

CHECK
TRY IT THIS WAY

SUSTAINABLE DEVELOPMENT AT THE LOCAL LEVEL

CKL

LIST

The European Council
of Town Planners' Guide
for Spatial Planners



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TRY IT THIS WAY

S U S T A I N A B L E D E V E L O P M E N T A T T H E L O C A L L E V E L



European Council of Town Planners

Liaison committee of the national institutes of town planners in the member countries of the European Union

Conseil Européen des Urbanistes

Comité de liaison entre les associations et les institutes nationaux d'urbanistes dans les pays membres de l'Union Européenne

Autonomous Province of Bolzano - South Tyrol

Provincial Agency for Environment
and Labour Protection



Department of Regional and Townplanning



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A practical guide for sustainable planning

The European Council of Town Planners aims to provide an overview of practical recommendations for planners on how to contribute to sustainable development in spatial planning in day-to-day practice.

This guide gives recommendations and tips on what can be done by planners, and how to do it. Although knowledge about sustainable development and support for sustainable development objectives are widespread, many planners experience problems in their daily work. Most planners seem to be convinced that sustainable planning is needed, but the gap between agreements and practical application is wide. Conventional routines easily dominate in organisations of many different disciplines.

The large availability of information, studies, projects and good practice guides was the starting point of the ECTP's working group. The demand of spatial planners for a practical tool was the motive to prepare a concise guide. Therefore it has been set up as a series of checklists, organised according to the various aspects of sustainability as well as according to the various steps in planning processes.

Sustainable development requires different approaches depending on who is involved, the stage of the planning process, and the planning or political context in a country - or even in a city. In some situations, there are more opportunities than in others for a different approach; an approach which is more informal and more experimental.

Scope of this guide

The range of sustainable development aspects, scales, spatial and functional areas is wide.

Sustainable development includes ecological, economic and social aspects. For the purpose of this guide, these aspects are considered as far as they influence, or can be influenced by, spatial planning.

This guide concentrates on planners' activities and interventions related to planning on the local scale, from single projects to general land-use planning. The subject is viewed from the local plan to the smaller scale of public space as well as to the bigger scale of settlement structure and surrounding region. The focus is both on new city expansions and existing urbanised areas that need reconstruction. More precisely, this guide reflects the range of general planning, land-use planning, city expansion, urban development, new extensions, new infrastructures, regeneration sites, renewal interventions, local initiatives and single projects.

Planners activities and interventions apply to all types of areas: residential areas, historic centres, inner cities, business centres, commercial areas, industrial areas, ports and harbours, tourist and leisure locations, green areas, urban parks, rural areas in the urban fringe and transport infrastructures and networks.

Furthermore, this guide focuses on actions which enhance qualities or quantities, or both. It deals with the protection of quality, the reduction or enhancement of quantity, the supply of quantity and quality, and the management of both. It addresses questions of how to achieve or stimulate:

- cleaner air, soil and water;
- reduction of waste production and the separation of waste;
- reduction of polluting economic activities, the use of resources and energy use;
- better possibilities for flora and fauna;
- the green economy and the supply of green energy;
- the use of public transport and a reduction of (car) mobility;
- the involvement of relevant actors and how to promote public participation.

Structure of this guide

Part 2, Aspects of Sustainable Development

The second part of this guide addresses different aspects of sustainable development in relation to spatial planning. These aspects are: water, air and noise, soil and land, nature and ecology, transport and accessibility, energy, waste, heritage and regeneration, risk and hazard, and social quality. For every aspect, the importance of the work of spatial planners is stressed, followed by general objectives for a sustainable approach.

6 Tips, recommendations and possible relevant planning principles are given for the sub-aspects. Each aspect of sustainable development finishes - where relevant - with some related additional ideas for the quality of public space.

Since integration is one of the main messages for a sustainable approach to planning, there is strong emphasis on the importance of considering interrelations. The aspects of sustainable development more or less reflect policy as well as administrative sectors. The planner should attempt to combine the different aspects into one integrative approach.

Part 3, Steps Towards Sustainable Development

The third part of this guide addresses different procedural steps in the work of spatial planners. These steps are policy preparation, plan design, plan approval, implementation, and monitoring. Planners are not always involved in all these stages of spatial development, though this might be desirable for achieving long-term consistency. The steps should be considered as interrelated.

At every step, next to the technical aspects, integration, participation, communication, and involvement are at stake. All aspects of the previous chapter should be taken into consideration during the different steps. Integration is the central focus, and the question is how to involve all relevant actors in order to build support and commitment towards a result that is offering progress towards sustainable development. support and commitment towards a result that is offering progress towards sustainable development.

		P r o c e s s (part 3)				
		Policy preparation	Plan design	Plan approval	Implementation	Monitoring
A	S	Water				
	t	Air and Noise				
	c	Soil and Land				
	e	Nature and Ecology				
	p	Transport and Accessibility				
	s	Energy				
	s	Waste				
	A	Heritage and Regeneration				
	(part 2)	Risk and Hazard				
	Social quality					

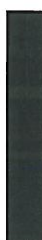
The parts 2 and 3 are complementary to each other. They reflect both sides of one coin.

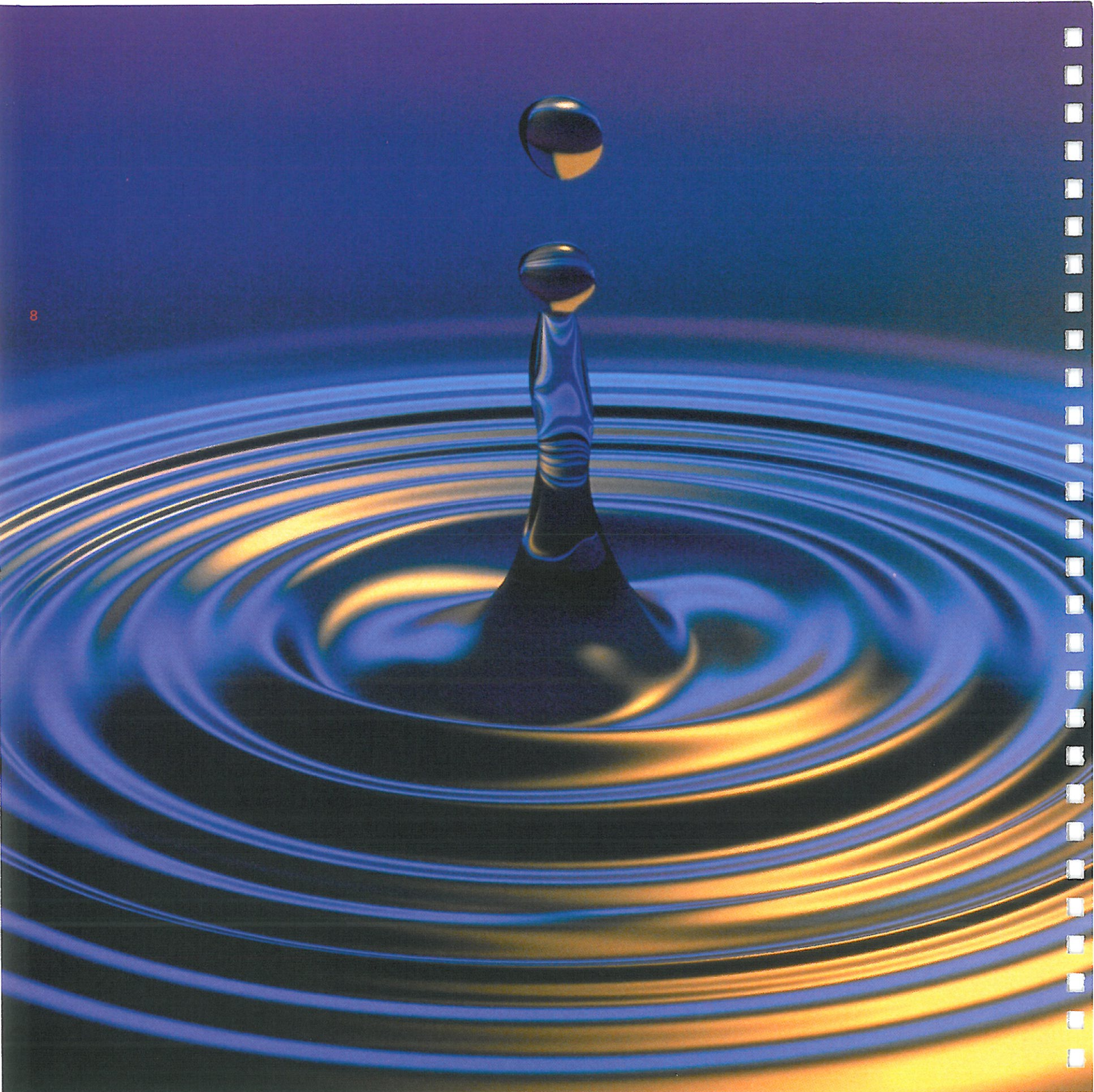
In each step of the process (the columns), all technical aspects should be considered in an integrative way. Every aspect (the lines) should be considered taking into account the different procedural stages of the process.

How to use this guide

The European Council of Town Planners is conscious of the responsibility of planners for a sustainable development. This guide aims to help the planner searching for tips and ideas. A planner might start from a sectoral problem: what should be done to prevent drying out of the soil? How can modal shift be encouraged? Alternatively, the planner might be contributing to policy preparation, or be asked to formulate requirements for a monitoring system. We advise against looking for solutions from one angle. If a problem is identified as a sectoral problem, the planner should also look at the stage of the process and consider those recommendations.

The guide does not claim to be complete. Different ideas from various experiences are collected for your consideration. Not all tips and recommendations can be applied in practice in one project. Instead, the recommended way to read and use this guide is to treat it as if the authors were saying: "Why not try it this way?" If sustainable planning is about integration, planners should acquaint themselves with basic knowledge of various sectors as well as basic skills of process management.





