



# The Green Structure of Sheffield

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## 1 Introduction

Sheffield has no Green Structure Plan, since such a ‘tool’ is not part of the UK urban planning process. This paper gives a brief overview of the present situation regarding greenspace in Sheffield and describes how the planning system has dealt with green spaces in the absence of a specific ‘Plan’. It also considers the need for a more effective approach to greenspace as a part of the city’s move towards more sustainable development.

Unlike many other cities studied as part of this COST C11 project, Sheffield’s problems relating to green structure do not stem from a lack of greenspace itself, or from

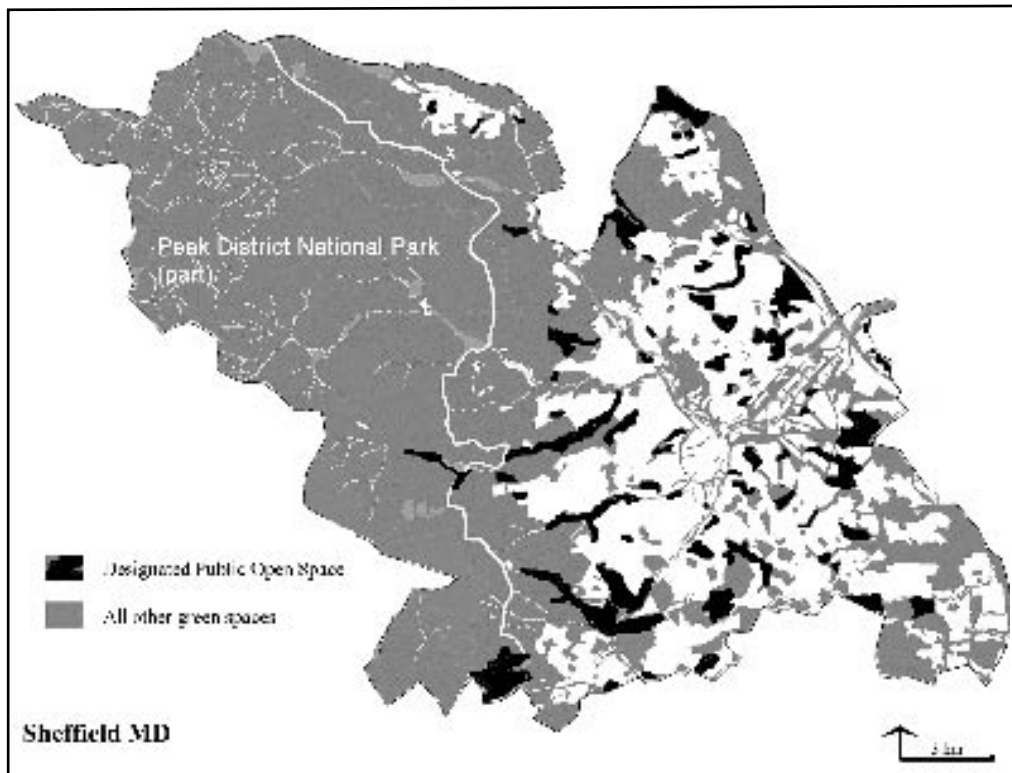


figure 1: Sheffield’s greenspace

unstructured greenspace. Instead there is a richness and variety of space and of high quality landscape for the population to use and enjoy. The problem facing the City is to manage this rich resource with very limited budgets and to use the planning system effectively, both to conserve the best greenspace and to enhance the remainder through sustainable land use and management. The City has been booming economically in recent years and the existing high quality green spaces, as well as those which have been enhanced, have helped to foster the frame of mind that has enabled this to happen. There is now a clear understanding in the City that its green spaces are important to its future and this is a very different situation from only five years ago.

## **2 Sheffield's green backcloth**

### **Background**

Sheffield is an industrial city in the north of England. It is the fifth largest municipality in England, with a population of 513,000 living within the Metropolitan District (MD - the administrative area which includes both urban and rural areas) on 36,238 hectares. The density of population for the Sheffield MD is 14 persons per hectare, although within the built-up area, that is excluding both the rural area and the Peak Park, it is 40 persons per hectare. One third of the Sheffield MD lies within the Peak District National Park (no other UK city has part of a national park within its boundary). One third is agricultural, with some scattered villages, and the other third is urban. Over half of the City's dwellings lie within 15 minutes' walk of open countryside or major urban open spaces and there are views out to open hills and fields from every part of the City, due its hilly nature. The topography has exerted an exceptionally strong influence on the form of settlement and the location of green spaces, partly because of the deeply incised river system and partly because of height variations – the lowest part of the City lies at about 10m above sea level and the highest over 500 m.

After three decades of great economic difficulties due to the restructuring of employment opportunities, Sheffield is once more a thriving city, attracting many commuters and shoppers from a hinterland of over 1 million people. The many regeneration projects funded by the EU and UK government initiatives have begun to make a major impact on the urban landscape, as well as the local economy and social life. Sheffield is one of the greenest cities in the UK. Even when owned by the City Council or Water Boards, much of the rural area and the moorland of the Peak District are maintained by private individuals or companies. In these areas access agreements ensure the public use of such land (footways and cycleways), and some funding is available for landscape improvements.

Figure 1 shows the major green spaces managed by the City within the context of the actual greenspace within the city boundary. It has been calculated that Sheffield's 99 major urban open spaces attract over 25 million visits each year. It is recognised that



1. Diagram of built-up areas. 2. Sheffield, Crookes. Housing now very popular with students. 3. Diagram to indicate the extend of green spaces within the city boundaries. 4. Ranmoor, late 19th century houses. 5. Cathedral St Peter and St Paul. 6. The top of the Porter Brook, steep sided valley, a footpath follow the stream down almost into the city centre. 7. Densification in Ranmoor. 8. Sheffield moors on the east of the city. 8. The Mayfield Valley to the west of the city centre (green belt). photos Anne Beer.

they play a vital part in the inhabitants' and visitors' perception of the local quality of life; in acknowledgement of this the City is actively upgrading sub-standard spaces, many of which suffered two decades of neglect as Council budgets for greenspace were cut. These cut backs were enforced by central Government controls over local authority expenditure, but the relative lack of regard for greenspace at the time meant that these were disproportionately applied to this area of the Council's responsibilities. A similar situation existed in all British cities (Swanwick et al., 2003).

The City also manages directly, or indirectly through management agreements, over 150 woodlands. Due to the hills that they often clad, these woods are visually dominant elements, so influencing visitors' as well as inhabitants' perceptions of the City out of all proportion to the extent of wooded land. Even within the totally built-up city centre and in the major industrial areas, there is a constant awareness of being near and surrounded by nature – a very unusual feeling for city-dwellers. A recent initiative to increase the area of woodland, which is already having an impact on the quality of Sheffield's urban fringe on the northern and eastern sides, has been the creation of the South Yorkshire Forest (SYF - [www.syforest.co.uk](http://www.syforest.co.uk)), part of which is within Sheffield. The SYF is supported by the Countryside Commission, Forestry Authority, the City Council and the neighbouring towns of Barnsley and Rotherham.

### **3 Sheffield and its urban landscapes and biodiversity**

To understand the green structure of the City of Sheffield - why there is so much greenspace and the distribution and variation in quality of that space - it is necessary to understand how Sheffield expanded from a group of dispersed villages into a major industrial city and to recognise the role that topography and the river system have had in limiting, directing and shaping that growth (see the COSTC11 website – [www.map21ltd.com/COSTC11/Sheffield](http://www.map21ltd.com/COSTC11/Sheffield) ).

#### **The qualities of the present green structure**

The present day green structure of the City has evolved as a pattern in response to the local physical environment. There is a web of linked greenspace corridors along the river system that leads into the surrounding moorland to the west and north of the City, and to agricultural land to the south and east. Much of this basic green structure remains very rich in wildlife, despite much of its being in the midst of an urban area.

Sheffield contains the most varied range of landscapes to be found in any city in the UK. These landscapes range from the hard surfaces of the dense urban centre, through the housing and industrial areas to its hills, lakes (dams) and moorlands. From every part of Sheffield the hills dominate the skyline. Its river valleys lead up to the open countryside that surrounds the City to the north, south and west. The geology of the area explains to a large extent the variation in the local natural

landscapes, as well as the initial growth of this city as an industrial centre based on local natural resources. It is the unique combination of natural and human cultural factors that have shaped Sheffield's landscape and created its special qualities and character.

Sheffield's agricultural fringe forms a major part of its green spaces; it is highly valued by its inhabitants. Most of it was bought by the City in the 1930s to hold for the benefit of the local people and later was declared as Green Belt. Farms are leased to farmers, who also manage the landscape. Some amalgamation of working units has taken place as farming has changed and many outlying farm buildings are now solely for residential use - and are much sought after. Development in the Green Belt is highly controlled, but there is constant pressure from developers to be allowed to build in this protected area and from central Government to reconsider boundaries. As a result, identification of any exceptional circumstances where development might be allowed is underway; this takes account of the strategic issue for the City relating to the viability of existing settlements, as well as the availability of serviced land (for instance, that previously used for other uses, such as schools).

### **Greenspace and Biodiversity**

Nature can migrate freely along the river corridors and move into domestic gardens and the open spaces in search of suitable habitats. Deer have even been seen where the green corridors penetrate the city centre and the industrial areas. Foxes and squirrels abound and are found in gardens as well as larger open spaces. There is a rich bird life in the gardens and those open spaces which are the well vegetated. Water quality has improved substantially in all the local rivers over the last decade. A wider range of fish and aquatic life is now to be found. The City, which for many decades has protected its best area of natural value lying within its boundary in line with Government guidance, is now considering how best to categorise and protect the non-statutory sites as well. English Nature, the UK Government's advisor on nature conservation, recommends that people should have an accessible natural green space within 300 metres of their home. They also recommend that Local Nature Reserves should be provided at the level of 1 hectare for every 1,000 people. It is likely that these standards will be incorporated into new city planning strategies. For further information about nature in Sheffield see [www.wildsheffield.com](http://www.wildsheffield.com) and the [www.map21ltd.com/COSTC11](http://www.map21ltd.com/COSTC11) website.

### **The private domestic gardens – preserving tree cover and biodiversity**

In extensive areas of the garden, and in some places the street, trees are an important feature of the local landscape; they do much to make it such a green place in which to live. The Council has statutory powers to protect trees which are of high amenity value: through the use of Tree Preservation Orders and Conservation Area Status, and, for specific sites, through Planning Conditions on new or modified development. Preservation orders can be placed on single trees, groups of trees and even whole woodlands. If a tree preservation order is in force, it is necessary to obtain consent

from the Council before carrying out any work on the trees covered. Generally tree preservation orders are issued only where there is some evidence that trees may be under threat of damage or removal, or where they are important features, visible to the public as landmarks. When planning permission is granted for a new development, a condition may be attached requiring permission to be obtained for any work on trees. In conservation areas it is necessary to inform the Council six weeks before carrying out work on any tree except saplings.

The planning system in Britain encourages the protection of tree cover as densification and redevelopment take place. So it is normal procedure for the planners to insist on layouts that retain the major trees. This may seem at first to be an excellent solution, but long-term studies by Dr. O. L. Gilbert (1999), a Sheffield ecologist, have shown that such trees deteriorate rapidly if buildings or service-runs are too close.

They often require felling within a decade because of the deterioration in their condition, although initially they might seem to have come through the site construction process unharmed. In Sheffield, the impact of densification on the urban landscape of the area to the west of the centre, an area laid out in the late nineteenth century and recognised as one of the highest quality suburban landscapes in Britain, is only gradually becoming obvious. The deterioration is likely to be exacerbated by the newest Government directives encouraging the densification of development. The British dislike of high-rise housing means that development takes the form of low-rise blocks or dense terrace housing (now termed 'town houses' for marketing reasons) to meet the density requirements of central Government. Both these forms mean that buildings and sealed surfaces take up virtually the whole ground area of the development, with only a small ring of unsealed surface around the edge. This approach inevitably has an adverse impact on tree survival rates and increases the likelihood of flash flooding, as the surface water can no longer sink into the ground. Developers are targeting the western side of the city, not because land is cheaper there, but because it is where they can make the most profit. In this area the cost of houses is substantially higher than in other parts of the City, as buyers are willing to pay a premium for a 'better' - in this case greener - looking location. However, it is exactly this special, green-dominated landscape that the new developments are killing off, with their direct impact on the health of trees. It is a situation that the City planners seem powerless to prevent, because of ill-thought out central Government guidance.

