



The Reference Framework for Sustainable Cities

5 DIMENSIONS AND 30 OBJECTIVES
FOR A EUROPEAN VISION
OF TOMORROW'S CITIES



SPATIAL DIMENSION

1. DEVELOP SUSTAINABLE URBAN PLANNING AND LAND USE

In the absence of effective urban planning, population growth tends to result in large conurbations and urban sprawl, as residents spill over from the core municipalities to occupy land in surrounding areas. In the absence of planning for accompanying services, amenities and infrastructures, the population then has to rely on car mobility for basic necessities with a part of the population being excluded (children, the disabled, the poor). The cost of the infrastructures required to correct this weigh heavily on city budgets as costs; swell the more housing and activity locations are dispersed. With pressure on land and natural resources comes adverse effects on land sealing, agriculture and biodiversity. These impact the urban economy and overall efficiency of the city region.

Adopting an integrated approach to sustainable urban planning means reconciling the policies and location of housing, business or social activities, public facilities and infrastructures, together with land use. For example, by:

- limiting urban sprawl, by prioritising recycling of land, favouring compact city planning and preserving green fields and natural areas.
- identifying locations within the existing urban area suitable for development
- offering affordable, high quality and resource-efficient housing close to services and facilities, while ensuring social mixity across the city.
- offering suitable and well connected economic infrastructures, integrating sustainable freight considerations, encouraging «symbiosis» and exchanges between industries, other economic activities, universities and research centres.
- identifying the green and blue infrastructure and natural areas that should be restored or recreated.

In order to work these strong planning policies have to be implemented on the right scale and with a broader governance. Supporting measures, such as fiscal incentives or land pricing strategies, can be effective levers.

2. ENSURE SPATIAL EQUITY

Urban development can increase inequalities by creating high property values in well-located new developments or through gentrification in existing parts of the city. As a result, low income groups find it increasingly difficult to find decent, affordable housing and may be forced to move away to places with fewer amenities, thus suffering from spatial segregation.

Spatial equity requires specific urban planning measures both in the provision of public services and management of the public domain:

- allocation of affordable housing near public transport centres and basic daily activities through tenure interventions in the housing sector for example

- ensure social mixity in new developments and on urban regeneration sites
- ensure access to high quality schools, health services and other public facilities in the public domain, in particular green spaces, play and sports grounds through deprived neighbourhood regeneration programmes, for example
- prioritise quality of education in deprived neighbourhoods, especially for the very young.

Spatial equity is key to achieving a resilient territory and economy.

3. ENCOURAGE TERRITORIAL RESILIENCE

Territorial resilience is defined as the capacity of a territory to cope with a hazardous event, trend or disturbance while retaining the same basic structure and ways of functioning. For example secure access to food, water and energy are central issues. Resilience is the capacity to self-organise and the ability to adapt to stress and change.

Hazardous events can be technology-, geology- or climate-related, such as heat waves, fires, floods, marine submersions, storms, landslides, earthquakes and droughts. Some are likely to be aggravated by the climate change «trend», urban sprawl and more generally un-adapted land use (leaving the soil deforested or devoid of plants, making it impervious etc.). New hazards are often the result of either combinations of the above, such as the difficulty to cool nuclear and other plants as river temperatures rise or the result of new technologies. Disturbance can also arise from major social unrest and at its worse from terrorist attacks.

Building the resilience of a territory requires specific data and studies in order to identify and assess the risks and vulnerabilities of the territory to relevant hazards. Crossing this data with the probability of expected impacts is necessary to plan disaster risk reduction actions and crisis management plans, including the so called «no regret adaptation» measures.

The resilience of the economy and the community are at stake. The key for success resides primarily in building a flexible governance process, in developing education programmes and in raising awareness among a wide range of stakeholders such as: health authorities and emergency services, representatives of civil society, schools and private companies, especially insurance and utilities providers, etc.

4. PRESERVE AND ENHANCE URBAN, ARCHITECTURAL AND CULTURAL HERITAGE

Urban and architectural heritage is a central issue for sustainable urban development as it enhances a city's economic and demographic attractiveness and helps create links between cultures of all population groups. By positively representing the pluralism of cultural heritage, it fosters tolerance and social inclusion and forges the social fabric. Culture is a factor of economic resilience thanks to restoration projects, innovative attractive events and tourist activities, in particular for small and medium cities.

Preserving heritage is not about putting whole neighbourhoods under excessively strict protection which would have the effect of fossilising them and reducing their resilience capacity and their ability to adapt to climate change. It is about integrating this issue into the urban strategy as a whole.

Cities can foster these synergies by:

- encouraging appropriation and reappropriation of urban and cultural heritage: use urban public space as open venues for leisure activities, artistic and cultural expression, foster interactions between contemporary and historic cultures.
- preserving and enhancing urban heritage. For example, some cities rediscover the potential of their waterways

and rehabilitate them, when others give back to pedestrians the benefit of some parts of their ancient centres. Some successfully organise new development that takes account of the urban heritage and its landmarks when reinterpreting this heritage through bold architectural schemes.

- mobilising innovative partnership and management.