Water

The importance of hydrological systems for the environment is understood. Spatial developments disturbing those systems affect not only the quantities, but also the qualities of water. Spatial planning in a sustainable way requires a broad understanding of hydrological aspects: how to plan with water? Planners should aim at avoiding unnecessary reduction of water qualities, drying out of areas or reduction of water levels. In addition, natural watercourses should be respected as parts of the ecosystem. Clean water is scarce and should be fostered, never unnecessarily mixed with polluted waters.

Objectives

- *Uninterrupted systems of surface and underground water flows.*
- *Enhancement of good water quality and maintenance of water quantity everywhere.*
- *Natural infiltration in the largest possible areas.*
- *Surface waters as attractive elements in cities and landscapes.*

Water system

- Try to understand the comprehensive system of surface and underground water flows.
- Restore streams and rivers to their natural courses and character, carrying out any essential maintenance as unintrusively as possible.
- Do not cover natural watercourses within cities, and if they were covered in the past, try to open and naturalise them.
- Be aware of vulnerable or dangerous parts of the system in case of incidental large quantities of water.

Quantity of water

- Protect ground wells, ground water reserves and watercourses against drying out.
- Never reduce the size of riverbeds and avoid building in riverbeds. Keep safe distances from the banks.
- Contain number and size of golf courses depending on the availability of tertiary treated water.
- Use plants that do not need a lot of watering while landscaping and planting in arid climates.

Quality of water

- Protect ground wells, ground water reserves and watercourses against pollution.
- Protect the water quality in wetlands, rivers and streams.
- Provide special closed pavements, isolation and drain systems for locations where infiltration of polluting substances may occur, like petrol stations, industrial plants.
- Keep apart or separate waters of different quality while intervening in the water system.
- Use water availability as a planning tool to guide functions, types and sizes of development.
- Remember that the flow of the water should always take care of its qualities (from good to bad); functions should be planned accordingly: polluting activities downstream and clean functions upstream.

Infiltration and retention

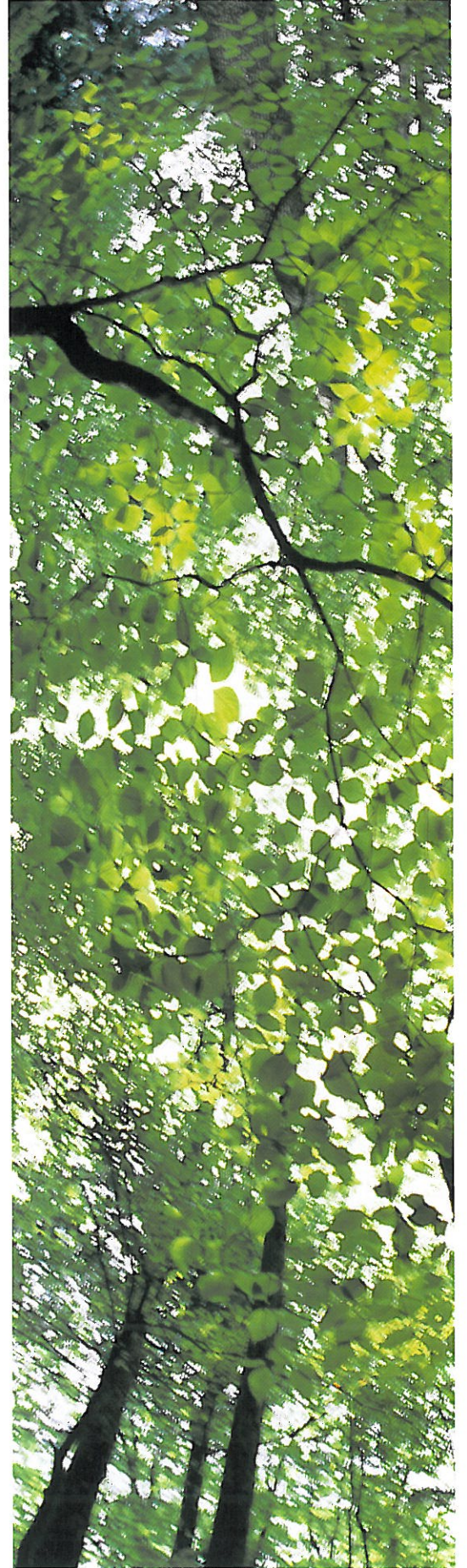
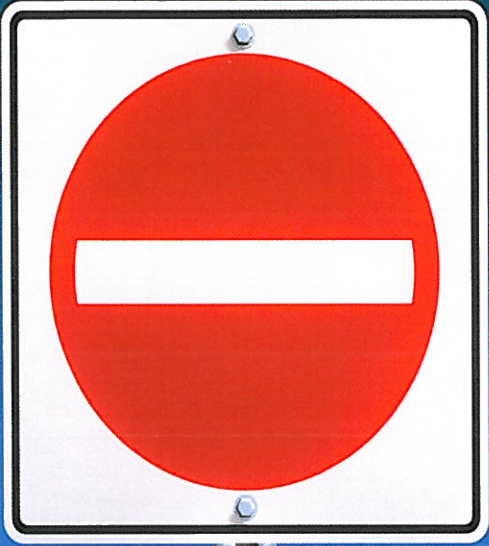
- Facilitate the infiltration of rainwater.
- Use urban and building design parameters to collect, store, recycle and re-use rain water.
- Reserve enough space for retention of surface water as well as artificial basins for infiltration.
- Promote management of rainwater by adopting grassed-roofs, absorbing wells, ponds and cisterns for the re-use of rainwater as non-potable water.
- Be economic with impermeable surfaces, so as to promote infiltration especially where ground water levels are falling.
- Secure as much as possible water permeability of the surface.
- Plan a great percentage filtrating ground of all non-built surfaces.
- Cover paths, pedestrian areas and streets with porous material.
- Take into consideration alternative techniques especially non-piped solutions for rainwater infiltration.
- Clean grey water locally, for instance with reed beds.
- Minimise culvertising (not the size of culverts).
- Encourage waterside vegetation and the use of reed beds to absorb pollutants and to regularise increased runoff.
- Promote the use of green roofs in rainy areas to absorb rainwater and re-establish the microclimate.

Water distribution and discharge

- Stimulate and facilitate differentiated systems of water distribution composed of the following separated networks:
 - drinking water network to distribute water into sinks, baths and showers;
 - rainwater network to send water to dishwashers and washing machines, for watering gardens, washing cars, etc;
 - grey water recycling network to send water to toilet flushing.
- Stimulate and facilitate differentiated systems of water discharge composed of the following separated networks:
 - grey water network coming from bathroom sinks, baths and showers to be sent to treatment plants;
 - wastewater network coming from other uses (e.g.: toilet flushing) to be sent to the sewer and to be cleaned before draining in the natural environment.

Spatial quality and water

- Use water elements for spatial coherence and variation while planning.
- Value water as an ornamental element in urban design.
- Use natural water elements to enhance spatial identity while locating new functions.
- Consider watercourses, their planted banks and the streams linking them as natural structural elements in the overall landscape.
- Develop sensitivity for adopting watercourses to new urban uses and developments.
- Refurbish and enhance the banks of ponds and basins for leisure and outdoor activities.



Air and Noise

The quality of air and the climate are important elements for human well being, and spatial developments influence both. Business areas, industrial parks and car mobility contribute to pollution. Spatial planning affects the local quality of air by locating polluting activities. Most air-polluting activities have large-scale effects. Even so, the spatial planner on the local scale should act responsibly and, on a small scale, act to contribute to a reduction of climate altering and CO₂ and NO_x pollution. Emissions are also a threat to human health.

Noise influences the quality of life. Spatial developments regarding new infrastructure (roads and railways), new industries and plants influence the places of noise pollution. Sensitive land uses are where people live, work, learn, recover or recreate. Spatial planners influence the situation of sound producing and noise sensitive functions.

Objectives

- *Clean air, minimised pollution.*
- *Non-disturbing sound levels, especially in zones with sensitive activities.*

Air quality

- Give priority to environmentally friendly means of transport and mobility such as cycling, walking, electric vehicles, etc.
- Plan in such a way that the need for private car traffic is reduced.
- Identify sources of, and adopt all feasible measures to reduce, air pollution.
- Promote the use of technologically innovative energy provision programmes such as low-emission heating systems, solar-powered water heating, thermal storage tanks.
- Plan green belts along main traffic roads to reduce emission levels.
- Increase the area of vegetation; it absorbs CO₂ and emits oxygen, reducing dust, lead and other particles from the air by up to 75 percent.
- Do not plan residential settlements close to potentially polluting activities.
- Locate sensitive functions upwind of potential pollution.
- Place potentially polluting activities in safe locations and provide green belts all around.

Sound level

- Identify sources and adopt all feasible measures reducing noise pollution.
- Promote actions for less traffic, slow traffic flows and traffic calming.
- Create quiet zones (parks, gardens, etc.) within the city.
- When considering planning applications for potential noise-polluting developments such as motorways, airports, disco's, open-air cinemas, apply strict noise level standards and monitor the situation after development.
- Make large use of tree planting and alignment as noise screening, especially in residential areas.
- Reduce penetration of noise by shaping the terrain (high rises), by planting green belts and trees, or by building noise barriers and screens.
- Promote the use of sound absorbent materials and the use of smooth surfaces to pave the streets in residential areas and near schools or hospitals.
- Enforce or subsidise noise insulation in existing buildings (double-glazing etc), which may be close to existing noise sources.
- Do not plan motorways, railways or airports close to existing residential sites; in case of such new locations provide all feasible measures to reduce noise pollution.
- Apply noise level standards for various areas and developments (residential areas, hospitals, and schools).
- Locate dwellings, playgrounds, kindergartens, hospitals, etc. in less noise affected zones.
- Space buildings out from streets putting car parks or green belts in-between.
- Space buildings out from main streets according to their function and use (first shops, then offices and finally dwellings).
- Locate major parking areas along traffic arteries and avoid them on residential streets.

