

A City in Good Shape |

*Trends
that are changing cities*

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1 The ideal of a modern city



NEW URBANISM

A key urban trend changing European cities is New Urbanism. It has its roots in the ideas of sustainable development, whilst also being connected with ecology, psychology and sociology. **NEW URBANISM** assumes a return to the traditional shape of the city, where people and their needs are the priority. Cities are once again to be friendly and comfortable for their residents, and it is therefore important to create attractive public spaces, appropriate scales of development, while removing transit traffic from the city and creating facilities for urban space users that don't rely on the car. The ideal of the modern city is sometimes referred to as the „compact city“, the „cohesive city“ or the „human scale city“, where multifunctional space combines housing, services, offices, recreation and cultural facilities. **THE PRIORITY IS TO CREATE SPACE THAT IS FRIENDLY, ATTRACTIVE AND SAFE.**

THE EVOLUTION OF NEW URBANISM

The concept has been developing since the 1970s and has become the basis for a number of other trends, such as **SUSTAINABLE URBANISM**, Green Urbanism and Ecological Urbanism. These trends have in turn fed into the development strategies of many European cities, with the ideas being applied accordingly. The evolution of the concept is ongoing due to the increase in social activity and growing consciousness of city dwellers. New currents have resulted, among them:

- social participation (inclusion of citizens in the decision-making processes of local governments concerning urban space),
- the sharing economy (turning away from consumerism in favour of pragmatism),
- a growing concern for the environment,
- the development of urban activism.

Over the years, cities around the world have been designed from the perspective of the car user or have been adapted to meet the needs of car users. In traditional, pedestrian-oriented cities, streets have over time become car-only places, with squares and public spaces often being turned into parking areas. In addition, an increase in the scale of investments, the separation of project functions, and the centralisation of public facilities have all contributed to urban sprawl - the process of suburbanisation further increasing the dependence of residents on cars.

It took years to realise that while road transport provides flexibility, such an organisation of cities leads to an inefficient use of space, increases distances between services and deprives residents of places for everyday interaction. Intensive urban growth also leads to air pollution, significant greenhouse gas emissions and the depletion of non-renewable energy resources. Based on data from the World Business Council for Sustainable Development, cities currently generate about 80% of total global electricity demand and account for 70% of greenhouse gas emissions. The main energy consumers and GHG emitters in cities are buildings. Estimates by the International Energy Agency (IEA) indicate that buildings are responsible for a third of CO₂ emissions, 40% of energy consumption, and 50% of the consumption of all natural resources. The scale of the phenomenon is, of course, determined by the fact that more than half of humanity currently lives in cities. In Poland, the urban living rate exceeds 60%, and in the European Union it stands at 75%.

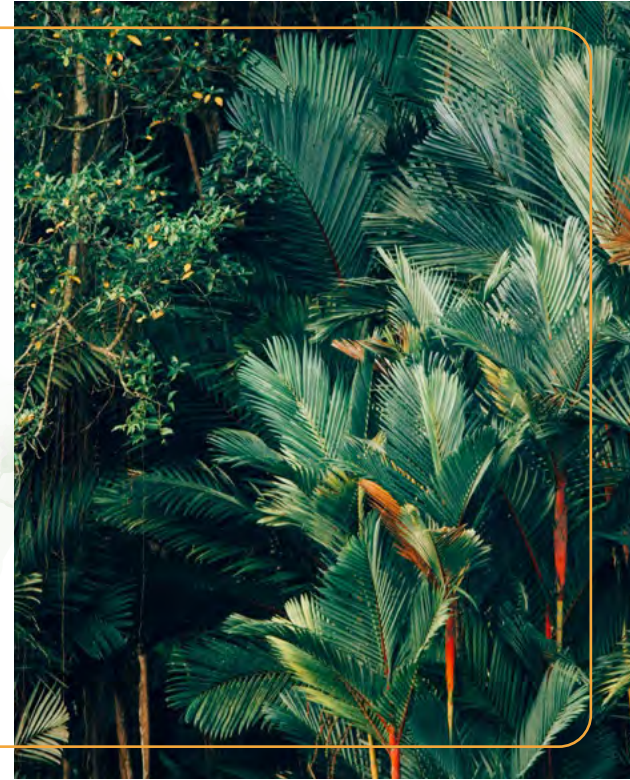
SUSTAINABILITY IS DRIVING THE DEVELOPMENT OF EUROPEAN CITIES

Faced with a growing number of climatic, demographic and planning challenges, modern cities are changing their priorities. To counteract these threats, more and more European cities are taking measures aimed at better urban planning, the development of public transport and cycling infrastructure, increased focus on renewable energy sources and the embracing of the green industry. As a rule, sustainable development is already a guiding principle for urban development in Europe.

SUSTAINABLE URBANISM

is an approach to urban planning which raises the quality of life and living standards, creating a better urban space. This is done via sustainable development, effective management of natural resources, transformation and repurposing of degraded land, filling in the gaps between existing buildings, landscape planning, development of transport systems, and care for other aspects of the environment. For the future development of cities, this means forming a dense, compact structure of mixed function development, with good access to infrastructure (technical, communication, social) and green areas.

Sustainable Urbanism derives from a combination of three trends: Smart Growth, New Urbanism and multi-criteria building certification (green building trend). It combines these three approaches to create a truly sustainable environment for people.



The key postulates according to which contemporary cities are shaped

	improving the quality of public space	the creation of multifunctional projects and spaces aimed at creating vibrant spaces (combining functions in mixed-use projects)	flexible development design to allow for future changes in function
avoidance of mono-functional designs and segregation of functions to reduce the need for additional trips	preventing urban sprawl	'inward' city development, increasing the intensity of development, including density (development of buildings vertically rather than horizontally) and upgrading the standard of existing districts	reducing „visual chaos” in public spaces
increasing the attractiveness of city centres, revitalisation of historic buildings	re-use (revitalisation) of degraded land and facilities	eliminating expressways in city centres, relegating motorized transport to the background, introducing traffic calmed zones	developing infrastructure for cyclists and pedestrians (no underpasses, footbridges, etc.)
developing of public transport	minimizing the impact of development on natural and agricultural areas	caring for urban greenery and increasing the amount of greenery in cities	focussing on ecological solutions, the priority is sustainable development

Sustainable Urbanism in Poland

A response to the current needs of local communities and an attempt to comply with legal requirements



In the largest Polish cities, as in the rest of the world, mono-functional housing estates, office areas and commercial destinations on the outskirts of the cities are all well established features. Furthermore, suburbs have grown in a chaotic way leaving them lacking in necessary services, as well as technical and transport infrastructure. As a result, few large centres have managed to create fully-fledged urban structures that are now spatially, functionally and socially sustainable.

Another consequence visible in Polish cities is the constantly growing level of motorisation, with most local governments having so far pursued car-promoting transport policies, favouring road investments over those aimed at walking, cycling or public transport use. As a result, the number of cars in Polish cities continues to grow, in the largest centres fluctuating between 680 and 850 cars per 1,000 inhabitants. In contrast, in European capitals the ratio is as little as half the Polish figure and is falling.

CHANGES IN THE APPROACH OF LOCAL AUTHORITIES

As social awareness grows, the expectations of inhabitants change and local governments evolve their priorities in the face of the growing number of challenges. In Polish cities, we can observe more and more actions compatible with the ideas of sustainable development and new urbanism. The innovative approach of local governments is becoming visible in their newly created urban development strategies. Although it is not yet a widespread phenomenon, local spatial development plans more and more often demand a combination of functions in new projects, abandoning monoculture and attempting to limit the overspill of residential development into distant city outskirts. A case in point is the Warsaw Neighbourhoods project that has been under construction in the capital since 2018.

Changes are also afoot in the way urban greenery, streets, bicycle paths and public transport stops are designed. Examples of organisational elements of Polish cities complying with new urban planning concepts - elements which are being implemented with increasing regularity - include: the revitalisation of post-industrial areas, pocket parks, traffic-calmed zones with speed limits below 30 km/h, woonerf construction, shared bus and tram stop construction, and the extension of cycling infrastructure.

In Poland, there are still too few comprehensive actions or strategies following the patterns of change observed in Europe, but the plans of local governments for the next few years are set to herald a growth and spread in these trends. The biggest urban plans implemented according to the principles of the sustainable urbanism are the New Centre of Łódź and the New Centre of Warsaw.

Poland is also an accredited member of the Healthy Cities Networks in the European Region (the WHO's Healthy Cities global urban health movement), with three cities (Warsaw, Poznań and Łódź) being involved in the Healthy Cities programme. According to the Healthy City principles, a healthy city should provide a clean, safe, high-quality physical environment, and an ecosystem that is sustainable in the long term.

THE NEW CENTRE OF WARSAW

The project is a series of ongoing changes in the Warsaw city centre that are scheduled for next few years to make the city centre more citizens-friendly. The key goal is to create comfortable and green public spaces, more accessible to pedestrians and cyclists. As part of the project, Jana Pawła II Avenue has been partly rebuilt and the square at the junction of Chmielna, Krucza, Bracka, Szpitalna and Zgoda streets is being redeveloped, which will be a space mainly for pedestrians. Another example is the changing vicinity of the Palace of Culture and Science, where the Museum of Modern Art is under construction and an attractive, green public space is planned.



THE NEW CENTRE OF ŁÓDŹ

The concept of developing the centre of Łódź envisages combining the functions of offices, housing, services, culture, entertainment and transport, to create an attractive public space in accordance with the idea of inward development of the city.

The revitalisation activities cover an area of almost 100 ha. The underground Łódź Fabryczna station - a multimodal transport hub connecting railways, long-distance buses and local public transport - is already operational. Office buildings have also been completed, and a new town hall and a residential area are at the planning stages. The project includes the ongoing reconstruction of the road system in the vicinity of the station.

As part of the revitalization of the area's buildings, the EC1 power plant building was restored and repurposed - it currently houses the Science and Technology Centre, a planetarium, the Comics and Interactive Narration Centre, and various institutions for artists.



CHANGES IN LEGAL ACTS

The changes we are beginning to observe in Polish cities are, on the one hand, a response to current social needs, but at the same time they are an attempt to meet the requirements of legal acts ratified at national and European Union levels.

The importance of sustainable urban development is emphasized by, among others, the National Urban Policy 2023 (2015), the Concept of National Spatial Planning 2030 (2011), and European Union documents such as the Leipzig Charter on Sustainable European Cities (2007), the European Green Deal and the Green Paper 'Towards a new culture of urban mobility' (2007).

LEIPZIG CHARTER (2007)

Prioritises the quality of life in cities and addresses territorial, cultural and aesthetic aspects of urban development. The document calls for, among other things, the preservation of a dense urban fabric based on the traditions of the European city, the provision of high quality public spaces, the promotion of urban transport, the modernisation of urban infrastructure networks and improvement in energy efficiency.

NATIONAL URBAN POLICY 2023

A policy aimed at directing state activities towards the sustainable development of cities and their functional areas, whilst making use of their potential in the development of the country as a whole. Emphasis is placed on the quality of space, land parcelling, and social participation. The policy aims to support sustainable urban development, including the counteraction of uncontrolled urbanisation.

CONCEPT OF NATIONAL SPATIAL PLANNING 2030

A document emphasizing the importance of the quality of spatial development plans and functional planning, paying heed to its influence on proper relations and spatial-functional cohesion within metropolitan areas.