5. PROMOTE HIGH QUALITY AND FUNCTIONALITY OF PUBLIC SPACES AND LIVING ENVIRONMENT

Public spaces are an essential ingredient in citizens' quality of life and the appeal of a city for tourists, investors and businesses. Shared by all population groups, they foster a sense of belonging and give an identity to the city. They link up places and buildings for people and goods through a hierarchic organisation of streets, from the pathway dedicated to pedestrians to the wide avenue concentrating all flows: people walking or jogging, cars, buses, tramways and bicycles. A large part of the public space is however given over to parking places. Public spaces are also centres of social and economic activities, from discussing with one's neighbour to shopping at the market or participating in an open air event.

They are places of rest and leisure: seated under a tree or in a lively square, spread out on the lawn or strolling along green lanes and riverbanks, enjoying the city landscape, its buildings and cultural and natural features; or leisure activities, in playgrounds and sport facilities.

Public spaces can be places for biodiversity in cities and for sustainable urban drainage and also support culture by hosting music, dance, drama and art events.

The usability, walkability and access for all public spaces may be lost, when:

- the parking and traffic function has priority over the others (the greater the traffic, the less conviviality).
- the design of the public spaces excludes a part of the population: children, teenagers, the elderly, women, people with disabilities.
- the public space is degraded or unsafe or considered as such by «users», especially when concentrated in deprived neighbourhoods and reinforcing spatial segregation.
- heat island effect and localised flooding hampers its use.

The regeneration of existing public spaces and efficient design of new ones, with the involvement and participation of all users, can help to restore their numerous functionalities and provide a high quality environment for all. Regaining some of the parking areas and wide roads for the city's other purposes: green corridors and lanes, playgrounds, waterways, allotments and collective gardens, are being applied by an increasing number of cities.

6. DEVELOP ALTERNATIVE AND SUSTAINABLE MOBILITY

Mobility is necessary to ensure access for all to work, education, basic services and products, leisure and health facilities and to friends and family. Local authorities are currently faced with numerous challenges linked to transport patterns such as congestion, insecurity, air and noise pollution and increasing difficulty to ensure mobility for the most vulnerable populations and to cover the rising cost of public transport infrastructure investment and management. Urban transport and particularly urban freight and private cars are estimated to account for around one quarter of CO2 emissions in Europe.

A low carbon, efficient and inclusive mobility strategy providing attractive, cost-effective and accessible alternative mobility solutions is essential for quality of life and air, economic appeal as well as for social cohesion,

reduction in infrastructure budgets over the long term and climate mitigation.

Success relies on :

- Analysing local mobility behaviour patterns to understand who is going where or wishes to go where, how, with whom and when (weekdays or week-ends) so as to provide mobility services to best meet the needs and wishes thus identified.
- Smart urban planning and management which reduce the need to travel by ensuring daily activities are located nearby for all residents, students and workers through mixity and intensity of use, facilitating alternative modes of working (work at home or in a nearby workplace), for example.
- Innovative partnerships with transport and urban freight stakeholders but also with shops, big retailers, offices, public services and facilities for efficient delivery of goods and services (innovative delivery centres and concentration of public and private services near public transport centres).
- Enhancing the attractiveness of mobility solutions that are alternatives to the use of private cars: dedicated and safe cycling and pedestrian lanes networks, frequent, comfortable and user friendly public transport, as well as bike parking areas, on street level, at home and in other places. Quality public spaces and green and blue grids increase the pleasure of walking, cycling or boating, whether for leisure or commuting purposes.
- Developing smart and integrated transport infrastructures that combine and integrate different mobility modes and facilitate the switch between walking, cycling, using trams, buses, trains, etc.
- Offering «real-time» information on the best way to go from point A to point B, for different types of users (elderly, children, teenagers, people with disabilities...) using different media such as mobility advisers, ICT applications and smart information and communication devices such as dedicated street displays.



GOVERNANCE DIMENSION

7. ENSURE AN INTEGRATED TERRITORIAL STRATEGY

Cities and their surrounding regions have an intricate web of relations and dependencies. While the countryside used to be mainly seen as a potential site for suburbanisation, industrial agriculture or a place to relegate unpleasant activities (landfill, incinerator, waste water treatment plants), the countryside is now seen as a land of opportunity: a supplier of renewable energy, clean water, local sustainably produced food, rural and outdoor activities for the leisure of urban dwellers, but also reservoirs of biodiversity and natural resources. In return cities offer employment and higher education opportunities, health, social and cultural facilities, a variety of shopping and service opportunities.

While mutual benefits do exist and are significant, there are still numerous sources of conflict that can also appear with regard to the "right of use" and protection of land and its resources and about who is paying for what: public transport and urban amenities, supply of green goods and services, compensation for loss of agricultural land to urban sprawl or land use restrictions (water catchment area).

The planning and management of public transport, housing, the economy and services allocations must be part of an integrated territorial strategy, meaning it also integrates the hinterland. On the other hand, hinterland planning has to take account of land pressure and ensuing rising property values as well as the economic opportunities offered by being close to the city. Mutual benefits come from developing strong partnerships and collaboration between local authorities, raising the specific questions of broader governance at the functional urban area level.

The strategy has to be delivered on the same scale, i.e. governance of urban planning regulation, taxes, citizen participation and on-going assessment also has to be widened.