Not only is the tree cover in private gardens important itself, but also the biodiversity that these trees are able to support. As in other British cities, Sheffield contains a 'patchwork' of gardens, which are as much a part of its greenspace as its parks and other public and private green spaces. According to recent research (Gaston, 2002 and Thompson et al., 2003) domestic gardens cover about 23% of the built-up area of Sheffield. There are over 175,000 gardens with at least 25,000 ponds, 45,000

nest boxes, 50,000 composts and about 360,000 trees taller than 2 m. This is a vast resource supporting the survival and enhancement of biodiversity within the built-up area. The gardens vary greatly in size, character and maintenance regime, as also in their capacity to support biodiversity. However, this resource could be enhanced still further, with increased public awareness ([www.sheffield.ac.uk/uni/projects/bugs](http://www.sheffield.ac.uk/uni/projects/bugs)).

### **Parks and other green spaces owned and managed by the City**

The City looks after a range of parks and other public open spaces. The quality of these spaces varies greatly, largely determined by when they were acquired and when the work was carried out initially to make them satisfactory landscaped places for a range of recreational activities. Prior to 1880 there were few public gardens in Sheffield and no real need for them, since everyone lived within a 10 to 15 minute walk of open land. The first designed park was the Botanical Gardens (1833). This was first opened as a 'fee paying' park for wealthier residents and was only opened up to the public later on.

The valley system of green spaces acted as a safety valve all the time that the City was growing, but gradually as people became more cut off from contact with the countryside, awareness grew that this lack of green was detrimental to the health of the workers. This coincided with the fashion for public parks in the UK and so from the 1880s, when the City was gifted Endcliffe Park for its people to enjoy, to the final 'gift' of Whirlow Park in the 1960s, the City acquired a substantial area of parkland, most of which was divorced from the valley system. These parks survived because wealthy industrialists ensured that the land would stay as parks by using legal covenants. These parks were diverse in their origin: for example, a deer park owned over the centuries by the aristocracy (Norfolk Park), the grounds of old houses (Graves Park and Firth Park), large mature gardens of Victorian houses (Whirlow Park), and woodlands which had been in private ownership (Ecclesall Woods). They remain the best 'parks' in the city (Sheffield City Council, 1997 and Barber, 1993).

The other parks in the City form part of the planned open spaces of the twentieth century. In the 1930s, when the town planning system began to become more effective, the maldistribution of open space within the City became apparent. For instance, many of the more densely populated areas had no access to local parks within a quarter of a mile (400m) of dwellings. It was recognised that there was no shortage of open space within the City; it was just not always in the right place. To rectify this the City began to set aside part of the land it was acquiring for housing as open space and up to the 1970s all new housing areas had to include a given standard of open space. However, most of this land was never properly landscaped and survives to the present as grass patches fulfilling no recreational, biodiversity or other sustainability function. From the 1930s to the 1970s it was also common to provide playing fields for schools and public use following the National Playing Fields Association (NPFA)



standards of provision. Substantial parts of the city are still laid out and maintained by the City for sports purposes. However, recently considerable sums have become available for indoor sports halls and this has been associated with the building over of some playing fields. Whether this is good for the greenspace provision of the City or for the health of the population is a moot point.

### **The involvement of non-governmental agencies and the volunteer sector**

Traditionally, the parks have been looked after by a 'Parks' unit, while the other open spaces have been cared for by 'Countryside' or 'Woodlands' units. However, there has been no financial capacity to extend their remit to cover all the green spaces within the City and in recent decades resource cutbacks have meant that less can be done. (Harrison's paper in this book deals with the growth in the volunteer sector, which has helped overcome these problems.) The decision has now been taken to do more to co-ordinate the work of the vast range of bodies involved in greenspace projects. The Government has worked with the City to bring in the Ground Work Trust ([www.groundwork.org.uk](http://www.groundwork.org.uk)) and to fund it properly. The purpose of Groundwork Sheffield is:

1. to promote the conservation, protection and improvement of the physical and natural environment in the City of Sheffield
2. to provide green spaces and recreation facilities with the objective of improving the quality of life for those living, working and visiting Sheffield
3. to increase public education in environmental matters in order to conserve, protect and improve the environment.

Groundwork Sheffield will have dual roles as a strategic co-ordinator and enabler of capacity in environmental regeneration, and as a programme deliverer. The Trust has been very successful over two decades in a number of towns in the UK, delivering enhanced greenspace and acting as a regeneration agency. Its staff has a wide range of expertise and knowledge.

## **4 The effectiveness of the city planning process in relation to greenspace**

A re-distribution of resources for greenspace has been underway in the last decade. This has involved a substantial increase in work undertaken by the voluntary and non-governmental sector, rather than any expansion of staff in local authority departments (Harrison, 2004 in this publication). Regeneration budgets have made a considerable input - see [www.sheffield.gov.uk](http://www.sheffield.gov.uk). There have been noticeable improvements to many green spaces, particularly in the city centre and the old social housing areas. Most of these changes are taking place on an ad hoc basis, the only planning guidance emanating from the Unitary Development Plan (UDP). This addresses greenspace within the urban planning process through consideration of a range of topics and by setting out of policies.

The present UDP (1998) recognises the role of green spaces as a support for leisure activities, nature conservation and the City's visual attributes, and also that the majority of the City's open spaces are in effect greenspace. It contains statements of intent on: protecting the Green Belt and its landscapes; improving public parks and green spaces; and the need to conserve the natural heritage. It considers the need to improve public open spaces for recreation and to support more wildlife, and the need to counteract the historic maldistribution of green spaces. Perhaps because of the disparate way in which greenspace is dealt with in the English UDP system, there is no real consideration in Sheffield's UDP of what ought to happen to the many other green spaces within the City, which are not classed as public open space and thereby protected. Luckily many of these green spaces exist because they are on unbuildable land (due to steepness, instability or liability to flood). However, over the past decade an increasing number of local green spaces have been built over. The recent planning guidance on densification make this trend likely to accelerate, as now even private gardens are being targeted by developers with the Government's encouragement and there is little that local planners can do to stop them.

The role that private gardens, and particularly their trees, play in people's perception of their local quality of life has never been recognised by the planning system. Yet almost as much pleasure can be had from strolling along a well-treed residential street, where all the vegetation in private gardens actually grows, as from a walk in a local public park. There is a real lack of thought in the UK, as elsewhere, about the impact of mishandled densification on the quality of life, and a lack of awareness of the long-term costs to society in both social and economic terms of neglecting to consider people's reactions to environments lacking usable greenspace (Van Herzele, 2002). Without a suitable mechanism such as a Green Structure Plan (Beer et al., 2003) drawing attention to the vital role of green spaces in a sustainable city, this situation is unlikely to change.

The nearest the Sheffield UDP comes to recognising the inherent multi-functionality of greenspace and how this might influence the overall environmental planning and management of the City is in the proposal for a 'Green Network'. This idea was developed by the City ecologists and so it emphasises the role of greenspace in linking habitats and allowing the movement of plants and animals. Its potential for carrying recreational activity requiring linear movement is not stressed. Sheffield's green corridors were never planned, although they were clearly identified as an asset in the unpublished plan prepared by Abercrombie in the 1930s. Parts of the river corridor system had been acquired by the City from the 1880s onwards, so part is designated as public open space. The remainder is unprotected, except where it coincides with nature or archaeological conservation sites. The Green Network described in the UDPs of the 1990s overcomes this lack of recognition within the planning process: a network of Green Corridors with Green Links is envisaged. The City's purpose in identifying this network is to protect areas from any development that would detract

from their mainly green character, or which would cause serious ecological damage; it is presented as that part of the city where wildlife and recreational values can be enhanced. Despite good intentions, the way in which the Network is described is in reality too vague to be used at the local level where decisions are actually made as to what should happen on a particular site, (perhaps because it had to be presented in a specific way to meet Government regulations on the scope and content of UDPs).

As in all other UK cities, Sheffield has been applying the ideas behind Agenda 21 in the environmental management of the city for some years now, but a more broadly based approach to the influence of sustainability on planning and design is being investigated, following further UK Government directives. It would be useful if there were a general recognition that urban areas can only function sustainably if the green areas (inevitably these include the natural water courses) are understood to be in a symbiotic relationship with the built-up areas – the one influences the other inextricably, and an increased infrastructure, social and environmental cost can only result from neglecting the link.

## **5 A role for a green structure Plan?**

There are several critical issues for the City as it addresses how to deal with greenspace within the more sustainable development process which is now its aim :

1. There is a need to recognise that public open spaces are only a part of the City's total greenspace system. Public open space can only be effectively planned, designed and managed sustainably in the long term if each space is understood as part of this much more extensive system. It includes the private garden as much as the river valleys; it includes the agricultural land, the woodlands and moorland, as well as the multitude of smaller greenspaces left over as development has rolled out across the landscape surrounding the core of the city. These latter spaces occur either because they were too difficult to build on, or because they were deliberately set out as part of the planned provision of open space in housing and industrial areas during the middle period of the twentieth century. Often such spaces were just grassed over, since no money for design and planting schemes was ever allocated; over time they have become part of the problem of the visual dreariness too often associated with social housing areas. These 'left over' spaces perform no function, failing to support user needs for spaces for activities, or biodiversity, or to enhance the aesthetic qualities of the areas around them.
2. City planning policies in general need to recognise fully and build on the fact that Sheffield is fortunate to have one of the strongest green structures of any city in the UK. This green structure, which at its core is linked by watercourses, underlies the City. The effectiveness of the river system as the core of the green structure is

supplemented by: the agricultural area, the moorland, the woodlands and water features which lie outside the built-up area. The public open spaces within the built-up area and extensive private gardens, which cover much of the surface of the City outside its core area, are also linked to this system, as nature does not respect man-made boundaries and can thrive anywhere that land is available for colonising.

3. All the features of the green structure in effect work together to make the City more environmentally sustainable: for example, together they act as a sponge to reduce flash flooding; they support a relatively high level of biodiversity, particularly because of the extent of the gardens and the existence of the natural corridors along the rivers; the valleys drain cooler air down from the hilltops towards the city centre and the industrial areas beyond, improving air quality and also temperatures in the summer in the built-up core. This structure was never planned, it happened by default because the un-buildable land was left to nature. However, its existence makes the City more sustainable than it would otherwise be and this feature can be built on through the planning process.
4. The maldistribution of local green spaces in quantity, type and quality needs a citywide approach. An examination of the distribution of greenspace in relation to the needs of local populations is at present planned, but such a study must also take account of all the green spaces accessible to the public, not just those designated as public open space, and recognise that all open spaces are multi-functional in a sustainable city. This study may well reveal the location of areas of greenspace which could be sold for development. This might even enable improvements to local open spaces to be self-financing, as has happened in other European cities (see Tjallingii on Breda in this book). However, in the UK some means of overcoming Government constraints on how local authorities can use financial gains will need to be found. At present much of the maldistribution has to do with the quality rather than the quantity of green spaces. In the west and south of Sheffield's built-up area there are many high quality urban green spaces used for a wide variety of activities, whereas most of those in the north and east, where development was undertaken mainly in the mid twentieth century, do not have the richness of landscape to support such a range of activity. They fail to enhance the local quality of life, or even to act as a wildlife support system. The City has identified these spaces as top priority for improvement and many are currently undergoing regeneration. However, without a planning document akin to a Green Structure Plan it is impossible to prioritise work effectively, or even to know what an appropriate design or management solution might be. While involving local people in the design process is of vital importance, their input can only be part of a broader package of decision-making for the design and management process necessary to change each site. It may well help local communities to be more effective in interacting with designers and managers if they can understand how their local space is part of a larger green structure and involved in making the City a more sustainable place; it may even

mean more resources can be allocated directly to local communities involved in enhancing their local green spaces in the future.

