressed, at least in part, through urban planning – which is one very strong argument for truly integrated planning.

Numerous studies have found that health problems in cities, such as high percentages of inhabitants suffering from physical inactivity or obesity, are often concentrated in low-income neighbourhoods; these are also the areas that do not perform well in terms of having an attractive public domain (which comprises aspects such as park safety, maintenance and good walking conditions).⁹³

Other research on upward social mobility in the USA has found that social mobility among children is affected by the neighbourhoods they live in and by the amount of time they spend in those neighbourhoods.⁹⁴ Upward social mobility is more likely to occur in neighbourhoods that have:

- elementary schools with higher test scores;
- a higher proportion of two-parent families;
- higher levels of involvement in civic and religious groups (social capital);
- more residential integration of affluent, middle-class and poor families; and
- less sprawl (shorter commutes).

Such studies underline the need to develop more equitable approaches to the planning of urban environments, regardless of gender, socioeconomic factors, race and ethnicity. While factors such as school results, family status, civic engagement and social capital may seem



Inspiration from Sweden

In Sweden, the challenges of social inequities with respect to health and well-being have received a great deal of attention in recent years, most notably in the Malmö Commission, which has thoroughly documented the health inequalities in the city. The commission's report considers strategies for how to address these inequalities and sets concrete goals, including reducing residential segregation to the extent that it reflects health inequalities. One concrete action is to transform barriers between neighbourhoods into linking areas.⁹⁵

to have very little to do with people's physical activity patterns, a number of studies reveal that these factors are in fact strongly associated with physical characteristics of cities such as walkability and liveability.⁹⁶ For example, analyses indicate that people living in walkable, mixed-use neighbourhoods have higher levels of social capital compared with those living in car-oriented suburbs. Respondents living in walkable neighbourhoods were more likely to know their neighbours, participate politically, trust others and be socially engaged. What is needed is a process that leads to a more profound understanding of how different demographic groups experience and use place, and how interventions that change the "hardware", or physical infrastructure, can be responsive to such experiences and needs.

Ageing cities

With a growing elderly population, special attention needs to be given to how the urban environment can support senior citizens in being physically active. Physical activity among the elderly is critical for social participation and well-being, but also as a means to prevent falls, reduce functional decline and help manage chronic conditions.⁹⁷

A study conducted among elderly urban citizens in Finland found that, for them, the ability to get out of their homes and go to the local shops is especially important and enhances the quality of their everyday lives.⁹⁸ This highlights the need for senior housing to be well integrated into local neighbourhoods and for special attention to be given to the needs of senior citizens, such as safety and high levels of accessibility in streetscapes. A study from California found that a lack of good street lighting, heavy traffic and poor access to public transport are the factors most closely associated with decreased physical activity among older people.⁹⁹

Equal opportunities for children

There are alarming rates of obesity and growing sedentary trends among children and young people,¹⁰⁰ not least due to new lifestyles where children and young people spend an increasing amount of time every day on electronic media. It is clear, therefore, that special attention needs to be given to encouraging such people to be more physically active in cities. Children growing up with inactive parents seem to reproduce this behaviour,¹⁰¹ thus exacerbating the situation. Indeed, a key way of making children and young people more active seems to be to allow them freedom to access outdoor spaces independently of adults.



Everybody needs safe crossings but especially elderly, who tend to cross at a lower speed.

A study at the OPUS research centre, University of Copenhagen, has shown that children who cycle to school are able to concentrate at school for longer periods of time than children who are taken by car or go by bus.¹⁰²

Co-benefits of planning for children

In the past decade, the City of Copenhagen has built and renovated many playgrounds as part of a strategy to attract young families. The Urban Life Account, which monitors trends in the city's urban life, has documented a new trend: an increasing number of adults are engaging in play activities, often using these new facilities.



Zoom in on the everyday life

The Living Area

Importance of good edge zones

The way in which buildings meet the street or the space around them affects how living and being in an area is perceived and increases the possibilities for social interaction. This, in turn, makes walking or cycling more attractive and enhances the perception of safety, which encourages more people to walk or cycle. Good edge zones are characterized by “soft” elements, such as open and transparent façades with doors and windows, a mix of functions along the street, use of details and variation in the façades, such as steps for sitting or resting, and stimulation of the senses – for instance, through the colour of the façades, planting alongside buildings, and vertical lines or features that introduce separation or “breaks” in a façade.¹⁰³ Good edge zones are also important in residential areas, where features such as small front gardens, outdoor staircases and planting can make edge zones “softer” and increase the likelihood of interaction and activities taking place.¹⁰⁴



Soft edges with planting and balconies in one of Vienna's new residential developments.

Parking in housing areas

Car ownership in European cities is generally high, which means that there is a high demand for parking in residential areas. But even with a car at their disposal, it is possible to encourage people to engage in daily physical activity – for instance, by locating parking in a central location, where some walking is required (this might also encourage people to either walk or cycle in the first place, if they are not going too far). In a similar vein, some new housing areas have experimented with having shared facilities such as garbage facilities placed centrally, thus building on daily habits of walking while at home and bringing the additional benefit of meeting neighbours.

Designing common spaces

Some housing areas are characterized by big open spaces, such as communal roof terraces, yards and gardens, which lack any clear definition of “ownership”. Open spaces in housing areas are often not used because people are uncertain of who they belong to and what they can be used for, or because building regulations restrict particular activities and functions in communal spaces, such as playing, using yards as protected parking places for bicycles, and taking bicycles in lifts.¹⁰⁵



Play streets and play areas

Especially for children, having areas for play in the immediate vicinity of their home is of huge importance. Studies show that children with a park playground within 1 km of their homes were more likely to be of a healthy weight than children without a park playground near their homes.¹⁰⁶ Safe streets for play are also important as they allow children to be less dependent on their parents accompanying them and have greater freedom to go out and play.

1. Sønder Boulevard in Copenhagen functions as an extension of people's living rooms and it invites for many recreational activities for both children, young people and adults.
2. Some streets in BO1, Malmö, Sweden, are car-free.
3. Safe streets for children to play, Vauban, Germany.



Zoom in on the everyday life

The commute

Incorporating active transport as part of the daily commute is a very effective means of reaching the recommended minimum of 150 minutes of weekly moderate exercise. This requires a good understanding of where people are commuting from and where they need to go – the commuting routes in the city.

Connected and integrated networks

Making active transport part of the daily commute requires a willingness to build a connected and integrated network that connects people to where they want or need to go. The alternative – putting pedestrian and cycle paths where it is easiest or least inconvenient to put them – runs the risk that the infrastructure is simply not used, and thus frustrates the aim of making people more physically active. What is in fact required is:

- a continuous and barrier-free pedestrian and bicycle network;
- a network that is linked to major destinations and daily functions;
- the removal of existing missing links in the network;
- direct routes with few detours;
- connections created between local and regional networks.

In addition to the route itself, it is important to build in good-quality cycle-parking facilities at the end destination. In cities with high numbers of cyclists, bike parking is a recurrent issue as it needs to function well alongside other public-space features, such as places to walk and places to sit.

Active-transport commuting for children

Walking or cycling to kindergarten or school is one way to introduce habits of physical activity from an early age. Safety issues or long distances are barriers that prevent many children from such active “commutes”. Mixed neighbourhoods with local schools that are close to homes are a prerequisite to encouraging children to walk or cycle. In Denmark, the number of children cycling to school is decreasing, which could be explained by the fact that many



High quality public space in front of the train station in Vejle, Denmark.

Inspiration from Denmark

In Copenhagen the municipality has gradually expanded the cycle track network by using road repairs as an opportunity to install cycle tracks or paths, thus making more effective use of infrastructure spending. It is also a sign of the city's long-term commitment to becoming more and more bikeable.



1

schools are being merged and smaller local schools are closing down.¹⁰⁷

Equally important is the creation of safe routes, either by making separate paths or by reducing speeds. Active transport also needs to be supported at the end destination – the school or kindergarten: good parking facilities for bicycles, scooters, etc. need to be provided.