8. FOSTER SUSTAINABLE ADMINISTRATION AND FINANCIAL CITY MANAGEMENT

At a time when falling revenues are threatening public budgets, local expenditures keeps rising as local authorities are given increasing responsibility as a result of decentralisation in many Member States and have to get involved in climate mitigation and adaptation, hosting refugees and the provision of local economic support.

Sustainable administration and financial city management should help local authorities optimise their human and financial resources in order to finance their own functioning, but also to maintain or develop their public services and their funding for citizen incentives and public services performed by other stakeholders.

Depending on their regulatory and funding powers, cities can adopt win-win solutions: cooperative competition between local authorities could ease the race to the bottom for taxes, which is harmful to city budgets. Regula-

tion could be linked to taxes: by capturing the added value of public services and infrastructures; by restricting the use of public goods and services, like parking spaces, water etc.; by not paying for the external negativities of activities that receive public subsidies; by eliminating harmful incentives and making them conditional on compliance with sustainable criteria. Innovative funding solutions can also be developed, like local cap-and-trade mechanisms, revolving funds, third party investment, etc.

Sustainable administration and financial city management is also about accountability reflecting environmental and social externalities and about transparency. Ethic-driven investment, green public procurement, open governance as well as extending payback periods for investments that integrate sustainability considerations are some examples of measures that could be taken.

9. IMPLEMENT A PROCESS FOR ASSESSMENT AND ON-GOING IMPROVEMENT

While good practice in urban governance is about a long-term vision, foresight and a solid base of evidence, there are necessary adjustments to be made in implementing the vision that require the measurement of outcomes and changes of external factors.

City administrations should be able to implement a process of assessment by: choosing and monitoring a set of appropriate qualitative and quantitative indicators, whether aggregated or not. Assessments should include measuring the influence of external factors and data must be handled with caution, especially as regards the less measurable issues. The results of an assessment could indeed be biased depending on the scope and formulation of an indicator. The assessment should be shared and communicated to develop a collective intelligence. Memoranda of understanding should be devised to compile, at little or no cost, data collected by other local organisations, associations for environment enhancement and protection, utilities companies, estate players, etc. while complying with personal data protection provisions. Internationally renowned methods of assessment should be used (e.g. for CO₂ emissions the International Protocol for Climate Change methodology or Life Cycle Analysis) without preventing creativity in finding alternative indicators to measure the broader context and secondary effects, for example broader than standard GDP.

10. INCREASE CITIZEN PARTICIPATION

Citizen participation enables the various political, social, religious and ethnic groups to participate in the decision-making that will affect them. It is crucial that citizens take over ownership of the urban policies and actions that are carried out by understanding the Why and How and by sharing a vision of the city's future with policy makers. A balance must be struck between participative democracy and elective representative democracy. To improve citizen participation, capacity building by city stakeholders can be encouraged to help them implement the appropriate means.

Citizen information and consultation may be compulsory at certain times for example for major development projects and new or revised planning document. This consultation is however very limited to information and communication and neither engage the citizen to understand the challenges and solutions and neither touch all parts of the population.

Indeed, the main difficulty of citizen participation, especially in the context of deprived neighbourhoods, is to get the opinion of every group of people concerned. Many people do not dare to participate in the debate, lacking

confidence and not knowing if they are legitimate to do so: Culture and leisure media can be an excellent support in getting people involved and helping them express their ideas and feelings about the urban project.

A strategy to have all citizens participate in a structured way as opposed to a succession of “one shot” participation events can ensure that policies are both better designed and better delivered and that money is better spent. This structured dialogue also presents less potential to backfire than a series of «one shot» participative democracy events. New technology-based participation methods open up a whole new area of possibilities through «living labs», whereas other possibilities like participatory budgeting and planning, «ordinary heroes» campaigns and competitions have yet to be duplicated.

11. STRENGTHEN GOVERNANCE IN PARTNERSHIP

A city's challenges and corresponding solutions are not limited to the city boundaries and cannot be properly tackled by mono-sectoral interventions. These issues are interwoven and dynamic and require an integrated, holistic sustainable urban approach and corresponding governance that integrates different levels with their respective roles, skills and scales of intervention.

Failure to develop a consistent governance strategy induces a great risk of relocating the problem elsewhere or of having a negative effect on another city dimension or part of the population.

Broadening governance means cooperating with other local authority levels, including experts, civil society and the private sector, while being aware that the final political decision will belong to the official elected representatives.

It also requires widening the governance of local taxes and regulations, so that the organisation of the urban infrastructure, especially transport links, does not stop at the local tax borders; that attracting companies does not result in a harmful competition through a «race to the bottom» with respect to taxes and environmental requirements; that the same urban infrastructure is not duplicated.

New more flexible forms of broader governance have already been developed at the level of functional urban areas to adapt the scale to the challenge at hand as metropolitan and polycentric city governance is being developed.

12. FACILITATE CAPACITY BUILDING AND NETWORKING

The interdependence of urban challenges makes it impossible for a sectoral and short-term approach to succeed. The integrated approach, with a longer timespan, becomes necessary but implies greater complexity that demands broader expertise and know-how in many different fields such as governance, the environment, social and economic issues.

For this approach to become a good habit, it requires not only specific capacity building and training, but also a dialogue and co-working between the experts and elected representatives in charge of different sectoral policies, environment, housing, transport, energy, social, cultural and economic development. This needs to be facilitated by different means, i.e. setting aside time for networking in the staff schedule and work performance evaluation and including it systematically in the project management process.

