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Sustainability Criteria Applicable to Urban Planning

a country *on the move*

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This document has been drawn up on the basis of a compilation of European studies, programmes and campaigns on the urban environment, acknowledged Internet sources and the knowledge and experience of its authors. It does not represent the position of IHOBE on each and every point covered. The purpose of this publication is to present in a comprehensible fashion some of the main points that can help to introduce sustainability criteria into urban planning. It is also in line with one of the five environmental goals laid down in the Basque Environmental Sustainability Strategy 2002-2020, which seeks to consolidate a balanced, accessible territory.

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Foreword

Sabin Intxaurraga
Basque Govt. Minister
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Goal 4 of the Basque Environmental Sustainability Strategy 2002-2020 ("Territorial Balance & Mobility. A Common Approach") stresses the importance of urban planning in the attainment of sustainable development. It sets the objective of achieving more sustainable use of land by promoting the renovation and rehabilitation of cities, sustainable urban planning and the integration of natural elements into the urban landscape, among other methods.

The report on Sustainability Criteria Applicable to Urban Planning presented here seeks to provide those responsible for urban planning with a series of criteria on which to base their reflections at all stages of urban planning and management.

This way of looking at urban planning must include environmental, economic and social aspects together with more conventional aspects of urban planning itself, in an effort to improve the welfare and quality of life of citizens.

This study was prepared by Bakeaz in co-operation with Isabel Vázquez for the publicly-owned environmental management company IHOBE, S.A., which answers to the Basque Government Department of Land Use and the Environment.

Introduction

Urban planning today

The very purpose of urban planning is to bring about physical changes in the world around us, but the work done is usually based on only the sketchiest knowledge of the environment. Engineers and architects, who are ultimately responsible for urban planning and land use projects, generally consider the natural environment as outside their fields, and as a matter for biologists, geographers or ecologists, who play only a secondary role in urban and land planning. In training for and practising urban planning, in-depth knowledge of the environment is generally seen as being merely an interesting area of secondary expertise when it comes to drawing up good projects. Thus, urban planning today – as a discipline and as a practical tool – is incorporating the effects of the change in paradigm taking place in our culture as the environment is factored into all areas of development, but only very slowly and superficially. It also needs to overcome a tendency to simplify the concept of sustainability and constrain it to those sectoral aspects most obviously related to the environment (e.g. noise, water treatment, energy and waste) rather than taking it fully on board as a basic element for integrated planning. It is a mistake to see environment policy as just one more sectoral policy and to ignore its cross-discipline potential.

A change is coming …

The continual sensation of crisis felt for years now in this field of knowledge has led to **rethinking along** several lines, some of which are closely linked to the factoring in of environmental and social aspects.

Theoretical thinking

These new concepts are gradually being accepted in the theoretical thinking of academic circles, but are finding it harder to establish themselves in practical day-to-day work, where old ways are maintained **through inertia**. Only in exceptional cases has the new way of thinking led to an actual new operational model for the working of cities and towns, in which the vast majority of people now live. This drift in urban planning in recent times is not seen by the public as a serious environmental or social problem, in spite of many obvious examples of excesses and speculative practices.

Environmentalism

Environmentalist pressure, which lies behind many of the processes involved in the change of culture that is a prerequisite for changes in design towards more environmentally coherent policies, did not at first include cities and built-up areas as prime targets for criticism and activism. Naive early environmentalist writings saw cities in two ways: either as areas divorced from the natural environment or as the main cause of degradation in that environment. Nature lay at the heart of the concerns of environmental activists. The urban environment, i.e. the ecological footprint and load capacity of cities, is a concept that arose only in the nineteen-nineties, in contrast with much earlier ideas of natural areas, natural ecosystems and biodiversity.

Tensions in urban planning

Fortunately, urban planning is now becoming more innovative and is beginning gradually and consistently to factor environmental concerns into its operational premises, in contrast with the still dominant trend towards fast, cheap production of urban land, infrastructure and real-estate products.

Public involvement

For the environment to take its rightful place within urban planning, a major change in logic is required that can only be brought about through greater public involvement in planning processes, enabling the public to use their collective intelligence to change their relationship with the environment. In this context **Agenda 21** and similar schemes (strategic planning, city plans, etc.) may well be a significant element for introducing sustainability criteria into the urban planning culture, provided the plans of action to implement them can draw up an integrated model of cities.

Commitment by institutions

Commitment by institutions is also needed, over and above party-political and short-term electoral lines, to bring

a new air to urban planning policies. Otherwise the problems of cities and their inhabitants will only grow and the quality of urban life will decline still further. Most Europeans now live in cities, and the urban lifestyle now extends to even the smallest towns in the region.

City halls need the support of higher-level institutions to provide frameworks, clarify the general lines for protecting natural ecosystems and determine the critical sectors for resource consumption and waste production. In the Basque Country the Basque Environmental Sustainability Strategy provides a framework that can help municipal authorities prioritise local environmental problems.

General Framework

Encouragement from the European Commission

As in other areas concerned with innovation and the environment, the European Commission has provided strong encouragement for this change in culture. For many years now it has been the source of the strongest criticism of the inertia-based planning model currently maintained, and of support for working groups such as the Expert Group on the Urban Environment and awareness schemes such as the Sustainable Cities and Towns Campaign. It has also promoted projects for action in cities from other viewpoints based on Community initiatives. However, the early diagnosis of urban planning problems provided in the 1990 Green Paper on the Urban Environment did not manage to accelerate the factoring of environmental and social criteria into sectoral policies. Few urban planning authorities have included measurable targets among their general goals, and fewer still have enlisted the support of the public or of social and environmental organisations to monitor and assess their goals.

European documents & campaigns concerned with the urban environment

- Green Paper on the Urban Environment (COM 218-1990).
- Towards Sustainability – a European Community programme of policy and action in relation to the environment and sustainable development (COM 23-1992).
- Europa 2000 & 2000+ (1991-1994).
- 5th Framework Programme for Environmental Action 1993-2000 (1993)
- URBAN I initiative (1994).
- Sustainable Cities and Towns campaign. Support for Agenda 21 schemes (Aalborg, 1994).
- Cities for Climate Protection Europe campaign.
- Sustainable Cities and Towns. Expert Group on the Urban Environment (1996).
- European Spatial Development Perspective (1994-1999).
- City and Environment (1994).
- Europe's Environment: the Dobris Report (1995).
- Moving Towards Urban Policy (1996).
- Car Free Cities campaign.
- Urban Exchange Initiative (1997-1998).
- Medium-sized Cities in Europe (1997).
- Strategies for Sustainable Development in European Metropolitan Regions (1998).
- Common Transport Policy - Sustainable Mobility: Perspectives (COM, 1998).
- New Neighbourhood policies (Council of Europe, 1999).
- Environment in the European Union at the Turn of the Century (EEA, 1999).
- Framework of Action for Sustainable Urban Development in the European Union (EC, 1999).
- Towards a Local Sustainability Profile: Common European Indicators (EC, 2000).
- URBAN II initiative (2000).
- 6th Framework Programme for Environmental Action 2010: Our Future, Our Choice (2001).
- Environmental Signals (EEA, 2001-2002).
- White Paper on European Governance (EC, 2001).
- Sustainable Development Strategy for the European Union (2001).

Institutional documents & initiatives

The documents produced from the initial 1990 *Green Paper* to the draft *Framework of Action for Sustainable Urban Development* presented by the European Commission in Vienna in 1999 maintain a line that seeks to strike a balance between the environmental, social and economic bases of urban planning as the foundation for a new way of working in cities. Some schemes, such as the URBAN programme based on the most advanced experiences of European Union Member States, have been highly influential in the design of urban regeneration programmes throughout Europe. However the effect of these one-off actions is more than offset by ever faster urban growth, by increasingly wasteful lifestyles and consumer habits and by the absence of any far-reaching change in general processes. Data on the development of European cities in the most recent reports (Döbris, TERM, Urban Audit, etc.) give little reason for optimism in regard to the trends in the urban environment.

Other international organisations such as the United Nations – through its Habitat programme – and the OECD – through its Ecological Cities, Sustainable Mobility and Neighbourhoods in Crisis working groups – have also done valuable work in this field.

A paradox

The pressure that cities currently exert on the environment is clearly unsustainable in terms of resource consumption and waste production. The "ecological footprint" of cities and towns is growing out of control, and the trend towards dispersal makes it difficult to envisage any short-term solution. That footprint is invisible to citizens, who are less and less aware of the effects of their way of life and consumer habits. Environmental infrastructures take away most of what might bother them, be it refuse or discharges, and conceals the actual workings of urban life from the inhabitants of cities. **Cities are made more habitable at the expense of increasing global unsustainability.**

Information, awareness & commitment

The way to sustainability must include improvements in information on the physical processes derived from the design and use of cities. That information must be passed on to the public so that society as a whole can assume joint responsibility with institutions and other organisations, and the pressure exerted by the market and its goals for short-term gains can be offset. The market tends to see cities as no more than a place of business: society as a whole must be able to assess and control the behaviour and attitudes of economic players in its territory and supplement their initiatives. That is why "participation" is a key word whenever sustainability, sustainable development and factoring the environment into urban planning are discussed.

The challenges of sustainable urban planning

The general goal of more sustainable urban planning is to attain high quality of urban life while lessening the impact of towns and cities on global sustainability. For that goal to be reached, all those involved, including businesses and the general public, must take on board the changes required and make them part of their day-to-day behaviour as well as part of their local and global policies. This is a political and cultural challenge that must be taken up by all players and institutions in society.

What is this document about?