Intermodality and quality of transport hubs

It is not realistic to suppose that all journeys will be made solely on foot or by bicycle, so it is essential that networks are well integrated with public transport options. Intermodal connections must be easy and smooth, good parking facilities for bicycles should be available, and access should be simple and direct whether you arrive on foot or by bicycle. And to make these multi-modal trips an attractive option, it is important that transport hubs themselves are of a high standard: they should be safe and comfortable places to wait; all signage should be clear and legible; and ideally they should offer other services that make it easy to attend to daily errands as part of the journey (e.g. small shops or kiosks; cash machines).



2



3

1. A good waiting experience at a bus stop in Horten, Norway.
2. Parking facilities for scooters in front of a school in Copenhagen, Denmark.
3. A safe school street that supports commuting by foot or bicycle, Odense, Denmark.



Zoom in on the everyday life

Spending free time

As sedentary lifestyles become more prevalent all over the world, public spaces in cities play an important role in enticing people to spend more time outside, and hence to spend more time being physically active.

Planning with the local climate in mind

Cities across the WHO European Region have very different climates, and opportunities for spending time outside vary accordingly. Planning strategies to encourage more outdoor recreational life need to take these local climatic conditions into account. In some parts of the region, strategies are needed that focus on winter activities and allow for features in public spaces that support such activities. In other areas, meanwhile, summer heat is the main issue, and shade must be provided if people are to be physically active in outdoor spaces.

Combining good routes with facilities that encourage informal, spontaneous use

Some very successful public spaces provide effective routes for pedestrians or cyclists to move through, while also offering incentives to play and exercise along the way. There is a broad range of such recreational components, including water features, trampolines, small skating rinks and basketball nets, as well as more subtle landscape features. With more people engaging in self-organized sports, public spaces need to meet new needs for flexible use – over the course of the day, week and year.

Old industrial infrastructure: a recreational resource

Green areas in cities are sometimes a scarce resource, so recreational spaces have to be developed in other settings. In many cities former industrial sites have been transformed into recreational resources. Some such developments may become attractive venues in their own right (e.g. new city parks), but others serve as junctions, connecting different parts of the city by means of new walking and cycling paths.

Parks and physical activity

Research has suggested that parks work via both direct and indirect effects on physical activity. The availability and quality of green spaces has a beneficial impact on people's stress levels and mental well-being, and high quality green spaces can also lead to more physical activity. Some characteristics of green spaces are more likely to encourage physical activity than others such as size, aesthetically pleasing natural environment, ease of access to urban destinations and facilities/amenities¹⁰⁹. Equally, an attractive physical environment that makes a place appealing for social contact, meeting people or doing things together may support physical activity as an incidental benefit.



1



2



3

1. Ice skating rinks is a popular way to invite for outdoor activities during the dark and cold winter times.
2. Attractive waterfronts invite people to go walking and to spend time outside. Lisbon, Portugal
3. Invitations for spontaneous physical activity can take many forms, such as this wooden deck along a pathway running through Copenhagen Business School, Frederiksberg, Denmark.



Zoom in on the everyday life

Daily errands

In some cities, various factors, such as long distances or mono-functional business parks far removed from residential areas, mean that it is not realistic to expect the usual mode of transport for commuting to change in the short term.

In such contexts, priority can be given to encouraging more physical activity as a normal part of running daily errands. So, when going to the doctor or the supermarket, how can people be encouraged to walk just a little bit further, a little bit more often?

The supermarket car park

Regardless of the distance between home and supermarket, some people are likely to take their car as this is the more convenient option. The result is car parks with high volumes of people passing through every day. Most car parks, however, are only designed for cars, with little thought given to how drivers and passengers may continue their journey on foot. If parking is made available in a few locations, interconnected by attractive routes for walking that serve key destinations along the way, it is possible to encourage more walking and to combine activities.



Attractive spaces in front of supermarkets can encourage people to walk and spend some time outside rather than quickly leave by car again.



1



2

1. Temporary playful elements in the street create unexpected experiences in the every day life of daily errands.
2. Non-interrupted sidewalks along a shopping high street provide a safe and comfortable space to walk along.



Evaluation



If urban planning strategies and projects are to have a real impact on people's patterns of physical activity, it is vital that these plans set clear goals and criteria of success that can later be measured and evaluated.

There is a growing number of cities that have initiated interventions that promote walking and cycling. While interventions such as pedestrianized streets and bicycle-sharing schemes are likely to increase awareness of active mobility, it is important that such interventions are targeted and adapted to local conditions and challenges in order to have a relevant and sustained impact. Even more importantly, we must learn from these interventions and the effects that they have. To determine whether they really achieved what they set out to do, proper monitoring and evaluation are required.

Evaluations in urban planning and public health

Evaluation as a concept spans many different models, including plan assessment, plan testing and evaluation, plan critique, comparative research and professional evaluation, and post-hoc evaluation of plan outcomes.¹¹⁰

This section explores the potential of post-hoc evaluation as a tool for measuring the effect of urban planning initiatives on levels of physical activity.

In general, there is a lack of evaluation models within the field of urban planning, and it is not common practice to carry out evaluations. If done, most evaluations are limited to “little E” evaluations that measure whether the prescribed plan or project actions were carried out; often they are no more than an assessment of whether a project met its targets in terms of time and money. “Big E” evaluations, on the other hand, look at the outcomes of plans or projects, setting out to explore underlying topics or themes such as economic vitality and health. In contrast to urban planning, this kind of evaluation is relatively common in the field of public health, which has a much stronger tradition of carrying out longitudinal impact assessments that measure the effects of a certain treatment or health intervention, including economic impact and cost savings.¹¹¹

Such evaluations may be rare in urban planning, but there are exceptions. New York City, for example, has put a lot of effort into developing different types of “big E” evaluation to measure the outcomes of public-space upgrades in relation not only to factors such as traffic flows, economic turnover and accidents, but also to more complex issues of social justice.¹¹² Another example is the city of Malmö in Sweden, where the Malmö Commission has set out to introduce health targets for urban development that can help to steer the city’s future planning.¹¹³

To work towards more and better physical activity in cities, there is an obvious gap to be filled. While the question of how best to carry out evaluations clearly needs rethinking, there is also a huge opportunity to combine competences from both public health and urban planning in order to learn much more about how cities can stimulate physical activity. Certainly, as a starting point, post-hoc evaluations need to be planned before the event, to ensure that appropriate baseline data are available to allow for comparison and that there is agreement about what will be measured.

Why do evaluations?

Evaluations can serve very different purposes. They can:

- most importantly, make sure that decisions are made on an informed basis;
- help gain knowledge about what works – all the way from policy and strategy to concrete design projects;
- communicate the benefits of an intervention to different stakeholders;
- introduce a new language in which citizens and their quality of life are more in focus;
- help to build the political courage needed to embark on or continue a process of change.



If you’re not measuring, then you’re not managing.

Janette Sadik-Khan,
former commissioner of New York City DOT¹⁰⁹

Case study



Copenhagen

Measuring as a tool for change

Copenhagen – a city often ranked among the most liveable cities in the world – is an example of how gathering people data has helped shape and steer the development of the city.

Copenhagen was the first city in the world in which comprehensive studies of public life were systematically conducted over several decades. What began as the Danish urbanist Jan Gehl's research on how people move through and spend time in Copenhagen has evolved into a method of informing city policy. The first studies were carried out in 1968 (documenting, among other things, the effect of the first pedestrian street in Copenhagen – Strøget) and have since been followed up in 1986, 1995 and 2005.¹¹⁴ These studies measured pedestrian flows and the types of activity people engaged in while spending time in public spaces. Both local government and the business community gradually began to see the value of such data as a tool for user-friendly urban development, and in recent years the focus on people data has been integrated into the daily planning practice of the City of Copenhagen.



The culture of monitoring has gone hand in hand with an incremental process of changing the urban landscape. Slowly and step by step, the city has removed parking from the city centre to make car-free public spaces, and this approach has since been extended to other neighbourhoods.

Inevitably, decisions are sometimes hard to make, but the support of data has helped politicians stay firm and work towards a common vision – regardless of what political party happened to be in charge at the time.