Spatial quality of public spaces

- Consider a differentiation in sound levels as a quality. When planning, locate quiet functions together and combine noisy functions.
- Take indirect sound generating effects into account, for example caused by traffic, people in bars, etc.
- Locate smelling activities away from public spaces.
- Reduce strong wind effects by planting trees and windscreens.



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Soil and Land

Sustainable planning considers land as a scarce asset that should be kept clean and unspoiled. Land is also a resource for development. Efficient use of land is promoted, giving priority to re-use old industrial land and brownfield developments. Urban sprawl and land-take should be limited; they decrease the size of rural areas and fragment the landscape.

Objectives

- *Clean soil, minimal contamination.*
- *Non disturbed geomorphological characteristics.*
- *Minimal land-take for urbanisation.*

Quality of soil

- Conserve land and soil of high fertility suitable for agriculture and forestry.
- Conserve mineral sites where resources are limited and reduce cumulative impact on countryside from extensive mining and quarrying.
- Make sure that filtrating soil represents a great percentage of the non-built surfaces.
- Provide geological studies for every site to avoid planning on potentially dangerous spots.
- Identify seismic areas, areas prone to floods, to earthquakes, to landslides, to avalanches, to eruptions and areas with unstable soil and develop specific development policies by limiting, prohibiting and controlling the development.
- Be economic with the use of imported soil (e.g. building sand).
- Avoid or reduce to the maximum soil excavation and any earth-moving activities.
- Avoid unnecessary mono-functional zoning.

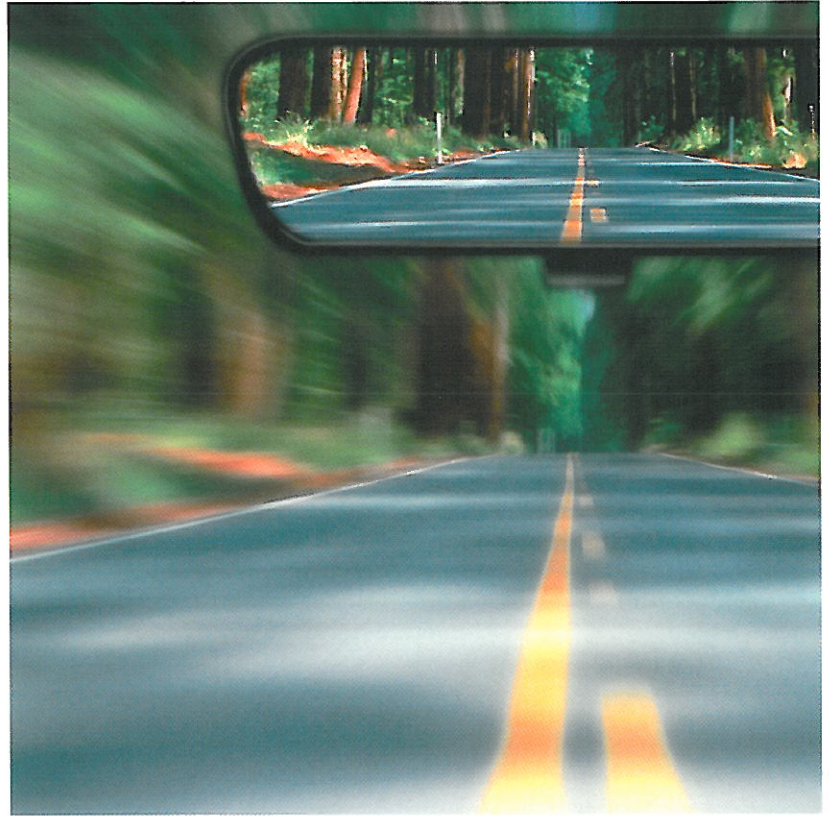
Land-take and land-use

- Promote an efficient use of space for urban purposes.
- Define and agree the maximum expansion limit of a settlement for the period of a number of years.
- Define and agree the density of a planned area, taking into account the carrying capacity of the environment and the scarcity of land.
- Rationalise the use of areas within the city by using high-density patterns both of population and activities.
- Rebuild and renovate existing buildings and urban structures.

- Reuse and revitalise derelict, contaminated and under-used land, thus reducing pressures on development of greenfield sites (outskirts of cities).
- Adopt the principle of 'recycling land' when designating sites for development (de-industrialised vacant areas, former military sites, derelict land, etc.).

Spatial quality of public spaces

- Define and agree "high dynamic" and "low dynamic" areas and actions.
- Develop a green structure and maintain and enhance green belts, provide links between the urban area and the surrounding countryside.
- Identify all natural and manufactured features that might possibly be reintegrated.
- Maintain where possible the original features of the land shape.
- Plan basins to guarantee infiltration.
- Restore and enrich soil and sub-soil by greening un-built up areas.
- Ensure that paving is permeable.
- Ensure permeability to air and water in as much as possible of the planning area.
- Place firm emphasis on qualitative standards to achieve the highest quality of the planned environment.
- In case of earth-moving activities, provide a soil management programme concentrated on:
 - minimisation of excavations from the initial stages;
 - co-ordination and direction of earth-moving activities;
 - obligation to transfer excavated soil to planned and indicated places.



Nature and Ecology

The presence and quality of natural features is essential for environmental conditions and aesthetic values. Areas with specific natural qualities or essential parts of ecological main structures should be protected from spatial developments. Urban development should be guided by protected areas. Feedback mechanisms and other ways of safeguarding and improving ecological quality have to be built into the urbanisation procedures from the very beginning. Spatial planning can maintain or increase the number and size of green spaces and stimulate bio-diversity.

Objectives

- *Complete eco-systems with uninterrupted flows and closed cycles.*
- *Ecological cohesion, large valuable areas connected by corridors.*
- *Maximal bio-diversity.*
- *Nature and ecology as basic component of any sustainable spatial development, action plan and urban design.*

Be aware of the fact that urban development cannot be always stopped by protected areas, but that feedback mechanisms, safeguarding and improving ecological quality, have to be built into the urbanisation process from its very beginning.

Ecological system

- Analyse existing ecosystems.
- Provide ecological connections and natural passages between the urban area and its rural (including agricultural) outskirts so as in the urban area to allow small animals and birds to settle in the town; avoid barriers.

Natural areas and natural values

- Analyse existing areas with high natural values in the urban and rural neighbourhood areas and analyse the existing landscape by:
 - identifying natural features of the site, particularly green species, watercourses and geological formations;
 - specifying native trees and shrubs, hedges, streams and terrain features of the site and any wildlife habitats which could be preserved;
 - analyse which values to maintain and to improve in the future.

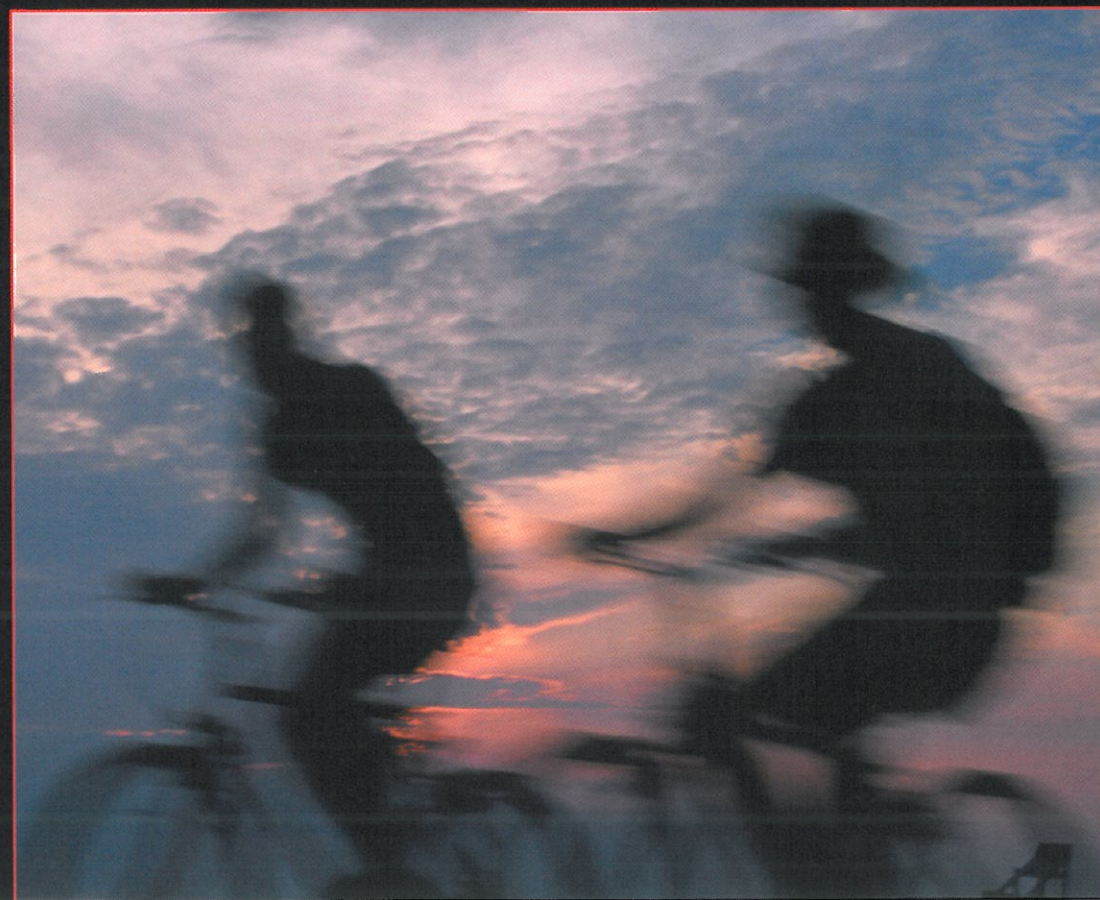
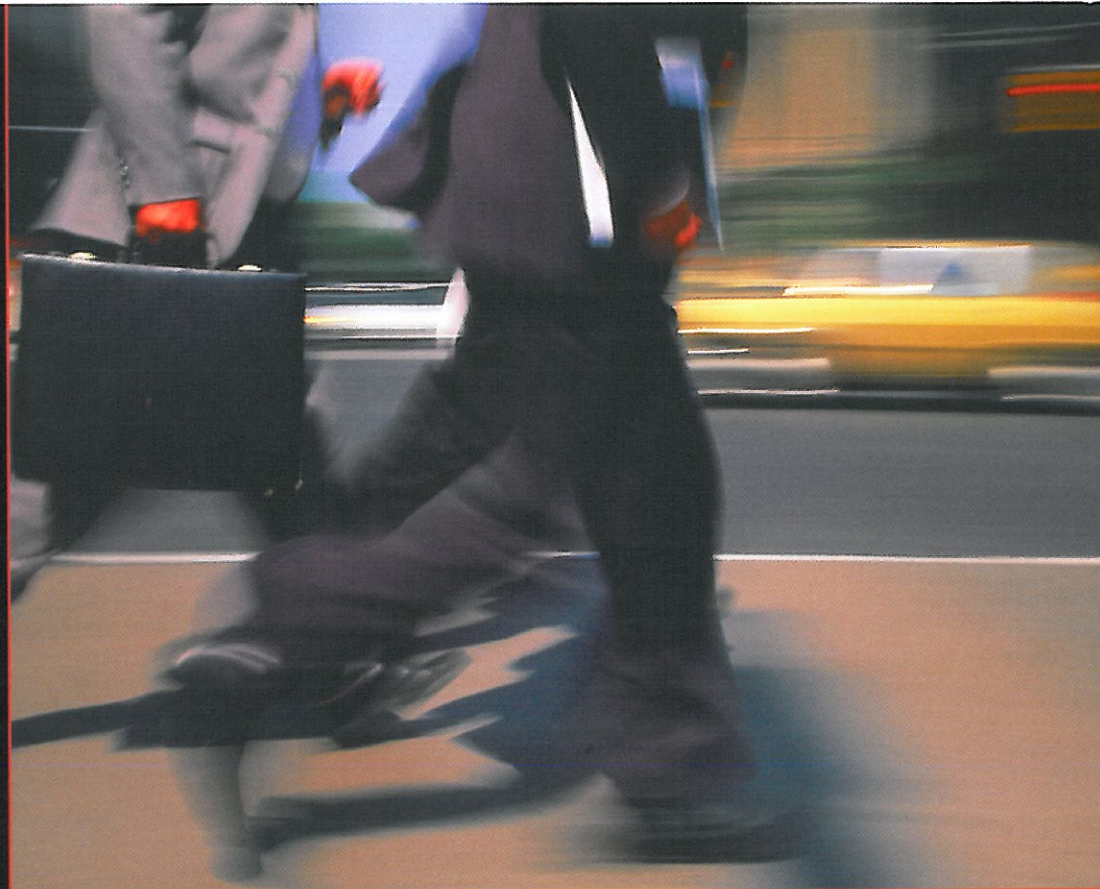
- Protect areas with natural and ecological values for urban development and urban influences.
- Develop a green framework to provide links between the urban area and the surrounding countryside.
- Identify and use nature, ecological potential and landscape to create an attractive and varied living environment by incorporating or re-integrating valuable elements into the initial layout of the plan or design process.
- Provide, and if necessary prescribe, a high percentage of green (gardens, flower-beds, parks, etc.) in planning areas.
- Provide inner courtyards with green.
- Compensate for removed trees.