EUROPEAN GREEN DEAL

The objectives of the European Union's climate policy up to 2030 are to reduce greenhouse gas emissions, increase the share of energy from renewable sources, and improve energy efficiency. These goals have an impact on environmental policy at the level of member states, who are obliged to adopt integrated energy and climate plans for 2021-2030.

Despite those first green shoots of change in the approach to urban development planning in Poland, the issue of rational space management still remains particularly important. It is true that ratified strategic and political documents are formulated with regard to sustainable urban development, but the reality is sometimes somewhat contradictory. On the one hand, technological solutions are developing in Poland - the popularity of ecological materials and technologies is growing, and modern commercial buildings are mostly holders of

„green” certificates. Polish cities, however, still face a number of challenges to further develop and reshape their transport needs - cases in point are the opportunity for inhabitants to „live locally” and the redirecting of infrastructure development towards walking, cycling and public transport. The need to introduce such changes in the organisation of Polish cities is clearly indicated by the Knight Frank diagnosis presented in the following chapter.

3 Polish cities against the European backdrop

Diagnosis

Urbane centres have been battling with the issue of emissions for years, and the debate over the negative impact of human activity on the environment has gained momentum with the advent of the pandemic. In light of the many challenges facing today's urban centres, Knight Frank has conducted a global study of 286 of the world's largest cities. The Active Capital report presents an analysis and assessment of factors in four categories (i.e. green, climate risk, brown, urbanisation pressures), resulting in a ranking of the largest cities in terms of sustainable development and, in particular, their attractiveness to investors.

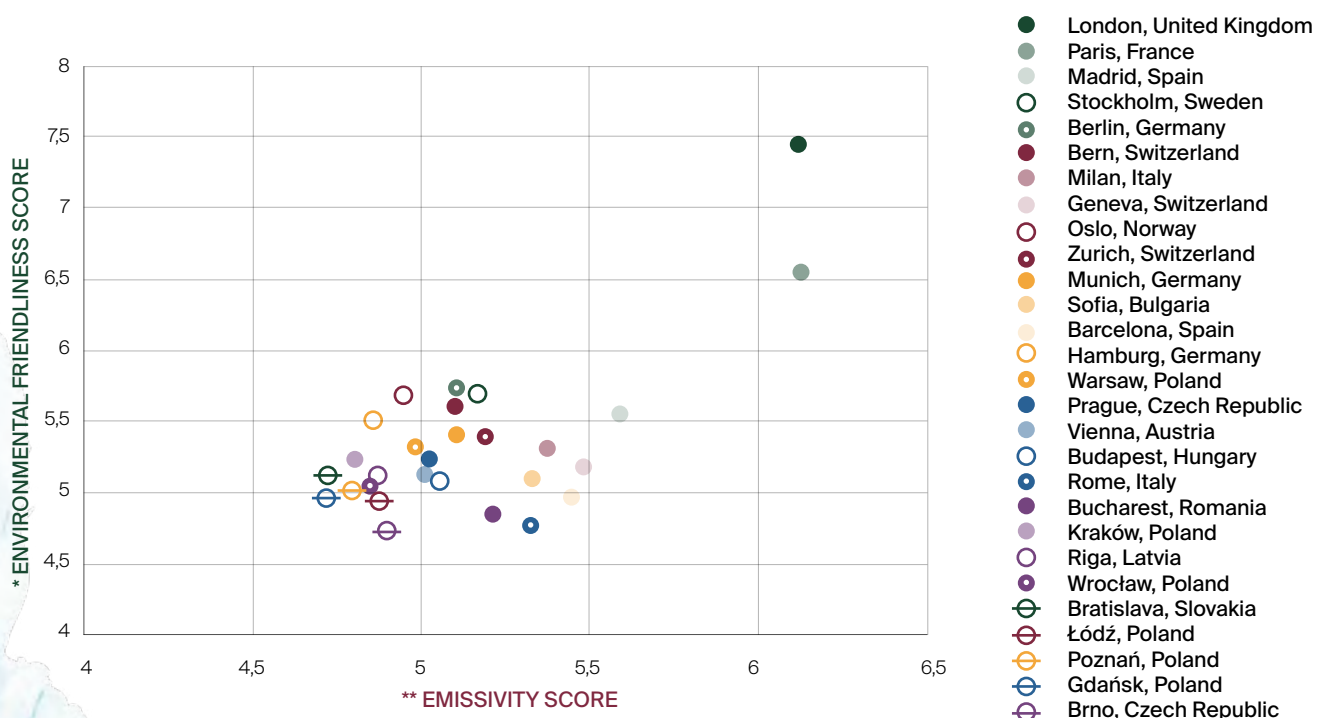
The research carried out for this report considers, first of all, the position of the largest Polish cities compared to other selected European agglomerations. It takes into account key aspects such as:

reduction in pollution emissions, the urbanisation process, and factors determining the extent to which the cities may be described as „green”. Polish cities are characterised by similar values of the factors determining resilience to climate change risks as other European cities. Our analysis, therefore, takes into account results for selected centres in two categories - emission reduction level and environmental performance.

The diagnosis analysed such aspects as the development of public transport infrastructure, the proportion of green areas, urban air quality, the number of certified green buildings, temperature changes, the rate of urbanisation, and measures aimed at reducing CO₂ emissions.



EMISSIONS AND ENVIRONMENTAL FRIENDLINESS OF SELECTED EUROPEAN CITIES



*factors determining the level of greenness of the cities (i.e. public transport infrastructure, green buildings, green areas)

**selected factors favourably affecting the reduction of CO₂ emissions and pollution

Source: Knight Frank

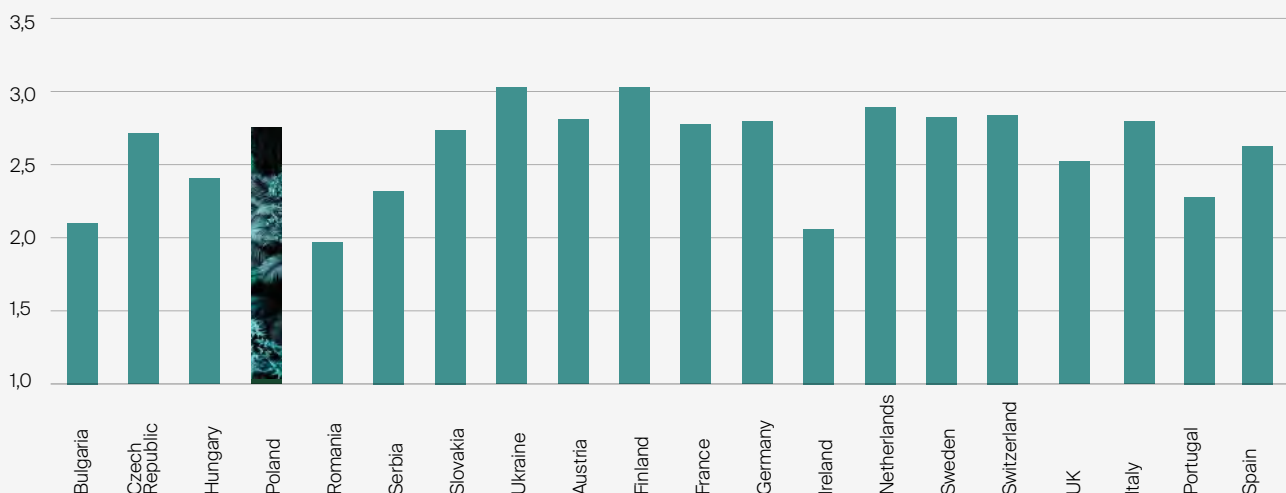
WARSAW IN TOP 20 CITIES IN TERMS OF SUSTAINABLE DEVELOPMENT

The analysis covered 118 European cities. London and Paris lead the way with high scores both in the category of environmental friendliness and reduction in pollutant emissions. Among Polish centres, Warsaw received the highest ranking with a position of 20th. The remaining Polish cities in the study, however, were somewhat lower in the ranking - Kraków was in 65th position, with Wrocław, Łódź, Poznań and Gdańsk ranked respectively 89th, 97th, 98th and 105th. The lowly positions were attributable mainly to the poor air quality in the cities in question, however these centres also have a lot to do in other aspects related to reducing the negative effects of urbanisation and improving the quality of life of city dwellers, which are presented below.

INCREASE IN URBAN TEMPERATURES

In 2016, as a result of the agreement of nearly 200 countries, the Paris Agreement was signed. It resulted in the creation of numerous initiatives and projects aimed at reducing carbon emissions in most industries. One of the assumptions of the Paris Agreement is to keep the global temperature increase in the current century below 2°C. Studies show that in most European countries, including Poland, the regional warming recorded since 1960 was over 2°C. Polish cities recorded an average temperature rise of 2.75°C during this period, putting them in the middle of the distribution compared to other European cities analysed.

REGIONAL WARMING (°C) SINCE 1960 IN SELECTED EUROPEAN COUNTRIES



Source: On the basis on Knight Frank global database

AIR POLLUTION WELL ABOVE WHO STANDARDS

One of the most serious problems of contemporary European cities is air pollution. Air quality analyses examine the presence of two types of particulate matter, distinguished by the size of the particles that form and circulate in the air: PM2.5 (up to 2.5 µm in diameter) and PM10 (up to 10 µm in diameter). Their origin can be both natural and due to human activity – the latter being the main cause of air pollution in cities. The main sources of atmospheric particulate matter are manufacturing and fuel combustion processes.

Particulate matter suspended in the atmosphere is one of the elements of smog, which is mainly observed in Poland during the colder months when heating is in use – although another form of it, photochemical smog, is noticeable in the summer. The formation of smog is the effect of a very high concentration of pollutants, with a key role being played by favourable atmospheric conditions: windless weather and low temperatures. The harmfulness of smog is emphasized by the fact that according to the World Health Organization it is the cause of premature death in 7 million people every year, and air pollution is, next to climate change, seen as one of the biggest threats to human life. Moreover, in 2013 the World Health Organization's International Agency for Research on Cancer (IARC) had already classified air pollution and particulate matter as carcinogenic substances. At the same time, it is worth noting that in 2019, according to the WHO, more than 90% of the world's population lived in areas where PM2.5 concentrations exceeded the permissible levels set by the World Health Organization in 2005. The key in the fight against polluted air is rapid action aimed at minimizing harmful emissions and paying heed to air quality. To this end, the WHO in September 2021, after conducting numerous studies, updated the permissible levels of pollutants. Concentration standards have been tightened and currently stand at:

- for PM2.5 – 15 µg/m³ per day and 5 µg/m³ per year,
- for PM10 – 45 µg/m³ per day and 15 µg/m³ per year.

POLISH CITIES AT THE TOP OF THE INFAMOUS RANKING

For Poland, which is among the most polluted countries in Europe, the WHO's new findings are tantamount to a call to speed up the introduction of an effective anti-smog policy. In many Polish cities, current concentrations of particulate matter exceed standards many times over, and Poland is already subject to infringement proceedings for failure to comply with the EU's air quality directive.

According to data published in the Global Carbon Atlas report in 2019, Poland was fourth among the 27 European Union countries in terms of CO₂ emissions, with only France, Italy and Germany ahead of it. In the WHO report on air quality in Europe published in 2016, out of the 50 most polluted cities, 33 were located in Poland, with 7 of them

making the top 10. Two years later, 36 Polish cities sat among the 50 most polluted European cities, indicating that the air quality problem was getting worse. According to analysis carried out in 2021 by members of the Sonar Europe project, the facility emitting the most greenhouse gases in Europe is the coal-fired power plant in Bełchatów. It produces 33 million tons of CO₂ per year, exceeding the annual CO₂ emissions of Denmark.