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# Contrasting green clothes within Marseilles city

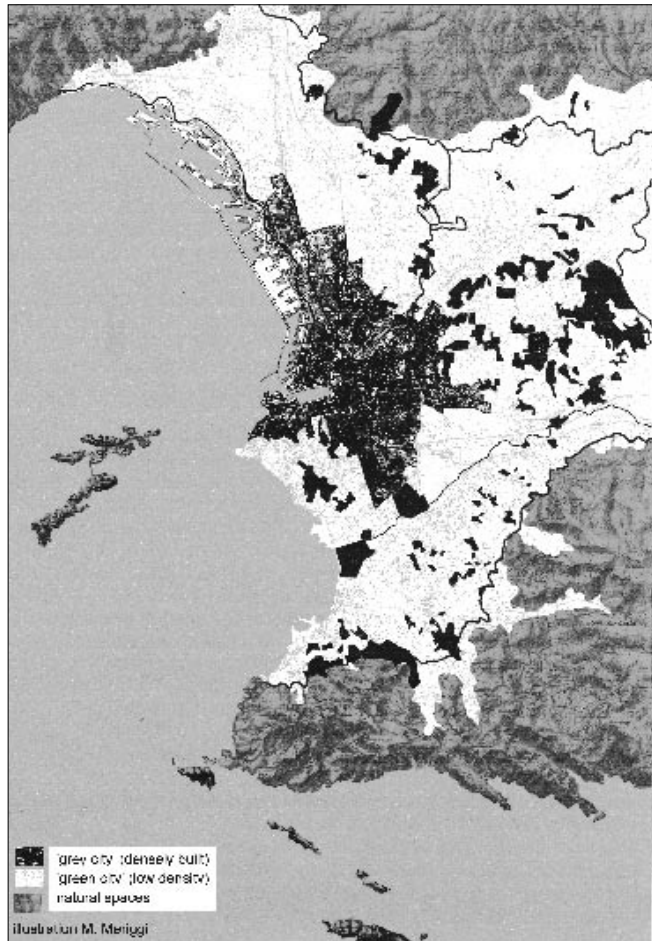
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## **1 Introduction, a town belonging to three cultural identities**

Marseilles is the second largest municipality in France, with a population of 798,000 living in the administrative area (both urban and rural areas), on 24,000 hectares. The density is 33 persons per hectare, although within the built-up area (excluding the 9,557 unbuilt and protected natural spaces) it is 55 persons per hectare. The town lays between the sea and the Provence, being also close to the outfall of the Rhône river. The coastal position is not only the principle for town-foundation, it is also the very first reference, in Marseille people's mind

and in visitor's mind. The centre is at the Old Port, where the urban landscape calls up history of the French oldest town. Mediterranean port, town of trans-shipment, importance of foreigners, features to be noticed in so many details, even if being Marseillais nowadays rarely means being a longshoreman, even if the town-wealth was more due in the past times to the manufacturing of raw materials rather than to the trade itself. The sea and the rocky-coast belong indeed to the city image and maybe authorise a special relation to density : an urban density very high in a well-defined perimeter, representing anyhow a small part of the whole town. It is, then, a typical Mediterranean populated and intricate built-up city, in its patterns of narrow streets



and in its urban spaces.

How is organised the relation to the soil of Provence ? The town boundaries are by hill-slopes, valuing the relation to the seashore and creating a special status for the town, being both influenced by the meso-climate of Provence (in vegetation and climate) and by the seaside conditions (wind, dryness, rocks) giving a sort of independence. Marseille appears to some extends more a town of interaction of Mediterranean worlds than a town of Provence soil.

## **2 A very dense city-core inside low-dense urban areas and numerous old village-nodes**

Surrounding the “grey-city” exist a “green city”. The town did possess on the wide civil-parish territory, in the ancient days, her own country. She succeeded in the 19 th century in providing citizens with copius water to create farms, with cattle and grazing-meadows, and to organise shady, greened and treed resting places, converting the hard conditions of local climate.

The town’s relationship with this suburb-countryside was quite specific to Marseilles (and other Mediterranean towns). This territory, mostly made of rich estates being second homes with farms, etc., all realms being behind walls, not visible from the narrow paths, was considered as the town itself, because of the customs in usual way of live, this part of the city having relevant parts and functions in the urban way of life (for the well-off and for humble people) and the town resisted the development of the usual urban sprawl until the last three decades.

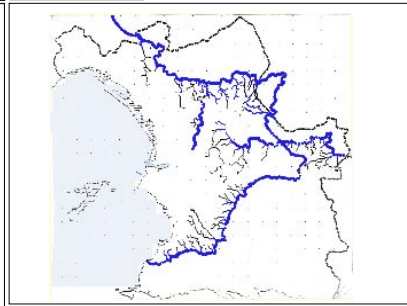
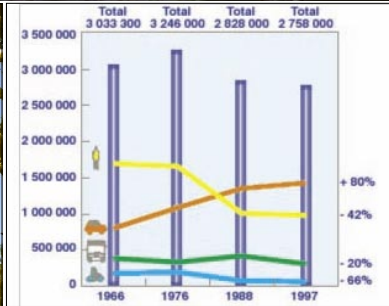
The city and this relationship with the countryside reached its peak in the middle of the nineteenth century due to industrial growth and to the creation of the water feeder (Marseilles’s canal), but after quite a long steady period (of a quite thriving city) , the imbalance in the green part of the town increased after World War II. The rich estates vanished or were transformed and the pressure of surburbanisation changed the look and the meaning of this special land.

These areas had long been identified with the use of vegetation and water and provided spectacular seascapes and scenic views, giving them a very strong identity; all of which could be considered beneficial for the change in scale of the urban lay out and planning of space. But some sectors lost their value, in social and economic terms: selling prices, reputation, quality of life (particularly in neighbourhoods on the northern periphery), all these being influenced by the building of a large number of social housing estates in the 1960s and 1970s.

It was often a disruptive development, a chaotic consumption of land ignoring existing sites and leaving the area in just a few years to become land filled by urbanisation and utilities, apart from a very few protected historic mansions. An image of the current outskirts and of low-density urban areas took the place of the specificity of the Mediterranean town.

Today the transformation is spreading over almost all the land, especially in the northern part. The ‘green’ city is a mix of buildings, social housing estates, individual

1. 'Calanques' limiting the city to the south. 2. the 'Old Port' in the centre. 3. a overall view of the 'grey city'.



4. view towards the sea from Bastide 'Giraudy'. 5. the Bastide itself. 6. an alley. 7. the canal watering the Bastides' estates. 8. a water-tower in one Bastide' park. 9. the increase of commuting and the loss of others transport modes, from municipal statistics. 10. the canal watering the green estates surrounding the densely-built part of the city (and in black, the administrative boundary of Marseilles).



houses (planned unit developments) and plots of land recalling the use of the site from another era, vestiges of parks (trees, etc.), agricultural fields, walkways and other features of the previous landscape: planted drives, water channels, etc., all footprints of the planning of space over centuries, of added elements to cultivate a land that would yield the highest quality of life despite the climate.

It is evident that the spread of numerous old villages, previously providing urban services for extensive areas of countryside, made a network that is still discernible on the map and in the landscape, although this network is failing by the day. These points of density fulfil various functions, the important one of which is giving roots in local history to the dwellers of this suburb-countryside.

At the city region level, urban areas have grown, as has traffic, large areas have become attractive for residential use, competition between nearby towns has increased; the way of looking at nearby outdoor spaces has been modified, masking their cultural significance.

Nowadays, what does this specific heritage look like? What did Marseille do in order to manage its suburban countryside? How can we assess green structure elements in ongoing urban planning? How can we react, and should we accept the disruption of such important areas as this suburban countryside, when carrying on making changes to suit those demands? What are the concerns of the actors and what tools are they using or wishing to use?

What information can the case study of Marseilles bring to this range of questions?

### **3 Simplified typology of the greenstructure, within the administrative area of Marseilles**

To give a general idea of Marseille's "green" structure, outdoor spaces are recorded here. These components (green but also blue -the sea- or white -the rocks-) are ranked by the importance of their image. Special qualities that can be applied to the whole city, stemming from the geography, the contour and grade of land surface of the urban site, are listed first, followed by components of the 'grey' city, then the ones of the green area beyond. The harbour spaces are on the border of both urban fabrics. A few of these elements will be highlighted, focusing on special questions relating to greenstructure or on a policy, tool or proceedings used to acknowledge the part played by some urban green spaces.

**High points and contour lines** (topography) have special importance for the whole town. High points give highly scenic seascapes and turn a building into a landmark; they provide interesting views from a lot of different places (from both the grey and green parts of the town). The church of Notre-Dame de la Garde is a highly attractive place, offering a public open space, greened, and is the most relevant landmark for the town, the image of the city, although most of these high points are within the boundaries of private properties (e.g. terraced gardens in typical country mansions).

The opportunity of developing such landmarks was not much taken when building

new housing areas in the recent decades despite there being many scenic views in the countryside, located on slopes, even on roads.

**Strong features of the natural environment** that surround the built environment as a natural green belt, **such as rocky coves** (calanques) and associated native vegetation (garrigues), also bring quality to the whole city. These plots of land remain unchanged by law through preservation constraints (scenic easement) and by means of the Local Plan.

**The ‘grey city’** (densely built-up) **comprises:**

1• **Drives/ walks/ boulevards:** urban forms with multi-functions (pedestrians and traffic); basic public spaces: strolling along the ‘allées’, social contacts, commercial purposes, importance for daily life. The ‘grey’ city has used these same walkways for three centuries: (Cours Belsunce, Allées Meilhan in the Canebière and Cours Pierre Puget, previously ramparts), accessible places for café terraces, all sorts of markets and for a variety of functions in popular areas.

2• **The Old Port:** this is the main public plaza, built on three sides (at a glance you can enter different historic periods), open to everyone and often busy. Its water strongly evokes wildlife.

• **Public gardens in town** (not a very large range by now and almost none for a long time) and a very few private gardens with an impact on public space (as the Prefect’s office).

3• **The avenues, public plazas and their trees** (often trees and a fountain together), lines of trees forming shaded vaulted ceilings over the public space, to make the city beautiful and comfortable. In this category some boulevards are more to do with improving the appearance of the area (such are le Prado/ boulevard Michelet).

4• **Outdoor spaces in private properties** are not many. Some specific programmes were undertaken in the nineteenth century for the benefit of the wealthy (for example, the quartier Longchamp), upgrading living in the town and contrasting it with the historic city core.

**The low-density, ‘green’ town** in the suburban countryside is characterised by an extensive range of green spaces, various streetscapes and landscapes, a mix of areas of farmland, high-density villages, country mansions and estates, ‘hardscape’ elements and sudden changes to accommodate urban growth, new pressures, fast access roads and highways: all these features created an intensely characteristic land but also, in some parts, a ruined area, sometimes considerably so.

Components to be found in the ‘green’ town include:

1• **Numerous private gardens** attached to individual houses, and the semi-private gardens of high-rise blocks of flats (residential dwellings or government-sponsored housing).

2• **Typical country mansions and estates called ‘Bastides’**, created in the eighteenth and nineteenth centuries by men involved in the financial or manufacturing worlds. Bastides were part of daily life and the countryside belonged to the town,

the same people lived in both, being at the Bastide on Sundays and in summer and in town for work. A century ago, nearly everyone could have such a second home: luxurious huge mansions or tiny ones called 'bastidons', a small plot of land with just a hut. Originally these estates used as second home also produced goods (to eat and sell). Rich people could make a little money from them, while having the pleasure of being very close to the town and dominating the harbour and the beautiful seascape. The making of these estates required skilled work to meet the geographical demands of the site, in order to provide a comfortable urban life and to enable people to settle in an advantageous location: having water, controlling the climate by possessing a 'fresh' garden (a deep stand of trees as in Alpine forests and grazing meadows as in Switzerland, waterfalls, tiny channels along paths). With reference to the number of 5,000 mansions mentioned in 1847, the link to this mainstay of a previous era is declining almost on a daily basis; only about ten of these have been offered protection as national heritage sites and are to be saved.

Nowadays agricultural production has changed drastically and the downturn in the economy is marked. Today, the Bastides have an aesthetic and cultural value belonging to all the Marseillais and they remain the symbol of quality of life and wealth. Their preservation as elements of a collective patrimony is a step forwards in valuing these outskirts. All the unbuilt land belonging to the Bastide demonstrates its potential for diversity, in the land surface itself, its forms, drawings, history and environmental aspects. The memory of a previous era can still be seen. The northern periphery has retained traces of the old days. Most social housing estates or units of individual homes were built within the boundaries of the long gone mansion and estate, roads are a mix of enlarged old paths and new ones, giving each sector a special identity. The general lines of construction and organisation of a site are reminders of its long history and can be shared by the inhabitants. As open spaces they can be put to various recreational and educational uses nowadays :

3• **The beach of le Prado** and its recently created public park and lawns has quite the same function that the Old Port. It is a major public space and a very busy place, and a great way to enjoy the sea and the surf.