Bio-diversity

- Maintain the topography, the hydrography, the trees and other vegetation which all influence the bio-diversity and the micro climate.
- Create non-accessible or partly accessible (natural) parks (green areas) and lakes and moors (blue areas) to obtain natural biotopes.
- Differentiate green areas in different parts of the city according to the use made by population.

Spatial quality of public spaces

- Differentiate accessibility within natural areas, which implies concentrating paths and recreation.
- Favour indigenous arboreal species.
- Provide basins for rainwater with low banks for a better accessibility of animals and to allow plants to grow.
- Provide space for new trees to grow, considering the space of roots to develop underground.
- Provide connections from the city outwards (for people to reach easily the countryside and enjoy nature, for instance).
- Encourage the use of green roofs.



Transport and Accessibility

Mobility is essential. Spatial development generates mobility and at the same time spatial developments are generated by the presence of infrastructure. Many cities face the problems of the huge growth of private car mobility. The functioning of cities is jeopardised by traffic congestion (decreasing air quality and raising noise levels). Private cars also take up too much scarce space. Rural areas face the problems of poor accessibility with public transport. Spatial development affects the number and length of trips. Spatial planners influence transport and accessibility when selecting sites and locating functions. Many measures need to be taken at regional or national level, but the consequences of the excessive car mobility are felt in urban areas at local level.

Objectives

- *Modal shift from private car use towards public transport and slow modes.*
- *No unnecessary or undesired mobility.*
- *Good accessibility and freedom to move.*

Traffic and transport system

- Analyse the traffic and transport system (roads, rail and stations).
- Plan compact rather than dispersed settlement patterns to minimise trip lengths and encourage public transport. Provide all basic facilities within walking distances.
- Avoid locating functions which generate car traffic outside the city e.g. peripheral supermarkets.
- Avoid locating new expansions in the outskirts if this means creating new traffic lanes.
- Create lanes for public transport only.
- Create or enlarge pedestrian areas and create cycling and pedestrian routes which are safe, attractive and have continuity. Separate lanes for cyclists are welcome.
- Design, implement and encourage cycle routes/facilities and pedestrian paths to make the settlement and parts of the rural area accessible.
- Provide good accessibility; avoid barriers.

Place of origin and destination

- Mix compatible land uses to minimise trip lengths.
- Create residential areas taking into account walking distances of each dwelling from bus stops or other public transport facilities.
- Connect high activity nodes, public spaces, sport centres and residential areas with direct cycling and pedestrian routes, as well as with public transport.
- Consider the choice between diffuse car traffic and concentration.
- Cluster facilities in local and district centres to encourage public transport.
- Make high dynamic zones accessible for public transport.
- Promote the use of access restriction on heavy goods vehicles and city distribution centres with small delivery vans.
- Support political and technical initiatives to stimulate the change from private car use to collective transport modes.
- Reduce the width of the carriageway and the number of car lanes where applicable.
- When planning new locations, make sure that means of public transports will be available at the beginning of the construction.
- Use local parking policy as a tool to influence the choice for public transport. This means avoid free parking where space is scarce.

Parking

- Use telematics for a better transport investigation.
- Do not export parking pressure to neighbouring areas, provide for underground garages directly connected with the buildings.
- Combine high dynamic zones with the urban mass public transport.
- Cluster facilities in local and district centres to encourage public transport.
- Locate major trip generating developments and functions (e.g. big industries) near public transport facilities.
- Provide adequate spaces for cycle parking, make them visible and make direct and safe access to dwelling units and/or places of work.
- Provide (prescribe them if necessary) an adequate number of private parking spaces in relation to the number of residents.
- Provide in each area (prescribe them if necessary) an adequate number of public parking spaces in relation to the number of workers, visitors and facilities of public transport.

- Facilitate Park & Ride places and promote the use of Park & Ride facilities.
- Facilitate specific parking places for car-pooling and promote car-pooling.

Traffic calming

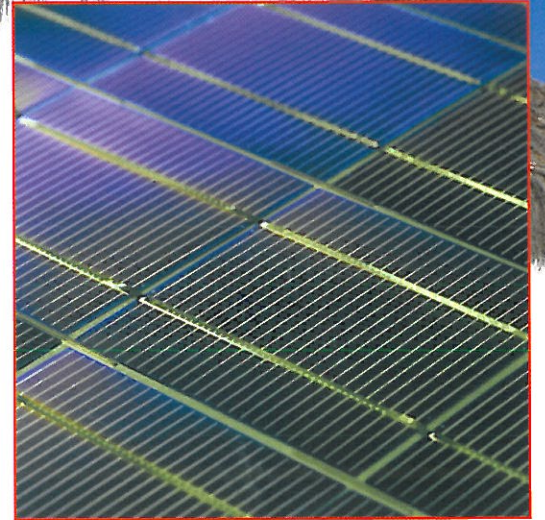
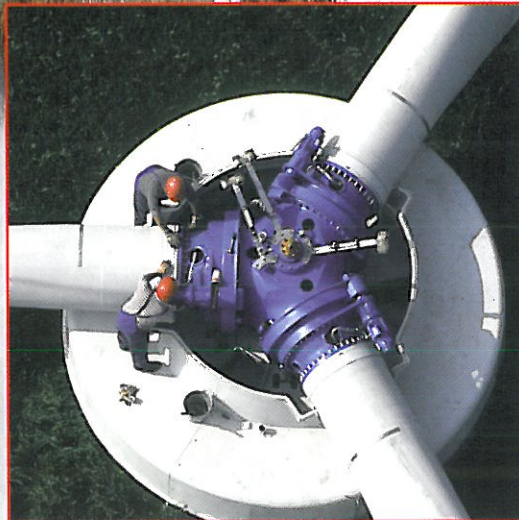
- Design local roads that minimise the impact of car use. Apply integrated traffic calming where appropriate.
- Consider possibilities of enforcing speed limits on residential roads by particular road design.
- Create new low speed zones (max. 30 km/h) where appropriate (near schools, hospitals, recreational grounds, etc.).
- Enlarge the 30 km/h zones.
- Use (mobile) barriers, which prevent cars but allow public transport to enter car-free city centres.
- Create or enlarge pedestrian areas.

Spatial quality of public space

- Adapt the roads to their environment, not vice versa.
- Plan car-free inner courtyards.
- Plan continuous pathways; provide them with good lighting.
- Plan direct, easy connections both for pedestrians and for bikers and skaters connecting residential areas to schools and playgrounds and avoid any unsafe road crossing.
- Plan underground parking spaces if possible (in city centres, under squares etc).
- Make railway-stations attractive as entrance or gate to the city.
- Make transfer-nodes attractive and safe.
- Separate parking and traffic spaces within residential areas clearly from bikes and pedestrian routes.
- Plan cycle and pedestrian routes in the sunlight; parking spaces can be in shade.