This dialogue and capacity building can be reinforced through networking with other cities faced with similar issues and through innovative partnerships with academic institutions, private players and civil society organisations.

The integrated and long term approach is also about better knowledge management, including the possibility of having access to a solid knowledge base. Tools and instruments for strategic planning and for formulating a shared vision of the city's future should become ordinary routine: expert panels, brainstorming sessions, scenario development and analysis, stakeholder engagement. Capacity building is also needed to enable inclusive citizen participation, extending citizen empowerment to weaker and marginalised groups.



SOCIAL DIMENSION

13. ENSURE SOCIAL INCLUSION

Social inclusion is about unlocking the potential of cities to integrate diverse populations to form a cohesive community while respecting diversity and using it as a force for the city. Social exclusion can arise out of poverty, unemployment, immigration or being on either end of the age spectrum, it can also arise from a combination of any of the above or from spatial segregation. Cities have a key role to play, by integrating their social policies with education, city planning, housing, public services, citizen participation and culture.

They can act through:

- city planning, urban regeneration programmes and housing policies that ensure social mixity, offer sufficient affordable housing and prevent the appearance of ghettos, whether rich or poor.
- public spaces and services for all that that participate in social inclusion by taking into consideration and reflecting cultural diversity, and by being adapted to less mobile citizens. ICT can help inform all population groups on what is available to them in terms of public services and equipment and better interact with them.
- measures to fight energy poverty and poor quality of housing such as social housing energy retrofitting and incentives for similar action by private landlords.
- policies dedicated to encourage social mobility through a transversal strategy working together on education, culture, job creation and citizen participation, to find ways to engage those excluded from labour market.

14. ENSURE SOCIAL AND INTERGENERATIONAL EQUITY

Cities are expected to take into consideration all parts of their population in their policy and urban projects, whatever their age, social origin, family status, gender and abilities. It means taking this diversity of profile into consideration in economic and housing strategies, social services, public space and transport, so as to ensure better living conditions for all, and long-term appeal and prosperity for the city.

Whereas the 50+ population is still actively engaged in urban life, they also require specific adaptation of public services and infrastructures, whereas the family has to be encouraged to stay in the city or at least not be discouraged by lack of accessible and adapted housing, green spaces and services.

In order to boost their commitment towards society, women, future adults-to-be, people with disabilities and elderly people should be consulted or integrated in citizen participation processes when designing and rethinking their environment.

Examples of age-friendliness and gender equality actions that share the same resources:

- urban public transport should be affordable and accessible to everyone (e.g. accommodate push chairs/wheel-chair space). They should ensure safety and comfort for all, being aware of elderly or disabled people while

driving, and also increase safety of passengers by night, for example by offering flexible night stops.

- public spaces should also be adapted to older citizens and children: abundant green areas and playground with benches, child- and thus elderly-friendly and shaded streets, either pedestrian or partially dedicated to play like the «spielstrasse», appropriate signalisation to help people find their way around and toilet facilities. Public spaces also have to integrate both gender preferences.
- Qualitative and quantitative care for children and dependants, directly or through other providers, through for example intergenerational buildings for seniors, teenagers and young children, such as day care centres, youth and culture centres that provide meeting areas.

15. BUILD UP A SUPPLY OF HOUSING FOR EVERYONE

Cities encounter many challenges to supply decent and quality housing for all, made more complex by changes in society: multiplication of single-parent families or families with unemployed parents, an ageing population, increased job mobility as well as a standardised offer from the private market that doesn't meet the diversity of the demand. Cities are also expected to supply housing that comply with strict building regulation and meet citizens' expectations, in terms of comfort and energy efficiency: double orientation, noise and heat insulation, natural light, more generally good design and access to transport, green and urban amenities.

The housing supply strategy should adjust supply to demand based on predictive planning that would integrate this policy with urban transport and social policies. Actions to provide housing for all, such as easy access to mortgages, should take the realities of the property market into account and be coherent with urban planning policies, for example by favouring renovation and infill development over greenfield developments.

Cities can tackle some of these challenges by:

- developing their knowledge of the property market (both built and non-built), by means, for example, of a dedicated "right sized" observatory.
- exchanging and cooperating with the private sector so as to supply affordable housing close to transport infrastructures, in exchange for example for guaranteeing their purchase by a social landlord or in exchange for the selling of publicly owned land.
- removing barriers to win win innovative solutions, like housing cooperatives and partially self-built houses, for example by adapting the local planning regulations for such schemes or by identifying a suitable plot.
- reinvesting the land's added value that was captured through appropriate taxation into affordable housing policies
- combine a land strategy with the housing strategy to identify and characterise potential development areas.

16. PROTECT AND PROMOTE HEALTH AND WELL-BEING

Health and well-being have become major issues for cities to become more attractive and prosperous. A sustainable city should continually create and improve the physical and social environments so as to enable people to mutually support each other in developing their maximum potential and more generally, in enhancing their sense of well-being. Prevention of health problems thanks to an active and healthy environment as well as providing access for all to quality health infrastructures are essential.

Measures to be taken concern:

- Reduction of air pollution: whereas current concentrations of fine particles cause 500,000 premature deaths each year in the EU, it has been proven that carrying out measures based on WHO guidelines increases life expectancy by an average of 22

months, with 30 billion euros in health benefits.