For Polish urban centres, one of the main problems influencing air pollution is the widespread use of outdated heating stoves to heat houses and flats. City authorities run and promote programmes under which their replacement is subsidised, but according to the Polish Smog Alert the rate of replacement has decreased in the last two years. It is worth, however, drawing attention to the effectiveness of the actions of some city authorities aimed at limiting the formation of smog. For many years, Kraków ranked high among the most polluted cities in Poland but, as of 2019, it no longer appears in such rankings. This is the result of a total ban on the burning of coal and wood in households, which has resulted in a decrease in harmful particulate matter emissions in the city.

CO₂ TERRITORIAL EMISSIONS IN 2019

Rank	Country	MtCO ₂
1	Germany	702
2	Italy	337
3	France	324
4	Poland	323
5	Spain	253
6	Netherlands	155
7	Czech Republic	101
8	Belgium	100
9	Romania	75
10	Austria	69
11	Greece	67
12	Hungary	49
13	Portugal	49
14	Sweden	43
15	Bulgaria	42
16	Finland	42
17	Ireland	37
18	Slovakia	33
19	Denmark	32
20	Croatia	18
21	Estonia	14
22	Slovenia	14
23	Lithuania	14
24	Luxembourg	9.8
25	Latvia	8.3
26	Cyprus	7.3
27	Malta	1.6

Source: Global Carbon Atlas, 2019

AVERAGE ANNUAL CONCENTRATION OF PARTICULATE MATTER IN SELECTED EUROPEAN CITIES (2017-2019)

	PM10 2017	PM10 2018	PM10 2019	PM2.5 2017	PM2.5 2018	PM2.5 2019
Prague, Czech Republic	24.09	25.32	19.51	60.37	65.31	49.98
Budapest, Hungary	25.37	24.75	20.25	65.06	56.57	42.50
Gdańsk, Poland	18.09	20.61	19.29	39.00	38.63	33.37
Poznań, Poland	23.93	23.57	20.82	73.74	42.50	36.60
Warsaw, Poland	30.09	34.09	24.21	71.83	77.45	62.77
Wrocław, Poland	32.34	28.01	24.76	75.99	74.70	64.62
Kraków, Poland	38.69	36.80	29.61	82.84	78.46	72.46
Bratislava, Slovakia	22.93	23.47	20.73	57.45	59.71	50.89
Vienna, Austria	20.05	19.64	17.02	53.10	53.01	46.80
Copenhagen, Denmark	22.71	27.84	24.52	46.23	47.36	37.53
Helsinki, Finland	14.04	16.71	14.87	23.64	30.48	27.45
Paris, France	24.59	22.46	24.12	55.22	52.59	53.66
Amsterdam, Netherlands	19.38	21.31	18.56	50.79	53.95	46.18
Oslo, Norway	13.92	16.25	15.91	29.46	33.93	32.90
Stockholm, Sweden	17.30	23.29	23.06	23.85	31.70	31.13
London, United Kingdom	21.49	19.77	18.41	27.26	29.04	27.01
Rome, Italy	21.58	21.81	21.61	52.69	49.95	49.10
Lisbon, Portugal	19.66	16.39	17.75	45.15	38.83	37.24
Madrid, Spain	15.43	12.66	17.90	37.34	34.82	38.67

WHO guidelines for particulate matter concentration (2005-2021):

PM2.5 - 25 µg/m³ 24-hour mean, 10 µg/m³ annual mean

PM10 - 50 µg/m³ 24-hour mean, 20 µg/m³ annual mean

Source: On the basis on Knight Frank global database

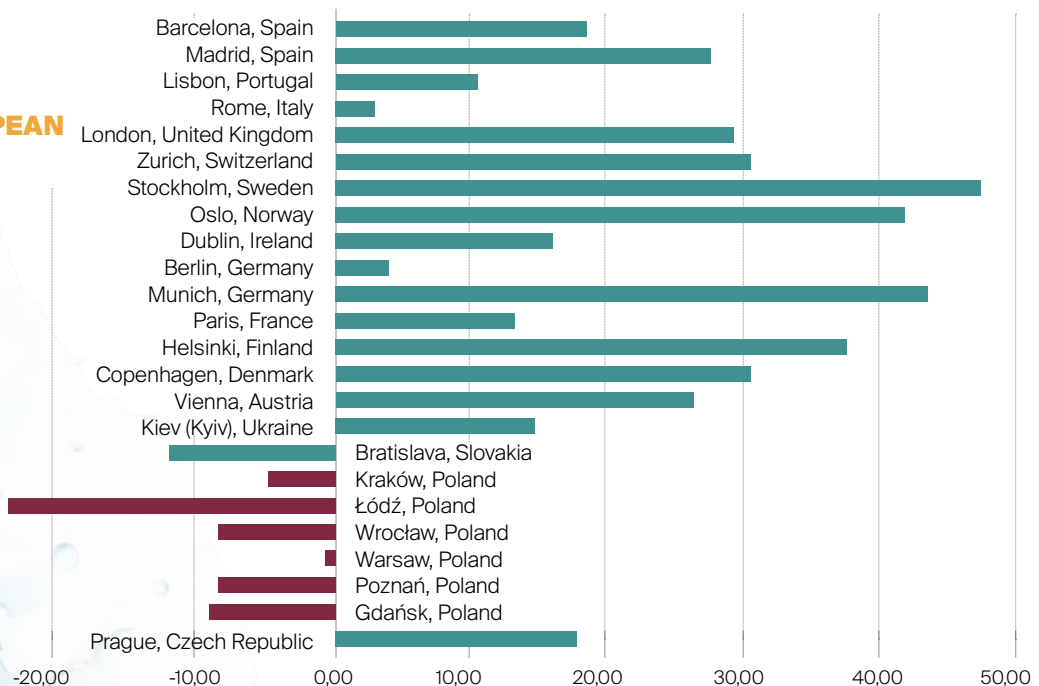
THE DEPOPULATION OF POLISH CITIES

Another problem facing Polish cities is the spatial overspill of the largest centres into the suburbs, resulting in a steady, gradual decrease in the number of city inhabitants. Poor air quality in cities, internal and external migration, and negative natural population growth have a key impact on these demographic changes. In the period from 1990 to 2015 all Polish cities examined by Knight Frank (Warsaw, Kraków, Wrocław, Łódź, Poznań, Gdańsk) recorded a decrease in population (by 9% on average), whereas many European urban centres experienced population growth. Among Polish cities, the smallest decrease in population was recorded in the capital city - by 0.68%, while the largest number of people left Łódź (a population decrease

of 23.5%). Among the largest European cities, only Riga is ahead of Łódź in this respect.

City dwellers are also exposed to another factor that has a negative impact on their quality of life: excessive noise, coming mainly from transport. According to a report by the European Environment Agency in 2020, one in five EU citizens lives in an area where the level of noise generated is considered by the World Health Organisation to have a harmful impact on health. It should, however, be borne in mind that this problem affects most European cities, where more than half of the inhabitants of urban areas are affected by road noise levels of 55 dB or more 24 hours a day.

CHANGE (%) IN THE NUMBER OF INHABITANTS IN SELECTED EUROPEAN CITIES (1990-2015)



Source: On the basis on Knight Frank global database

A SHARP INCREASE IN THE AMOUNT OF BUILT-UP SPACE

The rapid urbanization observed in recent decades has resulted not only in increased noise levels, but also in an increase in the share of built-up area in the total area of cities, most often at the expense of green areas. In the Knight Frank study, however, Kraków stands out among European cities. Despite a large increase in its built-up area (65%) it managed to record one of the highest increases in greenery ratio in built-up areas among all the analysed cities. For comparison, the same result was noted in Lisbon, and only three European cities can boast a higher indicator: Rennes, Lyon and Geneva. At the same time, between 1975 and 2015, Warsaw registered a 70% increase in its built-up area, placing it 3rd among the analysed European cities. In this respect, Warsaw is topped only by Madrid (a growth of 83%) and Kiev (86%). In contrast, the group of cities that recorded the smallest increase in built-up area in the analysed period included London (10%), Zurich and Barcelona (12% each), Milan (13%), Munich and Manchester (14% each) and Berlin (15%).

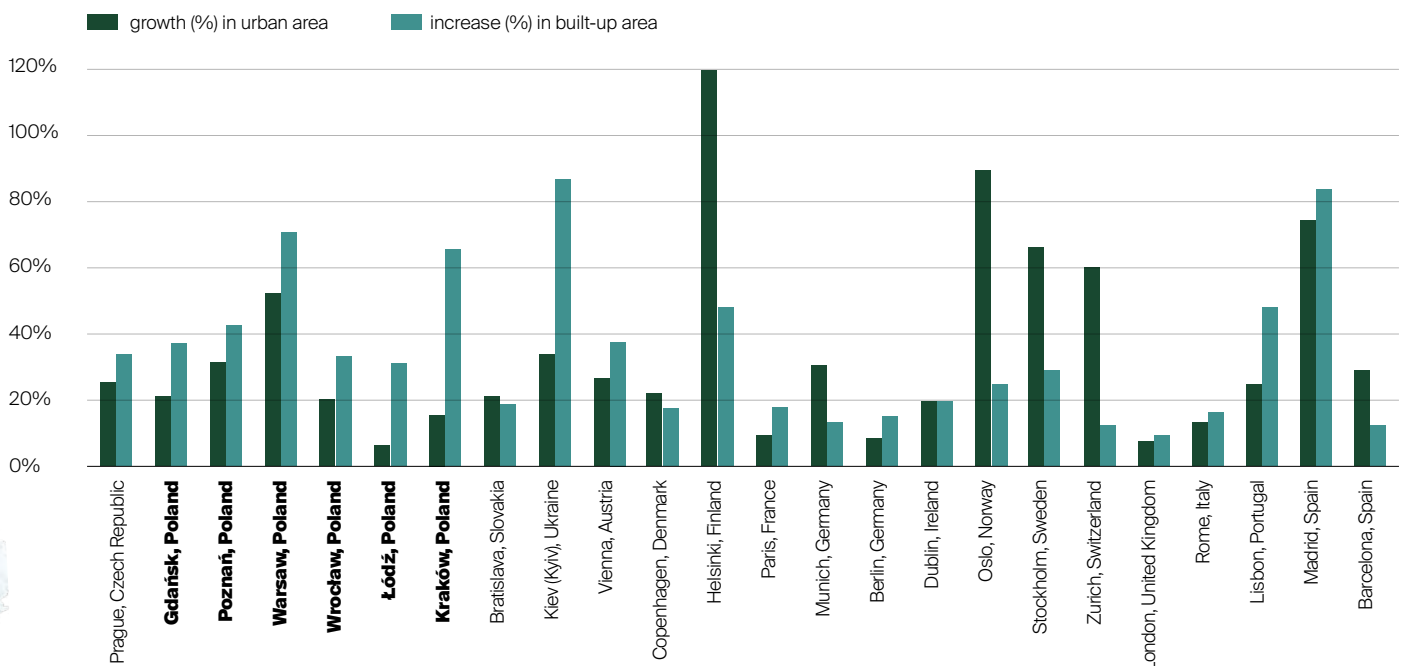
Knight Frank's analysis of the growth of high density urbanised area and built-up area in selected cities between 1975 and 2015 clearly shows that during that period the cities of Central and Eastern Europe (including Prague, Kiev and the analysed Polish cities) underwent the process of urban sprawl. In contrast, many European centres, especially in Scandinavia, were densifying their centres in line with the principles of new urbanism and the idea of sustainable development, as can now be seen in such cities as Helsinki, Oslo, Copenhagen, Stockholm, Zurich and Munich.