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Energy

Current use of energy leads to depletion of resources, pollution and climate change. Energy is largely wasted due to inefficient production techniques and heat losses during transport and distribution. The use of energy is increasing. Spatial planners influence the use of energy, when siting, zoning and mixing land uses. Planners also influence energy use on the scale of dwellings as result of sun-orientation, scope for application of solar cells, microclimatic conditions. In addition, the distances between power plants and the places of energy consumption, the space for wind-farming or solar plants are determined in spatial planning.

Objectives

- *Minimal energy demand.*
- *Minimal energy losses.*
- *Non-renewable energy sources replaced by renewable ones (solar, wind, water).*
- *Recovery of industrial waste heat and production of energy from waste.*

Energy demands

- Incorporate existing energy policies in local and action plans.
- Be aware of technical innovations aiming at the reduction of energy use and new applications.
- Aim at an energy-efficient built environment in harmony with the natural environment. (For instance, in cold climates, choose glass on the building face exposed to the sun and brick on the windy side.)
- Design and apply standards for building orientation, lighting (requirements which are necessary for specific purposes), building materials, insulation, green as shelter for the sun.
- Consider orienting new buildings in such a way as to exploit good heat and light insulation.
- Minimise facades prone to cooling and wind chill.
- In mountainous regions, avoid locating new expansion sites within areas of prolonged winter shadow.
- Promote the application of good dwelling and office design as well as good heating and ventilation devices for sun-oriented buildings.
- Plan inner courtyards wide enough to ensure good natural lighting and good heat insulation to all the units.

- Provide earth shelterbelts to improve energy conservation and use the building shape to minimise wind tunnelling and eddying.
- Design green curtains (climbing plants) to cover the south facades providing protection from the summer sun in southern Europe. Choose climbing plants that are bare of leaves in winter thus letting the sun-rays in.
- Limit overshadowing by adjoining buildings and trees, but (preferably) do not sacrifice existing trees to this end.
- Promote the installation of light level sensors (especially in public places) to switch on/off the light at the right time and movement sensitive lights.

Energy production

- Consider sustainable and technologically innovative energy provision programmes (solar, wind and water) and measures and try to identify the impact on planners activities.
- Consider the possibilities of neighbourhood or short-distance heating grids.
- Generate residential district heating from wood-waste and chips where this fuel is on disposal.
- Make use of waste energy (e.g. cooling water of production cycles) to heat units.
- Use water for the production of hydroelectric power wherever feasible.
- Use geothermal waters or steams for heating.
- Consider the possibility of implementing combined heat and power (CHP) schemes for high-density developments. Use wood-waste and chips or have co-generation plants based on natural gas to fuel CHP stations.
- Look for alternative sources of energy locally.
- Make wide use of solar energy roofs in private and public buildings where feasible.
- Integrate solar heat energy systems with building design:
 - adopt simple passive solar design solutions in the first instance;
 - consider active solar and alternative energy systems.
- Encourage the development of wind farms for wind generation wherever possible.
- Install sound abatement screens with solar energy elements.
- Apply energy storing possibilities e.g. in road asphalt and foundations.

Improvement of microclimate

- Preserve existing features which enhance the microclimate.
- Provide green areas to improve the microclimate.
- Build wintergardens.



Waste

The volume of waste is a big problem, although many European cities master this problem partly by recycling and separating waste at source. Liquid waste from households, hospitals and businesses results in eutrophy in lakes and rivers. The sewage network cannot solve this problem. Incineration contributes to the greenhouse effect and releases toxic substances such as dioxins into the air. Spatial developments of residential areas, industries, hospitals and so on will have impact on the volume of waste produced and the place of waste production. Spatial planners influence the location of these functions, dumping sites, waste incinerators and at a lower level the location of containers and bins in the neighbourhoods.

Objectives

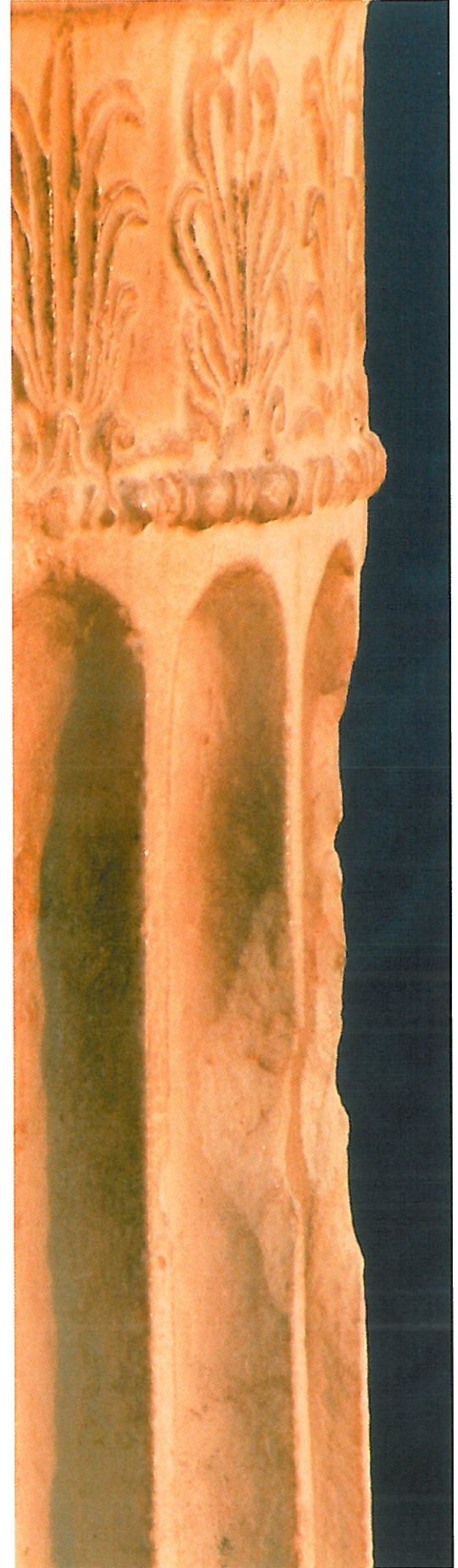
- *Minimal volume of waste generated.*
- *Re-used and recycled waste.*
- *Reduce the risks for the environment and the human health.*

Volume of waste

- Promote the use of natural and ecological building materials .
- Promote the use of materials from certified renewable sources.
- Favour local building materials over imported (wood, stone, etc.).
- Explore the possibilities of taxes on landfill treatment of solid waste.

Re-use and recycling

- Identify areas where recycled material can be used (e.g. stone, builders' rubble as hardcore in paths or building foundations).
- Consider possibilities to recover energy from biogas.
- Generate district heating from industrial or wood waste.
- Promote local composting of household and garden waste.
- Regard composting as an important component of the waste management system.
- Make provision for composting and recycling for each site.
- Integrate in the plan design proper locations for waste and recycling bins and connect them with the main planned functions.
- Places for recycling and waste collection should be accessible, attractive and safe.
- Design areas for collecting, separating and recycling of waste to promote a positive image of 'ecological islands'.



Heritage and Regeneration

Urban development is a continuous process of transformation from the past to the future. Cultural heritage embodying the beliefs and values of inhabitants, focuses on the maintaining of artefacts, structures and patterns. Urban regeneration regards the rehabilitation of existing structures, redevelopment of existing buildings and sites, or the re-use of urban land; it often concerns derelict or contaminated land. Spatial development offers opportunities for - as well as threats to - cultural heritage. Both cultural heritage and urban regeneration are at the heart of planners' activity.

Objectives

- *Renovation and re-use of existing buildings and urban structures.*
- *Integration of existing elements into urban fabric.*
- *Historic elements and structures fostered as part of cultural heritage.*

Historic patterns

- Consider characteristic existing patterns and structures as essential components of local heritage and cultural identity.
- Restore landscape patterns such as old roads, paths, water flows and areas of ecological value in urban regeneration plans.
- Create a relation between new expansion and existing urban structures, thus fostering continuity.

Existing elements

- Collect information and study specific architecture, urban traditional local features, archaeological and cultural historic elements (old buildings, mills) in urban and rural neighbourhood areas.
- Take care of existing historical elements when planning new functions and try to maintain old buildings.
- Integrate existing monuments and important trees in the plans.
- Promote the use of ecological principles in relation to water, waste and energy when redesigning old buildings for new uses.
- Prolong the life of structures by multi-functional and flexible design.

Spatial quality of public spaces

- Consider historic remnants as an essential element for urban design.
- Apply urban design guidelines considering issues such as street and plot layouts, mix of land-uses, landmarks and skylines, open spaces and images and associations or shared memories (history) of the place.
- Consider, if possible, local social and cultural traditions when planning the transformation of a site.
- Maintain or re-use existing pavements (stones, cubes, slabs, etc.) especially to pave squares and pedestrian streets.
- Plan ponds within built up areas; they constitute a mirror surface to reflect architectural structures surrounding and spanning them.



Risk and Hazard

Nature as well as industry and transportation can create potential risks for people. New residential areas should be planned considering possible future developments of industries; they should not increase the risks of nature and should not suffer from the threats of nature, industries and transportation. New industrial activities and infrastructure should not pollute existing residential areas. Spatial planners should create (physical and social) safe settlements, analyse risks and regulate developments.

Objectives

- *Minimal potential risks and dangers.*
- *Safe environments.*

Awareness of risks

- Map all potential dangers of the site (limitations).
- Adopt a site appraisal, which may reveal possibilities and limits of a site to be developed or reconstructed.
- Integrate risk evaluation and assessment into the planning process.
- Provide a geological study for potential dangerous sites before planning.
- Identify seismic areas, areas prone to floods, to earthquakes, to landslides, to avalanches, to eruptions and areas with unstable soil and develop specific development policies by limiting, prohibiting and controlling development.
- Identify areas with high fire risks, and apply specific and appropriate planning policies.