- Better internal air quality by providing affordable healthy housing. Internal air pollution is indeed a major threat to well-being and health, particularly to the most vulnerable like children and the elderly. This pollution is mainly due to smoke, volatile paint, varnish particles CO₂ and micro-organism concentrations aggravated by lack of sufficient air and humidity exchanges.
- Better water quality with guaranteed access for all to drinking water, thanks to water protection measures and to affordable healthy food, especially in public canteens.
- Healthier lifestyles as cities encourage physical activities. Green corridors and spatial equity in the provision of green areas and sports facilities contribute to improved health and well-being.
- Measures for the elimination of noise, odour and visual pollution and to enhance the feeling of safety, while integrating these considerations into city planning and public area and environment management.
- Prevention campaigns and centres for the local most common causes of health problems, for example: addiction, asthma, etc., developed through innovative partnerships with health authorities as well as with dissemination relays such as health referees from the work and education environment.
- Better and affordable services for active and healthy ageing through the use of ICT. ICT can also help to empower the citizen in the management of their own health through specific applications.

17. IMPROVE INCLUSIVE EDUCATION AND TRAINING

Education and training for all help build the qualifications and skills of the local workforce for a strong and resilient local economy as well as for citizens involvement in the public arena. Initiatives for inclusive education are numerous, from childcare facilities (young age) to second chance schools, open universities and in-service training to adapt to a continually changing job market. New technology provides opportunities to relay and open up these learning facilities to a broader audience and to tailor the training. Given the large number of such initiatives, local authorities could provide a framework that would stimulate coordination, talent identification, information and communication and support the most multi-beneficial initiatives such as innovative partnerships between local employers, educational, research and social organisations. Libraries and schools provide opportunities to improve inclusive education in innovative ways: organising public reading in green spaces, bringing diverse cultural activities and «ordinary heroes» to libraries and schools, etc.

18. PROMOTE CULTURE AND LEISURE OPPORTUNITIES

Culture enriched by successive migrations can be a strong driver for social inclusion through education and events. It also contributes to the sense of belonging by strengthening the identity of the city. The culture and leisure sectors are, increasingly, a source of creativity, innovation and job creation, contributing to growth in Europe.

A city can benefit from:

- Promoting an ambitious cultural policy in favour of creators, artists and guaranteeing access to culture for all (financial help, social pricing policy, school projects, etc.).
- Encouraging synergies between culture, leisure and education, for example, by encouraging art education and active participation in cultural activities for all thanks to partnerships with healthcare, childcare and elderly care organisations, especially in deprived neighbourhood areas.
- fostering a favourable environment for the development of cultural, creative and leisure economic sectors, including the audio-visual sector, for example by stimulating cross-fertilisation of initiatives from private and public actors and civil organisations. Festivals and other main cultural events, as well as sport competition foster the local economy and the tourism sector.
- creating synergies between health and sport activities.



ECONOMICAL DIMENSION

19. STIMULATE GREEN GROWTH AND THE CIRCULAR ECONOMY

In the EU, 4.5 tons of every 15 tonnes of materials consumed annually are wasted, and this even as raw material and mineral prices are rising. Measures such as better eco-design and reuse can bring EU wide net savings of up to 604 billion euros or 8% of their annual turnover to businesses.

The circular economy can thus stimulate green growth by reducing corporate costs, as well as by providing a range of new business opportunities based on services instead of products, such as leasing, sharing, repairing, upgrading or recycling.

Local authorities can provide the conditions to stimulate the circular economy and green growth, decoupling growth from natural resources consumption and degradation, by:

- encouraging the most resource-efficient products and services, thanks to green procurement policies and sustainable consumption campaigns.
- developing innovative financial instruments to trigger the development of “green” sectors like renewable energy, energy retrofitting, efficient technologies (e.g. best available technologies and techniques);
- deploying fiscal incentives, the so-called green taxes, as well as the green incentives for positive externalities, as well as eliminating environmentally harmful subsidies.
- supporting the development of “green” enterprises and industries by providing the basic underlying physical infrastructure as well as by supporting the development of green cluster and business incubation centres.

20. PROMOTE INNOVATION AND SMART CITIES

To manage the transition towards sustainability, cities need to foster innovation and become “smarter”. Smart approaches provide new and useful ways to build viable local economies, to better preserve natural resources and more generally to enhance quality of life.

Innovation and smartness can be altogether:

- social: by using innovative use of existing public infrastructures like schools and libraries and existing social and media channels to get citizens involved in the city fabric; more generally by encouraging initiatives that stimulate the capacity of the citizen to act in a way that is beneficial for the community, from small business creation to non-profit activities. Innovation in a city stems from innovative partnership.
- financial: while resource efficiency can improve profitability and competitiveness, it often requires initial investments. Innovative financial instruments are key to a successful transition, from micro-credits to revolving fund for energy retrofitting.
- technological: There is growing acknowledgement of the potential of Information and Communication Technologies

to achieve the desired results in urban development. ICT can help cities be smarter and more connected: by using the benefits of real-time information to optimise the city's infrastructure and services, by opening data sources with no or marginal cost to foster the development of applications that make it easier for citizens to live and work in the city, by delivering city services and applications to end-users through technical platforms (public services digitalisation).