HOW „GREEN” ARE POLISH CITIES?

The presence of greenery is a key factor influencing the quality of city life, making it a frequent subject for research. According to the HUGSI 2020 Index assessing the level of greenness of urban areas and covering 155 urban centres worldwide, Kraków ranked 3rd among European cities and 5th in the world. The analysis was conducted using satellite imagery and focused on the actual percentage share of green spaces in the metropolises. For European cities, the capital of Małopolska region was ahead of Stuttgart, Zurich, Hamburg and Prague, and was behind only Dortmund and Vilnius. The other Polish cities in the analysis - Wrocław and Warsaw - were ranked 16th and 17th respectively in Europe, and 22nd and 23rd in the world. Green areas make up 54% of the area of the capital of Lower Silesia, while in Warsaw and Kraków - respectively - the figures are 51% and 57%. German cities, with 20 out of the top 100, dominated the ranking.

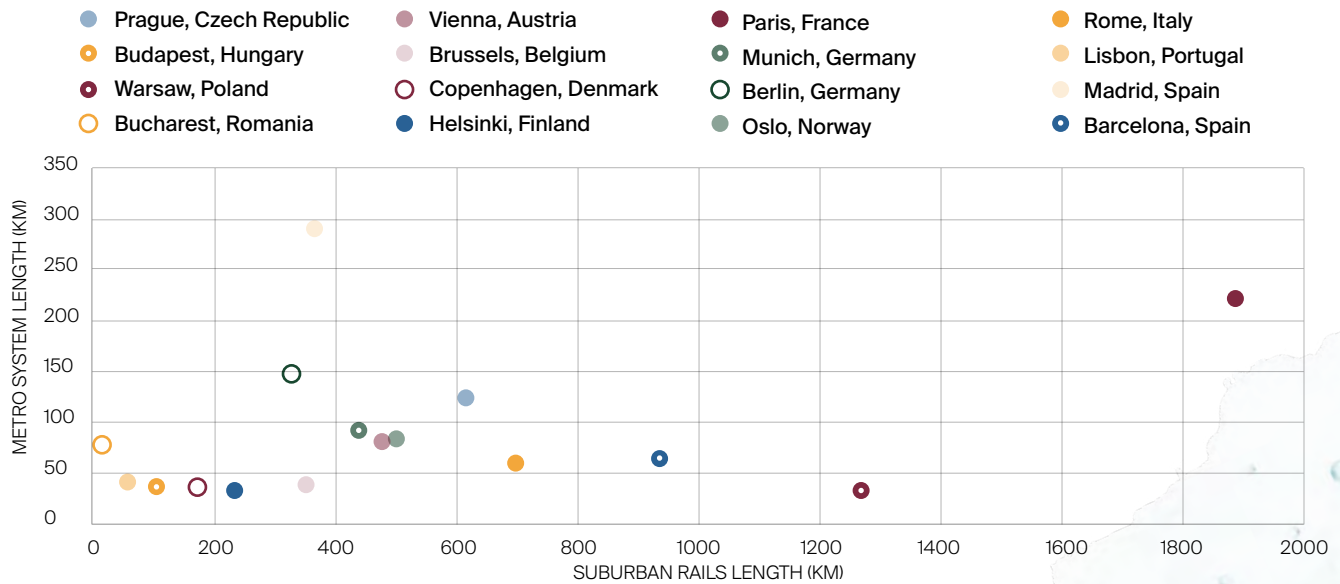
The importance of the presence of green areas in the surroundings of human beings is emphasized by a study conducted by Danish scientists from the University of Aarhus. Involving almost one million people born between 1985 and 2003, it showed that access to green areas during adolescence can contribute to a reduction in the incidence of mental illness by as much as 55%.

GROWTH (%) IN URBAN AREA AND INCREASE (%) IN BUILT-UP AREA IN SELECTED EUROPEAN CITIES (1975-2015)



Source: On the basis on Knight Frank global database

METRO SYSTEM AND SUBURBAN RAILS LENGTH (KM) IN SELECTED EUROPEAN CITIES



ECO-MOBILITY VERSUS CAR GROWTH

The high levels of pollution in Polish cities are closely related to a steadily increasing number of cars. In 2019, Kraków had 685 cars per 1,000 inhabitants, while Vienna and Berlin had 372 and 324 respectively. Other Polish cities recorded figures even higher than Kraków. In 2020, in Warsaw there were 833 cars per 1,000 inhabitants, in Katowice - 854, in Poznań - 850, and in Wrocław - 690. It is worth noting that Poland, compared to other EU countries, is very motorised,

and the number of cars in Western Europe is systematically falling. Rail transport, both metro and suburban railway, plays an important role in European cities. In terms of the length of suburban railways and underground lines in Europe, cities such as London, Moscow, Paris and Madrid stand out. Although Warsaw has one of the longest networks of suburban railways, it remains one of the most „car-dependent” capitals in Europe. In recent years, many European centres, looking for an alternative or addition to public transport and cycling infrastructure, have set about developing city bicycle networks. In the capital of Poland there are 3.25 urban bicycles per 1,000 inhabitants. By way of comparison, Paris has 11.18/1,000 inhabitants, Barcelona - 5.16, while Vienna and Moscow only 0.51.

NUMBER OF CITY BICYCLES PER 1,000 INHABITANTS IN SELECTED EUROPEAN CITIES

	number of inhabitants 2021	number of bicycles / 1,000 inhabitants
Paris, France	2 138 551	11.18
Milan, Italy	1 236 837	6.22
Brussels, Belgium	1 019 022	5.68
Barcelona, Spain	1 621 537	5.16
Munich, Germany	1 260 391	4.63
Helsinki, Finland	558 457	3.40
Berlin, Germany	3 426 354	3.32
Warsaw, Poland	1 702 139	3.25
Copenhagen, Denmark	1 153 615	3.22
Amsterdam, Netherlands	741 636	1.84
Oslo, Norway	580 000	1.49
Dublin, Ireland	1 024 027	1.41
Rome, Italy	2 318 895	1.39
Madrid, Spain	3 255 944	1.20
Bratislava, Slovakia	423 737	1.18
Prague, Czech Republic	1 165 581	1.12
Budapest, Hungary	1 741 041	0.97
Vienna, Austria	1 691 468	0.51
Moscow, Russia	10 381 222	0.51
Bucharest, Romania	1 877 155	0.32
Riga, Latvia	742 572	0.17
Kiev (Kyiv), Ukraine	2 797 553	0.07

Source: On the basis on Knight Frank global database

The diagnosis carried out by Knight Frank comparing Polish cities to European urban centres, based on selected factors influencing the quality of city life, revealed some critical areas. One aspect requiring immediate attention is the issue of eliminating emissions of harmful substances to the atmosphere, thereby limiting temperature increase and improving air quality. In addition, the analysis shows that Polish cities have been experiencing sprawl and depopulation for years. Local governments in Poland, observing the changes taking place in other European cities, are implementing more and more new solutions and are working on new strategies to follow the positive trends. This approach promises further new measures aimed at improving the quality of urban life in the years to come. The promotion of eco-mobility, green solutions, investments in attractive public space, infrastructure for pedestrians and cyclists, and the development of public transport networks can all contribute to improvements in air quality and a stemming of the outflow of people living in Polish cities.



Trends

that are changing cities



Cities need to change, because we are changing as a community and our needs are changing. Rapid urbanization, an interest in healthy lifestyles and the growing demands of citizens regarding urban infrastructure are determining the need to remodel cities. The quality of urban life is becoming the key.

In turn, the quality of life in cities is shaped by the changes currently taking place in social and economic areas, and environmental changes are no less important. These determine the trends that will shape the changes in the organisation and appearance of our cities in the years ahead.

Social and environmental aspects have become the common denominator for the vectors of change for modern cities, in order to make them more people-oriented and sustainable.





Trends

that are changing cities



a. Resident-oriented city and quality of life in the city

i. **INNER CITY DEVELOPMENT** *through increased intensity of development, revitalization of historical urban fabric and recovery of post-industrial areas*

Over the years, city centres have been depopulated and housing estates have spread into the suburbs. In opposition to this model of urban development, the concept of the compact city with a higher building density was advanced, and it has been gaining popularity in Europe for several years now.

Well-designed cities providing a better quality of life, rather than models of suburbanisation, are the answer to climate change and the needs of local communities. As a result, in shaping a sustainable structure for development areas, it is important to form communication spaces - streets, pedestrian routes, squares - in such a way as to favour the reduction of car travel and the use of alternative means of transport. In EU strategic documents this model is indicated as the idea of shaping urban space in accordance with the principles of sustainable development, and the idea itself draws upon the traditional urban fabric of historic European cities.

In contrast to urban sprawl, increasing the density of development brings financial benefits to the city, above all lower infrastructure costs, lower transport costs and a sound economic justification

for the development of public transport. Inner city development also means less time spent travelling, along with the possibility of preserving more green areas between the clusters of compact buildings. According to the estimates of the Polish Academy of Sciences (Costly Spatial Chaos, Report of the Polish Academy of Sciences, 2019), the cost of suburbanization in Poland is PLN 84.3 billion per year, equivalent to 20% of the national budget.

The concept of inward city development is based on what already exists, with new buildings being built incrementally. As a result, urban development strategies are increasingly adopting the idea of the re-urbanisation of inner city areas, often providing for an increase in the density of development in city centres and the development of the residential function in areas dominated by services. As part of increasing development density in the city centre, local authorities most often focus on revitalising historic buildings, redeveloping post-industrial areas with multifunctional facilities, and developing undeveloped land.

The activation of disused urban space in attractive parts of cities and its restoration to the local community is one of the important challenges undertaken throughout Europe.



Spectacular examples include the port areas of Hamburg, Kings Cross in London, Oslo city centre, and Carlsberg City in Copenhagen.

The trend of adapting post-industrial sites in Poland is also developing dynamically as re-development of historical buildings offers the chance to create unique places. Post-industrial sites are often located in excellent locations, the area comes equipped with utilities, and the development conditions make it possible to create extraordinary investments with a unique sense of place combined with stimulating architecture. Such projects have been carried out in Poland for a number of years now, but of importance is the fact that in Poland the number and scale of such investments is growing year by year. Mixed-use schemes are developed in largest cities as well as in towns. It is estimated that more than 20 such projects were completed, while more than 30 schemes are in the pipeline (more details in section 5, page 28).

These investments are usually associated with the revitalization of historical factory buildings or post-industrial areas in attractive parts of the city, and they therefore often become a tourist and business attraction as well as a draw and focus for the local community.

ii. HUMAN-SCALE CITY

compact city and 15-minute city



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The difference between standard of living and quality of life is that standard of living depends on how much money we have and how we spend it, while quality of life depends on how much time we have and how we spend it.

”

David Sim „Soft City”, 2020

With our current lifestyles, one of the most important resources is time from the point of view of city dwellers, and the quality of life itself is closely connected. The organisation of urban space as a dense, multifunctional structure, in which necessary functions are within easy walking or cycling distance, allows city inhabitants to save time spent on commuting, with a direct influence on their quality of life.