This document puts forward a number of general ideas and criteria as a basis for the reflection that all **urban planning schemes and programmes of action need to undertake.** They should not be seen as strict recipes or proposals, because the principle feature of a sustainable approach to problem-solving is that its solutions must be tailored to the specific circumstances of each case. All problems are inter-related, so one solution may affect others.

Sustainability principles & criteria in urban planning & management

These criteria are based on principles that should gradually be implemented at all levels and all stages of urban planning and management. Applying sustainability principles in regional planning can facilitate consistency of application of those same principles in urban planning. Likewise, good basic planning at city-wide level will facilitate solutions in special plans for specific neighbourhoods or districts, and will facilitate the creation of building projects, parks and amenities whose architecture is integrated into the environment.

These principles should also be applied at the planning, detailed design, actual construction and rehabilitation stages, and even in the demolition of amenities and buildings.

Pro-sustainability experiences

The criteria presented here are linked to case studies that can help explain the new approach from a practical viewpoint. The cases considered are experimental schemes staged by town halls, regional institutions and other organisations actually working to develop innovative urban action strategies. Many cities have not only accepted the risk of changing the way they work, but have offered other municipalities the chance to share in their ideas and experiences with a view to developing, managing and implementing urban planning policies and projects through information-sharing networks. To paraphrase Jose Manuel Naredo, before we can take about **good pro-sustainability practices** we must first talk about practices to correct the current trends towards clearly unsustainable situations.

Structure of the document

After the introductory section and this explanation of the general framework, the main body of the document comprises six chapters dealing with topics that may encourage people to think about how sustainability can be factored into urban planning actions. The document ends with a summary of conclusions and a list of bibliographical references. The topics covered include some of the main criteria for beginning to introduce sustainability into urban planning: basing planning on the capacity of the natural environment and joining cities with the area in which they lie, changing the structure of mobility and accessibility, concentrating on the recovery and rehabilitation of cities, bringing hitherto voiceless city residents into the urban planning process and designing plans from an integrated standpoint that includes environmental and social factors. It is hoped that these six chapters will provide food for thought and debate.

1

Integration into the Natural Environment

Land as a scarce resource: ecological footprint and load capacity

Ecological footprint

The current trend, not just in our own area but worldwide, is for the population to concentrate in cities and urban areas. Such areas are occupying more and more land, and even part of the land that remains free is used in the service of urban areas. In this context the concept of **"ecological footprint"** is a highly useful one: in outline it means the area of land that a city needs to maintain its production and vital functions, including the materials and energy it uses directly and indirectly. It is measured by calculating the area required to obtain resources for processing and use or consumption, plus the area needed to deposit or assimilate waste. London's footprint, for instance, is 120 times the size of the city itself, which gives a clear idea of the extent to which urban life is the prevailing mode, and of the overall impact of cities. For everyone in the world to live with the level of consumption enjoyed by the average US citizen we would require an area twice the size of the Earth. The ecological footprint of the Basque Country is estimated in *Environmental Indicators 2002* at 2.03 hectares per capita.

An impact analysis similar to ecological footprint estimation has been performed in the Basque Country, with material flow analysis methods being applied to the whole of Basque territory to establish the relationship between the consumption of natural resources by the economy and the capacity of the environment to provide materials and absorb waste. This enables direct and hidden physical flows of natural resources to be calculated from extraction through production use and recycling to disposal, taking into account the losses along the way. The 2002 report *Total Material Requirement of the Basque Country* gives figures for 2000 of 92 tons of material consumed per capita, up 11.6 tons on 1998 and 16.7 tons on 1989.

Load capacity

Urban planning in recent years has centred on regulating urban growth, giving no thought to whether that growth can continue indefinitely or whether there is a threshold that should not be crossed. The **"load capacity"** of a territory is another core question for sustainability in relation to planning. To measure the load capacity of a territory the resource use associated with urban living must be monitored to establish the upper limits on the use of the system beyond which its workings will be significantly upset. The system must be considered to include the use of those resources, the production of waste and the emission of pollutants. An urban area must not exceed the load capacity of its hinterland if it is to be sustainable. Pre-industrial cities, with their physical limitations on the appropriation of energy and materials, centred

their activities on the areas adjacent to cities themselves, and can therefore be seen in these terms as quasi-sustainable, though there are cases on record of clear environmental crises, some of which have actually resulted in the fall of cities or civilisations.

We are currently seeing two parallel trends: on a worldwide scale the population is **concentrating rapidly into large metropolitan areas**, which is a significant indicator of the extent to which our generations are plundering the fossil fuels that took so many centuries to form. The shape and size of cities clearly denotes the amount of energy available to a society.

At the same time urban areas are expanding, **even those whose population is not increasing.** Urban growth in the nineteen sixties and seventies was fast and uncontrolled, and linked to population growth. From the eighties onwards population growth has slowed or ceased, but land consumption has not followed suit. New trends towards more disperse urbanisation have resulted in more widely scattered residential areas that consume large amounts of land and require transport, energy, water and other infrastructures. Even in areas where the lie of the land leaves little space for urbanisation, individual houses are becoming the norm in new urban planning schemes.

Using less land: a criterion for sustainable urban planning

The reference criteria of the *Framework of Action for Sustainable Urban Development in the European Union* (COM 1998-605) include one that addresses this problem directly: **"the promotion of urban models that can make efficient use of resources, limiting dispersal and the indiscriminate use of land".**

The expansion of cities takes land away from arable and livestock farming, brings cities into competition with environmentally important natural areas and turns nature reserves into islands, thus threatening their richness and biodiversity. The data indicate that in Europe agricultural land is being lost to urban uses at a rate of over 2% every ten years. If not only exterior areas affected by city growth but also those areas that cease to be farmed due to expectations of future urban growth are included in the ecological footprint of cities, the figure involved is 4 hectares for every hectare actually occupied by urban growth. When the relationship between urbanised land and the surrounding open spaces is upset, regional ecosystems are threatened.

This is particularly serious in limited territories with high economic potential, high population density and many areas which are too mountainous or too close to the coast to be put to urban uses. The Basque Country is such a territory. Saving on land consumption by re.-using already urbanised land, limiting the dispersal of cities and implementing reasonably compact urban models suited to the actual lie of the land is a top priority goal in the Basque Country.

The first step in urban planning should be to **determine the size of the city's footprint, the load capacity of its hinterland and the potential for re-using land already urbanised rather than building over greenfield sites.** Re-using land already used in urban planning or by industry seems the most coherent option from the viewpoint of sustainable development. In the UK this criterion led to legislation requiring that brownfield sites be used before greenfield sites, and levying a tax on building on greenfield sites the revenue from which is used in urban regeneration projects.

The urban planning legislation of the Basque Country also reflects this concern for preserving greenfield and farm land and for conserving woodland, wetlands, grazing land and environmentally valuable areas. The recently approved Basque Environmental Strategy includes the idea of land as a scarce resource in its diagnosis. Indicators are proposed to measure the impact of urbanisation on the natural environment and to monitor and slow the consumption of soil for urban uses.

City and hinterland: with nature on our side

Habitability factors

When a new settlement is planned in an area, the habitability requirements made are:

- that the area have sufficient intake capacity to provide the desired quality of life and habitability;
- that there be an acceptable standard of safety and protection against the risk of natural disaster; and
- that the climate be suitable for a comfortable life.

These **habitability standards** can be attained on the basis of the **qualities provided by nature**, through **urban planning** and **architecture integrated into nature** so as to have a **minimal impact on natural processes**, or they can be attained by ignoring natural conditions and inputting energy to modify the initial conditions through techno-

logical processes that have a high impact on natural processes.

Taking the first of these premises as our basis, **occupation of land for human** use should always entail an analysis of three factors: natural **capital and its characteristics**, to make the best possible use of the intrinsic conditions and prioritise the most suitable activities, **load capacity**, so that different activities can be distributed suitably, and **active natural processes**, to assess whether they can be assimilated into the model proposed or must be modified.

The Green Paper on the Urban Environment

It may be useful here to recall the ideas outlined in the 1990 *Green Paper on the Urban Environment* and by other thinkers, who see the urban environment as an ecosystem. Cities and their activities are directly linked to the territory in which they lie. Resource use and waste emission do not affect only nearby areas: they have local, regional and global impacts. It is necessary to invest in natural capital and even promote its growth to relieve pressure on reserves of environmental goods and services by creating new ones.

Hinterland information

Planning must be based on a mutually beneficial relationship between land use management and environmental parameters such as climate, geomorphology, flora and fauna. To that end more local information is **needed on the characteristics of hinterlands before development is considered**, to increase the likelihood of comfort being obtained with the minimum possible impact on nature.

Green areas inside urban areas

Green areas within cities must also be seen as a valuable feature that can increase the levels of comfort for the whole city and cover the vital need for recreation of large groups of people, particularly children, the elderly and those in ill health. A well-designed, interconnected network of green areas featuring amenities on all scales (play areas on individual city blocks, city parks, open green belts outside or on the edges of cities) can have several positive effects: it can reduce pollution, improve the urban microclimate, create wildlife habitats inside built-up areas and provide access to nature for the city's inhabitants.

The easiest way to attain high-quality, economically-viable inner-city green areas and peripheral green belts is to locate them in existing areas of natural importance and connect them with nearby natural areas protected from urban development.

Compact urban models

Using reasonably compact models in new urbanisation projects makes it easier to create controllable, complex spaces for social relations while at the same time helping to keep some land free from development. We must of course avoid urban congestion with the overcrowding, insufficient sunlight and poor ventilation associated with outlying districts of our current cities and towns as a result of speculative development or a failure to allocate space generously enough in neighbourhoods with social housing.