Safety

- Do not plan residential areas in riverbeds or flood prone zones.
- Do not plan residential areas close to main streets, rails, airports, pipelines and canals that are used for the transportation of chemicals.
- Do not plan residential areas close to dangerous activities (chemical industries, fuel tanks, firework laboratories, magazines of explosives, etc.).
- Locate dangerous activities outside cities.
- Move existing dangerous activities outwards (chemical industries, fuel tanks, firework laboratories, magazines of explosives, etc.).
- Make buildings easily accessible for firefighting or connected to hydrants.
- Ensure that water in playgrounds is not deep.
- Provide pathways with good lighting for security.
- Avoid underground passages and tunnels for crossing roads.



Social quality

Social exclusion affects groups that are marginalised either socially, economically, physically and culturally. Spatial problems such as decay, deterioration and pollution contribute to social exclusion. All problems should be addressed in a co-ordinated way. By solving spatial problems and influencing spatial developments planners can contribute to the well being of the population.

Objectives

- *Healthy, secure and attractive environments, where people like to live and stay.*
- *Social cohesion and responsibility.*
- *Easy access for all to services.*

Health and security

- Stimulate a good microclimate and a healthy and pleasant environment.
- Stimulate the feeling of safety and stimulate a human atmosphere.

Social equity and cohesion

- Stimulate access to social, cultural and health services, public transport, retail and recreation.
- Locate residential zones nearby services, facilities and transport networks. All basic facilities should be provided within walking distances.
- Promote social mix in neighbourhoods; promote mixture of functions and of private and public services and facilities.
- Do not plan neighbourhoods for social housing in isolation.
- Stimulate the availability of housing facilities.
- Stimulate privacy of dwellings, choice and diversity.

Identity and orientation

- Consider beauty and harmony of forms and structures as an essential element in urban design.
- Consider typical elements and structure as identifiable elements which enhance both the historical continuity and the identity of place.
- Avoid too high heterogeneity of forms and structures, make it clear and simple.
- Create a neighbourhood concept in designing new residential areas, make use of historical and cultural elements to enforce local identity.

Quality of public space

- Consider quality of housing and accommodation as very important for the well being of the population.
- Strive for an overall high quality of the built environment as a legacy to present and succeeding generations.
- Plan residential areas with inner courtyards, which enhance the feeling of belonging and safety. Make them a public space or a playground and make them car-free.
- Plan safe playgrounds; make them accessible to all.
- Plan spaces where people can express themselves by means of minor arts (mural painting, graffiti, etc.).
- Furnish public gardens with wooden banks and tables but also with water basins and facilities for children's play.
- Avoid anonymous places and (parts of) public spaces where people can hide from the sight of others.
- Secure good visual connection to the street and the inner courtyards from each dwelling.
- Avoid very high residential buildings, which encourage isolation.
- Design dwellings taking into account the needs of the inhabitants (e.g. ground floor flats for older people or families with children).
- Consider that basement flats are provided with a tenant garden on one side to encourage gardening.
- Provide quiet spots within gardens or parks with gentle lapping waters.
- In areas with dominating winds, provide tree planting and alignment as wind screens.
- Provide alternation of shady and sunny spots.
- Plan cycle and pedestrian routes in sunlight; parking spaces are suitable for shade.



Policy preparation

At the outset of spatial development processes, agreements about objectives should be reached. The spatial planner is, on basis of experiences in different stages, well situated to contribute to spatial policies. The spatial planner may act as a mediator to reach agreements between various sectors showing various possibilities and impossibilities. Adequate communication with and involvement of relevant actors is crucial during the whole process of policy preparation. It is important to involve all relevant public and private actors as early as possible in the process so that they can deliver input and feel committed. Wide participation may well cause delays, but it works because policies are still general and understandable. Methods of communication (as early as possible) should be chosen carefully. Language and cultural differences are very important.

Local Agenda 21 can play a crucial role in the process of policy preparation. The differences between countries about the role of the Agenda are huge. Interaction with relevant actors (including citizens) should take place throughout the entire process of policy preparation. It is therefore interwoven in task appraisal and the preparation of policy. When the policy has been formulated, communication about it is essential.

Objectives

- *Consistency during the entire planning process.*
- *Agreements about objectives and the sustainable development ambitions.*
- *Integration, vertical (between policy levels) and horizontal (between sectors).*
- *Involvement and support by open communication during the different stages of the policy preparation process.*
- *Communication in a tailor-made way according to the different target groups and in understandable terms.*
- *Communication to all actors about the objectives of the policy and the values included in the term sustainable development and what it means specifically for their interests.*

Task Appraisal

- Relate the policy to plans and policies adopted by other local authorities, at national, regional or sectoral level for compliance with aspects of sustainable development.
- Identify potential inconsistencies between development policies and plans adopted earlier.
- (Re)formulate and (re)define the scope of the envisaged policy in relation to sustainable development.
- Define the limits of intervention and its possible effects (in time and space).
- Define possible available financial resources from different sectors and administrative levels.
- Formulate the process, prevailing policies, intended objectives and targets.
- Prioritise key objectives and targets.
- Fix the terms within which solutions must be found and improvements must be carried out.
- Ensure that adequate technical support for the whole planning process is provided.
- Ensure that sustainable development criteria are included in the policy so they can be secured in contracts with both public and private bodies.
- Ensure that assessment procedures of sustainable development in policy are applied very early in the process.
- Check that planning regulations or laws are consistent with sustainable development criteria; if not, preparation or application of some policies may be difficult, time-consuming or impossible to implement.
- Make or suggest the necessary amendments to the planning laws and regulations (if possible) to meet the objectives of sustainable development.
- Publish all information and steps regarding the planning process widely and precisely which means the right information to the right target group for instance in central places of cities (squares, pedestrian streets, public buildings, etc.), newspapers, TV, etc.
- Start a Local Agenda 21 process to raise awareness and overcome public indifference; this may result in the public demanding for more sustainable policies.

Preparation of policy

- Strive for the integration of sectoral policies and for an interdisciplinary approach; show different sectors how their interests may be affected.
- Formulate the tasks for all actors in terms of sustainable development and widen the scope taking into account all affected aspects.
- Discuss sectoral goals of and with each of the actors to identify consensus and conflicts.
- Organise or stimulate meetings between the actors to acquaint them with each other's interests and approaches; the effect is that actors, among them the approving bodies, are better informed and committed.
- Organise public meetings where interested citizens, targets groups and the initiators come together to discuss issues of common and of individual interests (which may be linked to Local Agenda 21 activities).
- Inform clearly and widely about roles (who has a role in decision-making), realistic expectations (interests may remain different), the time schedule (legal procedures must be observed), and budget restraints.
- Make inventories of opinions (including people's wishes), solutions of all actors; interrelate them and try to prioritise them.
- Make use of information collected in interviews and questionnaires. Be selective and use samples.
- Find agreement among actors based on their present and long-term interests.
- Expose possible conflicts between long-term benefits for society and short-term individual interests; this may open the way towards informal agreements, compromises or fiscal compensations and (long-term) modification of legal requirements.
- Bring forward good examples of sustainable development to allay scepticism.
- Identify potential effects of a policy on the environment, e.g. social and economic aspects, and identify measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects, or find main alternatives.
- Make use of an assessment, so that there is a systematic appraisal and comparison between various development policies.

Communication about the policy

- Inform people about the policy, bearing in mind :
 - Never speak to people about sustainable development but rather about the quality of the living or built environment. A scientifically accurate definition is less important than awareness of the importance of long-term effects on the eco-system and society;
 - Make it clear at all times that sustainable development seeks to establish a long-term stable balance between ecological, social and economic development;
 - Never speak to the lay public in terms of laws or technical regulations, but use clear and easy examples to show them what the result may be.
- Remember that the better the lay public is informed about the policy, the less likely it is that people will oppose it for invalid reasons.
- Show successful good examples.
- Make citizens' reactions also known to technicians and politicians.

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Plan design

Designing outlines of spatial developments belongs to the core of planners' activities. Sustainable development requires fitting in the wider environment, reusing existing systems and features and securing priorities to slow modes of transport, ecological values, human well being and safety. This should be achieved by integrating sectoral contributions, involving the public and other administrative levels and by building commitment of all involved.

Objectives

- *Continuity in the plan design of sustainable development objectives and ambitions derived from the stage of policy preparation.*
- *Transformation of sustainable development in specific proposals and functional solutions.*
- *Integration of interests of relevant actors with the public interest.*

Project & site appraisal

- Appraise the project and re-formulate the appointment to take sustainable development objectives into account. Ask for client confirmation.
- Make an inventory of accepted policies, trends, programmes and possible/feasible options.
- Analyse on maps existing systems, patterns and characteristic elements within the planning area and in the surrounding areas. Point out relations and barriers in the planning area and between the planning area and the surrounding areas.
- Fit the site and the programme to each other. Be critical about mismatches between site and function, report on them early and advise reconsideration of the site.
- Make a SWOT analysis (analysis of Strong and Weak aspects, Opportunities and Threats) of the area in relation to the programme.
- Discuss the results of appraisal of the site, programme and the SWOT analysis with all relevant parties, including citizens. This can be part of Local Agenda 21.
- Consider the possibility of a design competition.
- Aim to start with a pilot project, which provides a clear contribution and can immediately be translated into sectoral standards and procedures geared to the local situation.