21. ENSURE CONNECTIVITY

In a globalised world, cities are part of a broader network of cities and territories, from locally to globally. Access to markets and to technological and financial resources depends on the quality and intensity of the city's participation in these communication and exchange networks, which depends on how well it is connected:

- physical connections, through transportation infrastructures such as rail with regional cities nearby, air and rail connections with major European cities, allowing for business or academic day trips, as well as freight; high speed interurban transport infrastructures between major cities completed by a coordinated rapid transit system to smaller cities are backbones of a city's connectivity.

- communication connections, through telecommunication infrastructures based on high speed connections;

- informal connections to emerging cultural trends and to sources of innovation which depend on the quality and intensity of exchanges between the city's inhabitants and organisations and these sources of creativity.

Connectivity can thus be fostered by education, by fostering exchanges and networking between cities thanks to twinning programmes and by developing high quality telecommunications infrastructures for universities, R&D, and companies.

22. DEVELOP EMPLOYMENT AND A RESILIENT LOCAL ECONOMY

Cities are faced with the consequences of economic crises, and the need to challenge and diversify their economy, while tackling structural unemployment of groups: youth, especially the less qualified and more marginalised, but also 50+ year-olds. Therefore, cities need to stimulate endogenous growth, by developing a local economic development approach. Developing the local economy is also important to promote a sustainable and inclusive urban economy and consequently to improve the quality of life in cities and address inequalities. Moreover, local economic development makes cities more resilient and better armed to face global and local risks and trends, such as the relocation of labour intensive activities, climate change impacts on the economy and the infrastructures, ICT failures or refugee arrivals.

Local governments have a major role to play by leveraging their local assets and advantages, diversifying their economies and expanding economic opportunities for their population. Local governments may in particular identify comparative advantages and priority areas for investments and support activities that have great potential. For example, employment in environmental sectors and services has been growing by around 3% annually over recent years in Europe. The European renewables sector alone is expected to generate more than 400,000 new jobs by 2020.

Cities can help favour endogenous job creation by developing a broad local skills base through training and education programmes or by supporting incubators. They can develop innovative partnerships, better identify the skills and talents needed and devise incentives to foster the employment of the local workforce, as more and more cities do for major public works projects.

The strategy usually includes investment in one emblematic field: culture, industry, innovative and knowledge-based services; however, the city's resilient economic potential also resides in the distribution of the added value from collective and public goods and services between the private sector, the non-profit sector, the public sector and the domestic area (self-produced goods and services exchanged within families or social network of friends and acquaintances).

23. ENCOURAGE SUSTAINABLE PRODUCTION AND CONSUMPTION

Sustainable patterns of consumption and production in a world of limited resources is an essential requirement for sustainable development, as recognised in the Johannesburg Plan of Implementation (JPOI) at the World Summit on Sustainable Development in 2002. Sustainable production is related to resource efficiency, prevention and reduction of waste and more generally modes of production that are not harmful for the environment. This can be achieved by promoting eco-designed products that deliver the same particular service, but are sustainably produced from cradle to cradle, meaning from the materials sourcing and industrial or craft processes to the end of life.

The main criteria are:

- a design that makes it easier for the product to be maintained, repaired, upgraded, remanufactured or recycled, with a lengthened useful life.
- the use of sustainably sourced materials and the elimination of harmful substances for health and for the environment.
- a design and process that use fewer resources, like less clean water and air, fewer raw materials and less energy.

To stimulate sustainable production, a local authority can focus on promoting the consumption of sustainably produced goods and services as well as a green and circular economy, for example through:

- strong green and fair procurement policies, including criteria on the product's life cycle in calls for tenders. From paper furniture to building or managing urban infrastructure and services (e.g. by requiring use of secondary raw materials and eco-labels, that now exist for a wide range of products), local governments are presented with many opportunities to support green businesses.
- a shift of taxation away from labour and on to environmental impacts and tax incentives for the citizen to consume more sustainable products.
- promoting sustainable lifestyles and the shift from "owner" to "co-user" through campaigns and education, while avoiding the rebound effect of resource-efficient technologies.
- specific actions on food that also benefit local agricultural and food sectors: promotion of the production and consumption of local, seasonal and sustainably produced food, by organising farmers' markets or other short producer consumer circuits; taking measures to counter food wastage.

24. FOSTER COOPERATION AND INNOVATIVE PARTNERSHIPS

Sustainable urban development requires strong collaboration among sectors and institutions, individuals and organisations. A city's innovativeness and adaptability highly depends on the quality of the dialogue and cooperation between local government, businesses, academia and the civil society: professional associations, trade unions, local citizen associations and NGOs.

Local governments can foster knowledge-transfer and cooperation by:

- cooperating with universities, a source of scientific and social innovation and provider of good practices that might be adapted and implemented in the city context.
- promoting cluster and joint technological or social initiatives between universities, the private sector and professional associations. For example public calls may be launched for projects encouraging joint responses or cities may adopt economic policies to support clusters in essential economic sectors.
- creating innovative partnerships with the private sector, from landowners to service providers, in order, for example, to foster the financing and the application of their know-how to urban regeneration and development. In the same way, innovative partnerships may foster the development of local renewable energy sources, of building stock energy retrofitting and of smart infrastructures. To ensure that the public interest is met, that the cost, benefits and risks are equitably distributed and that the public realm remains public, the city has to develop a framework setting down the principles of such private public partnerships and the role of each, and implement

it through regulation and sound and fair contracts.