If it is to adopt this approach, more **sustainable planning must avoid additional consumption of land for urban uses insofar as possibl**e, and help conserve the structure of existing natural areas. Land is a scarce resource everywhere, and land with high environmental value and high biodiversity such as autochthonous woodland, wetlands and shoreline areas is scarcer still.

Criteria for more sustainable planning: land consumption and the structure of natural areas

- Before developing greenfield sites, analyse alternatives involving the **recovery of areas inside** the urban environment so as to contain urban expansion.
- **Encourage reasonably compact**, varied urban areas with medium population densities and a good mix of land uses.
- **Analyse the physical features of the city's hinterland** from the viewpoint of landscape and the logic of the ecosystem that it contains.
- **Encourage arable and livestock farming** so that a balance is maintained in regional development and economically weaker land uses are not left out of the equation.
- **Protect and reserve the most environmentally valuable or fragile areas** inside and around the towns or area affected by planning.
- **Create recreational natural areas around cities**, and study how they can be used by different groups in society with different needs. Provide for non motorised access to these areas.
- **Protect valuable natural areas inside cities through action to maintain the wealth of their biodiversity**, e.g. natural regeneration of rivers and protection of urban woods and steep slopes.
- **Provide for ecological continuity between these protected areas an the green areas** that result from urban planning actions to prevent their becoming isolated and fragmented: join them via ecological corridors or green belts.
- **Provide for action to recover and balance natural capital lost as a result of urban pressure in highly urbanised areas**, involving woodland, wetlands and shoreline biotopes.
- **Establish a coherent system of open green areas including features on a variety of scales**, from pocket-sized parks to major green belts or regional parks, and facilitate non motorised access of people and animals. Base the design of these areas on existing plants and water courses, and use local plants in newly created areas. A good system of green areas is fundamental to the health of the city's inhabitants and to the health of the environment.
- **Set and designate city and town limits and mark them visually and through use to prevent the edges of cities from becoming shapeless**, unregulated areas from which it is hard to reach the countryside, to which anything that cannot be located in the city centre is relegated and in which land value speculation by landowners is rife.

Case Studies

The Green Belt Around Vitoria-Gasteiz

Vitoria's green belt is one of the projects resulting from the implementation of a pioneer among Local Agenda 21 schemes in our country.

The proposal by the municipal authorities to create a **multi-purpose green belt** around the city seeks to improve the quality of the local environment, provide economic and social benefits for the population, integrate nature into the city and enable the agricultural hinterland to act as "breathing space" and a filter for Vitoria. Environmental remediation work in suburban areas affected by urban development but still recoverable has involved imaginative measures implemented in co-operation with numerous local organisations and associations. Economic activities in the area have been respected insofar as they are environmentally friendly.

The amenities designed have enabled new leisure and recreational activities as well as environmental education

and awareness schemes involving direct contact with nature to be established. There are also educational activities in areas of employment linked to the environment for disadvantaged groups and persons who have difficulty finding employment and integrating into society. Far from having a negative impact, use by the general public actually ensures the conservation of these green areas. The green belt can be accessed from the heart of the city via pedestrian paths and non polluting transport.

Its design combines social and environmental goals: the areas of water recovered are not only sites for bird-watching and recreation, but also relief areas in case of flooding. Maintenance is highly economical thanks to the environmental consistency of the approach used. The area has been welcomed by local people, who are visiting it in huge numbers for recreation and to attend the activities scheduled there.

General Urban Land Use Plan of Torroella de Montgrí

It is ironic that in most coastal resort towns urban planning provides examples of how NOT to factor the natural environment into planning calculations. Sun and sand based tourism, which in its very essence would seem to be based on enjoying nature, turns out to be one of the biggest predators of the natural environment. Its voracity in taking up the most beautiful areas of coastline has led it to take over much of the ecologically sensitive area that makes up the land/ sea ecotone: massive coastal land occupation has turned beaches into biologically inert areas.

Torroella de Mongrí, a coastal resort in Catalonia, is an example of efforts to redirect municipal planning into more environmentally-friendly forms, with the initial burden of a legacy of extensive re-zoning of land in the nineteen seventies that generated rights and expectations for landowners and developers. The municipality comprises the districts of Torroella and L'Estartit on the Pals bay opposite the Medas Islands. The turnaround came through two successive general land use plans that implemented a new model based on the actual capacity of the area. A land use model was developed that factors environmental conditions into the need for growth. The environment and the landscape are core values in the new model, and are fundamental for sustainable development in accordance with the actual resources of the area. To quote from the Plan, "*The philosophy is to complete the tasks envisaged in the plans dating from the 1980s, slowing growth, with an option to deurbanise in 2000 and eliminate those structures that compromise the proper development of the land use model. Unoccupied land is a scarce resource and as such must be conserved to maintain the necessary balance between occupied land and the hinterland that serves it*".

2

The Urban Model

2 The Urban Model

Principles of sustainability applicable to urban planning

Sustainable development

The concept of sustainable development began to be formulated in the nineteen seventies, when it was known as "eco-development". It gradually took shape over the following twenty years on the basis of the common-sense perception that in nature nothing can keep growing indefinitely: when certain upper limits are reached processes collapse and degrade, and their degraded or fragmented components come to form part of new development processes. Once the initial growth phase has been passed, it is information and complexity that enable societies to advance. In the overall context of the biosphere, the idea of development is thus inextricably inked to the idea of the life-cycle, in which waste from one process is turned into raw material for others in a dynamic balance that allows for self-regulation and feedback throughout the system. Based on the cycle as a fundamental concept of ecology, these ideas can be summed up as follows: the closer one gets to the **cyclical form** of natural processes, the more sustainable processes guided by human beings will be, and the more they will help to maintain a **balance** in the conditions for human well-being.

A new concept of planning

Applying this idea of sustainability to the form and structure of our cities means adopting a **new concept of planning** that can:

- allow the physical working or "metabolism" of cities to reshape itself into a cyclical form, in the sense of making the energy and materials consumed in urban life renewable, and ensuring that waste can be re-incorporated into the natural cycle;
- set limits on growth and choose urban models that combine different approaches to ensure the rational use of scarce resources, rational, sustainable transport systems, increasing complexity based on information and common intelligence, and a standard of habitability and quality of life that can be generalised to the whole population.

The cities and towns envisaged would be organised according to relatively compact models, with a mix of uses that encourages the use of non motorised mobility and a good network of public spaces and amenities close at hand (thus doing away with dependence on private cars in day-to-day life); they would see conviviality and relations between residents as the greatest of urban values; and they would be committed to the continuous improvement of the existing built-up structure, creating new model cities from existing cities.

Lines of action

The lines of action of sustainability applied to urban planning would have to be based on making the **best use of the initial conditions of each specific area** in all planning tasks. For that to be possible, good initial **environmental information at microscopic level of the area to be affected by planning** needs to be obtained.

Analysis of the **specific characteristics of each area must be the foundation for establishing the shape and structure of the city design**. Otherwise, the price must be paid later. In the worst cases, neglecting local conditions can result in natural disasters, even in modern times (building in areas susceptible to flooding, etc.). More often, it results in higher building and maintenance costs, and makes it impossible to achieve optimum results. Examples include tunnels plagued by chronic flooding and green belts located on barren land.

Criteria for action

Some criteria that could be applied to development based on the opportunities offered by the land – also known as respect for the *genius loci* of the place of action – are listed in the table below.

The metabolism of the city

The initial premise in regard to the **metabolism of the city** is that urbanisation always results in significant changes to natural flows. In contrast with natural systems, the urban ecosystem depends largely on importing finite natural resources (materials & energy) and exporting waste. One clear goal of sustainable urban planning is to **conserve material and energy resources used to supply urban services by seeking the most efficient, least wasteful processes**. The overriding idea is to close the material and energy cycles and take into account all flows from beginning (sources) to end (waste), including replenishment and the search for solutions to environmental problems that arise in the early stages of the cycles. The concept of the **"urban ecosystem"** is essential in this: it establishes an integrated scenario in which these cyclical processes are concentrated, and within which planners must seek to close the cycles.

Cities work as open systems that must degrade energy and materials to keep themselves alive. The key to the sustainability of the biosphere is that degradation centres on the energy received daily from the sun – which would have degraded in any case – and not on whether the biosphere is capable of repairing that degradation. Thus, we must move from a system that consumes resources and exports waste to one that makes more efficient use of resources and generates less wastage in the form of waste or intense quality.

Criteria linked to the characteristics of each land area

- Analysis of environmental **opportunities and problems**.
- Analysis of opportunities offered by the **area** as is: climatic features such as hours of sunlight, temperatures, wind speeds, humidity, existing plant life, drainage, ventilation, etc. in regard to natural capital; also landscape aspects such as points with good views, stand-out landscape features, impact of the proposed development on urban & natural views, etc.
- Detailed study of **weather** at different times of the year and of the day (cold & hot months, differences throughout the day, etc.).
- **Identification of the elements** that give the landscape or built-up area an identity, so that they can be used as key features in the new development.
- Allocation of **uses** consistent with basic characteristics of the area, e.g. wetlands are well suited to green areas, sunny sites with good views to residential use, etc.
- Prior **remediation** of land contaminated by former industrial uses and environmental recovery for use as urban land.
- **Design of a city** shape that makes use of the opportunities offered by the climate and the lie of the land and corrects any existing environmental problems: possibility of sun in winter, cross-ventilation, protection from wind or rain, use of breezes and shade, avoidance of unwanted shadows, etc., always in relation to the microclimate, its problems and its opportunities.
- An **urban structure** in line with advanced criteria concerning density, the mix of uses, job creation adjacent to residential areas, local amenities in all neighbourhoods, a system of public spaces and green areas distributed evenly throughout the city with easy access via pedestrian and cycle routes.
- A **basis for urbanisation** that facilitates the minimising of impact on the original surface: minimal earth movement, landfilling and slope levelling, recovery of topsoil for use in making green areas, reduction of impermeable, hard surfaces and encouragement of soft areas that enable the land to breathe and absorb moisture.