The concept of the compact city discussed earlier views a city's structure as a number of regions, parts or districts with distinct centres, having highly diversified functions and differing in character. The division into districts becomes a cultural element of the city and an essential element of the urban lifestyle. As a result, the centres adopt an idea of city planning that meet the inhabitants' needs

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The factors that create a sustainable city have become the same factors that determine liveable cities. These include mixed-use facilities, good connectivity, high quality public spaces, local character and flexibility. When all these characteristics exist simultaneously, they create a mix of sustainability, social benefits and a dynamic economy. Such cities can reduce the need for car travel, energy consumption and emissions, use local materials, encourage entrepreneurship and create communities with which people identify.

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*Rob Adams,
Transforming Australian Cities, 2009*

concerning work, leisure, shopping, and entertainment. These needs can be satisfied within 'self-sufficient districts' which can function with minimal car use.

Many European metropolises form a mosaic of areas with slightly different characteristics, their distinguishing elements are often the public spaces: squares, transport nodes, and main streets, which become a certain kind of centre offering a combination of functions. This concept assumes that cities should be organized in such a way that in the vicinity of their place of residence a person can study, work, go shopping, and spend free time. This is facilitated by multifunctional projects combining office, residential, service, cultural and recreational functions. From the place where they live, a person can expect to be able to take care of all their basic needs within a distance of no more than a 15-minute walk or cycle ride – an expectation that also applies to their place of work.

The structure of cities as systems of independent regions

- parts of districts developing around public transport nodes
- can be observed in many metropolises of the world. „Cities of neighbourhoods” include London, Paris, Berlin, New York and San Francisco. London, for example, is a mosaic of areas and places, often with a distinctive identity, such as, among others; the City - the business district; Notting Hill - the artists' district; Camden - the alternative district. The model of development of a polycentric urban structure with optimal density depending on the accessibility to transport nodes and distance from the centre, proposed in 2000 in the British strategic document Towards an Urban Renaissance, has become the basis for the development strategy of London and many other British cities.

PARIS - 15-MINUTE SCALE

Starting in 2019, the 15-minute city concept is being developed in Paris. It involves reorganizing the districts of Paris to transform them into a network of self-sufficient neighbourhoods / districts. According to the concept, key elements such as education, healthcare, work, shops, entertainment and green spaces should all be available within a 15-minute walk or bike ride of the place of residence.

The implementation of the concept is to be facilitated by limiting car traffic, providing more space for pedestrians, and arranging green areas on previously inaccessible roofs. The Paris authorities, implementing the ideas of inward city development, are adapting former public administration buildings and post offices located in suitable city centre locations for housing purposes.



iii. RECLAIMING SPACES

FOR PEDESTRIANS *Improving the quality of public space and safe walking and cycling in the city*

In recent years, European city authorities have been discussing both the need to ensure motorised traffic flow, and the promotion of alternative modes of transport and the attendant need to redirect people's transport needs towards them. In a modern approach to urban organisation, the influence of cars on the city's shape is reduced, with the space regained being made available to pedestrians.

Until recently, most cities benefitted from a lot of data on cars, but have had little information on pedestrian behaviour. One of the results is that, for many years, cars have received preferential treatment in space allocation decisions, with pedestrians, the largest group of traffic participants lest we forget, receiving far less consideration and space. Numerous studies though have shown that streets with a high share of pedestrian traffic are in fact safer, and people on foot use local services or shops incomparably more often than drivers of passing cars. In addition, by spending more time in public spaces people participate more actively in the life of the local community.

Streets are one of the most important elements of public space as they represent 30% of the open spaces in cities. It is important,

therefore, to take a holistic approach to urban mobility and to consider the functioning of different modes of transport and different options for travel within the same space. Urban streets should not only permit a smooth flow of traffic, but should also be public spaces with street furniture, frontages, cycle lanes and the like. The street is thus an element in the wider, balanced, spatial and functional structure of the city. The future in resident-oriented cities therefore lies in easy pedestrian access to public spaces, convenient cycle paths and a spatial design which does not exclude any social group. Examples can be found all over the world: in New York, many streets have been closed off to cars and transformed into public spaces; in Copenhagen, the Stroget shopping street has been transformed into Europe's longest pedestrian zone; in Seoul, a busy city centre street has been removed to reveal a riverbed; Hamburg is preparing to ban individual car traffic in the city centre.

At the same time, it is important to emphasise that a people-friendly street is not solely a pedestrian area. Thoughtful design makes it possible to divide the street space for use by different modes of transport. Cars are necessarily a part of this, but people-oriented design is the priority. In practice this means narrower streets with cycle



A city, a neighbourhood or a subdivision is never finished. If a place is to be sustainable, the urban form must be responsive and able to change. A flexible public space is multifunctional and thus responsive to evolving needs. Boulevards, avenues, streets, alleys, all these types of streets as public spaces can support open-air living. Streets have been conceived as transport corridors, but they can be important places for people to spend time, where spending time is as important as moving around.



David Sim „Soft city“, 2020



lanes running along them and wider pavements with green elements. Car parks are tucked away underground allowing attractively designed public spaces, such as squares and boulevards, designed only for pedestrians and cyclists. Numerous examples of this approach can be found in, for example, Swiss and French cities.

Street space can also be designed to favour different users and modes of transport at different times of the day or week. For example, Nowy Świat and Krakowskie Przedmieście streets in Warsaw are closed to cars at weekends and on holidays, when they become pedestrianised. Another example can be found in Tokyo, where the main artery of the Kagurazaka district has a tidal nature, running in one direction in the morning, before being closed to cars at lunchtime, and reopening to run in the opposite direction for the afternoon traffic.

WOONERFS

Woonerfs, which are gaining in popularity in many European cities, as well as in Poland, are in harmony with these ideas and assumptions. On these streets, pedestrians have priority. Car and bicycle traffic is permitted, although it must adapt to the speed and flow of the pedestrians. This is often achieved via wider pavements, trees, benches, street art or art installations, along with larger areas for restaurant gardens.

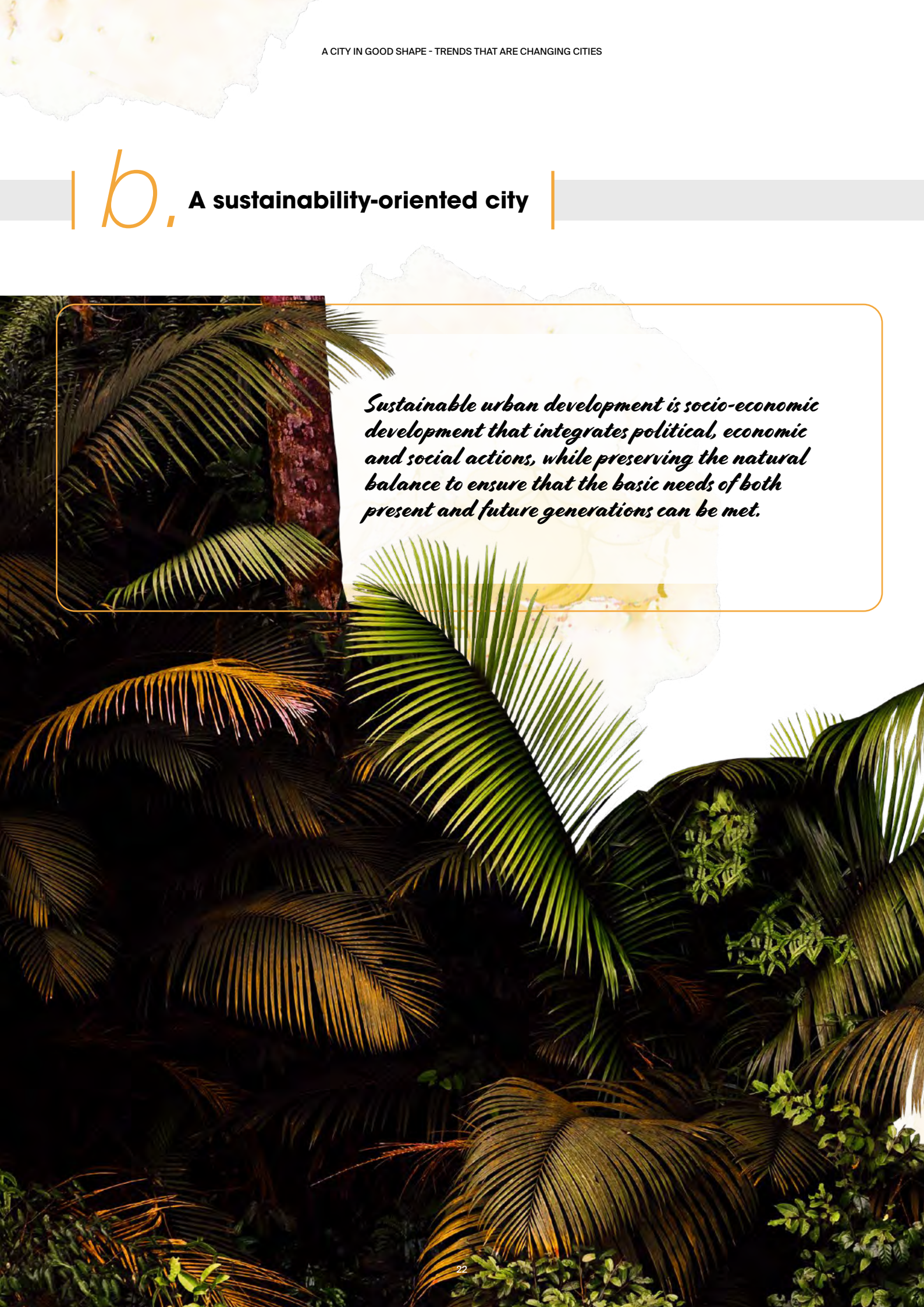


iv. *DEVELOPMENT OF LOCAL COMMUNITIES*

In cities with a high quality of life, urban development should also encourage proactive lifestyles that inspire city users to participate in the building of relationships within the local community. This is facilitated by the appropriate planning of urban space, the creation of attractive meeting places in public spaces, and the offering of opportunities for people to spend time together, for example, recreational areas or urban gardens. Encouraging physical activity, promoting social participation and a culture of sharing, whilst also building intergenerational relations are all directions that have a positive influence on the well-being of residents, whilst giving them a sense of belonging to a group.

An increase in social activism is related to a greater awareness in people who want to live in a sustainable environment; they want to have a say in shaping their neighbourhoods, and are willing to get involved to adapt their surroundings to the current and future needs of their local communities.

| b. A sustainability-oriented city



Sustainable urban development is socio-economic development that integrates political, economic and social actions, while preserving the natural balance to ensure that the basic needs of both present and future generations can be met.

BASED ON THIS DEFINITION OF SUSTAINABLE DEVELOPMENT, IT IS WORTH POINTING OUT THREE ASPECTS OF URBAN DEVELOPMENT THAT CONTRIBUTE TO THE MAINTAINING OF ITS GOOD CONDITION IN THE FUTURE.



i. RECLAIMING LAND FOR GREENERY, IMPLEMENTATION OF GREEN OPEN SPACES

One of the specific tasks of objective 11 of the list of 17 Sustainable Development Goals is to ensure access to public spaces, including green spaces, for all groups in society.

In practice this can be achieved by creating new green areas in the vicinity of residential, employment and service areas. However, the degree of urbanisation in many cities is so high that the creation of large green areas often proves impossible due to a lack of available land. As a result, so-called 'nature-based solutions' (NBS) are increasingly being used.

NBS are efforts to protect, sustainably manage and restore natural or modified ecosystems that adapt to societal challenges while providing human well-being and biodiversity benefits.