The Bicycle Account

An important planning tool that has helped Copenhagen achieve the title of number one city for cyclists is the Bicycle Account. First published in 1996, the Bicycle Account provides



a status report on bicycle mobility in the city: number of cyclists at various locations, bicycle infrastructure, number of kilometres cycled, travel time, etc.; and it also goes into more detail on specific issues and trends, such as safety perceptions, accident statistics, congestion on cycle paths, ownership and use of cargo bikes, and (not least) motivation for cycling among citizens. Concerning citizen motivation, the Bicycle Accounts have demonstrated, year after year, that the number one reason for cycling among Copenhageners is that “it’s the fastest way to get around”, followed by “it’s the easiest way to get around”, while the third most common reason for cycling is “to get exercise”. This again reinforces the fact that – while we may aim for, and finally observe, an increase in physical activity – this is not necessarily the most effective “selling point” or the main factor that stimulates behavioural change.

A metropolis for people

In 2010 Copenhagen adopted a new vision – “A Metropolis for People” (2010–2015) – to make Copenhagen the most liveable city in the world. The vision included simple and tangible, yet ambitious, metrics for urban quality of life, and the city again committed to quantitative and qualitative targets to put people first on the agenda, such as getting “more people walking”, “increasing the level of people spending time” and “increasing the level of satisfaction with the public realm”. Since then, such metrics have informed investments in public spaces in Copenhagen and served as a guideline for all new urban space projects. Having reached many of its goals in 2015, the City of Copenhagen has now formulated a new vision to “Co-create Copenhagen”, which focuses on community and co-creation.¹¹⁵

New approaches to impact assessments in cities

Cities vary in the type of data they collect and the types of evaluation they carry out. Here are some examples of the kind of information that is valuable when promoting physical activity in cities.

Modal splits

Gathering data on the modal split – the division of people by mode of transport – paints a picture of the level of car dependency, the use of public transport and the level of active transport. While some cities collect numbers on both pedestrians and cyclists, others gather data only on cyclists. Getting more information on pedestrians and cyclists represents a major shift, as most traffic departments traditionally only collect numbers on cars.

Bicycle accounts

A few cities around the world, such as Copenhagen, Leicester and Auckland, have published bicycle accounts. While they differ in their design and what they report, these accounts set out to provide a comprehensive picture of the status of cycling in the city concerned, ranging from documenting investments in infrastructure to monitoring progress in the bicycle culture of the city.

Economic benefits

Economic benefits are likely to be a strong motivating factor when it comes to improving conditions for physical activity. Such benefits work at different levels: citizens who save money riding a bicycle rather than driving a car; local retailers who increase sales by having good pedestrian and cycling infrastructure in the surrounding environment; public authorities that can make great savings on their health expenditure.

Cycling and walking to school

Few cities collect such data, but having accurate numbers on how many children walk or cycle to school is a great investment, as it builds active habits early on in life. The data may be collected as travel surveys by the schools themselves, thus calling for interdisciplinary and interdepartmental collaboration.

HEAT: Health Economic Assessment Tool

To facilitate evidence-based decision-making, the World Health Organization has developed, in collaboration with experts in the field, an online tool to estimate the value, in terms of reduced mortality, that results from regular walking or cycling.¹¹⁶ The intention is that the Health Economic Assessment Tool – or HEAT – should play a part in comprehensive cost–benefit analyses of transport interventions or infrastructure projects, complementing existing tools for conducting economic valuations of transport interventions, for example on emissions or congestion.

The tool can be used in a number of different situations, for example:

- to help plan a new piece of cycling or walking infrastructure;
- to evaluate the reduced mortality due to past and/or current levels of cycling or walking;
- to provide input into more comprehensive economic appraisal exercises, or prospective health impact assessments.

Areas that need further development

Getting more real-time data on walking and cycling

It is important to get more real-time data on walking and cycling behaviour: to get more information on how long and how far people walk or cycle. Copenhagen's Bicycle Account has shown, year after year, that most people choose to cycle because it is the fastest and most convenient way to get around. For this reason, it is vital that cities monitor if cycling continues to be a fast way to get around or whether in fact some routes suffer from congestion or other circumstances that make cycling less attractive.

Gaining knowledge of activity levels in specific population groups

Basic and generic data on numbers of pedestrians and cyclists is not sufficient for measuring the impact that physical interventions may have on targeted groups such as young people, the elderly or socially disadvantaged citizens living in deprived neighbourhoods. For example, if cities are to promote physical activity among a specific group (for example, those who are currently least active), methods must be developed to measure the effect of a given intervention on a broad range of people who may vary in terms of their previous activity level, location in the city, age, profession and other socioeconomic indicators. Having such data available is essential to measuring the impact among different groups, assessing equity outcomes and informing future revisions.

Developing evaluation tools for specific age groups

The current model of WHO's Health Economic Assessment Tool (HEAT) is only suitable for adults of approximately 20–74 years of age. Evaluation methods targeted specifically at children, young people and the elderly need to be developed.

Collecting and unifying local data sources

Many different actors within city landscapes are collecting relevant data at any one time. For urban planners and health professionals aiming to promote physical activity, it is important to bring together these sources of data to provide as complete a picture as possible. For example, local travel surveys – either at schools or in workplaces – could usefully be fed into the same databases and thus inform future planning and design solutions in cities.

Using evaluations in planning

Before- and after-surveys

Redesigns of public spaces, streets, etc. can benefit from well-grounded surveys conducted both before and after an intervention. Before-surveys can help to define the problem which the redesign seeks to solve, while after-surveys help to establish whether the redesign has succeeded. For instance, the modal split on a given street section could be assessed both before and after an intervention, to evaluate whether the redesign has led to an increase in pedestrians or cyclists.

Pilots and a strategic project process

More and more cities are experimenting with temporary projects and interventions. Various cities, including New York City, São Paulo and Oslo, have successfully piloted new solutions in streets and public spaces. In this way, they not only showcase the issue but also present policy-makers with a clear choice in which solutions are not descriptive texts or drawings in a planning proposal, but a concrete (albeit temporary) installation or redesign that has actually been tested in an urban space. For such pilot projects to have a strong strategic and long-term impact, it is important that they are part of a project process that is founded on measurements of the current situation and assumes a willingness to follow up and refine the project.

Getting citizens into the loop

Evaluations of various kinds are tools for engaging with citizens in new ways and make it possible to be more responsive to their views. As the motivation factor is important in encouraging more physical activity, it is essential that city planners continuously update their understanding of the people that their city is designed for. One such example is the Auckland cycling account, in which the city now explicitly asks citizens what they think should be measured.¹¹⁷

To fully understand how to encourage physical activity and evaluate the effect of different types of intervention in the urban environment, there is an apparent need to develop new metrics for urban physical activity.



Surveys of car traffic, pedestrian movement and stationary activities helped inform the design of New Road in Brighton, and follow-up surveys have demonstrated its success in terms of increased pedestrian activity.

Towards new metrics and tools

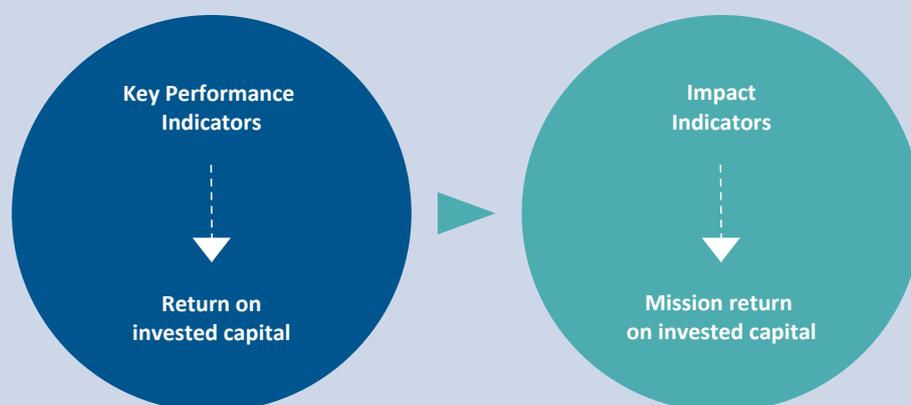
All too often, projects are evaluated in terms of their ability to meet narrow project goals such as deadlines and budgets and not so much in terms of the impact and value they bring. In this respect, there is a fundamental need to rethink the ways in which evaluations are conducted.