We must re-think the metabolism of our cities based on the individual characteristics of each area of land, so that both resource consumption (materials, water, energy) and waste production (MSW, pollution, greywater & sewage water, etc.) are factored in. The first step in this process is to learn the **extent and characteristics of these flows in today's cities**.

Once the processes are known, the next step is a change of approach, from designing infrastructures to meet any demand that might exist (or even to induce demand) to working on a **demand management** basis. This new approach calls for a re-thinking of existing needs to avoid waste and concentrate on savings when creating infrastructures and drawing up plans and programmes.

In the case of waste and emissions the goal of all new urban planning should be to minimise waste and foster recycling or conversion into new resources whenever possible.

Sectors to be analysed from a demand management perspective

The **sectors** that need **to be analysed** from this new perspective are:

- Water cycle.
- Energy consumption.
- Consumption of construction materials.
- Waste treatment.
- Treatment of emissions.

The basic idea is to reduce the requirement for resources and to ensure that most resources are then recycled into new resources rather than being disposed of as waste.

In general terms, the urban planning criteria to be factored into this action would be to **include studies of the urban metabolism and a total resource/waste balance sheet for each location when drawing up urban development plans.**

Criteria linked to the water cycle

Conventional urban planning merely checks that potable water supply and treatment facilities exist or are planned. Criteria for improved urban planning to factor in water saving and demand management include:

- Adapting **water quality to the needs of each specific use** to avoid increasing demand for potable water and encourage the re-use of water for secondary uses.
- Using natural drainage whenever possible to ensure that most **rainwater is returned directly to the natural environment**.
- Providing sufficient **permeable land surfaces** in urbanisation processes.
- Separating the different types of **waste water** to simplify re-use and treatment as far as possible. For instance separating greywater from sewage water will enable greywater to be treated on site using very little energy.
- Designing **water mains** for maximum efficiency of use, considering the complete water cycle for the surrounding environment.
- **Providing facilities** to help save and re-use water in every home, building and construction.
- **Re-using water** by treating it in ways that enable it to be fed back into the water cycle.
- Respecting the distribution of land uses in **wetlands** and similar areas.
- Using design criteria centred on **autochthonous plants** and water saving.

Criteria linked to energy

- Intelligent location of buildings can drastically reduce energy requirements for heating and cooling of indoor areas. Optimum **building orientation** calls for a study of the actual needs of future users so that the best use can be made of the local microclimate.
- Factoring sunlight and protection against cold wind, etc. into building design can result in considerable savings in what is known as **"passive bioclimatic architecture"**. The goal should be to achieve maximum interior and exterior comfort while avoiding unnecessary use of climate control systems.
- These points must be taken into **account in alignments and ordinances**. A study in the United Kingdom has revealed that in many current plans savings of up to half the energy demand of each residence could be achieved merely by re-thinking road layouts and re-orienting city blocks.
- The urban structure of new areas must be analysed on regard not only to heating **requirements during cold weathe**r but also to cooling in warm weather. Air conditioning is becoming a major item on the energy bills of our area. According to the Urban Audit, winter pollution levels on a European scale are clearly dropping, but summer pollution is becoming more of a problem.
- Ordinances should facilitate or directly require the **installation of equipment to make use of renewable energy** sources in new buildings, for specific uses such as hot water and to produce energy that can be incorporated into the mains grid to balance the energy impact from non renewable sources in newly developed areas.

Criteria linked to construction materials

- The energy used to produce **materials for construction** must be taken into account when selecting what materials to use, though the energy consumed over the useful lifetime of a building is generally far greater than that expended to produce the materials of which it is formed.
- Another important factor in energy consumption linked to construction materials is whether they are **available nearby or need** to be transported in from elsewhere. Using materials available nearby not only avoids the negative impact of transport on the environment, but is also positive for the economic development of the local area.
- **Building to last** is a good basic criterion for selecting materials that have a positive environmental effect in the long run once the full life cycle of materials and energy is considered.
- Another point to be considered is whether construction **materials can be recycled**, or whether recycled materials can be used in buildings.
- Some **materials** that have traditionally been widely used in construction are **not recommendable**, as they originate from production processes that cause serious damage to the environment or may lead to harmful effects on the health of users of the building made with them. These products are gradually being banned or withdrawn from the market, but it is wise to obtain independent technical advice so that the principle of caution can be applied.

Criteria linked to municipal waste

- **Deciding in advance how waste** produced in urban areas should be treated will subsequently facilitate its proper management. Properly located common facilities at neighbourhood or city block level make separation, collection and re-use of urban waste more economical. Collecting organic waste separated at source takes careful planning, but enables it to be composted and turned into valuable organic material.
- Planning must earmark **conveniently located sites** for the solution of waste collection and treatment problems, just as it does with other amenities necessary for urban life.
- Demolition processes must fit in with plans for the re-use of **construction waste**, which is an eyesore and illegally occupies a great deal of land around cities. The best solution is planned deconstruction followed by on-site treatment and re-use of usable waste.

Criteria linked to pollutant emissions

- Pollution in cities is closely linked to the impact of **motor vehicles**. Much of their noise and pollutant emission problems result from the over-use of private cars.
- Other sources of pollution, such as **industry and economic activities**, are generally factored into regular planning decisions.
- Indoor **noise pollution** is a major problem for habitability in compact areas, that can be mitigated by setting regulatory requirements for insulation between buildings and work areas, and in areas with specific uses. The desirable mix of activities should include precautions to prevent situations conducive to problems of coexistence.

Case studies

Barcelona Solar Power Ordinance

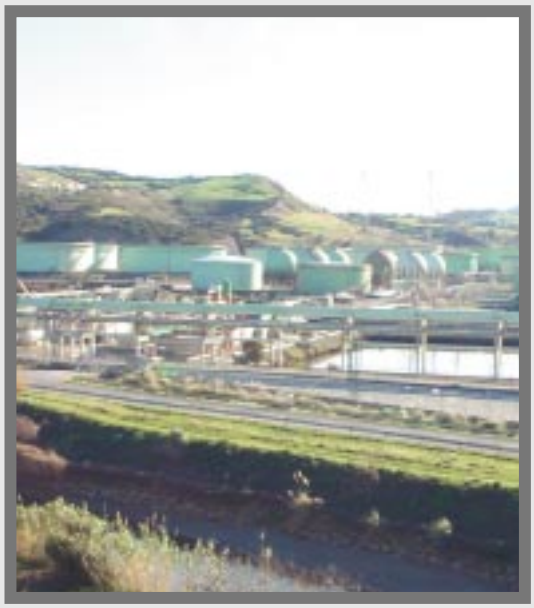
Like other major European cities, Barcelona has decided to reduce fossil fuel consumption by homes and offices, and thus to cut CO_2 emissions. The solar power ordinance (Annexe to the General Environment Ordinance on The Capture of Solar Energy for Heating) has begun to require that solar water-heating systems be installed in buildings constructed or renovated as from August 2000.

Following a transitional period, the ordinance requires as from 2001 that solar power collectors be installed on all buildings in Barcelona that consume more than 2000 litres of water per day. Sant Joan Despí, a small municipality close to Barcelona, has an even stricter ordinance that applies to all buildings that consume more than 720 litres per day.

The decision to require the construction of solar power systems was widely discussed with specialists in all relevant fields, and the first assessment is positive. A municipal survey reveals that 80% of people would be prepared to pay 10% for clean energy.

The Solar Power Ordinance primarily covers new buildings, but existing buildings are also affected. The City Council intends to equip existing municipally-owned buildings with significant hot water consumption (swimming-pools, schools, gymnasia, etc.) with solar power units. Studies are also being conducted into the provision of thermal hot water systems and photovoltaic electricity supply systems for municipal produce markets. Municipal and regional funding can be provided to cover up to 50% of the cost of installing such systems.

The Solar Power Ordinance was passed as part of an ambitious energy programme that sought to install 100,000 m^2 of solar power collectors by the end of 2002, in line with the undertakings announced at the Kyoto conference, which established the need to replace 12% of fossil fuel use by renewable energy sources and to make cuts of 17% in CO_2 emissions in each European Union country. In Spain the Barcelona experience is being closely monitored, and other cities and towns are already drawing up or planning similar ordinances.



The Sarriguren Eco-town (Navarra)

The "eco-town" project in Sarriguren is an initiative of the Regional Government of Navarra, as part of its move to integrate sectoral policies in a framework of sustainable development. It comprises a plan to build a development of 4200 price-capped new homes close to an existing town near the regional capital Pamplona. The scheme is presented as a demonstration project to set an example for public institutions, the private sector and society as a whole in Navarra.

The goal is to set up a model project that applies a bioclimatic approach to architecture and urban planning in a town created *ex novo* for the purpose. The stress is on improving the quality of urban spaces, and secondarily to solve problems of mobility and accessibility.

The three principles of bioclimatic construction applied are energy saving, the integration of renewable energy sources and healthy construction (in terms of materials & air quality). Other significant aspects of the project include the creation of a true urban community, offering a variety of types of residence at affordable prices and fostering cooperation between public institutions and private firms in the development process.

The project includes a number of green corridors linking urban green areas with the natural areas in which the new district is set. Public spaces are designed to incorporate traditional, classical city models (streets, squares, boulevards, town halls, etc.) alongside attractive new resources such as a large central park with an artificial lake.