Integrative design approach

- Be aware that every plan is different (and difficult), which means determining the best solution for those specific circumstances.
- Monitor required adjustments and improvements during the stage of plan design.
- Design from global and abstract into detailed and concrete options.
- Start by analysing and drawing the main transport network (road, rail) and the water and ecological network of the area surrounding the project area. The transport network has a guiding effect on highly dynamic functions, and the water and ecological network has a guiding effect on low dynamic functions.
- Designate land uses, putting emphasis on coherence within the planning area but also with the surroundings (regional level or city, depending on size and site of planning area).
- Develop different models of desirable main transport and water networks.
- Integrate linear networks, nodal and zonal systems on maps in the models.
- Structure (nodal) elements dedicating areas to all programmed functions (mixed and/or zoned) in connection to the different models.
- Work with some (3-5) alternative integrated models in which different sectoral solutions are combined and proposed on basis of a sustainable development SWOT analysis. Analyse relative advantages and disadvantages of the models and open this for discussion (if possible, linked to Local Agenda 21).
- Show how sectoral aims can be achieved in a sustainable integrated solution.
- Sketch graphic concepts, combining qualities and mitigating disadvantages.
- Develop ideas, sketches, drawings, references for different areas and characteristic details.
- Carry out design studies for various locations in order to facilitate the choice of location on these alternatives.
- Provide also a series of alternative design for just one location in order to obtain a more objective picture of the possibilities and capacities.
- Differentiate densities of dwellings in areas: high densities around railway stations and in city centres and low densities in areas which are ecological valuable.
- Differentiate (potential) spatial characteristics and qualities.
- Incorporate in the layout design the retention of existing features and their visual setting, the visual and physical relationship of

the site to town and landscape.

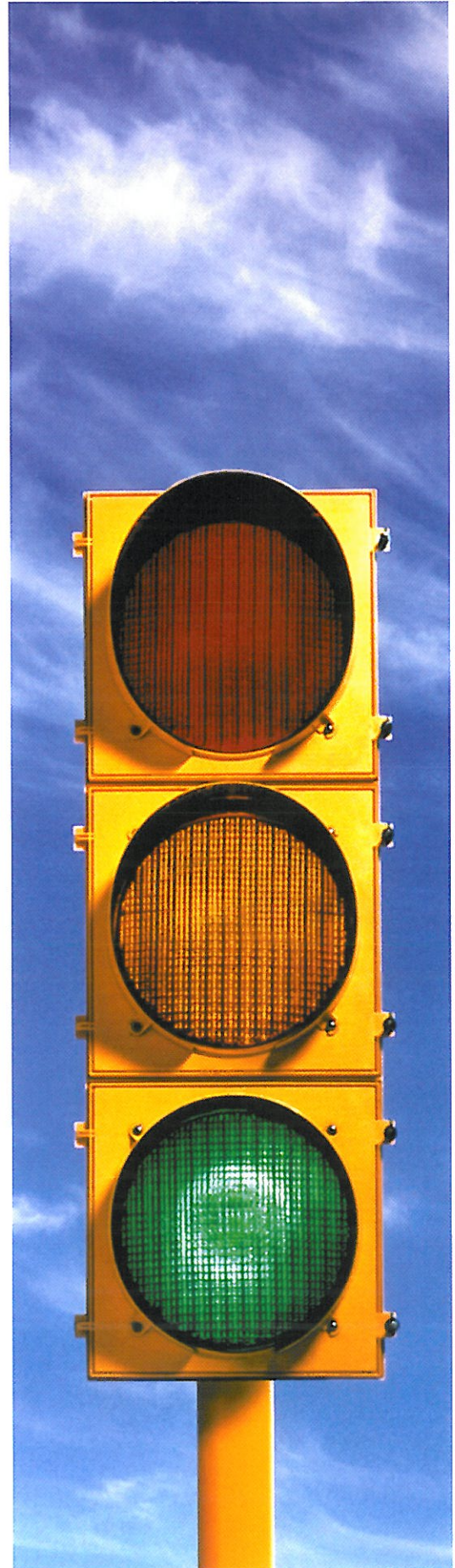
- While drawing the plan, remember to use clear and understandable signs and symbols, avoid redundancy.

Participatory design

- Involve sectors and actors as early as possible in the design process.
- Involve participants of the policy preparation stage.
- Involve participants of the implementation stage.
- Involve future users.
- Involve relevant parties on both sides of territorial administrative boundaries in order to co-ordinate developments and to organise (physical) continuity and cohesion.
- Collaborate with other experts as much as possible; ask for their opinion on technical matters in a way that stimulates creative solutions towards sustainable development.
- Find effective ways to commit architects and landscape architects to the same efforts, start dialogues with them about qualities.
- Find commitment for experiments and consider an alternative scenario in case of failure or resistance.
- Start negotiations about alternative solutions (e.g. transfer of planning rights to other locations).
- Negotiate on the basis of feasible goals and interests. Isolate the problem and propose alternative solutions fitting interests better, mediate between interests.

Communication about plan

- During presentation of the plan use simple language, define the plan as precisely and as simply as possible.
- Communicate benefits of plan proposals specifically for different target groups and visualise improvements if participants do not recognise their interests reflected in the planning document.
- Show different packages of qualities as much as possible explicit and show how one quality may compensate for another.
- Link the plan to existing programmes such as Local Agenda 21.
- Highlight improvements of qualities for longer term and bigger scales.
- Highlight specific design parameters that will improve the quality of the environment (aesthetic parameters, landscaping, etc.) with simulated computer graphic or 3D-paintings.
- Show examples of good experiences elsewhere.



Plan approval

Local plans which have to be adopted politically and approved by higher levels of administration, may sometimes state goals that are locally much appreciated, but not supported by the higher authorities. The reason can be twofold. These higher authorities sometimes tend to react from a sectoral viewpoint, or it may be that vertical integration was not sufficiently addressed. The spatial planner should involve approving actors within the preparation of the local policy and plan design in order to acquaint them with local problems, (integrative) considerations and objectives.

In different planning systems, plan control and approval are differently organised. If local plans can be interpreted in different ways, plan approval and appeals are very important. The development control process is a vital part of planning in some countries, linked to the implementation stage.

Objectives

- *Avoidance of unforeseen reactions that disturb the process.*
- *Reliability of approving agencies.*
- *Co-ordinated local and regional development policies.*
- *Commitment to sustainable development through different scales.*

Commitment

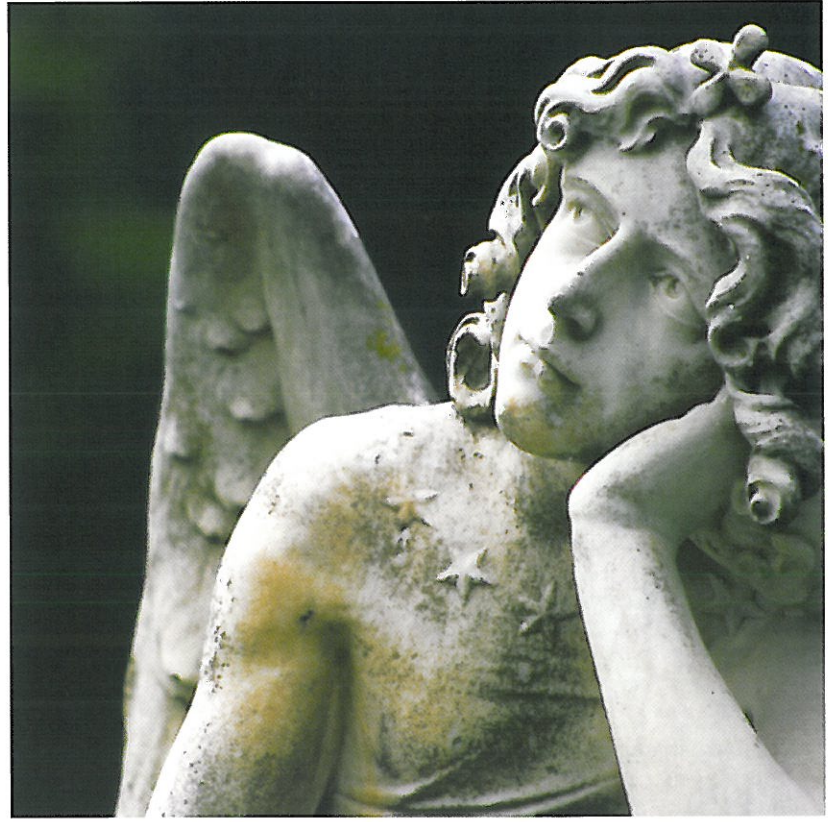
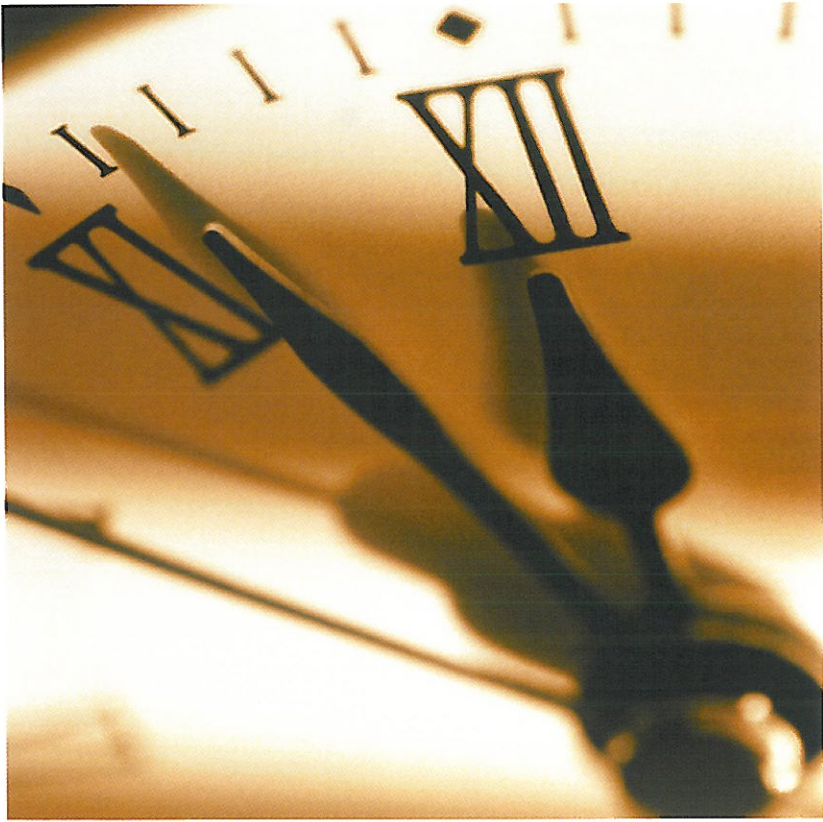
- Involve officials of different administrative levels in the earliest stages.
- Mobilise responsible local politicians to contact higher authorities early.
- Communicate locally supported objectives to approving authorities.
- Integrate reactions of different approving authorities by organising joint meetings.
- Contact approving officials without hesitation to ask whether they need more information, other considerations, etc.
- Inform and consult with approving officials - better too much than not enough.