At an overarching level, evaluations should address both behaviours and attitudes: behaviours, because these are where the health impact lies; and attitudes, because these offer insights into people’s motivations for being physically active (or not).

In broad terms, we need:

- more baseline information on physical activity in different everyday situations: what are we trying to affect – commuting, shopping, recreation or something else?

Figure 2 **From return on investment to return on mission**



- more baseline information on citizens' activity levels in different areas of the city;
- information on the links between reported quality of life/happiness and changes in activity patterns.

In refining and improving evaluation tools and research methods that can provide more information about the relationship between the built environment and physical activity, it appears that more qualitative approaches will be of great importance, as a supplement to the more quantifiable measures of building density, population density, etc. This will involve developing objective measures for a number of environmental attributes that are relevant to physical activity, such as pavements, pedestrian zones, and factors affecting intersection quality (for example, pedestrian crossings and traffic-calming).¹¹⁸

Given that the urban environment has a substantial role to play in supporting physical activity, one further recommendation is to encourage more cross-sector collaboration in the execution of evaluations.

This would include public health agencies regularly working with other sectors, such as city planning, city transport and park agencies, in order to continuously assess and report on the state of environments that support physical activity. This would involve public health professionals participating in local planning groups.

Equally important is for public health professionals to collaborate with sectors working on environmental sustainability. The aim here would be to bring identify and assess evaluate that promote physical activity and achieve health benefits at the same time as contributing to the reduction of energy consumption, greenhouse gas emissions and air pollution. Such initiatives call for more joint research and practice as well as joint funding.

Opposite:
Evaluations do not need to be objective and quantifiable. Other more qualitative tools can help spark a new type of dialogue focusing on what is important and should be prioritized. One such example is the 12 quality criteria for public space developed by Gehl.

Urban Quality Criteria

Protection

Protection against traffic & accidents — feeling safe

Protection for pedestrians and cyclists
Eliminating fear of traffic
Safe crossings

Protection against crime & violence — feeling secure

Lively public realm
Allow for passive surveillance
Diversity of functions 24/7/365
Well lit / lighting in human scale

Protection against unpleasant sensory experiences

Wind/draft
Rain/snow
Cold/heat
Pollution
Dust, noise, glare

Comfort

Opportunities to walk/cycle

Room for walking
Interesting facades
No obstacles
Good surfaces
Accessibility for everyone

Opportunities to stop & stay

Attractive & functional edges
Defined spots for staying
Objects to lean against or stand next to
Facades with good details that invite staying

Opportunities to sit

Defined zones for sitting
Pleasant views, people watching
Good mix of public and café seating
Resting/waiting opportunities

Opportunities to see

Reasonable viewing distances
Unhindered views
Interesting views
Easy orientation
Lighting (when dark)

Opportunities to talk & listen

Low noise levels
Public seating arrangements conducive to communicating, 'talkscapes'

Opportunities for play & exercise

Allow for physical activity, exercise, play & street entertainment
Temporary activities (markets, festivals, exhibitions etc.)
By day and night
In summer and winter

Enjoyment

Dimensioned at human scale

Dimensions of buildings & spaces in observance of the important human dimension in relation to senses, movements, size and behaviour

Opportunities to enjoy the positive aspects of climate

Sun/shade
Heat/coolness
Shelter from wind/breeze

Aesthetic qualities & positive sensory experience

Good design and detailing
Good materials
Fine views/vistas
Rich sensory experiences: trees, plants, water



Conclusion



Promoting more physical activity in cities is an important step towards more healthy cities. As this publication has set out to show, cities have a role to play when it comes to encouraging moderate physical activity – the kind of physical activity that is associated with people’s daily movement and recreational patterns. However, raising physical activity levels requires an integrated approach in which such activity is not seen in isolation. To promote physical activity involves, among other things, understanding people’s basic need to feel safe, their desire to get quickly and easily from A to B, and – not least – the way in which their behaviours are affected by the quality of the urban environment. As such, public spaces in cities can act as important drivers for change, provided that those in authority are careful to make them suitable for many different uses; and that includes making them appropriate for more physical activity, whether that be walking, cycling or playing.

The joined-up thinking required in this area also involves acknowledging and planning for the many co-benefits that arise from urban environments that support physical activity. Indeed, encouraging more walking, cycling and playing has potential benefits when it comes to addressing a number of other urban challenges, such as social equity, air pollution, congestion, urban economy and innovation. Taking full advantage of this potential calls for far greater cross-sector collaboration between the public health and the urban planning sectors. At the same time, it should also be recognized that, while increasing physical activity may not (politically) be a major selling point, it may nevertheless emerge as a co-product of other priorities; for instance, development of an improved transport network may lead to more physical activity, even though that outcome was never, explicitly, part of its motivation. These are opportunities to be identified and grasped.

Encouraging more physical activity does not usually mean that cities have to draw up specific planning documents to this effect; generally, it is just as effective if the necessary messages are routinely woven into the fabric of today's many urban planning projects and programmes. In some cities, however, a more radical change in overall vision and policy is required. The cities that are most successful in promoting physical activity have a strong vision of the kind of city they want to be; and having such a vision allows pragmatic solutions to be adopted along the way, and specific measures to be identified and implemented. Change will not happen overnight; sometimes a step-by-step process is needed. But as numerous examples throughout this publication have shown, change is entirely feasible.

To help steer such processes of change, monitoring and evaluation are vital so that we may continually learn what works in practice. Moreover, such evaluation informs adaptation over time and – equally important – provides a way to respond to people's (changing) needs and patterns of behaviour. And such sensitivity is essential, even if it means rethinking what might be the most relevant and effective areas for intervention.

References

- 1 Physical activity strategy for the WHO European Region, 2016–2025. Copenhagen: WHO Regional Office for Europe; 2016 (http://www.euro.who.int/__data/assets/pdf_file/0014/311360/Physical-activity-strategy-2016-2025.pdf?ua=1, accessed 31 August 2017).
- 2 Lee IM, Shiroma EJ, Lobelo F, Puska P, Blair SN, Katzmarzyk PT. Effect of physical inactivity on major non-communicable diseases worldwide: an analysis of burden of disease and life expectancy. *Lancet* 2012;380(9838):219–29. doi:10.1016/S0140-6736(12)61031-9.
- 3 Carmichael L, Racioppi F, Calvert T, Sinnet D. Environment and health for European cities in the 21st century: making a difference. Copenhagen: WHO Regional Office for Europe; 2017 (http://www.euro.who.int/__data/assets/pdf_file/0020/341615/bookletdef.pdf?ua=, accessed 31 August 2017).
- 4 Physical activity strategy for the WHO European Region, 2016–2025. Copenhagen: WHO Regional Office for Europe; 2016 (http://www.euro.who.int/__data/assets/pdf_file/0014/311360/Physical-activity-strategy-2016-2025.pdf?ua=1, accessed 31 August 2017).
- 5 Paris Declaration. Fourth High-level Meeting on Transport, Health and Environment. Copenhagen: WHO Regional Office for Europe and United Nations Economic Commission for Europe; 2014 (https://www.unece.org/fileadmin/DAM/thepep/documents/D%C3%A9claration_de_Paris_EN.pdf, accessed 31 August 2017).
- 6 Declaration of the Sixth Ministerial Conference on Environment and Health. Copenhagen: WHO Regional Office for Europe; 2017 (<http://www.euro.who.int/en/media-centre/events/events/2017/06/sixth-ministerial-conference-on-environment-and-health/documentation/declaration-of-the-sixth-ministerial-conference-on-environment-and-health>, accessed 31 August 2017).
- 7 New Urban Agenda: draft outcome document for adoption in Quito, October 2016. United Nations Conference on Housing and Sustainable Urban Development; 2016 (<http://habitat3.org/wp-content/uploads/Habitat-III-New-Urban-Agenda-10-September-2016.pdf>, accessed 31 August 2017).
- 8 Barton H, Tsourou C. Healthy urban planning: a WHO guide to planning for people. London: E&FN Spon; 2000.