3

Sustainable Mobility

3 Sustainable Mobility

Impact of the spread of private cars

The basis for modern urban planning and its departures from the classical structure of cities can be traced to the appearance of the **private car** and its extraordinary spread as the prevailing means of transport, used more and more often by more and more people for all types of journey, regardless of the distance to be travelled or its efficiency.

Many urban planners see this invasion by private cars and the consequent adaptation of existing urban structures and creation of new ones in the service of those cars as a serious attack on the very essence of the coexistence and well-being that should lie at the heart of quality of life in cities. Traffic causes congestion and pollution of all types on unacceptable levels, and between streets and parking spaces it takes up most of the public space. Other, less polluting means of transport are unable to attain minimum requirements of safety and comfort that would encourage large numbers of people to use them. Apart from their wider use in leisure time, walking and cycling have become residual forms of movement, used normally by people who by reason of their age or economic circumstances are unable to travel by private car.

Zoning

The **division of functions into separate areas of a city**, an urban planning feature that arose from the Athens Charter, means that people need to make a great many journeys to go about their everyday business.

The 1990 *Green Paper on the Urban Environment* acknowledged the widespread problems of congestion and pollution in European cities and the degradation of buildings and natural spaces as the main problems of the urban environment. It mentioned modern urban planning practices, and in particular zoning, as one of the principal causes of these problems, along with the mercantilisation of cities, indicating that rigid zoning ignored the geographical reality and cultural heritage of cities, and destroyed the flexibility of cities and their buildings.

As a fundamental criterion for remedying this situation, thinking not only of traffic problems but also many other growing problems in European cities (social segregation, security, problems in access to work, etc.), it proposed that rigid zoning be avoided and mixed use of urban space be encouraged.

Diversity of use of urban areas

Encouraging **diversity of use in urban areas** would help districts be more self-sufficient, and thus reduce the number of journeys needed to complete day to day business. Creating proximity is a radical but coherent way of slowing the massive increase in journeys by private car, with all the serious consequences those journeys entail in terms of energy consumption, pollutant emissions and the invasion of public spaces.

Public transport & the creation of proximity

Another point made in the Green Paper is that **public transport is important** as a more rational means of achieving environmental goals and using urban spaces as places for meeting and communication. The combination of various forms of public transport and non motorised trans-

port, together with restrictions on the indiscriminate use of private cars in what is known as an **"integrated urban mobility plan"** currently seems to be the option best suited to seeking solutions to the various types of journey that must be made. For shorter journeys, providing pleasant pedestrian and cycling routes is the best solution. This means that a basic design criterion for urban areas must be introduced that prioritises accessibility for more environmentally-friendly modes of transport (public transport and non motorised modes) over more roads for motor vehicles. Planners must seek to achieve **cities where distances are short**, and must do so by encouraging proximity and mixed uses so that unnecessary journeys are avoided.

General criteria for action

In short, urban planning must seek to **minimise mobility requiring motor vehicles and gradually increase the potential for mobility using less polluting, more environmentally-friendly modes**. Some of the points covered in previous chapters are also basic in facilitating sustainable mobility:

- Encouraging **diversity of use** in all urban planning schemes involving new building and rehabilitation, taking proximity as a fundamental concept of urban coexistence.
- Seeking to **re-use land occupied by now obsolete** facilities (industrial plants, railway lines, etc.) in inner city areas, which are usually more accessible than isolated sites outside the main built-up area.
- Prioritising the design of reasonably **compact urban areas in development schemes,** so that public transport systems are viable.
- Analysing **access for pedestrians and cyclists to amenities** in residential and business areas so that non motorised transport can always be used.

The specific criteria for transport infrastructure design and mobility management are listed in the following table.

Sustainable mobility criteria

- Locate the **most heavily used urban services** near intermodal public transport stations, or on the other hand do not build **major poles of attraction** (shopping centres, sports complexes, cultural centres, business parks, etc.) out of town where they can only be reached by private car.
- Guarantee **public transport** and **good access for pedestrians and cyclists** in all new developments, and ensure connections with existing urban spaces.
- Establish a **network of pedestrian pathways and safe**, pleasant cycle-paths throughout the built-up area, with specific connections to centres of attraction and amenities such as schools, nurseries, outlying parks, health centres and shopping areas.
- Develop an **intermodal transport system** to bring together existing transport networks, ensuring that it is easy to use public transport and non motorised transport to obtain full access within each neighbourhood and between neighbourhoods and town centres for all types of services.
- Draw up a **parking policy** to discourage excessive use of cars, e.g. prevent access to town centres and encourage the use of cars only for those journeys on which they are truly most useful. For instance deterrent parking areas can be established on the edge of towns, connected to pedestrian paths or public transport routes into town centres.
- Redistribute the **space allocated to motorised and non motorised transport** in planning proposals to achieve a balance in the use of urban spaces that is more in accordance with the number of journeys made, with the balance between social groups and with the environment. Limits could be set on how much land may be occupied by transport infrastructures.
- Stress the **recovery of high-quality urban spaces** that may currently be invaded by excessive use of private cars.

Case studies

"Donostia Camina"

The "Donostia Camina" project seeks to improve mobility and enhance the quality of public spaces in the city of San Sebastián. The process began with the 1992 Traffic Plan, which was integrated into the General Urban Land Use Plan in 1995. The project involves local residents as well as a broad representation of institutions and private bodies in its discussions and in the drawing up and implementation of actions.

The 1992 Traffic Plan established routes in the city where pedestrians and cyclists had priority, and reserved other routes for public transport only. The earliest measures were not well understood by the population, so it was decided to increase public participation so as to help modify the plan and bring it into line with the different needs of the city. Special emphasis was given to the needs of those most closely associated with mobility, such as transport and distribution firms, taxis, traders and cyclists. With the support of the Municipal Mobility Group, the initial network of pedestrian and cycle routes through the city was configured by 1996.

This new approach to mobility in the city prioritises pedestrian traffic, not only in the centre and the most attractive areas for visitors but also through marked pedestrian routes throughout the city. There are good pedestrian links between all neighbourhoods and with the city centre, and walking has become the chief method used to move around the city. Use of public transport is encouraged for longer journeys through exclusive road lanes.

These changes have had a positive effect on the quality of life in the city, and have helped boost trade. Public opinion is firmly behind the new culture of urban mobility: 1999 saw the signing of the Civil Mobility Pact, which states that "priority is given to those forms of transport that are most environmentally friendly, in particular walking, cycling and public transport".

Data for 2002 show that the length of pedestrianised streets in the Old Town has increased from 3 to 5.5 km, freeing an area of over 100,000 m2 from motor vehicles. Cycling has become a more and more popular form of transport, and more than 1500 cyclists per day now take to the roads of San Sebastián, accounting for 1% of all journeys in the city. Improvements in the frequency, quality, accessibility and area covered by public transport have also resulted in a 10% increase in passenger numbers.

'Eskolara bizikletaz' in Zarautz

Although on a smaller scale than the mobility plans of San Sebastián, the 'Eskolara Bizikletaz' campaign is an interesting starting point for municipalities interested in introducing sustainable development processes. It comprises the design of a network of cycle routes through the town to connect various points of interest such as schools, sports centres, the town hall, etc.

The municipality of Zarautz is a pioneer of Local Agenda 21 implementation in the Basque Country. It joined the Basque Government's 'Udaltalde 21' scheme in 2000, and in December 2002 became a member of the 'Udalsarea 21' network, which brings together the Basque municipalities most advanced in sustainable development matters.

The 'Eskolara Bizikletaz' experiment was begun in 1997, when the Salbatore Mitxelena school, located just under two kilometres from the city centre, suggested to the town council that a cycle route should be created between the school, the railway station and the town centre. The school for its part undertook to build bike sheds. The town council responded by designing a 13 km network of cycle lanes, known in Basque as *bidegorri*, and made it compulsory for cycle lanes to be included in all new development areas.

Three years after the implementation of the scheme three quarters of the staff and pupils aged 7 and over cycle to school, making a total of over 400 bikes per day on the route.

4

Rehabilitation & Recovery of Urban Areas

4 Rehabilitation & Recovery of Urban Areas

Urban Planning for the People

Innovation in urban planning

On the road to sustainability it is advisable to take a be realistic approach. Ambition must be tempered by the need to build on what is already in place, to recover traditional local features and to make fair, efficient use of resources. **Innovation does not mean merely doing things differently: it means setting new, more environmentally and socially coherent goals and seeking** to combine new and recovered methods, qualified instruments and novel possibilities to achieve those goals.

Natural, human & artificial capital

Studies into sustainable development refer to three types of capital that must be transferred to future generations: **natural capital**, which has been widely discussed above, **human capital** in the form of people, relationships and culture, **and artificial or built capital**, comprising buildings, infrastructures, cities and towns. We have a built environment that is an immense wealth, whose maintenance is sometimes allowed to fall into the hands of people who have no support and no guidelines for turning it into an opportunity for the future. In neighbourhoods populated by high wage-earners, recapitalisation and continuous improvement are not a problem, but in middle- and lower-income neighbourhoods and in run-down areas there is a risk that the wealth of the built environment will be lost for ever. The trend towards relocating major activities such as shops, amenities and leisure facilities out of town reinforces the image and the reality of abandonment found in many neighbourhoods of this type.

"Building city upon city"

We have already said that sustainable urban planning must centre on the **regeneration of brownfield sites rather than the urbanisation of ever-more-valuable greenfield sites or farmland.** In the process to implement **urban planning** oriented towards the people in Barcelona in the nineteen eighties, this was referred to as **"building city upon city".** The idea is to rehabilitate historical inner city areas without their losing their status as popular neighbourhoods, and to encourage strong action based on rezoning of public spaces and the recovery of outlying areas for quality urban life.