4• **Public gardens and recent parks**, specific natural areas with native plants.

5• **Leisure spaces, derelict spaces, open plots of land** linked with factories and shopping centres, farmland on the urban periphery, valleys and family allotments.

6• **Marseilles's canal** (water feeder), built in 1847 and responsible for a new type of agriculture replacing vineyards and olive-trees. Vegetables and grazing meadows could be created to provide daily needs, as in 'huerta' areas, because of the watering system. Private parks could be watered. Life improved as the water helped to give humidity to the air, releasing water into the atmosphere and creating updraughts, applying the same knowledge as used in Andalusian and North African towns. The canal is used less now. It could become a leisure facility, benefiting public spaces, but the dangers of drowning, pointed out by the municipal staff, have negated this suggestion.

7• **Streetscapes:** narrow shaded paths and country roads, and others allees, trees in rows along streets in the high-density old parts of the town.

#### 4      **The stakes in the green town**

As a metropolitan area, Marseille needs to restore its position of leadership in the regional context and to improve the dynamics of the economy. The municipality aims to welcome new inhabitants, employment, new headquarters for industry and commerce. Its aim is to have one million inhabitants within the town itself, while the whole urban area is aiming at 2 million inhabitants. Land seems to be abundant in this part of the town, and, as a large part of this rocky surrounding resource has been preserved, it is said able to accommodate growth.

This strategy appears in the Local Plan, with the objective of raising density in the low-density part of town. The urbanisation process is not particularly related to detailed methodology or strategies, especially regarding sustainability. Most of the green town is just seen as appropriate to housing settlements.

New fast access roads were included as an aim in the planning documents (Structure plan and local plan) as road traffic had increased dramatically, even with the creation of the underground, and their impact on the area, landscapes, images and identities is the subject of much debate.

A huge change in the habit of decades seems necessary when planning additional development and road infrastructures, if there is a strong will to maintain qualities of an existing identity, to value environmental and social concerns and a good urban legibility.

The question of maintaining diversity and socio-spatial balance is relevant in these new fast-growing suburbs largely created by private developers inside the 'green' town. The relationship between filling the gaps in the 'green' city and the existence of previous pieces of built environment (social housing estates, villages and other various small settlements) needs to be faced. What is the cultural and social impact? How can we seek a higher profile for the town, strengthening the network of villages, the urban character, the services offered and public transportation, while at the same time preserving the green structure, which gives it identity?

The main characteristics of the 'green' city stem from the variety of historical circumstances: from immigrants, varying incomes, changes over time, changes in aesthetic tastes. Many researchers see these rapidly changing areas as a challenge, wanting to find appropriate connections without diluting the diverse aspects when developing amenities and housing.

It is a special time to try to plan the future of the 'green' city. A new trend stresses the attractiveness of the urban core in the polynuclear area as increasing, the opportunity for a debate from which planning would benefit is recognised by at least a few. (See the book "*Aire métropolitaine marseillaise, encore un effort*", where such ideas are

expressed by deputies, architects, sociologists, and specialists in urban planning and economics).

## **5 Planning tools and approaches to preservation**

### **Planning tools**

Experts in planning put forward proposals to manage the green city quite a long time ago (with the first generation of Master Plan called Extension Plans), but their awareness is still to be acknowledged. The one issued for Marseilles in 1933, for “urban growth and beautifying the city” (Jacques Greber, architect) is notable, outlining a real project aiming at coherence in developing spaces in the future. The general idea was: lowering density in inner city, make movements easier and greening the whole town. It comprised three matrices: a zoning plan, a circulation plan and an open spaces system plan, and also included rules for building and a project for the renovation of the historic core of Marseille. The general sketch was a forerunner of the future and was not approved by the municipal authorities, but a large number of proposals were finally carried on from one plan to the next and finally its strong direction heralded the urban planning of the town in the local plan of 1978.

This document showed how stunning urban planning was at that time, forecasting the need for preserving the historical character of sites inside the ‘green’ city. In the plan, the road network classified different types of roads through and around the town: fast access roads were in a parkway design and scenic roads with a surplus of green were carefully designed using the gradient of natural topography. Areas were set aside from plots of land intended for building development in order to stay as green spaces, either as the surrounding forests and native ras vegetated zones, or as smaller, isolated green spaces within the housing area, protected as old mansions and their parks, or farmland and existing woods. The general design aimed to value the landscape’s elements.

Greber’s urban plan can be seen as an ambitious attempt to accommodate urban growth and to develop an image of valuable landscape at the same time.

The benefit of Greber’s plan can be seen in the preservation of the wilderness of the hills surrounding the land occupied by the urban perimeter and the built and natural countryside. The next Master Plan (not a compulsory plan, by Meyer-Heine, 1949) retained most of these proposals, especially those relating to a system of parks and green open spaces going with the main road design of a parkway running along the main river and the scenic road on top of the hills.

Later on, the Structure Plans (1969, 1973) also focused on the need to protect large natural areas and organised a network of large infrastructures and some greened ‘gaps’ (islands of green spaces), to break the continuum of housing and amenities.

The recent Local Plan (POS: plan d’occupation des sols) for the ‘green’ city grants the legal right of use of the areas of designated private properties and contains general principles for the discerning use of the land and landscape, but not much

detailed information on how to succeed.

In the national policies, issued in recent decades, some tools appear appropriate to address the landscape and greenstructure issues but have not yet been put to use, although they probably will be used later on. The success in implementing expert proposals in active projects – through development processes or spatial strategies – is very uneven, the projects frequently being delayed or minimised. It also takes time before the national regulations can be fully adopted, as can be seen with the recently issued planning policy (DTA: Directive territoriale d'Aménagement), which concerns the large scale of inter-municipal city-region.

**Approaches to the protection of the Bastides** (preservation, reclamation and provision of information about the Bastides (typical mansions of the countryside).

About 200 of these mansions are mentioned as elements of interest (and of cultural importance) in the Local Plan without a spatial strategy being developed for them.

Quite a large number of mansions were transformed (in use or in form) and turned into public amenities (the building itself becoming a hospital, or a town hall, for example), but only rarely were the ancient private parks saved (for example, parc Borély, which was turned into a municipal garden a century ago; St Joseph/Gd Séminaire, bought in 1976, became a town hall for the northern periphery; parc Pastré, 111 hectares on the hill of Marseilleveyre, was bought in 1974-; and parc Brégante).

Nowadays the sea and the beach offer crucial opportunities for up-to-date and successful water sports, and the seaside development is a strong competitor in the provision of public spaces. Having being the backbone of the urban, low-density periphery for a very long time, and continuing to give a special identity to this land even when a lot more of inhabitants came in, the mansions are seen as a major component of the landscape by practitioners, students, associations, groups of inhabitants and stakeholders. So the idea of a 'parc bastidaire' was created, a project for a green finger entering the city-core in which relevant mansions and parks close to one another could find a new use and be a testimony to the lay of land, slope, surface features, and to this art of managing a harsh climate and beautiful views in appropriate resting places.

The project was formulated into a proposal, using the planning tool of a Landscape Plan (Plan de paysage) in 1993, but is still delayed today. Other proposals with the same objectives are under discussion concerning buildings or open spaces needing preservation, as well as educational and recreational, innovative practices for the stewardship of this land and activities connected with the inhabitants of the nearby large social housing estates. Progress is to notice anyhow since the beginning of the 1980s about keen analysis of the countryside and of the heritage, including the knowledge on the importance of the mansions.

### **Conclusion**

The town is modernising at a relatively late stage compared with several other European large harbour cities. For example, attempts to slow down the traffic in central areas (with special regulations, plans to improve the underground, and the

creation of special bus lanes) were long overdue, as were the projects for the reclamation of run down areas in the town centre (Belsunce, la Canebière), and new layouts for public spaces and derelict areas of factories near the harbour (Euroméditerranée, St Charles railway station). The city is being appraised. New headquarters are coming, and its Mediterranean character is now viewed more as a factor of diversity and identity. Residents appreciate the special relationship between the sea, a densely built city and a coastal and still natural location.

Residents also want the wide range of green spaces needed for modern life and some new programmes of parks have developed. Another main challenge, proposed after much debate by specialists, concerns the question of the relationship between communities and the road system, and all that brings: pollution, lack of legibility in courses, lack of identity, lack of urban amenities, increasing dependence on cars, new roads filling the most vulnerable parts of the outskirts. These questions make an ambitious challenge, worthy of the new millennium.

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# The Breda experience

## the role of green structure in urban planning

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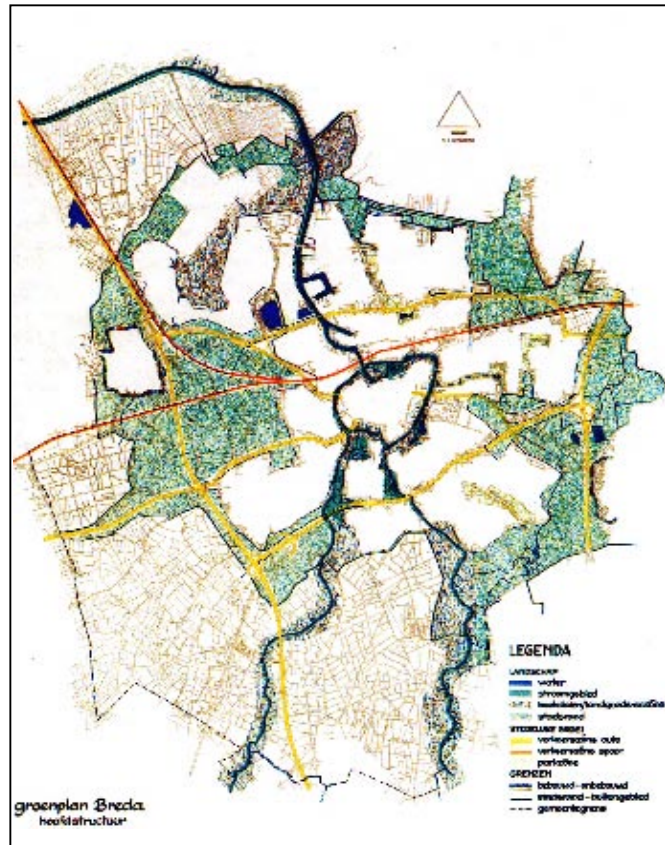
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### 1 Introduction

#### Research context

Breda was one of the first municipalities in The Netherlands to make a *Green Structure Plan*, a strategic plan that aimed at integrating the plans for individual parks, woodlands and graveyards into a vision for the development of the urban landscape. Because of this pioneer role the analysis of the Breda case deserves a special place in a research programme about the role of green areas in urban planning. The research concerns the experiences in Dutch cities and contributes to the European research co-ordinated by the COST C11 action. In an earlier paper I followed the same case study approach for the analysis of green structure planning in the city of Utrecht (Tjallingii, 2003).



1. This paper is partly based on research of the author at Alterra research institute, Wageningen



## Issues and research questions

Green structure planning originated from the concern in the 1980s that it became increasingly difficult to defend green areas against increasing pressure from building activities. Some actors in the green sector consider themselves to be the weaker party and feel the need to develop better defensive or offensive strategies: *green against red*. Some of the actors in urban planning, however, think the most effective strategy to keep green areas green is integrating green areas with urban development rather than defending them. Is green structure planning an instrument for defence or for integration or does it perhaps serve both strategies?

Against this background a relevant question is whether the green structure is equivalent with the *green network*: the idea of a network of pathways connecting wildlife conservation areas, an idea that has developed as the backbone of nature policy in The Netherlands. In practice, this view tends to develop into a defensive strategy. The integrative approach is found, for example in the combined planning of greenways and cycle tracks to give new life to an attractive traffic network that has a long tradition in Dutch cities. Another integrative option is found in riverside parks and floodplains and in other combinations of water storage and recreation functions of green areas. In which way green area planning is combined with policies concerning the networks of wildlife traffic and water?

Obviously, successful green area strategies require budgets for development and maintenance. Here too, the question is how green structure planning is related to financial planning. Is it public or also private? Does the future of green areas depend on the municipal green area sector departments' budget only, or does combined use also lead to joint financial responsibility? In this context the link is important between structure planning that creates conditions and operational planning that realises concrete projects.