Edwards P, Tsouros A. Promoting physical activity and active living in urban environments: the role of local governments. Copenhagen: WHO Regional Office for Europe; 2006 (http://www.euro.who.int/__data/assets/pdf_file/0009/98424/E89498.pdf, accessed 31 August 2017).
- 9 Edwards P, Tsouros A. A healthy city is an active city: a physical activity planning guide. Copenhagen: WHO Regional Office for Europe; 2008 (http://www.euro.who.int/__data/assets/pdf_file/0012/99975/E883.pdf, accessed 31 August 2017).
- 10 Global report on urban health: equitable, healthier cities for urban development. World Health Organization and UN Habitat; 2016 (http://www.who.int/kobe_centre/publications/urban-global-report/en, accessed 31 August 2017).
- 11 Urban green space interventions and health: a review of impacts and effectiveness. Copenhagen: WHO Regional Office for Europe; 2017 (<http://www.euro.who.int/en/health-topics/environment-and-health/urban-health/publications/2017/urban-green-space-interventions-and-health-a-review-of-impacts-and-effectiveness.-full-report-2017>, accessed 31 August 2017).
- 12 Warburton D, Bredin S. Health benefits of physical activity: a systematic review of current systematic reviews. *Curr Opin Cardiol.* 2017;32(5):541–56. doi:10.1097/HCO.0000000000000437.
- 13 Ng M, Fleming T, Robinson M, Thomson B, Graetz N, Margono C et al. Global, regional, and national prevalence of overweight and obesity in children and adults in 1980–2013: a systematic analysis for the Global Burden of Disease Study 2013. *Lancet* 2014;384(9945):766–81 ([http://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(14\)60460-8/abstract](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(14)60460-8/abstract), accessed 31 August 2017).
- 14 Reiner M, Niermann C, Jekauc D, Woll A. Long-term health benefits of physical activity: a systematic review of longitudinal studies. *BMC Public Health* 2013;13:813. doi:10.1186/1471-2458-13-813 (<https://bmcpubhealth.biomedcentral.com/articles/10.1186/1471-2458-13-813>, accessed 31 August 2017).
- 15 Hallal PC, Andersen LB, Bull FC, Guthold R, Haskell W, Ekelund U. Global physical activity levels: surveillance progress, pitfalls, and prospects. *Lancet* 2012;380(9838):247–57. doi:10.1016/S0140-6736(12)60646-1.
- 16 Global recommendations on physical activity for health. Geneva: World Health Organization; 2010 (<http://www.who.int/dietphysicalactivity/publications/9789241599979/en>, accessed 31 August 2017).

- 14 Sallis JF, Cerin E, Conway TL, Adams MA, Frank LD, Pratt M et al. Physical activity in relation to urban environments in 14 cities worldwide: a cross-sectional study. *Lancet* 2016;387(10034):2207–17. doi:10.1016/S0140-6736(15)01284-2.
- Handy SL, Boarnet MG, Ewing R, Killingsworth RE. How the built environment affects physical activity: views from urban planning. *Am J Prev Med.* 2002;23(2 Suppl):64–73.
- Wendel-Vos GC, Schuit AJ, de Niet R, Boshuizen HC, Saris WH, Kromhout D. Factors of the physical environment associated with walking and bicycling. *Med Sci Sports Exerc.* 2004;36(4):725–30.
- Urban green spaces and health: a review of evidence. Copenhagen: WHO Regional Office for Europe; 2016 (http://www.euro.who.int/__data/assets/pdf_file/0005/321971/Urban-green-spaces-and-health-review-evidence.pdf?ua=1, accessed 31 August 2017).
- 15 Physical activity strategy for the WHO European Region, 2016–2025. Copenhagen: WHO Regional Office for Europe; 2016 (http://www.euro.who.int/__data/assets/pdf_file/0014/311360/Physical-activity-strategy-2016-2025.pdf?ua=1, accessed 31 August 2017).
- 16 Physical activity strategy for the WHO European Region, 2016–2025. Copenhagen: WHO Regional Office for Europe; 2016 (http://www.euro.who.int/__data/assets/pdf_file/0014/311360/Physical-activity-strategy-2016-2025.pdf?ua=1, accessed 31 August 2017).
- Parma Declaration on Environment and Health. Copenhagen: WHO Regional Office for Europe; 2010 (http://www.euro.who.int/__data/assets/pdf_file/0011/78608/E93618.pdf, accessed 31 August 2017).
- Healthy Cities Pécs Declaration. Copenhagen: WHO Regional Office for Europe; 2017 (http://www.euro.who.int/__data/assets/pdf_file/0005/334643/Pecs-Declaration.pdf, accessed 31 August 2017).
- 17 Gehl J. *Life between buildings: using public space.* Washington (DC): Island Press; 1987/2011.
- Gehl J. *Cities for people.* Washington (DC): Island Press; 2010.
- 18 Hallal PC, Andersen LB, Bull FC, Guthold R, Haskell W, Ekelund U. Global physical activity levels: surveillance progress, pitfalls, and prospects. *Lancet* 2012;380(9838):247–57. doi:10.1016/S0140-6736(12)60646-1.
- 19 Mackett R, Paskins J. Children’s physical activity: the contribution of playing and walking. *Children and Society* 2008;22;345–57. doi:10.1111/j.1099-0860.2007.00113.x.
- 20 Mackett R. Children’s travel behaviour and its health implications. *Transport Policy* 2013;26;66–72 (<http://discovery.ucl.ac.uk/1343012/2/1343012.pdf>, accessed 31 August 2017).
- 21 Physical activity and health in Europe: evidence for action. Copenhagen: WHO Regional Office for Europe; 2006 (http://www.euro.who.int/__data/assets/pdf_file/0011/87545/E89490.pdf, accessed 31 August 2017).
- 22 Carmichael L, Racioppi F, Calvert T, Sinnet D. Environment and health for European cities in the 21st century: making a difference. Copenhagen: WHO Regional Office for Europe; 2017 (http://www.euro.who.int/__data/assets/pdf_file/0020/341615/bookletdef.pdf?ua=, accessed 31 August 2017).
- 23 Hallal PC, Andersen LB, Bull FC, Guthold R, Haskell W, Ekelund U. Global physical activity levels: surveillance progress, pitfalls, and prospects. *Lancet* 2012;380(9838):247–57. doi:10.1016/S0140-6736(12)60646-1.
- 24 Lee IM, Shiroma EJ, Lobelo F, Puska P, Blair SN, Katzmarzyk PT. Effect of physical inactivity on major non-communicable diseases worldwide: an analysis of burden of disease and life expectancy. *Lancet* 2012;380(9838):219–29. doi:10.1016/S0140-6736(12)61031-9.
- 25 Kelly P, Kahlmeier S, Götschi T, Orsini N, Richards J, Roberts N et al. Systematic review and meta-analysis of reduction in all-cause mortality from walking and cycling and shape of dose response relationship. *Int J Behav Nutr Phys Act.* 2014;11:132. doi:10.1186/s12966-014-0132-x.
- 26 Transforming our world: the 2030 Agenda for Sustainable Development. New York (NY): United Nations; 2015 (http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E, accessed 31 August 2017).
- 27 Carmichael L, Racioppi F, Calvert T, Sinnet D. Environment and health for European cities in the 21st century: making a difference. Copenhagen: WHO Regional Office for Europe; 2017 (http://www.euro.who.int/__data/assets/pdf_file/0020/341615/bookletdef.pdf?ua=, accessed 31 August 2017).