New urban planning trends in America place particular emphasis on turning existing disperse cities into communities: the rehabilitation of existing inner city areas and towns in a context of coherent metropolitan areas, the reshaping of disperse suburbs into communities that are true neighbourhoods and districts, the conservation of natural settings and the defence of cities' architectural heritage. This may be one of the future challenges facing urban planners in our own areas.

Points of attraction must be **found that will enable investment and activity in old areas to continue**, thus ensuring their economic prosperity and habitability. It is therefore essential to examine the needs and priorities of local communities and to take environmental considerations into account.

Recycling, re-using and improving run-down urban structures is a major point in the struggle for a sustainable habitat. Acting from a standpoint of environmental coherence to bring about substantial improvements in the **standards of habitability** of interior and exterior spaces alike is a challenge for most neighbourhoods as they stand today. Only if these efforts are successful will it be possible to fulfil the goals and principles listed above in the chapters on preserving the natural environment.

An idea of the **weight of regeneration of built-up** areas can be obtained from the fact that rehabilitation work accounts for 50% of the construction work currently ongoing in the European Union. A world-wide study by the OECD reveals that in European Union countries between 7 and 25% of the population live in run-down neighbourhoods.

Challenges

The challenge is to **recover run-down neighbourhoods** and see **how existing neighbourhoods can be continually** improved to prevent the number of run-down

neighbourhoods from increasing. Efforts must centre on the character of each neighbourhood, on the type of services, amenities and housing needed and the type of transport required to connect to city centres. It must also be determined what changes are needed for the quality of life in each neighbourhood to improve as the built environment – and often also the population – ages. But considerations of habitability and the quality of public spaces must share centre stage with considerations of how to minimise the ecological footprint of each area.

Co-operation structures

The implementation of **co-operation structures** involving public and private sector bodies, associations and voluntary or not-for-profit organisations is one key factor in managing run-down neighbourhoods. Another is strong leadership: this role must be taken sometimes by the municipal authorities, though it may be the fabric of local society itself that takes the initiative in a bottom-up process.

Plan of action

The objective is to draw up a **plan of action that is realistic and involves the public:** one that has the support of all members of the co-operation structure, is suited to the particular needs of the area in question and can establish a balance between economic, social, material and environmental goals.

Projects for action can be based on strategies to replenish amenities, to improve the identity or the cultural/ educational standards of the neighbourhood, to improve public spaces and accessibility, to build affordable housing or to improve health, security and the image of the area.

Another aspect of **rehabilitation is the recovery for urban use of obsolete or disused industrial sites.** Changes in economic activities in areas formerly occupied by industry, transport infrastructures or military sites can free land strategically located close to city-centres and offer highly interesting opportunities to improve and reconstruct cities.

The recovery of these sites, in the context of improvement of the city as a whole, can come up against difficulties in terms of the economic expectations of the firms or public institutions that manage them, who may see such land on a strict owner-occupier basis. This attitude is lacking in solidarity when it is found in private bodies, but is quite incomprehensible in public institutions.

Criteria for the rehabilitation and recovery of urban areas

- Analyse the **history and characteristics of the land and buildings to be recovered** so that any contamination can be detected and factored into the plan of action for the project
- Start by remediating **land contaminated** by former industrial uses to permit its re-use as urban land.
- Encourage associations and set up a co-operation **structure involved** with the maximum possible involvement of the neighbourhood or town.
- Establish a consensus-based **strategic project** to provide a common vision of the future and a realistic plan of action combining measures to remedy environmental, social and economic problems.
- Use **participative activities** such as workshops and forums to involve people from the outset and keep them involved throughout the process.
- Provide **neighbourhoods with local services** that reduce the need for long journeys.
- Promote **local community development projects** in neighbourhoods with run-down economies and encourage the involvement of all sectors of society and economic players.
- Apply **bioclimatic urban planning and architecture** in the regeneration of the fabric of the neighbourhood, making use of environmental conditions to create comfort in interior and exterior spaces.
- Reinforce **the diversity of uses and people** involved in the projects ongoing (rehabilitation of residential buildings, clearing of empty lots, new activities, etc.).
- Ensure that local regeneration and improvement processes become a process of **individual and collective improvement** for the people in the neighbourhood.
- Set up a **sound process** monitoring system controlled by a team formed within the neighbourhood itself, including representatives from as may players as possible, to assess and check on progress towards the initial goals.

Such sites offer excellent opportunities for the reconstruction of run-down areas, and are ideally suited for mixed uses, for decongesting overcrowded areas, for building centrally-located social housing, for creating parks and green areas and for many other actions to enhance the quality of towns and cities.

There is a serious risk of contaminated land at recovered sites which must be analysed from the outset, and the principle of caution must be exercised. This problem has been under study in the Basque Country for some time, and there is an active policy of inventorying, investigating and recovering contaminated land on such sites. A Land Protection Act is being drawn up and is expected to be passed soon to provide a framework for dealing with the problem.

Case Studies

"Urban" Programme in Barakaldo

The first Urban community scheme was set up in 1994 to find ways of dealing with the economic, social and environmental problems that accumulate in run-down areas. Funded by the European Regional Development Fund (ERDF) and the European Social Fund (ESF), the Urban programme combines financial actions with actions to recover the fabric of urban areas in order to tackle economic decline and, through synergies, the deterioration of the urban environment. Its target areas include medium-sized towns and cities which were industrialised early and are in crisis following the collapse of their economic foundations. Barakaldo is such a town, and its Urban project was approved in 1996.

With around 100,000 inhabitants, Barakaldo stands on the left bank of the river estuary in the metropolitan area of Bilbao. Its recent history is closely linked to steel production, and it has undergone a far-reaching restructuring of its industry since the mid nineteen seventies, leading the city to slide into decline in all aspects. The loss of industry resulted in structural unemployment that at its height affected one third of the working-age population, and a 7.1% drop in population levels in the 1980's. The legacy of industry meant that the best land in Barakaldo – the level strip alongside the river estuary – was occupied by industrial buildings and its soil was heavily polluted. The town's residential neighbourhoods were concentrated on steep slopes, with unattractive buildings and a very high population density. What little public spaces existed were occupied by private cars.

The Urban Barakaldo project sought to rehabilitate the town centre and at the same time to decontaminate the disused industrial sites so that new, high-quality urban areas could be built there with connections to the town centre. It also involved improvements in the network of public spaces and pedestrian areas, in the refurbishment and construction of infrastructures for the economic recovery of the town and in the construction of a whole new designed neighbourhood in Galindo, on the decontaminated land beside the river Nervión, including parks, sports facilities and green areas.

Rehabilitation of the Old Town of Vitoria-Gasteiz

In the nineteen eighties the Medieval old quarter of Vitoria-Gasteiz was seriously run-down in urban and architectural terms. It was also losing residents and acquiring major pockets of marginalised people. The population had dropped by 40% in twenty years, and was characterised by advanced age and low income.

In the face of this urban and social decline, the city council drew up the Special Integrated Rehabilitation Plan (known by its Spanish initials PERI), centred on four main points:

- **Urbanisation**. Recovery of a number of spaces for public use by installing street furniture and rehabilitating buildings for community use.
- **Architecture**. Rehabilitation of residential buildings and restoration of the historical heritage, enabling the urban environment to recover.
- **Social Aspects.** IInvolving the population in the decisions made, in an attempt to ensure social consensus for the plan to go ahead.
- **Economy**. Implementation and rehabilitation of premises for community activities, to help maintain existing residents and attract new ones.

Almost all the urban and social recovery measures envisaged in the PERI were implemented, and the area has been transformed into a highly-valued part of the city: it is functional and is integrated into the life of the city as a whole, but has lost none of its historical character.

The involvement of local government authorities was a decisive factor in this process. Total investment in recovering historical heritage sites and residential buildings and in improving urban planning and infrastructures in the area was 78 million euros, most of which came from the public purse.

5

Joint Responsibility and Public Participation

5 Joint Responsibility and Public Participation

The Role of Civil Society in Sustainable Urban Planning

Complexity of cities

In seeking to achieve the most sustainable urban model, the **complexity of the process** must be acknowledged, as **must the intrinsically desirable nature of the decisions to be made** and the **extent of the changes needed in current behaviour in urban life and in relations with rural communities.** Decisions should not be imposed from above, but rather made with the involvement and participation of the citizens concerned. Problems must be resolved through open discussion so that public participation is assured.

Civil society & local authorities

Calls for local authorities to play a greater part in decision-making are perfectly compatible with a **stronger role also for civil society**. Local authorities have political and administrative power, and their proximity to the general public gives them a major role in incorporating the whole fabric of society into efforts to re-think urban and territorial planning models. **They provide the best way of promoting local democracy and direct public participation**. The principle of subsidiarity is fundamental in achieving sustainable urban development.

Relations based on co-operation

Action must include strong local **co-operation to determine the challenges, strategies and priorities involved, to allocate resources, to put plans into practice and to monitor and assess them.** Co-operation should be broad-based and effective, and should include economic and social groups, NGO's and residents' associations.

Local Agenda 21 schemes based on the methods developed by ICLEI, which place great emphasis on the participation of all areas of society at all stages of the process, are an excellent instrument for channelling participation in work to determine the urban model desired, provided that the proposals backed by the public are then actually included in urban planning regulations, which are the only document with regulatory force at this time.

This requirement of co-operation is fundamental, even though it is sometimes seen as an added difficulty in projects. Public participation assures that external factors of specific projects that affect different social groups and areas of sustainability are taken into account.