Below, several selected solutions are presented – solutions which have not only been successfully implemented across the world, but are also becoming increasingly common in Polish cities. The common feature of the presented solutions is that they provide ecosystem services, i.e. benefits obtained from the environment. They include, among other things:

1.

REDUCTION OF THE PHENOMENON OF SO-CALLED URBAN HEAT ISLANDS

vegetation evaporating accumulated water and reflecting solar radiation protects surfaces from heating

2.

REDUCTION OF NOISE

plants partly reflect and partly absorb sound

3.

WATER RETENTION

vegetation helps slow down rainwater runoff

4.

AIR PURIFICATION

by absorbing particulate matter and carbon dioxide

5.

SUPPORTING BIODIVERSITY

provide habitats for numerous animal species (mainly insects)

6.

IMPROVEMENT IN THE HEALTH OF RESIDENTS

gardening reduces stress, offsets irritability and lowers blood pressure

7.

PROVISION OF CULTURAL AND SYMBOLIC SERVICES

creating friendly urban landscapes

POCKET PARKS

The idea of pocket parks is to create green enclaves even on small (in Poland it is usually 300-1,000 sq m) areas, such as squares between buildings or neglected squares. In Poland, both large cities such as Kraków (the Gardens of Cracowians project initiated in 2018 by students of the Jagiellonian University), Wrocław (parks created as part of the implementation of the Grow Green EU project), Warsaw, Gdańsk and Łódź, as well as smaller cities such as Olsztyn, Bydgoszcz, Białystok and Włocławek can boast their own successful projects. An important feature of these activities is the active involvement of citizens in decision-making processes regarding the content and location of such parks.

LINEAR PARKS

Linear parks around the world are created, for example, along rivers, canals or roads, or are inserted between the existing urban fabric. They have a predominantly linear shape. Their idea is to connect previously separated fragments of the city. Thanks to them, a multi-functional area is created, e.g. recreational, service and transport functions. One of the best-known linear parks in the world is the High Line in New York. In Poland we are currently working on the first such area. The Linear Park in Służewiec will be located on Suwak Street in Warsaw, in the place of an undeveloped area along the railway line. The tender for the construction has already been announced, and the park is to be ready for use in 2023.

GREENING OF TRAMLINES AND RAILWAY TRACKS

„Green” tramlines and railway tracks are becoming popular in cities around the world and are one example of good practice used to combat worsening climate change. Specialist studies show that seeded tracks retain between 50-70% of annual precipitation in a given area (up to 90% of rainwater in summer). Green swards also mean a reduction in temperature in the immediate surroundings. In summer, a sward of grass can reduce the temperature of the rails by up to 20°C, and the air by up to 10°C. Grassed tracks are also a way of reducing air pollution (through absorption of fine dust by greenery), and city noise.

„GREEN” PARKING SPACES

Instead of building classic concrete or cobblestone parking spaces, city authorities with a sustainability-conscious policy are turning their attention to, among other things, so-called „green” parking spaces. These are based on a green surface in the form of a full lawn or grass, which grows out of an openwork concrete or plastic grid. This does not block the water infiltration into the soil and therefore does not disturb an area's water management.

VERTICAL FORESTS/GARDENS

Vertical gardens are facades of buildings vertically covered with plants. They can take the form of green facades with climbing plants whose roots are in the ground, or living walls with a special irrigation structure. One of the most popular examples is the Bosco Verticale in Milan. The two residential towers completed in 2014 have 800 trees, 4,500 shrubs and 15,000 plants growing on a total of 46 floors. If all these plants were planted on one flat space, it would have an area of 3.5 football pitches. Another spectacular project is the skyscraper-garden One Central Park in Sydney. It has 34 storeys, and its glass façade and roof are decorated with some 35,000 plants.

GREEN ROOFS, THE SO-CALLED FIFTH ELEVATION

Green roofs can be divided into intensive and extensive varieties. Intensive roofs are, in a nutshell, classic gardens adapted to human use, which to a large extent have a recreational function. Extensive roofs (e.g. roofs of commercial or public buildings) are not intended for use by people, and are planted with mainly ecological benefits in mind (e.g. to ensure an appropriate ratio of biologically active surface in the investment). One of the examples of extensive implementation is the greening of roofs of bus shelters in Warsaw. The concept's implementation has been underway since August 2020, and there are currently 19 bus shelters in the capital with roofs covered with sedum.



ii. CIRCULAR ECONOMY

The consumption of raw materials over the last 100 years has reached a scale hitherto unseen. While this has enabled a high degree of economic development to be achieved, it has also had enormous consequences for the environment and the population. During its evolution, the industrial economy has never moved from its basic path: a linear model of resource consumption, following the pattern: „take, produce, use, throw away“. In practice this means that companies extract materials, consume energy and labour to produce a product and sell it to the consumer, who then throws it away when it no longer serves its purpose. As a result, not only are natural resources consumed, but the area occupied by landfills for waste that can no longer be recycled is growing and growing. The consequences of this approach are manifested in climate change and its impact on the lives of city dwellers.

This has led cities to increasingly signal their commitment to moving towards an alternative economic model - the circular (closed loop) economy. The goal of this model is to keep products and materials in the value chain for a longer period of time, and to recover raw materials after products have been used, ready for their next use.

It should be borne in mind that although cities are aware of the need to make the transition to a circular economy, the circular economy on a national scale has little chance of being successfully implemented without the cooperation of central and local governments. Additionally, perhaps, we ought not to speak of an effectively implemented closed loop strategy, but rather we should perceive it as a constantly evolving, living process, subject to change.

Implementing the vision of a circular economy in cities can bring economic, social and environmental benefits, including: uncoupling economic development from the consumption of scarce resources; fostering innovation in the design, regeneration, repair, recycling, bioeconomy and entrepreneurship sectors; creating new jobs; increasing resource productivity; reducing demand for raw and other materials. This concept also offers opportunities for meeting the challenges of increasingly scarce resources in the face of decreasing security of supply and increasing greenhouse gas emissions.

„CIRCULAR CITIES PROGRAM POLAND“

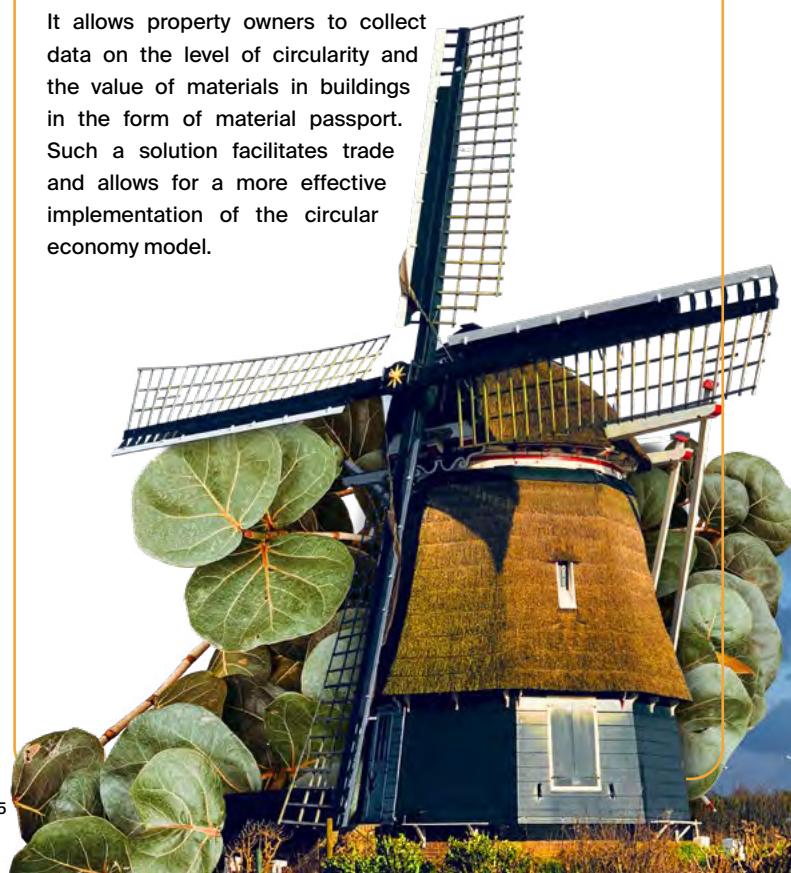
On April 19, 2021, an official presentation of the reports of the „Circular Cities Program Poland“ project took place, implemented - for the first time - in three cities: Gdańsk, Kraków and Lublin. During the programme, an analysis was carried out to identify practical solutions to support the transformation of Gdańsk, Kraków and Lublin into cities with closed-loop economies. The objective of the programme was to prepare a separate analysis of the current waste flow for each of the cities. On this basis, three practical and ready-to-implement strategies of transition to circular economy were developed.

The strategies include selected potential actions to kickstart the circular economy in the cities. Some of them are common for all cities (e.g. requirement for all new buildings to be built according to circular standards, pilot neighbourhood repair and reuse hub), while the others ideas are specific for the city (e.g. zero waste tourism covenant for Kraków and Gdańsk, pilot brownfield redevelopment project in Kraków, establishment car-free zones across Lublin and Gdańsk).

These selected actions were set based on stakeholder workshops, surveys and interviews, and are initial recommendations that will need further revision. Ultimately there are longer-term objectives, including diverting away from fossil fuel, landfill, and incineration. To achieve these goals will also require bold legislation and policy as well as addressing larger infrastructures.

THE NETHERLANDS

The Netherlands aims to create a fully closed-loop economy by 2050 and to reduce the consumption of primary raw materials by 2030. This policy has made one of its priorities to ensure that the construction sector is an integral part of sustainable development. As a part of this policy an online register of products and materials in the construction sector was established in the Netherlands. It allows property owners to collect data on the level of circularity and the value of materials in buildings in the form of material passport. Such a solution facilitates trade and allows for a more effective implementation of the circular economy model.



iii.

ECO-TRANSPORT

The dynamic nature of urban development has made mobility one of the main challenges for local governments. Due to the significant impact of transport on sustainable development, health, economics and quality of life, improvements in transport can address many urban problems simultaneously. Shifting the dominant mode of transport in a city from private cars to alternative transport (e.g. public transport, rail transport, bicycles), can prevent urban sprawl and positively promote increased residential density, affecting land values and carbon footprints for decades to come. Additionally, a shift to electric transport can increase energy independence by reducing reliance on imported fossil fuels.

To reduce the environmental impact of petrol and diesel powered vehicles, sustainable transport solutions are being introduced in cities, whilst maintaining levels of mobility.

LIMITATION OF CAR TRANSPORT

Reducing car traffic in cities (the so-called car-free movement) is a postulate of social activists, urban planners, transport engineers and ecologists, who all believe it is a solution to the problem of traffic jams and high carbon dioxide emissions. The result is the creation of more friendly cities. Awareness of the benefits of this idea has led European cities to employ a variety of methods to put it into practice.

One solution is a total ban on cars, usually introduced in small areas within the city, such as around very popular tourist quarters or in historic city centres. An example is Paris, where in 2015 a car ban was introduced along the banks of the Seine, one of the city's main arteries. If for some reason it is not possible to ban cars totally, systems can be used to regulate traffic volumes in specific areas. London has set up a so-called ULEZ - ultra low emission zone - in its centre, charging vehicles that produce more pollution. The project saw car traffic drop by some 30%. Another solution described as pro-people rather than anti-car was introduced in Barcelona. This concept combines a number of traditional city blocks and transforms them into pedestrian-only „superblocks“ in which internal roads are devoid of car traffic (or are severely restricted for cars). Each of these areas encourages new parks, neighbourhood interaction and integration, along with street-level retail where cars and parking spaces once stood.