- 28 The state of European cities: cities leading the way to a better future. European Commission/UN Habitat; 2016 (<https://unhabitat.org/books/the-state-of-european-cities-2016-cities-leading-the-way-to-a-better-future>, accessed 31 August 2017).
- 29 Ibid.
- 30 Good, better, best: the City of Copenhagen's bicycle strategy, 2011–2125. City of Copenhagen Technical and Environmental Administration, Traffic Department; 2012 (http://kk.sites.itera.dk/apps/kk_pub2/?mode=detalje&id=823, accessed 31 August 2017).
- 31 We will be carbon-neutral by 2025. In: Copenhagen Capacity [website] (<http://www.copcap.com/invest-in-greater-copenhagen/investment-opportunities/copenhagen-carbon-neutral-2025>, accessed 31 August 2017).
- 32 Marrying cycling and public transport [factsheet]. European Cyclists' Federation; 2012 (<https://ecf.com/sites/ecf.com/files/Factsheet-ITF2012-PT.pdf>, accessed 31 August 2017).
- 33 The state of European cities: cities leading the way to a better future. European Commission/UN Habitat; 2016 (<https://unhabitat.org/books/the-state-of-european-cities-2016-cities-leading-the-way-to-a-better-future>, accessed 31 August 2017).
- 34 Cities in Europe: facts and figures on cities and urban areas. PBL Netherlands Environmental Assessment Agency; 2016 (<http://www.pbl.nl/sites/default/files/cms/publicaties/PBL-2016-Cities-in-Europe-2469.pdf>, accessed 31 August 2017).
- 35 Carmichael L, Racioppi F, Calvert T, Sinnet D. Environment and health for European cities in the 21st century: making a difference. Copenhagen: WHO Regional Office for Europe; 2017 (http://www.euro.who.int/__data/assets/pdf_file/0020/341615/bookletdef.pdf?ua=, accessed 31 August 2017).
- 36 TEMS: The EPOMM Modal Split Tool [online database]. European Platform on Mobility Management (EPOMM) (http://www.epomm.eu/tems/compare_cities.phtml, accessed 31 August 2017).
- 37 Data from Technical University of Denmark (DTU).
- 38 The state of European cities: cities leading the way to a better future. European Commission/UN Habitat; 2016 (<https://unhabitat.org/books/the-state-of-european-cities-2016-cities-leading-the-way-to-a-better-future>, accessed 31 August 2017).
- 39 Chart: Eastern Europe's incredible shrinking cities. City Metric [website]. 15 August 2014 (<http://www.citymetric.com/chart-eastern-europes-incredible-shrinking-cities>, accessed 31 August 2017).
- Maheshwari T. Redefining shrinking cities. Berkeley Planning Journal; 2013 (<https://berkeleyplanningjournal.com/urbanfringe/2013/12/defining-shrinking-cities>, accessed 31 August 2017).
- 40 Ibid.
- 41 Hall T, Vidén S. The Million Homes Programme: a review of the great Swedish planning project. Planning Perspectives 2005;20:301–28. doi:10.1080/02665430500130233.
- 42 Olsson L, Loerakker J. Revisioning Amsterdam Bijlmermeer. Failed Architecture [website]; 2013 (<https://www.failedarchitecture.com/the-story-behind-the-failure-revisioning-amsterdam-bijlmermeer>, accessed 31 August 2017).
- Bjørn N, editor. Arkitektur der forandrer: fra ghetto til velfungerende byområde. Copenhagen: Gads Forlag; 2008.
- 43 Quality of life in European cities, 2015. European Commission; 2016. (http://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/urban/survey2015_en.pdf, accessed 31 August 2017).
- 44 Befolkning og fremskrivninger [Population and projections] [online database]. City of Copenhagen website (in Danish) (<http://www.kk.dk/artikel/befolkning-og-fremskrivninger>, accessed 31 August 2017).
- 45 Health inequalities in the EU: final report of a consortium. European Commission Directorate-General for Health and Consumers; 2013 (http://ec.europa.eu/health/sites/health/files/social_determinants/docs/healthinequalitiesineu_2013_en.pdf, accessed 31 August 2017).
- 46 Income disparities in street features that encourage walking [research brief]. Bridging the Gap; 2012 (http://www.bridgingthegapresearch.org/_asset/02fpi3/btg_street_walkability_FINAL_03-09-12.pdf, accessed 31 August 2017).
- 47 Environment and health for the European cities in the 21st century: making a difference. Copenhagen: WHO Regional Office for Europe; 2017 (<http://www.euro.who.int/en/health-topics/environment-and-health/urban-health/publications/2017/environment-and-health-for-the-european-cities-in-the-21st-century-making-a-difference>, accessed 31 August 2017).

- 48 Cities alive: towards a walking world. London: Arup; 2016 (http://publications.arup.com/publications/c/cities_alive_towards_a_walking_world, accessed 31 August 2017).
- 49 TomTom Traffic Index [online database] (https://www.tomtom.com/en_gb/trafficindex, accessed 31 August 2017).
- 50 Air quality in cities [web portal]. European Commission (https://ec.europa.eu/info/eu-regional-and-urban-development/cities/priority-themes/air-quality-cities_en, accessed 31 August 2017).
- 51 Economic cost of the health impact of air pollution in Europe: clean air, health and wealth. Copenhagen: WHO Regional Office for Europe; 2015 (<http://www.euro.who.int/en/health-topics/environment-and-health/air-quality/publications/2015/economic-cost-of-the-health-impact-of-air-pollution-in-europe>, accessed 31 August 2017).
- 52 Carmichael L, Racioppi F, Calvert T, Sinnet D. Environment and health for European cities in the 21st century: making a difference. Copenhagen: WHO Regional Office for Europe; 2017 (http://www.euro.who.int/__data/assets/pdf_file/0020/341615/bookletdef.pdf?ua=, accessed 31 August 2017).
- 53 The state of European cities: cities leading the way to a better future. European Commission/UN Habitat; 2016 (<https://unhabitat.org/books/the-state-of-european-cities-2016-cities-leading-the-way-to-a-better-future>, accessed 31 August 2017).
- 54 Hennig M. Sustainable urban mobility: the example of Istanbul. Eschborn: GIZ; 2011 (http://www.sutp.org/files/contents/documents/resources/C_Case-Studies/GIZ_SUTP_CS_Sustainable-Urban-Mobility-Istanbul_EN.pdf, accessed 31 August 2017).
- 55 Ibid.
- 56 Istanbul: an accessible city – a city for people. EMBARQ/Gehl Architects; 2010 (<http://www.wrirosscities.org/sites/default/files/Istanbul-Public-Spaces-Public-Life-EMBARQ-Turkey-Gehl-Architects-Oct-2013.pdf>, accessed 31 August 2017).
- 57 A walker's paradise: pedestrianising Istanbul's ancient streets. Eltis [website]; 2016 (<http://www.eltis.org/discover/case-studies/walkers-paradise-pedestrianising-istanbuls-ancient-streets-turkey>, accessed 31 August 2017).
- 58 Öztaş CC, Aki M. Istanbul historic peninsula pedestrianization project: current state assessment. EMBARQ; 2014 (<http://www.wrirosscities.org/sites/default/files/EMB14-Istanbul-Historic-Peninsula-Pedestrianization-EMBARQ-Turkey.pdf>, accessed 31 August 2017).
- 59 Dill J, Howe D. The role of health and physical activity in the adoption of innovative land use policy: findings from surveys of local governments. *J Phys Act Health* 2011;8 Suppl 1:S116–24 (<https://www.ncbi.nlm.nih.gov/pubmed/21350252>, accessed 31 August 2017).
- 60 Cities alive: towards a walking world. London: Arup; 2016 (http://publications.arup.com/publications/c/cities_alive_towards_a_walking_world, accessed 31 August 2017).
- 61 Making walking safe: a brief overview of pedestrian safety around the world. WHO (http://who.int/violence_injury_prevention/publications/road_traffic/make_walking_safe.pdf, accessed 31 August 2017).
- 62 Goodyear S. A new way of understanding “Eyes on the Street”. CityLab; 2013 (<https://www.citylab.com/equity/2013/07/new-way-understanding-eyes-street/6276>, accessed 31 August 2017).
- 63 Lawlor E. The pedestrian pound: the business case for better streets and places. Living Streets; 2014 (https://www.livingstreets.org.uk/media/1391/pedestrianpound_fullreport_web.pdf, accessed 31 August 2017).
- Shoppers and how they travel [information sheet]. Sustrans; 2006 (<http://cidadanialxmob.tripod.com/shoppersandhowtheytravel.pdf>, accessed 31 August 2017).
- 64 Skinner I. Riding towards the green economy: cycling and green jobs. WHO Regional Office for Europe/UN Economic Commission for Europe/UN Environment Programme; 2016 (http://www.euro.who.int/__data/assets/pdf_file/0017/311471/Cycling-and-green-jobs.pdf?ua=1, accessed 31 August 2017).
- 65 Carmichael L, Racioppi F, Calvert T, Sinnet D. Environment and health for European cities in the 21st century: making a difference. Copenhagen: WHO Regional Office for Europe; 2017 (http://www.euro.who.int/__data/assets/pdf_file/0020/341615/bookletdef.pdf?ua=, accessed 31 August 2017).
- 66 What is a healthy city? Copenhagen: WHO Regional Office for Europe (<http://www.euro.who.int/en/health-topics/environment-and-health/urban-health/activities/healthy-cities/who-european-healthy-cities-network/what-is-a-healthy-city>, accessed 31 August 2017).