Innovation in local life

Urban planning actions based on sustainability are in themselves **innovations in local life**. Existing planning, management and public participation structures are desig-

ned to **bring about actions** in the city under a model that does not in principle take sustainability into account. There is therefore innovation not only in the type of action taken but also in the way in **which actions** are shaped and led by social groups and local authorities.

But a philosophy that calls for far-reaching changes will only have substantial effects if it can exert influence on the way in which cities work, i.e. on **collective decision-making processes** and on **management policies**. Sustainability must be seen as a local creative process that seeks equilibrium.

Basis for pro-sustainability dialogue

To provide a suitable political basis for dialogue in pursuit of sustainable development the **cohesion of civil society and the development of a associations must be encouraged**. Social capital must be cultivated, and it is the local authorities that must foster organisational abilities and schemes, and must help to harmonise such schemes.

It is important to include **players from as many areas of society a possible in the process**, especially those groups that are or feel themselves to be outside the mainstream of decision-making, such as young people, women, the unemployed, ethnic minorities, recent immigrant workers and the disabled. It is important not to allow the viewpoints of pressure groups that already have other means of making their voices heard to dominate the discussions. The complexity of today's society, with its constant movement of products and people, gives rise to cities whose citizens come from many different points of origin and are resident in them for differing periods of time. Multi-cultural societies can lead to exchange or to conflict. Establishing suitable communication channels will help bring about the former rather than the latter.

The process of participation is also one of **education** and access to knowledge of **processes**. This has added advantages once the plan has been implemented, in that it makes for consistent behaviour in the long term.

From reactive to proactive urban planning

With the ideas that arise from the wide range of players involved, it is easy to move from **reactive urban planning**, in the wake of initiatives by businesses and developers, to **proactive planning** based on a clear, constructive model that seeks to meet the expectations of the majority of the population. The cities and towns of the future must respond to and protect the diversity of their inhabitants and assure that they can all access services and activities to build the best possible urban life.

There is a wide range of techniques that can be used to survey the opinions, demands, needs and points of view of the players in urban life and to assure high levels of agreement and negotiation between them. The participation of large numbers of the people involved ensures that all problems and all approaches to solving them are taken into account.

Criteria for joint responsibility and public participation

- Open up schemes to as many **people and organisations** as possible to reflect the diversity and complexity of the society in which action is to take place.
- Set up an organised process with a number of **logical steps**, but sufficient **flexibility** to adapt to circumstances as it is developed.
- Analyse and select the most suitable **techniques and methods** for each part o the process.
- Provide for a **monitoring and assessment system** so that conclusions can be drawn as to the standard of participation throughout the project and strategies can be reinforced or adapted if results are weak.
- Encourage a **culture of public action** based on the concept of relational administration.
- Encourage the forming of **associations by providing funding** to enable them to act independently of official bodies in terms of making contributions and monitoring the social processes that affect them.
- Set up **observatories** with the involvement of different players in society to gather and analyse information.

Case Studies

Trinitat in-Nova in Barcelona

The remodelling of the neighbourhood of Trinitat Nova, in the upper part of Barcelona, is a fine example of a governance process in urban policies developed on the basis of initiatives by local residents.

Trinitat Nova is a 55-hectare neighbourhood of houses built by the public authorities, with around 12,000 residents. It was built hastily to take migrants who moved to Catalonia from elsewhere in Spain in the nineteen fifties drawn by jobs in industry. It comprises several different publicly-backed developments of low-end social housing at the bottom of Mount Collserola, with no proper urbanisation or prior planning. The extremely poor initial conditions have gradually been improved by the addition of amenities, the proper urbanisation of streets and the extending to the area of first a bus service and more recently the Metro underground railway. As Barcelona has grown, this has ceased to be an outlying neighbourhood and is now fairly close to the city centre, with good road and public transport links.

In the late nineteen nineties problems of porosity were detected in high-alumina cement used in around 1000 residences in the neighbourhood. The problem was so serious that a large part of the neighbourhood had to be demolished and rebuilt.

The residents' association already had a long record of campaigns to improve life in the neighbourhood. In 1997 a Community Plan was set up in which local residents were involved in establishing a diagnosis, a system of participation and lines of action in four initial areas: education, health, culture/ sports/leisure time and employment/ unemployment. Urban planning was brought within the Plan soon afterwards, when it was realised that the neighbourhood would have to undergo large-scale remodelling.

The Community Plan involved local residents and those in charge of technical and social services in the area in the process, and other technicians, university departments, etc. also co-operated. The idea was to avoid seeking confrontation as the only way of working with the authorities, and to advocate a more co-operative way of working with both local and regional authorities, including the presentation of proposals and alternatives by the public.

Residents, technicians and politicians met in the EASW Workshop for the Future and decided how they wanted the neighbourhood to look after remodelling. They determined that key points for the design of the new neighbourhood would be sustainability, participation, a close relationship with nature and the incorporation of water as a symbolic identifying element (the neighbourhood had long been known as the gateway through which Barcelona received its water). Public institutions have begun work with neighbourhood associations to create a sustainable neighbourhood in Trinitat Nova. The Community Plan seeks to introduce the highest possible level of environmental consistency in its final projects, without neglecting the goals of revitalising the area in social and economic terms and continuing the process of education linked to the transformation and improvement of the city and its people.

6

Integrated Urban Planning

6 Integrated Urban Planning

Sustainability and Planning Instruments

The change in logic entailed by the incorporation of environmental, economic and social sustainability in urban planning implies also the incorporation of clear objectives into the planning instruments used to structure land and municipal development. The change must permeate the whole philosophy and practical implementation of planning at all levels and all stages of development. This chapter looks at various types of plan and how they would be affected by the factoring in of environmental criteria. It also considers the need for new plans to take an integrated approach.

City and town councils draw up **general urban land use plans and subsidiary regulations** (identified here by their Spanish initials PGOU and NNSS respectively) to determine the use to which municipal land may be put, to classify and zone land, to structure and regulate infrastructure networks, public spaces, open spaces, services and amenities, rehabilitation policies and strategies for the economic revitalisation of their cities and towns.

Proposals approved by urban planners classify land and thus determine the areas of action for growth and rehabilitation of the built environment, and the areas that may be put to new urban uses.

Land classification, or "zoning", determines the land uses permitted in each area or PGOU sector, and is thus a determining factor in the creation of a diverse city with a broad mix of uses.

When earmarking land for amenities and services, planners may opt for models based on proximity and urban balance or for centralised models with large amenities remote from the catchment areas they serve.

When laying down basic networks of essential urban services they may opt for classical methods or for methods that seek to improve the urban metabolism in line with the philosophy expressed in this chapter.

If the establishing of a system of public spaces and green corridors and the recovery of areas of natural value within cities are not covered at PGOU level it will be much harder to deal with them at lower levels.

Mobility policies such as the creation of pedestrian pathways, public transport routes and a network of cycle paths must be studied at municipal planning level with the same attention to consistency as is brought to bear when discussing the road system.

Areas of special natural or landscape value must be given protected status and excluded from building developments to safeguard natural capital.

Proposed urban structures are defined in zoning regulations (comprising land structure, land use and general system regulations). The rate at which a city can grow is determined by its regulations governing land use, its location and the possibilities for urbanisation.

Additional documents such as catalogues of natural, architectural, historical and artistic heritage sites, classifications of industrial activities and guides to planning regulations and the natural characteristics of the area also have great potential for the inclusion of a thoroughly sustainability-based approach.

The incorporation of municipal environmental diagnoses with public participation, consistent with progress in the development of **Local Agenda 21** schemes, may be a useful way of factoring the environment into the planning process from the very beginning.

Partial plans are operational instruments intended to supplement PGOU's by authorising development for urban uses. They cover areas of land classed in the PGOU as "susceptible to development", and determine

systems for action, the estimated cost of implementing services and urbanisation work, undertakings in regard to completion dates, etc., guarantees of fulfilment of undertakings and regulations for the conservation of developments if they are not to be maintained by the public authorities.

Matters such as the location of buildings (an essential factor in constructing a city with effective passive climate control systems and a network of public and natural spaces suited to conviviality) are determined at this stage. Environmental concerns may or may not be taken into consideration when deciding what type of development is permitted.

Detailed studies are supplementary planning instruments that establish or adjust alignments and grade levels, thus filling any gaps in PGOU and NNSS proposals. They also propose structures in regard to volume. They may not change any uses envisaged in the PGOU, reduce road areas or open spaces or increase volumes.

If they are well designed, these instruments can help structure future construction work in a manner more consistent with a policy of comfort and habitability based on the efficient use of energy.

Special plans and Special Internal Reform Plans (known by their Spanish initials PERI) are instruments drawn up to regulate the rehabilitation or renovation of neighbourhoods with serious accumulated problems. They may cover areas such as the creation of amenities, the resolution of mobility and accessibility problems, the improvement of the urban environment, drainage, revitalisation, re-use and conservation of heritage sites and other similar purposes.

Urbanisation projects cover such matters as the permeability of the soil, the use of suitable materials in construction and urbanisation work and the establishing of measures to increase environmental comfort in public spaces (protection from sunlight, trees, sunlight in winter, etc.). They need to take careful account of the characteristics of each site, including environmental opportunities, and must include analyses of soil contamination, water levels, views and autochthonous plants.

Municipal ordinances cover building types, with certain regulations being common to all types, frameworks ad regulations for use, licences and orders for work and specific rules governing areas and systems.

Public participation must be emphasised at all the steps that must be taken to design a plan. Currently this is limited to the unconvincing level of displaying projects and holding the occasional explanatory talk.

A well-organised process of broad, open participation must be built into all four stages of any plan: **analysis/ diagnosis**, **preliminary information** on measures to attain objectives, **initial approval** and public display and provisional then final approval.