- empowering and fostering community-led initiatives that have a public interest, local or global, by different type of support: organisational, financial etc.

Successful partnerships could also be fostered by capacity building that will enhance the local capacity to cooperate innovatively. It fosters smart, inclusive and attractive cities.



ENVIRONMENTAL DIMENSION

25. MITIGATE CLIMATE CHANGE

Cities emit significant and growing amounts of greenhouse gases (GHGs) – accounting for 37- 49% of total global GHG emissions (IPCC 2014). The International Energy Agency's projections indicate that urban energy related GHG emissions will rise from around 67% today to 74% by 2030 (IEA 2008). Without waiting for decisive global policies on climate change, some cities have started to take action. Cities can thus serve as “centres of policy ingenuity” that drive concrete local energy and climate action plans. To promote their efforts towards reaching national and European targets, they can report their CO₂ emissions on a voluntary basis and commit to complying with strong CO₂ reduction targets, for example through the Covenant of Mayors. If adequately managed, climate mitigation measures could also lead to a reduction in air pollution, lower energy costs for the local authority and its citizens as well as to the development of the local economy.

Cities implement their plan through:

- using their planning and taxation powers to encourage smart urban planning, energy-efficient buildings, renewable energy and district heating.
- increasing energy efficiency on their building stock and more generally in the public realm;
- encouraging local renewable energy sources and energy efficiency, including combined heat and power generation, by including criteria in their contracts with ESCOs (Energy Service Companies).
- developing innovative financing instruments with private and public partners.
- raising awareness among citizens, and providing a contact point for advice, technical and financial audits to reduce energy consumption, especially for energy retrofiting.
- encouraging sustainable production and consumption, as well as sustainable mobility and waste prevention.

Energy poverty should be specifically targeted through dedicated programmes. Smart grid and more generally ICT applications help to have real-time detailed information of when and how energy is consumed and on the renewable energy produced. This helps identify areas of progress, giving control over energy consuming devices and helping to balance supply, demand and energy storage.

26. PROTECT, RESTORE AND ENHANCE BIODIVERSITY AND ECOSYSTEMS

Over the past 50 years ecosystems have changed more rapidly and extensively than in any comparable period of time in human history. Globally, populations of fish, birds, mammals, amphibians and reptiles have declined by 52 per cent since 1970; and freshwater species have suffered a 76 per cent decline – an average loss almost double that of land and marine species. Threats to biodiversity in Europe are mainly due to habitat loss as a result of agriculture intensification, including the use of pesticides and fertilisers, urban development, increased frequency of fires and climate change. Planning of all land, marine and water use has to be done with an inte-

grated, strategic and multi-scale approach which aims to protect and restore biodiversity and ecosystems by reducing these main threats.

This approach is based on four pillars:

- identifying green and blue “corridors” and “nodes” of the green infrastructure to be protected from development;
- avoiding urban sprawl and soil sealing by improving the quality of life in already urbanised areas and taking measures, including financial, to promote brownfield regeneration over greenland take;
- promoting sustainable land and marine and inland water management, thanks to sustainable agriculture, forestry and fisheries practices;
- mitigating fragmentation impacts of existing and future transport and other infrastructures.

Nature in the urban environment can offer multiple services, and benefits: increasing wellbeing and quality of life, reducing the heat island effect and the quantity of runoff water, improving the air quality, but also attracting businesses or offering opportunities for recreation. Last but not least, ecosystems provide supporting services, like soil formation, photosynthesis, nutrient cycling and the conservation of gene pools that are necessary to sustain almost all other ecosystem services. To be strengthened, these services need not only to provide enough surface areas for habitats, including on roof and walls, but also a diversity of habitats and species within the city. Having a no pesticides policy and differentiated management of green spaces, raising awareness of the richness and benefits of nature among the inhabitants, especially among children, are examples of measures that reap benefits while preventing conflicts.

Beyond city boundaries, habitat and biodiversity protection also presents many synergies with flood risk reduction, climate change mitigation and adaptation, water quality and tourism. They are identified as nature-based solutions.

27. REDUCE POLLUTION

Since the start of the industrial revolution in the 19th century environmental pollution has grown into a global transboundary problem that affects air, water, soil and ecosystems, and is linked directly to human health and wellbeing. A substantial proportion of the EU's population is exposed to levels of air pollution, including indoor air pollution that exceeds the World Health Organisation's recommended standards. The urban population is particularly exposed with a high level of fine particles, ozone, nitrogen oxide and mutagenic “polycyclic-aromatic hydrocarbons” concentrations resulting from the concentration of population and activities, especially through the burning of fuels for heating and for cars and lorries. Indoors, citizens are exposed to volatile particles emanating from varnish, paint, glues, aerosols sprays and cleaning products (volatile organic compounds). All these pollutants are dangerous for health, especially for the most vulnerable, and present carcinogenic effects.