DEVELOPMENT OF URBAN BICYCLE SYSTEMS

The first self-service bicycle rental system in Poland began operation in Kraków in 2008. Over the next 13 years the offer of city bikes has spread to many Polish cities and by 2020 in Poland there were some 70 systems in operation, offering around 20,000 bikes. Key advantages of urban rentals include competitive costs compared to the cost of using public transport and good accessibility resulting from locations in strategic places in the city. Bike-sharing is also part of the increasingly popular sharing economy, which consists of sharing certain goods with others as opposed to individual ownership.

IMPROVEMENT OF CYCLING INFRASTRUCTURE

An efficient, high quality, cycling infrastructure system influences the competitiveness of cycling in cities against other transport modes. The key element of urban cycling infrastructure is, naturally, the cycle paths, but other, smaller elements are also important, such as: bicycle racks and stands, bicycle parking and shelters, footrests and handrails at road crossings, and the signposting system. In addition, the growing popularity of cycling (with a particularly noticeable increase during the COVID-19 pandemic) ensures more and more Polish cities have cycling policies. It is also important that the inhabitants of cities are increasingly involved in the creation of such documents. Copenhagen is a city worth taking heed of, as it has been developing a system of dedicated lanes and infrastructure for bicycles for over 25 years now. As a result, it is expected that by 2025 the city will become the first carbon neutral capital in the world.

DEVELOPMENT OF ELECTRIC MOBILITY

Electric vehicles play an increasingly important role in the development plans of cities. E-mobility in Poland means, among other things, public transport. Cities are continually expanding their fleets of low- and zero-emission buses. By the end of 2020, the electric bus fleet in Poland consisted of 430 vehicles, a 253% increase y-o-y. This was achieved thanks to the implementation of tenders for 130 electric buses in Warsaw and a further 50 in Kraków.

Some Polish cities are also trying to develop infrastructure for electric cars. It is even more important given that the number of low- and zero-emission cars is growing in Poland. In 2020, there were almost 19,000 of them, almost double the number for the previous year. In European agglomerations, e-mobility has been functioning for years and is constantly developing. This development is supported, for example, by national subsidy systems, where citizens can receive grants to purchase electric cars and are not obliged to pay parking fees.

5 How does the office sector fit into the new trends?

Ideal city landscapes shaped according to the idea of sustainable development, providing friendly places to live and work, in buildings that adapt to the changing needs of the people living in them is something which is yet to arrive. The building sector is still one of the most emission-intensive in Poland. Estimates indicate that buildings are responsible for 38% of CO₂ emissions in the country, so each initiative taken by developers and the construction sector is highly important. The National Energy Conservation Agency (KAPE) estimates that even with a partial reduction of building energy demand, it will be possible to reduce the emission of over 46 million tonnes of CO₂ and some 90,000 tonnes of dust per year.

The Polish office sector in recent years has indeed seen a number of changes in the development of sustainable investments. The number of investors who place an emphasis on increasing the comfort of office users, while paying attention to the requirements of health, well-being and safety in buildings, optimal energy efficiency, and the lowest possible negative impact of office buildings on the environment, has demonstrably increased. By the end of 2020, of the estimated 11.7 million m² of modern office stock, 83% will be green-certified. Buildings of this type are characterised by the limiting of their negative impact on the environment, including in terms of energy efficiency, water and waste management, construction materials, and eco-mobility (access to public transport, bicycle parking and electric car charging points). Currently, there are almost no new office investments in Poland that don't meet the requirements of multi-criteria certification. It is most visible in Warsaw, where as many as 94% of modern offices are certified space. It is, indeed, an aspect that distinguishes the capital city from other European cities. The sector, recognizing the need to create healthier cities and buildings, is increasingly turning to WELL and Fitwel certification - independent certification systems that validate the healthy aspects of cities and buildings. These two methods are considered a level higher than sustainability and focus on issues related to human health and well-being.



From the point of view of the new trends shaping cities it is, however, crucial that a building is a harmonious whole, fulfilling an urban function, whilst being as functional as possible for its users and having a minimal impact on its surrounding environment. Urban structure directly influences the functioning of a building and its users, partly by imposing architectural and urban design features and infrastructure elements. In modern cities, therefore, an office building can no longer be solely an „island in the city”. Urban planning steers and influences architecture. Thus, four postulates of modern urban planning have been formulated for buildings, forming part of multi-criteria certification:

- **REDUCTION IN THE NUMBER OF CARS IN THE CITY CENTRE,**
- **PROVISION OF ALTERNATIVE SOURCES OF TRANSPORT,**
- **EMPHASIS ON PROJECT LOCATION IN AN AREA CHARACTERISED BY A LARGE NUMBER OF SERVICES,**
- **INCREASE IN GREEN SPACE PROVISION.**

In line with the ideas of sustainable development, developers are increasingly ensuring that office buildings are integral parts of the urban fabric and that their potential can benefit all users of the city, not only those working in the buildings – hence the growing popularity of mixed-use projects, along with the creation of places and spaces that can encourage and serve the interaction of all interested parties, often outside standard office hours.

a. Mixed-use projects as an optimal scenario in the regeneration of brownfield sites

The revitalisation of large, neglected, post-industrial sites, often located in attractive parts of the city, sometimes including historic factory buildings, is becoming an increasingly important way of improving a neighbourhood's attractiveness. As a result of such investments, unique places with original architectural concepts are appearing on the city map, providing residents with a rich, well-balanced variety of differing functions.

These are flexible and city-defining projects that best respond to the changing expectations of today's city dwellers. The aim is not to juxtapose buildings with different functions, but to create leisure spaces that „live” - i.e. service and cultural centres, incorporating the unique character of the place and its surroundings.

Post-industrial areas are often located in excellent locations - the land is developed, and the conditions for further development allow for the creation of unique investments characterised by a distinctive atmosphere of place and interesting architecture. Such projects have been realized in Poland for a few years now, and examples include: Centrum Praskie Koneser, Browary Warszawskie, Fabryka Norblina, EC Powiśle in Warsaw, Browar Lubicz in Kraków, Manufaktura in Łódź, Stary Browar in Poznań, Bulwary Książęce in Wrocław. Furthermore, a number of other spectacular projects are in the pipeline, including Bohema, Port Praski and Soho (Warsaw), Fuzja, OFF Piotrkowska and Monopolis (Łódź), and Garnizon and DOKI (Gdańsk). It is important to note that in Poland the number and scale of such investments is growing year by year. At the preparation stage, there are further large urban projects such as: Młode Miasto (Gdańsk), Nowy Wełnowiec (Katowice), Towarowa 22 (Warsaw), Stara Rzeźnia (Poznań).

GARNIZON, GDAŃSK

As part of the revitalisation of a military area, a multi-stage investment is being carried out in the centre of the Wrzeszcz district to incorporate an area of 25 ha into the urban fabric of Gdańsk. The project, under way since 2006, combines residential, office, retail, service, entertainment and cultural functions. Garnizon's strengths are the public spaces integrated into the historic buildings and the priority given to pedestrian traffic. The complex will eventually offer offices for 15,000 people and flats for 7,000 residents.

TOWAROWA 22, WARSAW

The complex is to combine residential, office, retail and catering functions, retail and catering spaces and a festival cinema. The project involves the refurbishment of the pre-war Kazimierza Wielkiego square and the revitalisation of the Polish Word House, which will be a local cultural centre. An important part of the complex will be a public park, but the space will also be filled with other green areas, including roof gardens.

NOWY WEŁNOWIEC, KATOWICE

In the northern part of Katowice, a former steelworks with an area of 25 ha will be reclaimed, revitalised and integrated into the urban fabric as a green, multifunctional district. The post-industrial area will comprise 270,000 m² of usable floor space, which will combine residential, office, service, entertainment, cultural and social functions (school, kindergarten, care home for the elderly, cinema, museum). The project involves combining attractive, green public space with high-intensity buildings.

FUZJA, ŁÓDŹ

The project, to be developed on the 8 ha site of the former Scheibler factory in Łódź, will offer 600 flats and 40,000 m² of offices. In the historical buildings of the factory, services, shops and restaurants are planned, while on the 4 ha site green areas, city squares and public spaces are designed to be integrated into the urban fabric.

| b, Healthy Sustainable Architecture

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A sustainable building is created to minimise the use of resources throughout its life cycle, and to provide a high-quality environment conducive to the health and productivity of its occupants.

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Faced with the issue of climate change and the changing expectations of office users, the real estate sector has a new task on its hands. This involves not only designing buildings sustainably, but also creating healthy environments for people. We have reached a turning point, where health and well-being have arguably become the most important components of architecture.

Following the trends, more and more employers are transforming their office spaces by creating offices that are technologically advanced, as well as pro-health, safe and user-friendly.

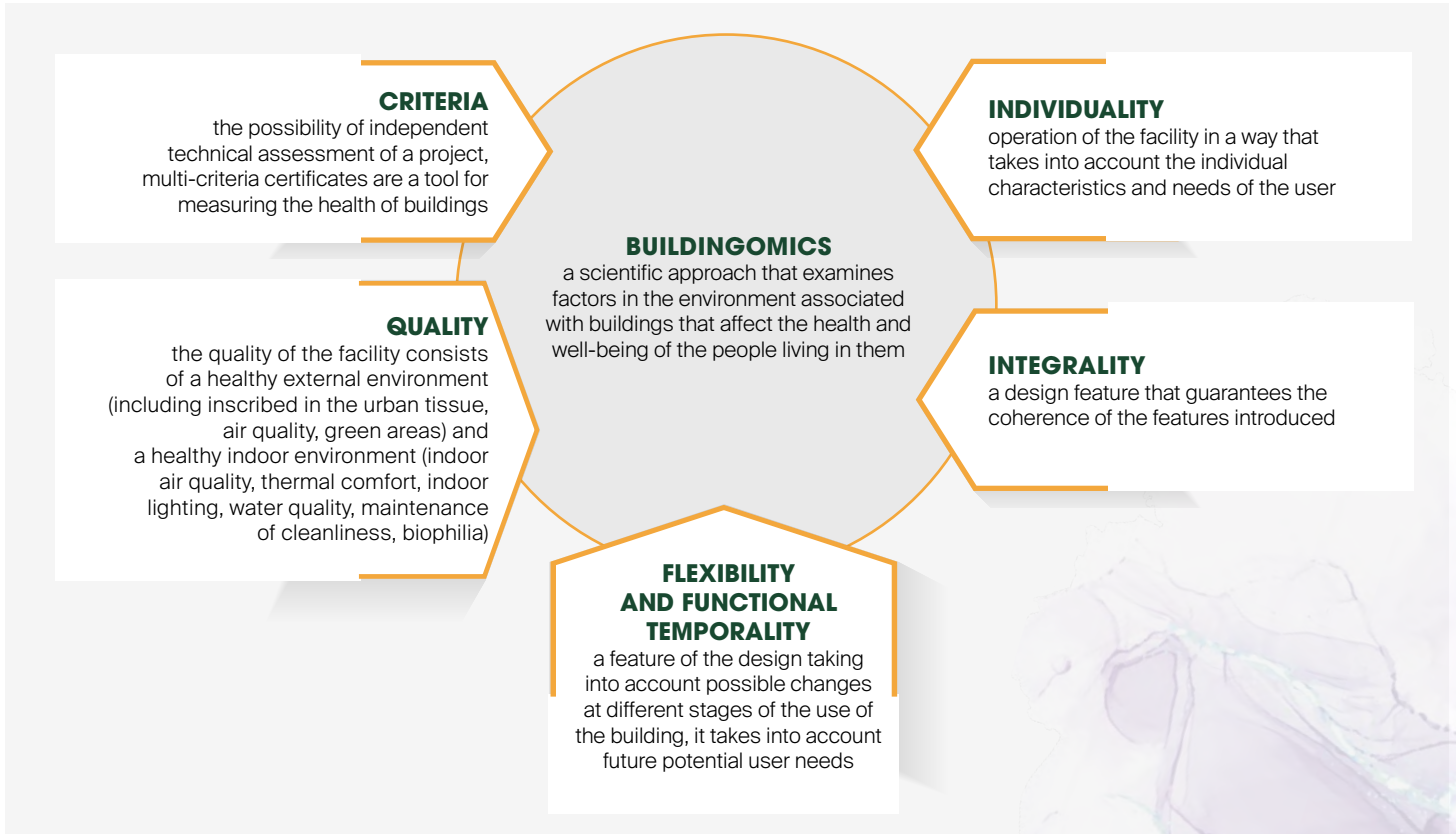
Numerous publications, offering multiple evidence, prove that office design has a real, tangible impact on the health, comfort and productivity of office users. Research also shows that 'sick buildings' have a significant impact on the respiratory, immune, digestive and cardiovascular systems of those who pass through them.