- 67 Measuring the street: new metrics for 21st century streets. New York (NY): NYC DOT (<http://www.nyc.gov/html/dot/downloads/pdf/2012-10-measuring-the-street.pdf>, accessed 31 August 2017).
- 68 Florida R. A playbook on the politics of better streets. CityLab; 2016 (<http://www.citylab.com/design/2016/03/janette-sadik-khan-book-handbook-urban-revolution/473145>, accessed 31 August 2017).
- 69 Lovasi GS, Hutson MA, Guerra M, Neckerman KM. Built environments and obesity in disadvantaged populations. *Epidemiol Rev.* 2009;31:7–20.
- Harrison RA, Gemmell I, Heller RF. The population effect of crime and neighbourhood on physical activity: an analysis of 15,461 adults. *J Epidemiol Community Health* 2007;61:34–9.
- Molnar BE, Gortmaker SL, Bull FC, Buka SL. Unsafe to play? Neighborhood disorder and lack of safety predict reduced physical activity among urban children and adolescents. *Am J Health Promot.* 2004;18:378–86.
- 70 Fish JS, Ettner S, Ang A, Brown AF. Association of perceived neighborhood safety on body mass index. *Am J Public Health* 2010;100:2296–303.
- 71 Gomez JE, Johnson BA, Selva M, Sallis JF. Violent crime and outdoor physical activity among inner-city youth. *Prev Med.* 2004;39:876–81.
- Brown HS 3rd, Perez A, Mirchandani GG, Hoelscher DM, Kelder SH. Crime rates and sedentary behavior among 4th grade Texas school children. *Int J Behav Nutr Phys Act.* 2008;5:28.
- Bennett GG, McNeill LH, Wolin KY, Duncan DT, Puleo E, Emmons KM. Safe to walk? Neighborhood safety and physical activity among public housing residents. *PLoS Med.* 2007;4:1599–606; discussion 607.
- 72 Carmichael L, Racioppi F, Calvert T, Sinnet D. Environment and health for European cities in the 21st century: making a difference. Copenhagen: WHO Regional Office for Europe; 2017 (http://www.euro.who.int/__data/assets/pdf_file/0020/341615/bookletdef.pdf?ua=, accessed 31 August 2017).
- 73 Ibid.
- 74 Edwards P, Tsouros A. Promoting physical activity and active living in urban environments: the role of local governments. Copenhagen: WHO Regional Office for Europe; 2006 (http://www.euro.who.int/__data/assets/pdf_file/0009/98424/E89498.pdf, accessed 31 August 2017).
- 75 Weiss M, Paffumi E, Clairotte E, Drossinos Y, Vlachos T, Bonnel P et al. Including cold-start emissions in the Real-Driving Emissions (RDE) test procedure: an assessment of cold-start frequencies and emission effects. Luxembourg: Publications Office of the European Union; 2017 (<http://publications.jrc.ec.europa.eu/repository/bitstream/JRC105595/kjna28472enn.pdf>, accessed 31 August 2017).
- 76 Road safety: speed. WHO/World Bank/Road Safety Is No Accident; 2004 (http://www.who.int/violence_injury_prevention/publications/road_traffic/world_report/speed_en.pdf, accessed 31 August 2017).
- 77 Gehl J. Cities for people. Washington (DC): Island Press; 2010 (<https://islandpress.org/book/cities-for-people>, accessed 31 August 2017).
- 78 Sallis JF, Cerin E, Conway TL, Adams MA, Frank LD, Pratt M et al. Physical activity in relation to urban environments in 14 cities worldwide: a cross-sectional study. *Lancet* 2016;387(10034):2207–17. doi:10.1016/S0140-6736(15)01284-2.
- 79 Dill J, Howe D. The role of health and physical activity in the adoption of innovative land use policy: findings from surveys of local governments. *J Phys Act Health* 2011;8 Suppl 1:S116–24 (<https://www.ncbi.nlm.nih.gov/pubmed/21350252>, accessed 31 August 2017).
- 80 Pucher J, Buehler R, Merom D, Bauman A. Walking and cycling in the United States, 2001–2009: evidence from the National Household Travel Surveys. *Am J Public Health* 2011;101(Suppl 1) (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3222478>, accessed 31 August 2017).
- 81 Dill J, Howe D. The role of health and physical activity in the adoption of innovative land use policy: findings from surveys of local governments. *J Phys Act Health* 2011;8 Suppl 1:S116–24 (<https://www.ncbi.nlm.nih.gov/pubmed/21350252>, accessed 31 August 2017).
- 82 TEMS: The EPOMM Modal Split Tool [online database]. European Platform on Mobility Management (EPOMM) (http://www.epomm.eu/tems/compare_cities.phtml, accessed 31 August 2017).
- 83 Ljubljana: cycling in Ljubljana. CHAMP project; 2014 (<http://www.champ-cycling.eu/en/The-Champs/Ljubljana/Ljubljana>, accessed 31 August 2017).