## 2 The Breda Case

### Landscape and urban development of Breda

The city of Breda has approximately 160,000 inhabitants who live on a surface of 130 km<sup>2</sup> ( the density is 12 persons per hectare). The Breda urban region has about 300.000 inhabitants and is part of an urbanised zone south of the Randstad Holland. For the first part of this short outline I follow the text of an earlier case study (Tjallingii, 1995: 125) that contains all the details of the municipal sources.

Breda is situated between high and low. The settlement originated where the higher landscape of Pleistocene sands crosses over to the Holocene lowlands where, due to floods, sea clay has been sedimented. The valleys of the small rivers, the *Mark*, the *Aa* or *Weerijis*, the *Molenlei* and the *Bijloop* flow out here into the wider and once busy river *Mark*, which flows to the west between a few remaining sand ridges. More than anything else it is the pattern of the river valleys that structures the green areas in the city. To the south of the city the landscape is wooded, but above all influenced by intensive farming. The farmers heavily fertilise and drain their land and this frequently leads to peak flows that make the city water levels rise by more than one

meter. The increasing paved surface of the city, of course, adds to these problems. The deeper ground water flows reach the surface in a seepage zone on the northern edge of the city. Both rapid drainage and removal for drinking water lead to sinking groundwater tables in the seepage zone.

It wasn't until after the war that the city also expanded to the north, and in the 1960's the district *Hoge Vucht* sprung up, with a great deal of medium rise buildings and much light, air and space in the functionalist tradition. Green areas were planned for use and the total surface had to meet a standard number of square meters per person. In the 1970s urban building took a different turn and the new expansion to the Northwest, Haagse Beemden, became one of the first urban developments in The Netherlands which was deliberately designed in dialogue with the existing landscape. Together, landscape architect Frans Maas and urban planner Leo Tummers conceived a new urban area with 10.000 dwellings. Recreational use was not neglected, but green was more: the existing landscape with old country estates, woodland and farmland gave structure to the urban plan (Tummers & Tummers, 1997:125).

### **The 1986 green structure Plan and the 'green' planning history**

Partly inspired by the results in *Haagse Beemden*, the Parks and Gardens Department of the time also started to think in a structural manner about the green areas in the centre of the city. The result was the Green Structure Plan for the inner city (1982). This was expanded four years later to a Green Structure Plan for the entire city (fig 1). The plan made it clear that the local hydrology with river valleys and the floodplains, infiltration and upward seepage zones, was a basic ecological condition for the urban landscape. In this period, the municipal services were drastically reorganised and the Parks and Gardens Department became the Nature and Landscape Sector in the new Environment Department. After a public enquiry procedure, both Green Structure Plans were adopted by the city council and this strengthened the position of the sector department within the municipal organisation. The green sector took the lead in urban planning (Langeveld, 1992: 378). Local councillor Frans Römken, was responsible for environmental issues in that period. He took an active part in the making of the GSPs and, looking back, he explained: "In doing so we made clear that, starting with the green environment, we were able to develop a vision for the whole territory of the municipality" (van Ginkel et al. 1995:12).

The strong image of the main green network as a carrier for urban development and the teamwork in the making of the GSPs created political support. At the same time it led to many local projects that further expanded the public support in the Breda community. One example is the Ponds Project: development of *new nature* in urban green areas, directed at aquatic vegetation and amphibians. Some schools adopted a pond project in their vicinity. School children were engaged both in design and maintenance work (Timmermans, 1995: 150).

By the end of the 1980s, the leading ideas of the GSP were challenged by a new growth task for Breda inspired by the Fourth National Report on Spatial Planning. A struggle followed between the Environment and Urban Development depart-

ments. Both departments published new studies and there was a lively public debate. Following this, the national Eo Wijers Foundation directed their third spatial planning ideas competition at the *eco-region* Breda, with the title *Concepts which embrace town and country with ecology as the guiding principle*.

As a result of the discussions and the design competition consensus grew about the need to conceive an urban development policy that considered both the spatial claims for building and the basic natural system that was underlying the GSP. Step by step the policy documents of the Environment Department demonstrate a move from a green sector view to an integrated approach incorporating both *green* and *red* issues. These steps were marked by the Landscape Policy Plan (1990), the Municipal Environmental Policy Plan (1991) and the Regional Ecological Model (1992). This Regional Ecological Model further elaborated the GSP frame to become an ecological frame for sustainable urban development of the Breda Region and included all functions requiring space. The frame was able to position new residential and commercial developments but also new ecological corridors and new urban forests.

Local politicians, civil servants and the public in Breda were highly inspired by worldwide events that led to the 1992 UN Rio Conference about sustainable development and this theme became a leading idea in municipal policy. A former State Minister of the Environment became the mayor of Breda and he further promoted a strong environmental policy. Green became identical with a broad policy for sustainable urban development that included both green structure planning and an operational programme of projects.

In 1995, the broad green structure approach was challenged by the provincial plan that returned to a narrow sector concept of green as nature. The local planners, however, were able to amend the plan for the Breda situation. In 1997, as integrated planning had further developed at the local level, an actualisation of the GSP frame was required in the context of the new urban structure plan, the *Stadsplan*. The name Green Structure Plan had disappeared but the leading idea survived and contributed to the basic networks that form the sustainable frame for dynamic urban development. This basic network is confirmed by more recent local structure planning documents. In recent years, the important role of landscape structure in both rural and urban development is recognised and named the *groundlayer* of spatial planning. Both in Dutch national spatial policy (Ministrie van VROM, 2001) and in the European Spatial Development Perspective (European Commission 1999), a layer approach is adopted with landscape as the *groundlayer*.

In the year 2003, for the third year in a row, the national initiative for sustainable development elected Breda as the most sustainable city in The Netherlands. This demonstrates the continuity of the planning tradition of which green structure planning is the backbone.

### **Planning, management and maintenance practice**

The Breda GSP combined financial commitment to priorities in the green network

with *the principle of give and take* (Verburg et al. 1994:270). This implied that in neighbourhoods with a lot of green areas some public green could be turned to private green or even to red. The GSP included the agreement that the money generated in this way could be used by the Parks department itself to improve the quality of green areas in other places. This gave the Parks Department a certain freedom of operation even in a period of severe budget constraints. The GSP provided the basic comparative information about green areas in different districts. But most important was the way the GSP gave priorities for investment in the main green network.

The GSP also played an important role for the department itself. Maintenance practice was changing under the pressure of increasing ecological awareness in the 1980s. This implied the decision to force back the use of chemicals for weed killing in green areas and on paved surfaces. The use of chemicals, however, is rather cheap and more ecological alternatives were still in an experimental stage. This led to a process of learning with experimental pilot projects that were assessed by the maintenance workers, designers and local residents together. Special workshops made designers familiar with new practices that required for instance minimal paved surfaces. Detailed instructions about the regime of maintenance are not specified in the GSP but in the operational green management plan.

### **Ecological networks, water and traffic**

From the beginning green planning in Breda included an open eye for the synergism between green areas and water issues like groundwater, riversystems and rainwater retention. The Zaartpark project is only one example, but projects have been realised in all river valleys and in almost every part of Breda. One of recent projects is the *watermachine* to the northeast of the city where rainwater storage is combined with purification in a system of lakes and watercourses on the edge of the city. A recent plan for the inner city proposes to open up again the old harbour that was filled in the last century.

Planning for the interaction between green structure and traffic networks has focused on issues like the crossings of rivervalleys and the main roads. Presently, planning efforts in the existing city are concerned with radial development zones and the railway zone where traffic, new buildings and the quality of public open space all play their role. A major new project and a challenge for green network planning poses the new Amsterdam – Paris high speed train that passes the city through the western fringe. A concentration of the new railway with existing infrastructure in this zone creates new opportunities for broad viaducts that enable the crossing of local traffic, pedestrians, cyclists and wildlife.

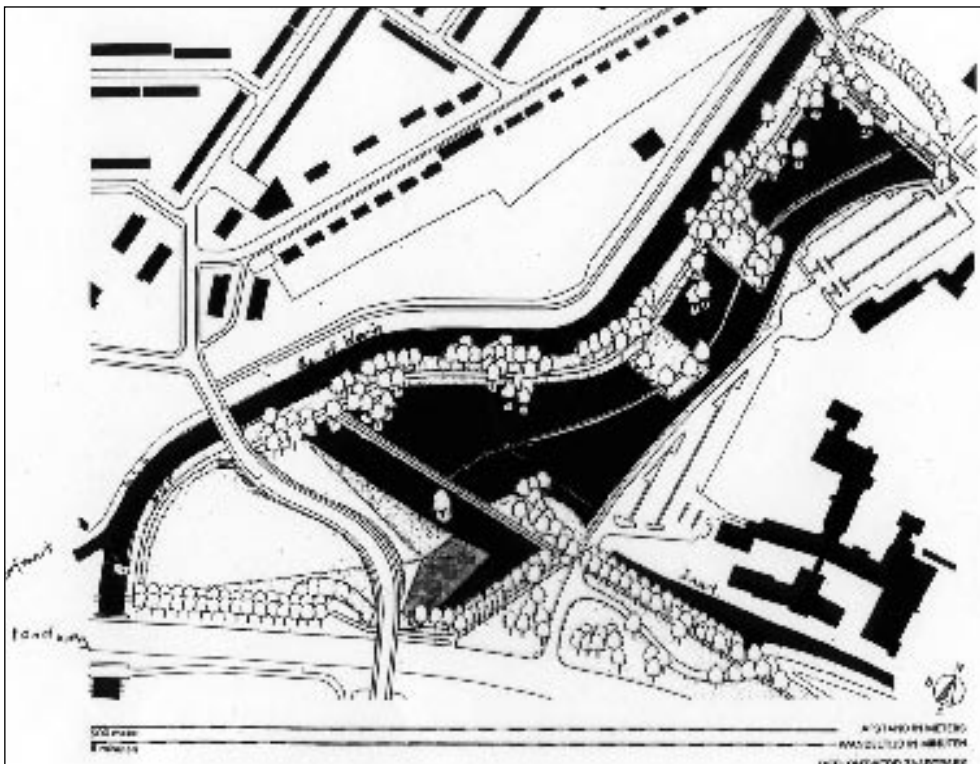
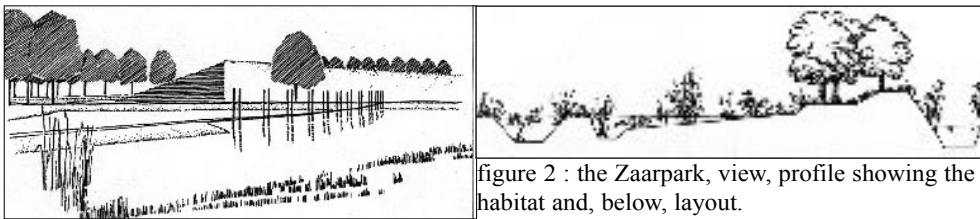
### **Structure plans and projects**

The Breda GSP started a policy development that increasingly created good conditions for projects. Starting in 1994 a series of *yearbooks for sustainable urban development* reported about the concrete urban projects that were realised. From 1994 onward, yearbooks for sustainable urban development presented projects and

activities of the current year. These projects include new urban developments like the Westerpark district, a planned digging up of the old harbour in the inner city and a number of water retention plans in the urban fringe. The yearbooks demonstrate the wide support for an integrated approach from citizens, civil servants and politicians. The 1999 yearbook focused entirely on green area projects (Kater et al., 1999). The Zaaipark (figure 2) may serve as an illustration.

### The Zaaipark case and the green structure plan

In 1991 a small park (6 ha) was laid out in one of the river valleys in the city of Breda. The designers of the Zaaipark, landscape architects H+N+S, created a green area with many functions for the local residents who participated in the making of the plan. The new park also adds an important habitat to the spatial ecological network for plants and animals. And, last but not least, it performs an important function in the water system by providing storage for the clean water of the Zaaipark, a brook that runs into a polluted small river. The project costs were approximately € 1 million.



The Parks Department had not planned the project for 1991, so initially no funds were available. However, the 1986 Green Structure Plan with its map provided a clear picture of the priorities for investments in green areas. Moreover, *the principle of give and take* enabled the Parks department to use money generated by privatising public green spaces for funding projects connected with the green network. Under these conditions the money paid by a local hospital to buy land for the extension of its parking lot was used to start the project. Moreover, taking advantage of the structural position of this site in relation to the water system, an innovative plan was designed that made the Zwartpark a pilot-project that generated extra funding. In this way a small quantitative loss of green land could be used as a lever to gain an important qualitative improvement in the green network.