The relationship between the various systems of the human body and the technical aspects of a building is most often addressed in the WELL Building Standard certification, or via the implementation of individual points from LEED or BREEAM. All the leading certification systems, however, seek to, directly or indirectly, improve health and well-being – furthermore, the WELL Building Standard and the WELL Health-Safety Rating System, are entirely dedicated to this task.

Initially, sustainable architecture was defined by parameters relating to energy efficiency, waste management and potable water quality and use. This was complemented by indoor air quality considerations, which widened the remit to include the indoor environment. Over time, the interdependence between the quality of the indoor environment and the health and well-being of the building user has been recognised. This translates into real, measurable costs, as it is the employees themselves who generate the value and largest costs for most companies (employment costs, i.e. employee salaries and benefits, are estimated to be around 90% of operating costs on average). Consequently, it is concern for the health of employees and the creation of conditions that improve their productivity that make the greatest potential financial difference to the employer.

The concept of Healthy Sustainable Architecture assumes that the human is the most important element in architectural and urban design. The form of development, finishing materials, modern technical solutions and space organisation employed are all tools that shape the built environment and affect its health and well-being.

HEALTHY SUSTAINABLE ARCHITECTURE HAS SIX CHARACTERISTICS THAT DEFINE THE TECHNICAL STANDARD OF THE BUILDING AND THE EXTERNAL AREAS



Source: M. Promińska, Zdrowa Architektura, Nowy standard budownictwa zrównoważonego, 2021

It is worth noting that the new approach extends the notion of flexibility in building design beyond the functional-utility framework. The flexibility of healthy, sustainable architecture is primarily the ability to adapt the function or even modify the function of a building several times over according to market needs. This involves changing the purpose of part or all of the building and is a natural consequence of the diversity of the 'life of the building'. A flexible approach to the functional change of a building and the ability to adapt to market conditions is without doubt better for the environment and CO₂ emissions than demolition and new building constructing. This direction is becoming more and more visible in the largest European cities. According to Knight Frank estimates in Paris, more than 1 million m² of office space has already changed function and been converted for residential purposes. Of course, not every office building can easily be converted into a residential building, as some of the space has no access to natural light. It can, however, be used differently - when changing the function, for example, of one Washington DC building, a large lobby was retained and the middle of the building was converted into recreational space.

In order to talk, however, about a sustainable architecture that genuinely benefits people and the environment, it is necessary to change the definition and scope of design – it needs extending to include the stages of 'inhabitation', operation and demolition, and ought to be based on a circular economic (closed loop) model. The construction sector which, of all the key economic sectors, is responsible for the greatest environmental damage, is still based primarily on a linear economic model. To achieve real environmental benefits, it is necessary to implement the principles of the circular economy on a large scale across the construction industry. The application of this model will result in buildings being designed, constructed and reused without the wasting of raw materials, and with limited CO₂ and waste emissions. The outcome will be a significant impact on environmental pollution – one which will bring sharp, beneficial reductions.

Conclusion



The measure of the success of urban forms is their ability to improve the quality of life of their inhabitants, as well as their resilience and ability to adapt to a changing society, environment and economic conditions.



David Sim, „Soft City“, 2020

Data from the World Business Council for Sustainable Development shows that although cities occupy only 3% of the Earth's surface, they currently generate around 80% of total global electricity demand, and are responsible for 70% of greenhouse gas emissions. The scale of the phenomenon is determined by the fact that over 50% of the world's population currently lives in cities. Cities as we know them today have developed over many decades. It wasn't, however, until the nineteenth and twentieth centuries, with the advent of the era of increasingly available cars, that the evolution of cities began to focus primarily on the needs of car users. In many cities, this led not only to the degradation of urban space – with, for example, squares and public spaces being turned into parking spaces – but also to the twin phenomena of „city sprawl“ and suburbanization. This, inevitably, brought further increases in residents' dependence on cars. It was only after some time had passed that it was noticed that although road transport provides flexibility, such a way of organizing cities leads to inefficient use of space, an increased distance between individual services,

and residents deprived of places and opportunity for daily interaction. Furthermore, intensive development of urbanized areas also results in air pollution, significant greenhouse gas emissions and a depletion of finite energy resources from non-renewable sources.

As a result, urban planners began to sit up and take notice, and a breed of buildings started to appear that referred back to traditional urban development patterns – compact, focused on the needs of residents, with transit traffic diverted outside the city, and offering the kind of amenities for urban space users that would render the car unnecessary. Climate issues also lent their weight to the popularization of such trends as Sustainable Urbanism. Environmental degradation due to over-exploitation of the city itself and over-exploitation of non-renewable natural resources resulted in an increase in average air temperature and air pollution, which in turn brought increasingly common severe weather events such as floods and hurricanes in one part of the globe and droughts elsewhere.

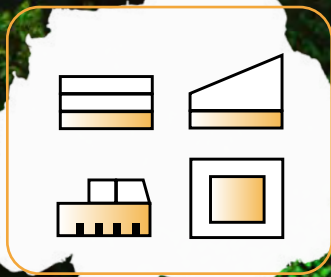
Knight Frank has formulated a diagnosis of the position of Polish cities against the backdrop of European urban centres, after analysing selected factors affecting the quality of urban life and how it is perceived. The most pressing issue is that of the reduction of the scale of harmful emissions into the atmosphere, and the improving of air quality. Additionally, the analysis shows that Polish cities have been undergoing the processes of sprawl and depopulation for a number of years. Although many solutions for reducing the negative impact of cities on the wider environment can already be seen only in other European capitals, Polish local governments have also identified the need to implement new solutions. They are constantly working on new strategies to set them on the right path and, as a result, new trends should be expected to emerge in the coming years – trends very much aimed at improving the quality of life in the city.

In this report, we highlight **THE HUMAN SCALE**, as it applies to both individual investments and whole residential areas. The concept of the 15-minute city, which has been implemented and promoted in Europe by the Parisian authorities, views urban space as a dense, multi-functional structure in which necessary functions are easily accessible within a 15-minute walk or bike ride, thus allowing residents to cut time spent on commuting and, consequently, enjoy the positive effects on their quality of life. This concept is also associated with **A RICHER VARIETY OF BUILDING FORMS** and a step away from monocultural spatial development. This trend is well suited to the mixed-use projects under the spotlight in this report. These projects allow the city to be densified within its borders (by creating additional buildings in areas already partially built up with post-industrial buildings) and complemented with newly-created aesthetic spaces offering many functions useful for residents in one place (e.g. workplaces in offices, trade, services, culture, space for integration). Furthermore, they also constitute an example of the application of the principles of a **CIRCULAR ECONOMY** (e.g. by using materials from the demolition of buildings from a given area in the construction process of new buildings). Due to the way urban space is used on a daily basis, its design places more and more emphasis on the **DIVERSITY OF EXTERNAL SPACES**. Examples of pocket and linear parks around the world show that a visually and functionally attractive public space contributes to an increase in the mobility of residents and their willingness to move around on foot or by bike, rather than by car. The Barcelona concept of 'superblocks' led to an increase in pedestrian traffic by 30%. Such pro-human concepts also have the chance to prove themselves beneficial in terms of **IMPROVING THE MICROCLIMATE** of a neighbourhood. Green areas, even if implemented in relatively small spaces, combined with other nature-based solutions – such as vertical gardens / green facades, green roofs, green tracks or parking spaces – can also contribute to an **INCREASE IN THE BIODIVERSITY** of an area.

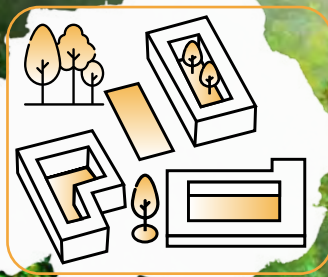
If, in addition, residents are offered a user-friendly and effective bicycle infrastructure in a given area, it may well turn out that car use will decrease. In the long term, such activities may create the opportunity for **REDUCTIONS IN CARBON FOOTPRINT**, as evidenced by Copenhagen, where a bicycle policy pursued systematically for 25 years will allow the city to reach carbon neutrality by 2025.

The ongoing COVID-19 pandemic has shown the importance of the role of urban space in the lives of residents. The trends in this report do not present an exhaustive list of solutions to the issues outlined. Their implementation, however, will enable aesthetic, visual gains in cities, and will result in improvements in the quality of life of residents, facilitating better fulfilment of their needs. In the long term, the trends can contribute to reductions in CO₂ emissions and quite possibly the achieving of carbon neutrality in many cities. That said, since radical climate change for the better will not come about in a decade, and the world (and therefore cities, albeit to a possibly different degree and in possibly differing ways) will continue to experience the effects of climate change, it will be vital for cities to build up their resilience. It can be expected that the implementation of urban trends based on ideas of either Sustainable Urbanism or Healthy Sustainable Architecture will contribute to the effective building of this resilience.

Human-friendly city



**Diversity
of building forms**



**Variety
of external spaces**



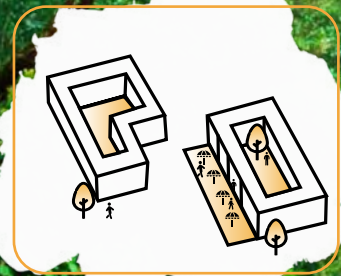
Flexibility



Human scale



Pedestrian accessibility



A sense of belonging



Pleasant microclimate



**Reduced
carbon footprint**



Biodiversity



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URBAN LIFE DOES NOT ARISE BY ITSELF, NOR DOES IT DEVELOP AUTOMATICALLY IN RESPONSE TO HIGH INTENSITY, IT DEMANDS A MUCH BROADER AND TARGETED APPROACH. VIBRANT CITIES REQUIRE A COMPACT ORGANISM STRUCTURE, MODERATE POPULATION DENSITY, ACCEPTABLE WALKING AND CYCLING DISTANCES, AND GOOD-QUALITY URBAN SPACE. THE INTENSITY OF DEVELOPMENT MUST BE COMBINED WITH QUALITY IN THE FORM OF GOOD URBAN SPACE.

”

Jan Gehl, Cities for People, 2014

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