The EU directives 2008/50/EC and 2004/107/EC organise compulsory monitoring of 15 pollutants, as well as the preservation of air quality or reduction of air pollution when applicable. Cities have many levers to reduce outdoor air pollution in partnership with other levels of governance. In cases of pollution alert or crises, dedicated measures like free public transport, traffic restrictions, urban road tolls and low emissions zones can be implemented by local governments. Indoor pollution measures include raising awareness among citizens and tackling indoor pollution in public buildings, especially in schools and nurseries. Over the long term, the reduction of all types of pollution includes measures common to climate mitigation, renaturing cities and sustainable mobility.

Pollution of water, including groundwater and of soil results from diffuse agricultural or urban and industrial sources as well as atmospheric pollution. As for soil pollution, there are an estimated 340,000 contaminated pieces of land in Europe, most of which have yet to be identified. The orphan polluted sites require specific actions from cities to unblock the recycling of land for urban redevelopment as well as for facilitating access to funding mechanisms. Finally, pollution reduction has to deal with noise pollution that could threaten quality of life in cities.

28. ADAPT TO CLIMATE CHANGE

Rising sea levels, inland floods and extreme weather events – in particular, increased heat – as well as increased droughts, often associated with water scarcity and air pollution, and the potential spread of diseases, can have widespread negative impacts on people's health, livelihoods and assets. Cities are highly vulnerable to climate change, due to their high concentration of population and economic activities, public services and infrastructures. Local governments play a key role in adapting to existing and emerging threats facing their cities. They need to better understand their degree of exposure and vulnerability to potential impacts, so as to be able to assess the risks associated with these impacts.

The process has to involve key stakeholders, such as experts, service providers and the local community, with the aim of developing cross-cutting adaptation plans, with actions such as:

- developing the resilience of the community, including immediate no regret measures in urban planning and management, like sustainable urban drainage, green infrastructure, support of local resilient food and water supply and inclusion of adaptation measures in new buildings, infrastructures and public spaces or in their maintenance and renovation programs.
- increasing public awareness on climate change, its projected impacts on the community, and what citizens can do to mitigate and adapt.
- developing strategic partnerships to organise crisis management for heat waves, droughts, flood events and their associated impacts, as well as to organise post-crisis resilience.

Capacity building and networking should be paramount for such a complex subject, and the identification of innovative sources of funding is of the utmost importance. Developing adaptation plans for climate mitigation is a good way to pool relevant resources and solutions. The Covenant of Mayors 2030 integrates the two approaches.

29. MANAGE NATURAL MATERIALS RESOURCES SUSTAINABLY AND PREVENT WASTE

Resource-efficient cities combine greater productivity and innovation with lower costs and reduced environmental impacts. The sustainable management of natural resources and materials and waste prevention are thus not only major environmental considerations, but also key to the transition towards a green economy with the success of sustainably produced goods and services and the ensuing cost reductions.

EU has set the ambition that waste generation per person should be in absolute decline by 2020 and proposes to reduce food waste by at least 30% by 2025. These ambitious objectives may be reached thanks to sustainable production and consumption, through eco-design, packaging reduction, re-using, repairing and refurbishing, recycling and composting.

Initiatives to promote these as well as natural resources sustainable management are developing on the territory and metropolitan levels. They are essentially of the following nature:

- organise separate collection and recycling of plastics, biowaste, glass, cardboard packaging, paper.
- organise the recycling, upcycling, composting of collected products, including by allocating dedicated locations for these processes to take place in the planning documents.
- develop specific actions targeted to the building sector to reduce construction and demolition waste (still increasing at the EU level).
- encourage sustainable practices in forestry, agriculture, fishery and extractive activities by regulation, financial leverage and green procurement;
- develop specific actions to protect the services offered by a healthy soil (food production, water retention and

depollution, carbon storage etc.).

- guarantee a high level of environmental protection to essential habitats through biodiversity and ecosystem protection measures.
- protect energy, clean air and water resources, by reducing pollution, mitigating climate change and managing water sustainably.
- encourage the shift from “consumer” to “user” and from “owner” to “sharer” thanks to promoting social and economic activities linked to renting, sharing, swapping, repairing and manufacturing products, through the circular economy.

30. PROTECT, PRESERVE AND MANAGE WATER RESOURCES

Water resources are under increasing pressure in many parts of the world, and Europe is no exception. The most important legislation in Europe for the protection of our waters is the Water Framework Directive (WFD). It sets up a new legislative approach setting very ambitious objectives for the quality and protection of our waters, and relies on a river basin approach for water management. Water quality and local availability is still at risk, despite the requirements of the Water Framework Directive for a sufficiently high ecological and chemical quality of all surface waters by 2015. The EU Directive limits abstraction of groundwater to the portion of the annual recharge not needed to support connected ecosystems, whether they be surface water bodies, or terrestrial systems such as wetlands. Biodiversity, health, whole economic sectors including leisure and tourism activities are impacted.

If agriculture is the leading source of pollution and of water consumption, cities also have a role to play in:

- maintaining and developing the vegetation cover and more generally avoiding soil sealing. A fully functioning soil stores 400 mm of precipitation per hectare.
- ensuring excellent waste water collection and treatment.
- protecting wetlands and river basin from urban development.
- encouraging the reduction of water consumed and polluted by the citizen, through right pricing and campaigns.
- being exemplary on the public domain, by a zero pesticides policy, a choice of low water consumption plants and generally low water consumption devices.