### **Discussion**

Returning to the issues and questions of the introduction I will discuss them under the following headings.

- ***from green areas to green networks, from quantity to quality***

The Breda case confirms the idea that Green Structure Plans represent a shift of attention from individual green areas to green networks. A survey of 18 Dutch municipal GSPs (Meeus et al. 1989) describes this shift towards a spatial network approach as a general trend. In the Utrecht case study (Tjallingii, 2003) I describe the same trend and discuss how it relates to an international tendency illustrated for example by the role of the green zones in the German Ruhr area (IBA Emscherpark, 1992). For green open space planning in London, Turner (1992) characterises the trend as: *from standards per 1000 to green strategy*. Previous reports, he argues, have focused on the quantity and distribution of open space. In the new approach the emphasis is on the quality of open space and on its structural role (Turner, 1992: 385). The Utrecht GSP struggles with the quantity versus quality issue and found no clear relationship between the quality of a green area and its surface. The Utrecht GSP authors, however, expect poor quality if the surface of a green area is below the standard of 20 m<sup>2</sup> per inhabitant (Gemeente Utrecht, 1990: 35). Although the Utrecht GSP showed spatial green structures, the green area department was reluctant to use these structures as an indication of value and commissioned further research to quantify the value of green areas. There is no evidence, however, that the resulting figures (Hinssen, 1992) were performing as a practical tool in the negotiations about *green* and *red* in Utrecht. In the Breda case, the basic regional ecosystem determined the spatial structure and this is the backbone of the green structure and the value of this structure in urban planning.

This does not imply that figures were unimportant. Quantified data were analysed and used for work planning and budget control (van Asperen 1983). But the Breda GSP highlighted the structural base and used the images of the plan to convince others of the need to adopt an ecological base for both red and green development of the city.

- ***defensive, offensive or integrated***

The Breda case leaves no doubt about the strategic role of a planning approach that started with the GSP. This approach is neither defensive nor offensive. Rather, the Breda type of green structure planning is an integrated way to let green areas play a prominent role in urban projects. Apparently, the essential element is the move from green structure as a tool for sector planning to green structure as a groundlayer and frame for integrated urban planning. The Zaartpark case illustrates the usefulness of this tool in the Breda situation. In comparison, the Utrecht GSP resulted from a defensive attitude. At the project level Utrecht has had some impressive green successes, however. One project involves the digging up and restoration of a canal with green banks that was filled thirty years ago. The evident success of this project, however, is not a result of deliberate green structure planning (Tjallingii,2003).

- ***strategies and budgets***

The Zaartpark case also demonstrates a possible link between green structure and budgetary planning. The Breda GSP combined financial commitment to priorities in the green network with *the principle of give and take* (Verburg et al. 1994:270). Thus the department could invest in green areas in spite of budget constraints. In the Zaartpark case this was not enough, but the backbone position of the new park in the Breda green structure made it possible to tap new financial sources. Obviously GSPs can be made more effective if spatial and budgetary strategies join forces.

- ***ecological networks, traffic and water***

The Breda cases confirms the expected link between green structure planning and policies to bring nature back to the heart of the city. In Breda, the most important ecological pathways are the river valleys that constitute the basic green structure of the city. The *Zaartpark* is just one example that demonstrates the potential for new habitat creation as a part of a public park.

The Zaartpark is one of many projects that combine green area and water planning. Other projects include the new Westerpark development and several new parks between the central city and neighbouring villages. Breda is pioneering in this field. This cannot be said of the combination of cycle tracks and greenways, where Breda is lagging behind. The Utrecht satellite new town Houten is the leading example in The Netherlands that shows the high potential of this greenway design principle.

- ***green structure planning and green urban projects***

The Breda and Utrecht cases demonstrate two different approaches. In the Breda case green structure planning became an instrument in the emancipation of the green sector. Gradually, a fruitful climate of co-operation grew that resulted in a wide range of integrated projects for sustainable urban development. In the eighties and early nineties, the Utrecht green sector department used green structure planning as a defensive tool that had a limited impact. The recent battlefields of *red versus green* had left their traces and the climate was coloured by strategic interests rather than by co-operation. In spite of this, some important green projects survived.

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# The Greenstructure of Munich

## The need for and risk of regional cooperation

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### **1 The formation of the greenstructure of Munich**

#### **The natural context ...**

Munich is situated 80 kilometres north from the Alps in the Munich plain, a glacial and postglacial outwash of limestone gravel (Fig. 1). The plain has few geomorphologic features to influence urban development except the floodplain of the river Isar with its sequence of river banks and terraces. Despite its overall homogeneous appearance, a variety of habitat types reflect the fine grained pattern of ecological conditions in the Munich plain. Today, only small patches remain of the natural woodland types of predominantly oak and the cultural landscapes such as the once extensive grassy heathlands and fenlands in the northern Munich plain (Fig. 2). The river Isar is a broad green corridor from south to north through the city. (More information can be found in the policy case study in chapter xx and on the internet <http://www.map21ltd.co.uk/COSTC11>).

Outside the floodplain, the woodlands have been mostly cleared in the northern part of the Munich plain, whereas the woodlands in the south were protected as forests. Clearings around villages give this landscape a characteristic structure until today. Most natural habitats were destroyed by modern farming practices and urbanisation. They are small, isolated and often neglected or badly managed. Still, the results from the first habitat survey in 1983 showed that 11% of the city surface are important sites for nature conservation. The city includes habitats that are unique and/ or have become extinct elsewhere. Interestingly, the city's biodiversity is higher than that of the surrounding countryside characterised by intensive farming. The natural context of the greenstructure is described in more detail in the "ecology" case study (in chapter 3 of the book). An extended version can be found on the internet.

#### **... and urban history**

The City of Munich was only founded in the 12th century on the western banks of the river Isar. *King Henry (Heinrich der Löwe)* tore down the old bridge over the river Isar



Figure 1: Munich is situated 80 km from the Alps in the Munich plain (source: Bavarian State Ministry for Regional Development and Environmental Affairs 2003, p.1)



Figure 2: Usable green structure in Munich and the Munich Region. The historic Englische Garten (Photo: S. Tiedtke) and fenlands in the northern plaine near Freising (Photo: I. Burckhardt)



Figure 3: Green structures and different standards of supply in the City of Munich (City of Munich, W. Nohl, 1995, p. 71)

further north to build a new one. The rise of Munich at the crossing of two important European trading routes, in particular for salt, began. Later, it became the residence of the Bavarian electors and then kings who created summer residences with large parks outside the city (*Nymphenburg* and *Schleissheim*). The summer residences were far outside the city and surrounded by farmland. They were linked to the city by canals, avenues and a sequence of places and small parks.

Munich remained a small town within medieval boundaries until the 19th century. The Map of 1812 shows the city still mostly confined within its medieval limits, surrounded by a corollary of gardens, keeping respectful distance from the floodplain and already expanding northwards with the first public garden in Europe in the English landscape style. The *Englische Garten* was created by *Friedrich Ludwig Sckell* from 1789. Unfortunately, Munich did not keep its old ring of fortifications with the bastions and most of the historic canals still shown on the map (Fig. 2). They were later mostly built over or filled in.

The first big projects of city enlargement took place in the first part of the 19th century, when the elector Maximilian and King Ludwig I built new neighbourhoods in the north, and northwest of the city. These extensions followed a grid pattern. They were speculative and very densely built up. The strong growth in built-up areas at that time was not complemented by the creation of public parks. Greenspace was only created in the form of small squares with a representative character. Moreover, big cemeteries were located at each of the four points of the compass.

Between 1871 and the turn of the 19th century, the city experienced a dramatic growth from 170,000 to over 500,000 inhabitants. In 1935, Munich had a residential population of 735,000 inhabitants (LH München 1991). Most of the industrial development took place in the north of Munich whereas high quality residential areas developed in the south, around Nymphenburg in the west and along the river Isar corridor. Thus, the differentiation between the 'rich' south and the 'poor' north of the city was already founded from the beginning of the city's development.

Another element of Munich's greenstructure that becomes more and more important today originates from this time. It is the railway system with a main corridor stretching from the city centre to the west. Together with Nuremberg and Berlin, Munich was one of the cities chosen by the Nazis to demonstrate their power. Fortunately, the planned grand style reconstruction of the inner city was not carried out while large-scale infrastructure projects such as the motorway ring in the north and the freight railway station were left unfinished. These derelict lands became big informal greenspaces and ecologically important sites in the northern part of Munich where public greenspaces are lacking. Many parts of the city were destroyed in WW II. Some squares and blocks were not rebuilt until recently (Marienhof, Marstallplatz). Just now, the redesign of an empty square in the city centre, Jakobsplatz, has begun after a debate about its future for over 50 years.

After the war Munich began to develop rapidly. Siemens and some other large

companies chose Munich for their headquarters. Larger projects to create new public greenspaces have only been realised after a long period since the 1970s, with the creation of the Olympic Park in the north, the East Park in the 1970s and the West Park in 1983. Each park is distinct by its “design language”. In the southern part of the city, the Isar still has some non-designed parts with gravel banks which are very popular for recreation. In 1984, Günter Grizmek, then professor for landscape architecture, started an initiative to promote this kind of “useful technical landscape” and he raised a lot of protest by those experts who held up the qualities of a well designed formal greenspace.

## **2 Challenges for greenstructure management in Munich**

### **Within the cities borders ...**

Munich is the 3rd largest municipality in Germany, with a population of 1,3 million. The density is 42 persons per hectare. In city statistics, Munich is listed as one of the most densely built-up urban areas in Germany. The economy is now mainly based on information technology, services, banking and the insurance sector. As a consequence, the Munich region has a high percentage of highly paid jobs and one of the lowest unemployment rates in Germany. There is a continuing strong need to build new homes and office floor space but land available for development is scarce.

The city is aware of the need to protect and develop its greenstructure. The urban strategy “Munich Perspectives” and it is subheaded ‘Compact - Urban - Green’. It includes a greenspace strategy to develop a greenspace network. The so called social land use regulation allows the city to levy a tax on the added value from development, and this means is also effectively used to implement social and ecological measures. However, the abandonment of building activities and creation of greenspaces within the city is opportunistic, for instance, when land becomes available as on the former railway areas or the new neighbourhood of Messestadt Riem. Densification of the city has been favoured by the planners to contain urban sprawl. Pressure on greenspace in low density residential areas by infill densification is very strong. As a consequence, gardens with many old trees are lost.

The city uses formal and informal instruments for greenstructure planning to achieve its aims. Formal instruments are for example greenspace protection. 19% of the city area are under different forms of protection, from strictly protected nature reserves and natural monuments (e.g. heritage trees) to protected landscape areas where development can be controlled. In addition, public greenspaces are owned by the city or the Bavarian state (e.g. the historic parks), and therefore well protected.

Formal planning instruments are the landscape plan on the municipal level and the greenspace master plan on the level of neighbourhoods. These plans set the goals for landscape planning. They need to be approved by the local council and the lower nature conservation agency of the federal state and are then integrated into the land use plan and Master plans, respectively. This integration gives the plans legal strength

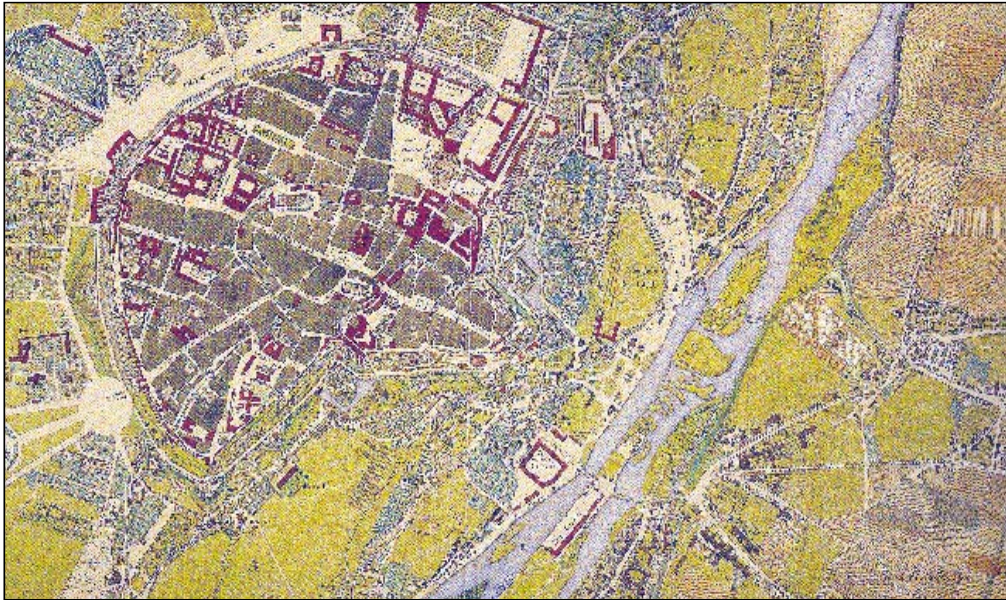


Figure 1: The Isar was once (1812) a wild alpine river (Schiermeier 2003, p.83)



Figure 2: The section of the inner city is the most important open space for recreation and outdoor activities (Photos : S. Tiedtke)



Figure 3: The redesigned first section of the river Isar aimed to restore the beauty of the wild river (Photos : S. Tiedtke)

but it also means that many of the “green” contents can become lost in the process (a more comprehensive account of the German system of landscape planning is given in English in Turowski 2002).