- 84 Colville-Andersen M. Ljubljana leading the way as a European cycling capital. Momentum; 2015 (<https://momentummag.com/ljubljana-slovenia-leading-way-european-cycling-capital>, accessed 31 August 2017).
- 85 <http://civitas.eu/content/ljubljana-1?ga=2.201971797.575527633.1507617129-1408629897.1495529801>
- <http://civitas.eu/content/ljubljana>
- 86 Urban green spaces and health: a review of evidence. Copenhagen: WHO Regional Office for Europe; 2016 (http://www.euro.who.int/__data/assets/pdf_file/0005/321971/Urban-green-spaces-and-health-review-evidence.pdf?ua=1, accessed 31 August 2017).
- 87 Abercrombie L, Sallis J, Conway T, Frank L, Saelens B, Chapman J. Income and racial disparities in access to public parks and private recreation facilities. *Am J Prev Med.* 2008;34(1):9–15.
- 88 Lommeparker, træer og andet grønt [Pocket parks, trees and other greenery]. City of Copenhagen; 2008 (in Danish) (http://www.bondam.dk/files/7/lommeparker_traeer_og_andet_groent.pdf, accessed 31 August 2017).
- 89 Ward Thompson C. Activity, exercise and the planning and design of outdoor spaces. *J Environ Psychol.* 2013;34:79–96.
- 90 Urban mobility plan of Barcelona, 2013–2018. City of Barcelona; 2014 (http://www.bcnecologia.net/sites/default/files/proyectos/pmu_angles.pdf, accessed 31 August 2017).
- 91 Bausells M. Superblocks to the rescue: Barcelona’s plan to give streets back to residents. *The Guardian.* 17 May 2016 (<https://www.theguardian.com/cities/2016/may/17/superblocks-rescue-barcelona-spain-plan-give-streets-back-residents>, accessed 9 September 2017).
- 92 Ibid.
- 93 Leslie E, Cerin E, Kremer P. Perceived neighborhood environment and park use as mediators of the effect of area socio-economic status on walking behaviors. *J Phys Act Health* 2010;7(6):802–10.
- 94 Chetty R, Hendren N. The impacts of neighborhoods on intergenerational mobility: childhood exposure effects and county-level estimates. Harvard University/NBER; 2015 (http://www.equality-of-opportunity.org/images/nbhd_paper.pdf, accessed 31 August 2017).
- 95 Commission for a Socially Sustainable Malmö. City of Malmö [website]; 2013 (<http://malmo.se/Kommun--politik/Socialt-hallbart-Malmo/Kommission-for-ett-socialt-hallbart-Malmo/Commission-for-a-Socially-Sustainable-Malmo-in-English.html>, accessed 31 August 2017).
- 96 Leyden KM. Social capital and the built environment: the importance of walkable neighborhoods. *Am J Public Health* 2003;93(9):1546–51.
- 97 WHO global report on falls prevention in older age. Geneva: World Health Organization; 2007 (http://www.who.int/ageing/publications/Falls_prevention7March.pdf?ua=1, accessed 31 August 2017).
- 98 Larsen TT. Betydningen av universell utforming og god boligkvalitet [The importance of universal design and good-quality housing] [presentation slides]. Stavanger: Husbanken (at Rogaland Conference); April 2017 (in Norwegian).
- 99 Balfour JL, Kaplan GA. Neighborhood environment and loss of physical function in older adults: evidence from the Alameda County Study. *Am J Epidemiol.* 2002;155(6):507–15.
- 100 Adolescent obesity and related behaviours: trends and inequalities in the WHO European Region, 2002–2014. Copenhagen: WHO Regional Office for Europe; 2017 (http://www.euro.who.int/__data/assets/pdf_file/0019/3311/WHO_ObesityReport_2017_v3.pdf?ua=1, accessed 31 August 2017).
- 101 Ward Thompson C. Activity, exercise and the planning and design of outdoor spaces. *J Environ Psychol.* 2013;34:79–96.
- 102 Holm CO. Børn, der bliver kørt til skole, koncentrerer sig dårligere [Children who drive to school concentrate less well]. *videnskab.dk* [website]; 2012 (<http://videnskab.dk/krop-sundhed/boen-der-bliver-kort-til-skole-koncentrerer-sig-darligere>, accessed 31 August 2017).
- 103 Gehl J. *Cities for people.* Washington (DC): Island Press; 2010 (<https://islandpress.org/book/cities-for-people>, accessed 31 August 2017).
- 104 Gehl J. “Soft edges” in residential streets. *Scandinavian Housing and Planning Research* 1986;3:89–102.
- 105 van Deurs C. Uderum, udeliv [Outdoor space, outdoor life] [PhD dissertation]. Copenhagen: Kunstakademiet Arkitekteskole; 2010 (in Danish) (<https://www.realdaniadebat.dk/SiteCollectionDocuments/Almenboligforum/Camilla%20van%20Deurs%20phd.pdf>, accessed 31 August 2017).

- 106 Potwarka, L. R., Kaczynski, A. T., Flack, A. L. Places to play: Association of park space and facilities with healthy weight status among children. *Journal of Community Health*-2008; 33(5), 344-350.
- 107 Astrup S. Cyklistforbund om fald i cykeltrafikken: "Det er i princippet katastrofalt" [Cycle federations on the decline in bicycle traffic: "In principle, it's disastrous"]. *Politiken* [online newspaper]. 24 February 2017 (in Danish) (<http://politiken.dk/indland/art5747981/Cyklistforbund-om-fald-i-cykeltrafikken-%C2%BDet-er-i-princippet-katastrofalt%C2%AB>, accessed 31 August 2017).
- 108 Urban green space interventions and health: a review of impacts and effectiveness. Copenhagen: WHO Regional Office for Europe; 2017 (<http://www.euro.who.int/en/health-topics/environment-and-health/urban-health/publications/2017/urban-green-space-interventions-and-health-a-review-of-impacts-and-effectiveness.-full-report-2017>, accessed 31 August 2017).
- 109 Florida R. A playbook on the politics of better streets. CityLab; 2016 (<http://www.citylab.com/design/2016/03/janette-sadik-khan-book-handbook-urban-revolution/473145>, accessed 31 August 2017).
- 110 Waldner LS. Planning to perform: evaluation models for city planners. *Berkeley Planning Journal* 2004;17(1) (<http://escholarship.org/uc/item/0kx2106k>, accessed 31 August 2017).
- 111 Ibid.
- 112 Measuring the street: new metrics for 21st century streets. New York (NY): NYC DOT (<http://www.nyc.gov/html/dot/downloads/pdf/2012-10-measuring-the-street.pdf>, accessed 31 August 2017).
- 113 Commission for a Socially Sustainable Malmö. City of Malmö [website]; 2013 (<http://malmo.se/Kommun--politik/Socialt-hallbart-Malmo/Kommission-for-ett-socialt-hallbart-Malmo/Commission-for-a-Socially-Sustainable-Malmoe-in-English.html>, accessed 31 August 2017).
- 114 Gehl, J., Bergdahl, K, Steensen, Aa. *Byliv 1986. Bylivet i Københavns indre by brugsmønstre og udviklingsmønstre 1968-1986*. Arkitekten. 1987; no. 12.
- Gehl, J. & Gemzøe, L. *Public Spaces Public Life*. 1996. Copenhagen: The Danish Architectural Press and The Royal Danish Architecture School.
- Gehl, J., Gemzøe, L., Kirknæs, S., Sternhagen B. *New City Life*. 2006. Copenhagen: The Danish Architectural Press.
- 115 <https://international.kk.dk/artikel/creating-liveable-city>
<https://www.kk.dk/artikel/f%C3%A6llesskab-k%C3%B8benhavn>
- 116 Health Economic Assessment Tool (HEAT) for cycling and walking. Copenhagen: WHO Regional Office for Europe (<http://www.euro.who.int/en/health-topics/environment-and-health/Transport-and-health/activities/guidance-and-tools/health-economic-assessment-tool-heat-for-cycling-and-walking>, accessed 31 August 2017).
- 117 The Auckland cycling account: a snapshot of cycling in Auckland in 2015. Auckland Council/NZ Transport Agency; 2015 (<https://at.govt.nz/media/1873018/akl-cycling-account-book.pdf>, accessed 31 August 2017).
- 118 Sallis JF, Cerin E, Conway TL, Adams MA, Frank LD, Pratt M et al. Physical activity in relation to urban environments in 14 cities worldwide: a cross-sectional study. *Lancet* 2016;387(10034):2207-17. doi:10.1016/S0140-6736(15)01284-2.



The WHO Regional
Office for Europe

The World Health Organization (WHO) is a specialized agency of the United Nations created in 1948 with the primary responsibility for international health matters and public health. The WHO Regional Office for Europe is one of six regional offices throughout the world, each with its own programme geared to the particular health conditions of the countries it serves.

Member States

Albania
Andorra
Armenia
Austria
Azerbaijan
Belarus
Belgium
Bosnia and Herzegovina
Bulgaria
Croatia
Cyprus
Czechia
Denmark
Estonia
Finland
France
Georgia
Germany
Greece
Hungary
Iceland
Ireland
Israel
Italy
Kazakhstan
Kyrgyzstan
Latvia
Lithuania
Luxembourg
Malta
Monaco
Montenegro
Netherlands
Norway
Poland
Portugal
Republic of Moldova
Romania
Russian Federation
San Marino
Serbia
Slovakia
Slovenia
Spain
Sweden
Switzerland
Tajikistan
The former Yugoslav
Republic of Macedonia
Turkey
Turkmenistan
Ukraine
United Kingdom
Uzbekistan

World Health Organization Regional Office for Europe
UN City, Marmorvej 51, DK-2100 Copenhagen Ø, Denmark
Tel.: +45 45 33 70 00 Fax: +45 45 33 70 01
E-mail: euwhocontact@who.int
Website: www.euro.who.int