Pro-active plan control

- Encourage planning officers dealing with development control to develop planning negotiating skills to convince developers and achieve planning agreements with applicants, maximising sustainable planning gains.
- Encourage planners working for approving and controlling authorities to acquaint themselves with local actions to prepare policies and plans in early stages.
- Analyse existing policies at different levels: what are their effects on local sustainable development and how does the plan address the objectives?
- Analyse and communicate sectoral inconsistencies and barriers to sustainable development in order to organise at least informal support.
- Prepare guidelines (edited by the approving officials), which will be used to test plans taking sustainable development into account.
- Be informed about draft versions of the plan and deliver input to the plan.

Communication about decisions

- Avoid stereotyped reactions by informal discussions about proposed plans.
- Keep informed all involved parties about the stages of approval and other authorities' reactions.
- Inform all parties, including those involved in public participation, about final decisions.



Implementation

The stage of implementing a spatial development plan is essential for the physical result of previous intentions. Interventions that disturb the existing reality are concentrated in the construction phase, and care is needed. At the same time, final modifications of plans and details are carried out for practical reasons, sometimes destroying carefully agreed details. This may be avoided by awareness of the importance for sustainable development by parties involved in the implementation stage and by prescribing procedures securing quality aspects. The planner should communicate the objectives and the chosen solutions with the project developers, architects and constructors.

Objectives

- *Implementation of the objectives and targets that were only words on paper in the previous stages.*
- *No pollution, damage or reduction of qualities during the implementation stage.*
- *Development of new solutions in practice.*
- *Involvement of local people in the implementation process.*

Administrative support

- Address bureaucratic slowness and legal difficulties by setting adequate deadlines and agendas; anticipate alternative actions.
- Provide good supervision in this phase with clear criteria for sustainable development; implementation may alter in response to unforeseen situations and affect sectoral interests or the results of the plan.
- Identify early and notify parties directly of alterations affecting sectoral interests.
- Strive for decentralisation of responsibility for resources.

Choice of partners

- Involve local people actively. It makes implementation easier and helps to avoid public indifference or abdication of responsibility.
- Involve human resources such as co-operative building, establishing of self-help interventions ('build-it-yourself') and willingness of co-operation partners and groups to help. Direct involvement of local people and their agreement on plans will help them to create their own space and reaffirm a shared identity.
- Implement plans that will initiate a series of private sector actions. The involvement of

the private sector is crucial to support the plan (including financially).

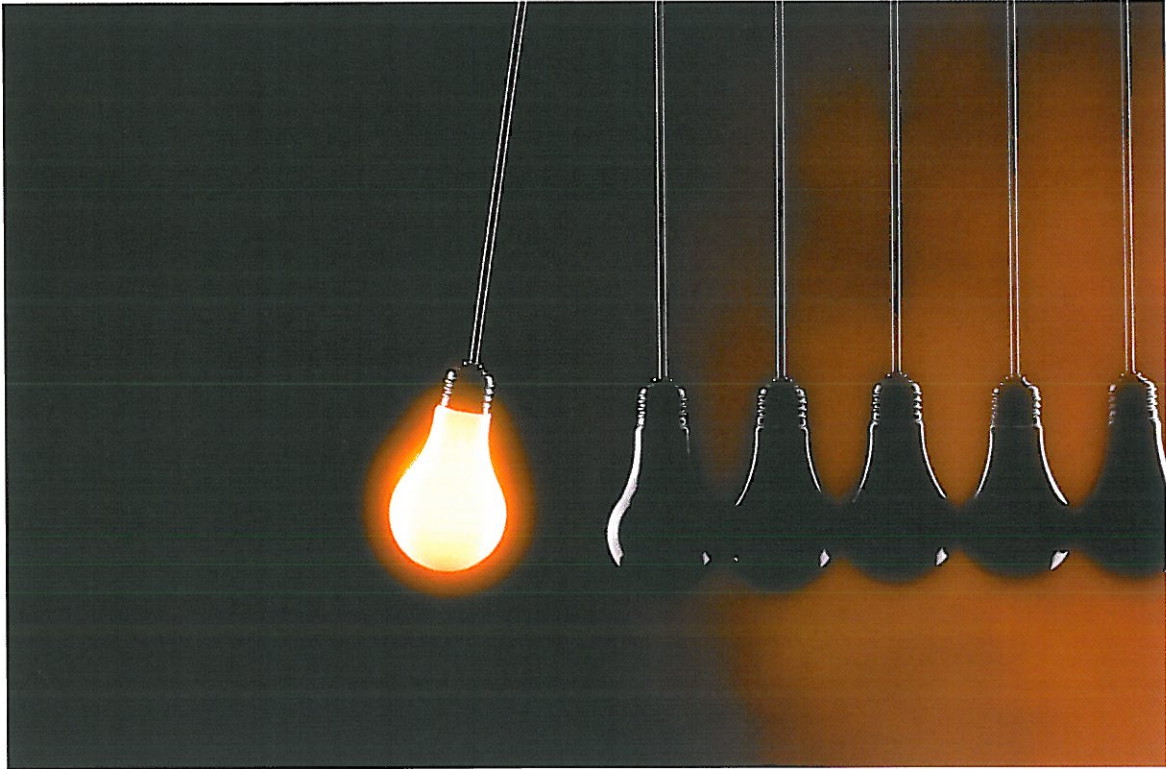
- Encourage private/public partnerships to implement sustainable policies.
- Choose partners with the most sustainable and cost-effective plan to implement. The time for preparation, implementation and funding of the plan is crucial for success.
- Choose or advise selection of project developers, architects and other experts who are explicitly committed to sustainable development.
- Make use of sustainable development criteria in contracts with the private sector.
- Challenge all involved parties, and where relevant the public, to find creative solutions for problems of implementing sustainable development.

Site management

- Relate to existing programmes (such as Local Agenda 21), policies and activities, which may support the implementation of sustainable development.
- Identify elements or parts of the plan which implementation enhances commitment and generates consensus.
- Identify physical factors that may jeopardise sustainable results.
- Prioritise key projects to be implemented first; they may have an advantageous effect.
- Prescribe and use standardised procedures for practical actions on site during implementation regarding the protection of trees and existing buildings, waste treatment, the use of toxic materials, pumping away water, soil deposit.

Communication about progress

- Communicate successful efforts of construction firms and others to achieve sustainable development.
- Reward creative practical solutions.
- Communicate successful results in a way that builds shared pride among all involved parties.
- Relate communication about the implementation of the project to (existing) Local Agenda 21 activities.



Monitoring

Monitoring spatial development processes is essential to measure the progress and to adapt the development policy as well as the plan. It helps to build evidence needed to increase the support for sustainable development. Monitoring may feed the dynamic process with new data and enables to adapt to new circumstances. Planning should be flexible. Indicators related to the policy choices and planning solutions should be agreed. Easy applicability of the results of monitoring helps the planning process to be cyclic. It is important that planners are involved in monitoring.

Objectives

- *Improvement of spatial development policies.*
- *Improvement of spatial development plans.*
- *Learning during and for the benefits of the plan.*
- *Building knowledge and consensus about the effectiveness of measures for achieving sustainable development.*

Monitoring system

- Develop a specific monitoring plan determining who, when/how often, and what.
- Prepare a timetable setting out targets and performance indicators by which progress will be measured.
- Create a relevant database and keep it updated.
- Update and review plans as soon and as often as necessary.
- Make sure for the long term that research and monitoring are carried out in co-operation with the planners in the Planning Departments.
- Interchange (if possible) planning officers from the plan making into the development control section (or vice versa) and collaborate with both. In this way experience gained from these two sections will help greatly the monitoring and plan updating process.

Indicators

- Combine the criteria for evaluation with the goals of the policy and the plan.
- Make sure that there is general agreement about the indicators before they are applied.
- Adopt indicators that are clear and controllable.
- Adopt indicators that are measurable, accessible and consistent.
- Adopt indicators that are significant within the local context.
- Adopt indicators that are sensible for changing conditions, and easily updated.
- Adopt indicators that are comparable with other programmes or plans.
- Relate monitoring to environmental impact and auditing studies.
- Relate monitoring to other audits of city's activities, of building stock, etc.
- Relate problems of present developments to the monitoring system in order to extend or change the use of indicators.

Communication about results

- Organise regular meetings with all relevant parties in order to examine progress to date, to identify outstanding tasks, to identify the need for future actions and to evaluate the adequacy of the resources being devoted to the activity/plan.
- Relate the outcomes of analyses of monitored developments to decisions to be taken about future developments.
- Co-ordinate the proposals for altering the plan.

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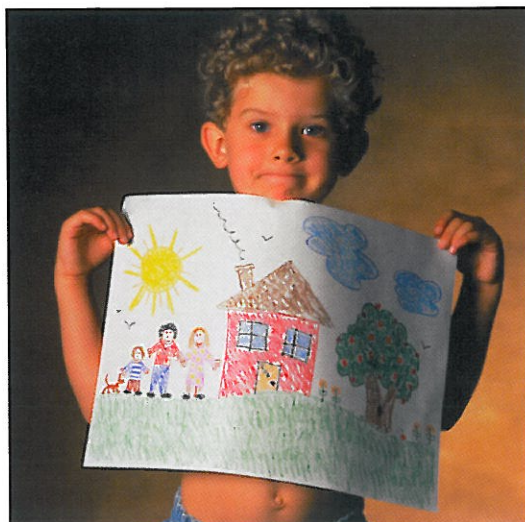
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