Mitigation banking is considered today as a potentially very effective instrument to link urban development with the creation of new greenspaces. Also mitigation banking allows to develop coherent greenstructures through combination of compensation measures from individual urban developments. Moreover, it is now required not only to compensate for individual projects but also for Master plans. It is an open question right now whether this compensation scheme can be extended to the regional level and how this can be used for the improvement of the greenstructure at that scale.

The creation of greenspaces is often linked with large development projects. Also, garden exhibitions have a long tradition in Germany, and especially in Munich. They set planners under pressure to present a park and also a consistent green strategy to the public. Cities compete with this informal marketing instrument and Munich will present the new neighbourhood of Riem with its greenspaces in 2005.

### **... and in cooperation with neighbouring municipalities**

Munich is a concentric and very compact town. It did not succeed to incorporate the neighbouring municipalities during the first half of the 20<sup>th</sup> century as other cities did. Therefore, the big challenge of today is to cooperate with independent neighbours and find solutions for the siting of unwanted infrastructure facilities. For instance, the new airport is about 40 km away from the city centre near Freising. It caused a huge problem for the transport system. Modern public transport was mainly realized in the 1970s before and after the Olympic games. A star-like light railway system connects a region from Freising to the lakes and Alps in the south. Today, the planners discuss how this system could be converted into a network system of public transportation to reduce the development and transportation pressure in the central city. Water supply, waste management and waste water treatment are further functions that Munich can only handle with the help of the region.

The big lakes and the Alps are a big attraction for Munich’s residents but 80 km away. The exodus to the south causes huge traffic problems every weekend. Since 20 years the northern region tries hard to provide recreation facilities close to the settlements. Lakes have been created from former gravel pits for swimming and recreation. More and more, the farmers are included in the maintenance and management of important landscaped zones and are encouraged to switch to self-marketing.

### **3 Present activities**

*In the centre* ...The densely built up inner city and neighbouring 19th century developments are the most deficient areas of greenspace. The closed blocks of the inner city are still attractive places for living in neighbourhoods with small shops, cafes, etc. However, it is difficult to increase the amount of greenspace in the small courtyards often used as car parks. Vacant lots are mostly redeveloped. The inner and

the middle ring road are some of the most problematic places to live because of the heavy traffic. The function of these roads has been an issue of great political debate. In 1996, the “green” interest groups lost a public poll to reduce the capacity of the ring road. Instead, it was decided to put the road underground and increase its capacity. In the north, a park has been built on top of the covered road (Petuelpark).

... *the city's fringe* ... A national garden festival is now due to open in the new neighbourhood Messestadt Riem in 2005. The area of the new Messestadt Riem was used as the main airport until 1985. The area became available for a large mixed development with residential areas, an exhibition centre, commercial areas and a modern park. In turn, the former exhibition centre (*Theresienhöhe*) is now being converted into a mixed neighbourhood in the inner city.

... *and the region*: In particular the city region is experiencing very strong growth. The landscape is flat and rather monotonous but has many ecologically important sites such as remnants of the grassy heathlands and fenlands. On this level, co-ordinated efforts of the different local authorities and all other stakeholders are required to protect and develop the greenstructure of the future regional city. Two initiatives have been set up for this purpose, the “Heathland Society” and the “Fenland Society”. Both contribute to the general aim to attract people in the northern part of the Region of Munich.

We will refer to two activities in detail in the case studies of part B of this book. The restoration of the river Isar floodplain in the central and southern part of the city is a major project to improve greenspace provision and quality (see “Policy” chapter). The city promotes a multipurpose green belt area around Munich (see “Ecology” chapter).

#### **4 Conclusions**

In some respects, urban development in Munich and its region resembles a merry-go-round. Areas formerly used for infrastructure facilities become available for urban development projects by modernising or translocating the infrastructure. These developments create also opportunities for developing public greenspaces. As an informal rule, one third of the overall area becomes greenspace in large projects such as the new neighbourhood Messestadt Riem and the redevelopment of areas along the main railway corridor. Of course, while big parks are created in this way, the overall amount of open space declines through each regional urban project. Moreover, the scale of impact increases with every cycle. The new airport and the new exhibition centre are much larger than their predecessors. This increase in size is connected with the loss of green space and wildlife habitats as the heaths and fenlands in the Munich plain.

The city did not plan a greenstructure during its main phases of urban development



and natural physical boundaries did not restrict urban growth. Consequently, the city has not a coherent greenspace system. Parks are rather scattered islands, except the river Isar floodplain. There is a lack of connecting green networks, in particular in east-west direction.

Recently, large parks were created but the overall greenspace balance is negative. The population has remained stable since the 1970s. However, due to increasing per-capita space demand and the need to locate new industries and services, the pressure on greenstructure continues to be very high. There is a need for adaptation of the existing instruments for greenstructure planning to meet the increasing and more diverse recreational demands and improve the environment in the city. A reduction of environmental impacts, the linking of greenspaces and the systematic reuse of previously developed land can only be achieved, if coordination and cooperation, including intensive public involvement, becomes the norm not only on a city wide scale but also in a regional and ecologically informed densification strategy.

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# Milan and the regional 'green structure' of Lombardy

## Maurizio Meriggi

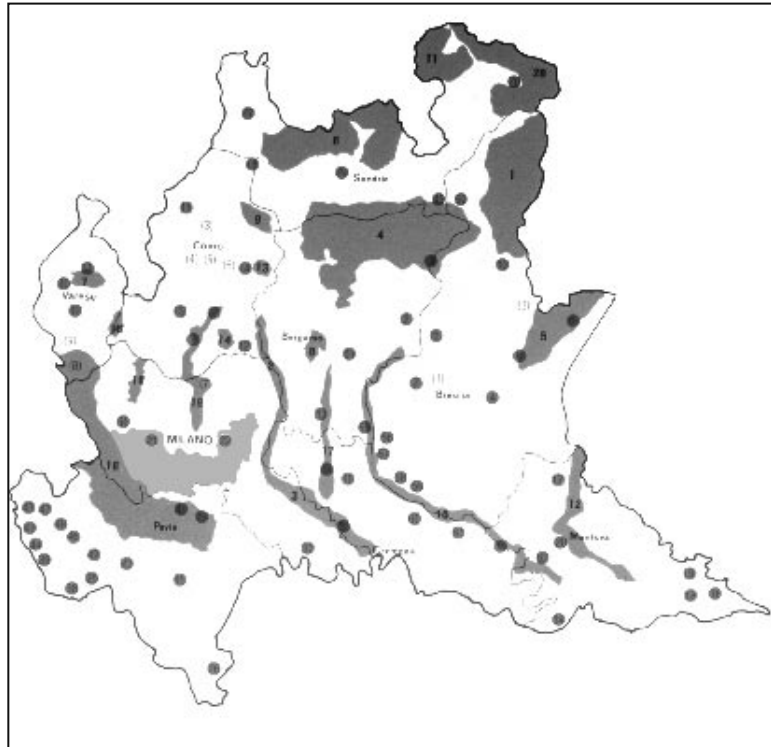
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### 1 Milan, geographic and demographic data

Milan (the Roman Mediolanum – “in the middle of the land”) occupies a central position in the Lombardy plain, between the foot-hills of the Alps (nearly 40 km to the north) the river Po (almost 50 km to the south) and two of the Po's main tributaries from the Alps, the rivers Ticino and Adda, (some 30 km to west and east, respectively).

At about 100 m. above sea level, Milan occupies a prime position in relation to water courses gravitating down from the Alps to the plain.

Ground in the northern part of the city is fairly dry, while land to the south is extremely lush and fertile. These geographical factors have long played a key role in the city's development. Dense urbanisation and manufacturing activities in the northern part of



the area expanded to the north-west (along the Ticino valley, towards Lake Maggiore) and to the north-east (along the Adda valley, towards Lake Como). Conversely, land to the south has remained principally agricultural, with relatively few towns concentrated mainly along the route between the western and eastern and the seabords.

Milan and her hinterland now form one of the most densely urbanised areas in Europe at the southern end of the so-called 'Blue Banana'. In all, the city, its suburbs and extensive outskirts (including both urban and rural areas), cover some 188 municipalities, encompassing a population of 3,5 million and an overall area of about 2,000 km<sup>2</sup>. The population density of this "Greater Milan" is 17,5 persons per hectare. Considered at the regional scale, complete with medium-size belt cities (the "Lombard Multinuclear City", with the cities of Varese, Como, Lecco, Bergamo, Brescia, Lodi, Pavia, and the outer poles of Novara in Piedmont and Piacenza in Emilia) the total population amounts to nearly 7 million.

A Milan "Urban Region" consisting of the area bounded by the rivers Ticino and Adda, to west and east, by the foothills of the Alps to the cities like Novara and Bergamo, has become a feature of Planning Documents in recent years.

## **2 The green structures of Milan**

As given above, Milan's Green Structures should be considered from two points of view : the city and the Urban Region, i.e. the system of urban "green structures" within the metropolitan core (extending from the city centre to the inner peripheries of "Greater Milan"), and the system of Regional Parks. The latter represents the most original experience Milan has to offer as a case study in the Italian and European panorama: an attempt to create a "green structure" of great size, on the scale of an "Urban Region", which also serves as a tool for "grey structure" planning.