The integrated approach to sustainable urban planning

Sustainable development strategies applied to urban planning policies seek to bring about major changes in the way in which cities and towns are created and the way in which they work. The new urban planning must include environmental, social and economic factors as well as traditional planning areas. If other areas are factored in only *a posteriori* or tangentially, planning is robbed of its ability to provide an effective framework for the future of cities and towns in the medium term.

The fundamental contribution of documents such as the *Framework of Action for Sustainable Urban Development in the European Union* lies in their reflection on the need to see actions in the urban environment as integrated actions. This **principle of integration** is being taken on board by most authorities, but their own sectoral organisation systems are a hindrance, as has been shown in specific European programmes and **Local Agenda 21** schemes.

The integrated approach to urban planning

The integrated approach is inseparable from the idea of urban sustainability itself: sustainability can only be seen in overall terms. Approaches based on single disciplines or single areas of knowledge result in actions that are too sectoral, and this lies at the heart of the unsustainability of the current situation.

In the discourse of sustainability matters of quality of life and social cohesion open up new possibilities for ways of using and distributing financial resources and for seeing quality of life in broader terms than mere economic growth, especially if we are moving towards a discourse in which the goals of wealth and greater well-being are not based solely on improvements in macroeconomic variables but on achieving a greater capability for well-being with less resources expenditure, and ensuring that well-being is shared by everyone.

But as the concept of sustainability has developed, there has been much more specific reflection stressing

such aspects as what type of mobility we should strive for, what type of management of the urban metabolism we should encourage and how planning instruments can be used to improve the economic and social prospects of the least favoured groups in society.

The challenge is to draw up an in-depth analysis for each specific territory, so that instruments for action such as territorial planning, urban planning, the drawing up of ordinances, urban design, housing policy and policies for the rehabilitation of historical buildings can be used to achieve the goals of sustainable urban development via a fully integrated approach.

Action based on sustainability must bring **together specific measures with the overall strategy for the city, its strategic plans and the strategies of the territory and region to which it belongs.**

Planning must propose a way of organising the city – in the case of large cities – that enables the whole to be a sum of integrated units or neighbourhoods that are well communicated and have high levels of self-sufficiency in services.

Municipal ordinances and regulations must foster, or at least facilitate, sustainable building and construction in neighbourhoods and constructions with high levels of social and environmental efficiency. The example set by the solar power ordinance in Barcelona could well be extended to other energy aspects and indeed to savings in other resources essential to the working of towns and cities.

Sustainability forces us to think in terms of the costs and benefits of each action, not just for the city itself but for its hinterland. It forces us to analyse both the short- and long-term effects of the measures proposed. It is essential to consider the matter of **irreversibility**. Setting out goals clearly and specifically helps to assess progress towards attaining them.

There is no tradition of **assessment of the effects of urban planning:** this is an aspect that needs to be incorporated into the rules governing plans and regulations just as it is in any other planning process, so that it can be learned whether goals are being attained. This also provides feedback for the process.

Criteria for an integrated approach to urban planning

- **Extend the fields** covered by planning to embrace land use regulations and infrastructure planning, in a broader vision of the urban model proposed.
- Develop **integrated territorial plans that envisage mixed land uses**, with limits on surface areas open to the expansion of residential, service, industrial and transportation use.
- Prioritise the **development of existing built-up areas and growth adjacent to areas already built-up over building on greenfield sites**.
- Support the **maintenance and improvement of towns and cities to reduce polarisation between regions**. Do this by combining economic and social policies with infrastructure and environmental quality policies.
- **Prevent the dispersal of suburban areas** and encourage quality actions based on reasonably compact city models.
- Support the **regeneration of urbanised areas** with medium density and compactness levels that are sufficient to provide efficient local services and public transport and allow local life to develop.
- Apply the **principle of caution** to the proposals in the plan, analysing active natural systems and preventing any action that might result in unnecessary risks or exacerbate existing risks.
- Establish a **system of mobility and accessibility** that emphasises **less pollutant modes** of transport as opposed to the over-use of private cars.
- Design a **network of public spaces** as a key structural element of the city, ensuring that they are convenient, continuous and suitable for use as spaces where people from all walks of life in the city can get together.
- Ensure **co-operation between cities and their outlying districts** or areas of influence.
- Factor urban **metabolism processes into urban planning** and information.
- Draw up and implement **economic, social and environmental assessment systems** applicable to the development processes envisaged in the plan, using instruments such as indicators or observatories, or other ways of ensuring continual monitoring over time.

Case studies

Girona City Plan

The City Plan of Girona (pop. 70,000) was first drawn up in 1992, when the city council perceived a need to tackle problems of chronic unemployment and lack of social cohesion in the sectors with least opportunity to obtain training and education. This means it was originally a project centred on social issues.

From the outset, the plan enlisted the co-operation of many organisations and associations from the rich social fabric of this major Catalonian city, from the university – an essential part of its social and cultural life – to not-for-profit organisations such as residents' associations and nature groups, plus institutions such as the District Council and the Civil Governor's Office, trade unions and employers' associations through the Economic and Social Council.

Action under the plan has become steadily more complex, moving away from training, employment and social integration policies to embrace a true remodelling of space in the city, of its green areas, of the links between its neighbourhoods and of its system of open spaces.

European aid was obtained for sectoral and territorial programmes. From 1994 onwards the city council brought all these projects together in a single *"City Plan"* which was a blend of strategic planning and a **Local Agenda 21** scheme, with five basic lines of action in the city:

- Moulding the city into a single territory.
- Modernising the economy.
- Safeguarding the environment and landscape.
- Achieving cohesion and social openness.
- Making education and culture the basis for progress in the city.

The projects drawn up in the city are fitted into this approach so all five lines of action are factored into each one of them. A permanent organisational structure has been established in the form of a Management Council and a General Council that bring together all the organisations involved in the process and provide support for institutions in implementing the city plan. There is also a Residents' Committee to support each line of work.

The results in terms of urban planning, heritage conservation and improvements in the urban environment can be summed up as follows:

- The city has been moulded into a single whole, and the centre has been joined to the outlying districts populated by immigrants via green corridors and the regeneration of natural areas such as the banks of the rivers Ter and Onyar. The degraded river banks have been turned into the back-bone of the new city, and maintaining them has provided employment for less favoured groups.
- The city centre has been revitalised on the basis of conservation policies and the refurbishment of historical heritage sites. Activities have been set up that increase its value as a tourist destination while maintaining its character as a habitable residential area.
- The network of public and green spaces has been recovered, with pedestrian pathways being prioritised.

Special mention must be made of how the various authorities and institutions have co-ordinated their efforts: this has enabled synergies to be found between projects and has maintained consistency in social, environmental, urban planning and economic goals. This was facilitated by the medium size of the city. The co-operation achieved with over 100 organisations and associations in the numerous projects is evidence of the city's ability to establish strategies and to work well with different sectors of society.

Conclusions

Change in logic

Changing the guidelines and the ways in which urban planning is carried out and incorporating sustainability criteria must result in urban spaces and towns in which improvements in well-being and quality of life of residents are compatible with environmental friendliness, a healthy local economy and a balanced social fabric.

This document seeks to encourage reflection on this necessary change, which must be taken on board by politicians, technicians, economic players and the general public, who are all jointly responsible for urban planning processes in our towns and cities. The ideas put forward in this document include:

Ideas for change

A Opting for a **reasonably compact city** where social life and public transport are feasible and excessive consumption of natural land is avoided by not allowing urbanisation to be too disperse.

B Achieving a **mix of uses and types**, and the **right diversity of people** in newly built and rehabilitated areas that can generate sufficient proximity and complexity to make urban life interesting without mortgaging it to traffic.

C Studying each **area** carefully so as to capitalise on its **potential** – the genius loci – (in terms of climate, views, landscape, sunlight, etc.) in order to attain good standards of comfort in the urban structure with the minimum energy expenditure and the minimum impact on the land.

D Respecting the initial **natural ecosystem** and protecting the areas of greatest environmental value, taking action to increase natural capital in areas where the impact of urbanisation is too great.

E Including an in-depth analysis of local **environmental conditions and of the workings of the urban metabolism** in planning information as a basis for making planning decision.

F Distributing **amenities and services evenly throughout** built-up areas and avoiding out-of-town developments so that a city of short distances is obtained.

G Proposing an **integrated mobility plan** to prioritise access via non motorised transport over excessive use of private cars, and public transport over individual transport on longer journeys.

H Setting up a **system of high quality public spaces** with good climate conditions to facilitate conviviality and urban life.

I Designing a **network of green spaces** containing elements on all scales to recover those natural areas that are engulfed by cities as they grow and link them to outlying parks and protected natural areas to prevent natural systems from becoming fragmented and isolated and to integrate nature into cities.

J Factoring the **improvement of all areas of the city into urban planning**, including less favoured neighbourhoods and abandoned or obsolete areas, which can provide opportunities to re-zone the city without consuming any new land.

K Providing the means for residents to become involved in **decision-making processes** at all stages of planning, thus attaining the political and social consensus required to implement medium- and long-term policies.

The right solution in each context

Sustainability must provide **solutions suited to the conditions of each place and situation.** There are no standard solutions applicable everywhere. The same combination of elements and actions cannot be expected to achieve the same results in different areas. Sustainability in no way implies uniformity or the renunciation of the individual identity of each city or area, where “identity” is understood as a collective construction element.

Complex, diverse, accessible cities

In short, the goals of planning must include the achieving of a **complex, diverse, accessible city** that provides multiple opportunities and facilitates contacts, with the least possible consumption of resources and emissions of waste.

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