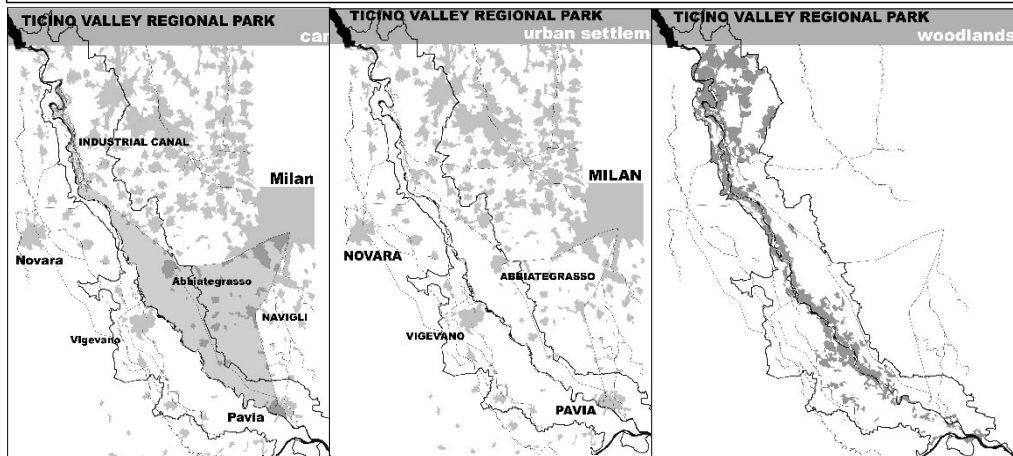
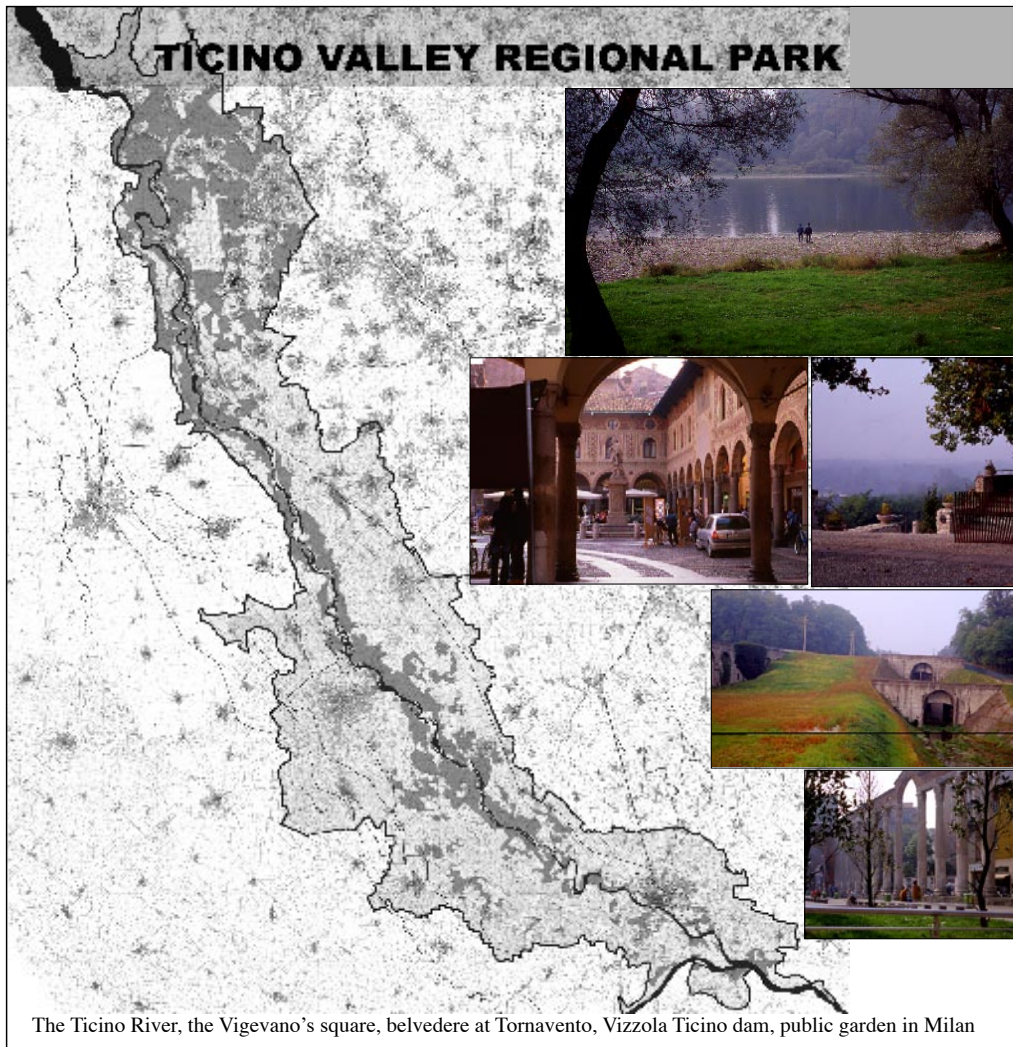
### **2.1 The green structure of "Greater Milan" : from city centre to northern periphery.**

The green structure of "Greater Milan" is composed principally of the city of Milan's urban parks, supplemented by several extensive green areas located outside the municipal boundary but within the administrative area of the 'Province'.

The development of this green structure followed the expansion of the city from the mid-19th century (when Milan was still a walled city) to the end of the 20th century (when Milan became a conurbation). As stated earlier, the principal thrust of this urban growth was to the north-west and to the north-east, with some recent exceptions to the north and east.

#### **• North-east system.**

In 1783, when the city was still under Habsburg rule, the first public park was begun in the north-eastern sector of the city intra-muros, on land formerly in monastery ownership, adjoining the "Venice Gate" (Porta Venezia). Originally designed as an "Italian garden" with a smaller "English garden" appended to the Royal Villa of



1790, this park became the “Giardini Pubblici di Porta Venezia” (17,7 hectares). In 1881, temporary structures were erected there for the National Exhibition (the first event of what was to become the Milan Fair). The role of the public gardens as a venue for the leisure and cultural activities was reinforced by the construction of the Natural History Museum (1893) and the Planetarium (1943). In 1777-1780, a Royal Villa was built at Monza (some 15 km to the north-east of Milan’s Porta Venezia) There too Italian and English landscaping influences were combined in the design of the associated park (732,5 hectares). In 1922 the famous Monza Autodromo (motor racing circuit ) was built in the park. The former Villa now houses a school of arts and crafts. In 1923-1927, the Monza Biennale (international exhibition of decorative arts) was held there, as was the 1930 Monza Triennale (forerunner of the Milan Triennale, first held in 1933 at the Parco Sempione). In the late 19th century, another large park was planned along the same Milan-Monza axis, complete with a hippodrome. All that came of the project was the race-track ; it was closed in the 1920s (when horse-racing was transferred to new premises north-west of the city). The former track was converted for use as an open air school (the Casa del Sole) and a park (the Parco Trotter).

• **North-west system.**

Soon after the “Giardini Pubblici di Porta Venezia” opened to the public, a large new sports stadium in the form of a Roman arena was inaugurated (1806) ; it flanked the then Parade Ground occupying part of a former ducal hunting ground immediately north-west of the Castello Sforzesco.

At the end of 19th century, the old Parade Ground was designated as the site for a new public park by the first Milan Master Plan (1889) :the future “Parco Sempione” (47 hectares). The second National Exhibition (1906) was held there and, nearly three decades later, the “Palazzo dell’Arte” was built in the Park for the first Milan Triennale (1933). Meanwhile, Parade Grounds a few kilometers to the north-west became available for other purposes. Extensive green structures had been planned around these Parade Ground since the late 19th century. In the 1920s and 1930s the Milan Fair was transferred to the site, and a group of parks was built nearby, with extensive sports facilities including a new horse-racing track, the San Siro football stadium and a large swimming pool at the “Lido”. This area was enriched during the Post-World War II reconstruction of Milan by providing new green areas on an artificial hill made with accumulated rubble from the bomb-damaged city (1943). Called Monte Stella, this hill also has an agricultural zone (Parco di Trenno).

• **East system.**

Two special parks were created to the east of Milan during the 1930s : Parco Lambro, on the River Lambro, and, a few kilometres further south the Idroscalo – a stretch of water originally intended to serve as a seaplane port within easy reach of Milano Linate airport. The Idroscalo was later converted into an aquatic sports facility. A new park was created nearby in the 1960s : the Parco Forlanini.

- **Metropolitan belt park system : North Park and South Agricultural Park**

Milan's most recently created parks are the North Park (1975) and the South Agricultural Park (1990). Located at the interface between the Metropolitan administrative area and neighbouring municipalities, both these parks were planned as links between the metropolitan core and the belt of the Regional parks.

The North Park (600 hectares) is located within a built-up area ; it encompasses subsisting patches of agricultural land, scattered woods, a former military airport (part of which is now used as a 'recreational airport') and a large Secondary School complex. The North Park represents the most southerly ramification of the northern Regional parks, forest land for the most part, stretching like fingers through the agglomeration of Milan's northern suburbs.

The much larger South Agricultural Park (48,000 hectares) forms a 15 km-wide green belt around the southern part of the city and its outskirts, linking two Regional Parks : the Ticino Valley Regional Park (to the west, on Lombard and Piedmont Regions) and the Adda Valley Regional Parks, South and North (to the east). Composed principally of cultivated fields and compact farm buildings of the courtyard type (the "cascina" traditional to the Po Valley ), the South Agricultural Park also encompasses a number of some of satellite "dormitory towns built in the 1970s and 1980s.

- **New city parks in the making**

In 1995, the Nine Parks project was adopted by the City of Milan. The aim was to create new parks in zones mainly occupied by redundant industrial and military premises, by means of public-private partnership agreements : the Municipality would sanction planning zone changes (from industrial to residential) and high building quotas providing 50% of the overall site area was given over to parkland. Six of the Nine Parks are now at the construction phase.

- **Dynamics**

By analysing the way Milan's green structures have been formed, we may observe some phenomena closely related to the problems of the densely built metropolitan conurbation, notably the problem of finding enough large areas of land for parks.

We have seen how the creation of parks in the north-west system of green structures followed outward shifts, from the centre to the periphery, of activities requiring extensive areas of land, such as military Parade Grounds or the Milan Fair : Parco Sempione was laid out on former military land (the old Parade Ground) and, for a while, the Park shared this site with the Milan Fair. Later, the Milan Fair was relocated to a site vacated by other Parade Grounds which, in turn, moved still further out of town ; that site has since become surplus to military requirements too, and a new park is now proposed there (one of the Nine Parks). As the Milan Fair has been yet again, to an out-of-town location, the question of whether or not its previous site should be used for a green area is currently under discussion. In the case of "green structures to the east and the north system of the city, we have seen how the creation of parks shined upon re-using former airports or airport-related facilities for leisure uses :

the Idroscalo, where a seaplane port was converted for use as a “water park” ; and the “North Park”, where a former military airport became a “recreational airport”.

The inter-relationship between airports and ‘green structures’ is also a major issue with regard to Regional parks in the vicinity of Milan (cf infra, The Ticino Valley Regional Park relationship with the Malpensa hub).

Another characteristic of Milan’s green structures in the parallel development of parks within the city and on its outskirts. Such was the case when Milan’s first green structure (the “Giardini Pubblici”) was created within the city walls while the Duke’s park was taking shape a few kilometres away, at Monza. A comparative pattern emerges from analysis of the role played by the Regional Park network, in creating green structure at the scale of the “Urban Region” as is explained below.

## **2.2 ‘Urban region green structures’: Regional park network**

When considered at the scale of the “Urban Region”, ‘green structures’ are represented by a network of Regional Parks where Municipalities and Provinces, working as consortia, have direct responsibility for works of environmental renewal and revitalisation, and for enabling public use of these parks by building and/or maintaining such structures as cycle ways or canals. (for further information, cf ‘Policies’, the Chapter five, Milan Case Study).

This network is composed as follows: two riverside parks, to east (the South and North Park of the Adda River, 31,400 hectares) and to west (Park of the Ticino, 90,000 hectares); a metropolitan belt park to the south (Southern Milan Rural Park, 48,000 hectares); and two linear parks wedged between built-up areas to the north-west (Parco delle Groane, 3,445 hectares) and to the north-east (Lambro Valley Park, 7,254 hectares). These are linked by smaller Regional parks.

This extensive green belt of parks positioned around the city has been used by planners as a strategic tool, to curb the outward expansion of the “Urban Region”. Yet the designation of Regional Parks - which constitute Territorial Plans at a supra municipal level and thus take precedence over Municipal Master Plans - has turned out to be the only possible mechanism through which the city can be equipped with green structure, at a time when the Milan Metropolitan area is confronted by the increasing deregulation of building development and the extreme fragmentation of administrative powers and planning instruments.

## **3 The Lombard Ticino valley Regional Park as an example of ‘regional scale green structure’**

The Lombard part of the Ticino Valley Regional Park, on the western outskirts of the Milan Metropolitan Area, is the largest one of the Lombard parks. It was designated in 1974 and represents the Lombardy Region’s first experience in combining the overall planning and design of green areas with environmental protection, as a means to counteract urban sprawl. One of this park’s characteristics is the very wide swathe (20km to 30 km or more) of protected land running the entire length of the river

valley. In all, the park covers a total area of 90,640 hectares ; it encompasses 430,000 inhabitants and 47 municipalities in the provinces of Milan, Pavia and Varese.

The Lombard Ticino Valley Regional Park covers the Ticino river valley from Lake Maggiore to the River Po ; its boundaries envelope river banks and the canals, large areas of woodland (including former feudal hunting grounds) and agricultural land, three medium-size cities (Pavia, Vigevano, Gallarate), several smaller cities, 2500 agricultural businesses and Malpensa airport (the inter-continental hub for northern Italy). Three highways, four railways and several national and provincial roads traverse the river (and hence the park).

The Ticino river bed, with its multiple floodplain ramifications, is the widest bed of all the Po tributaries. It presents an exceptional biodiverse environment and constitutes an ecological corridor (the only one in northern Italy) between central Europe and the Mediterranean. These conditions are unique in Italy, there are no other plain of similar size, nor any comparable ‘natural’ environment, anywhere else in the country. Moreover, the Ticino valley is within easy reach of the sprawling Milanese agglomeration, yet because it was used as a game reserve throughout the 19th and 20th centuries (by members of the Lombard and Piedmont nobility and subsequently by rich industrialists), its natural environment has survived, more or less intact.

Another remarkable aspect of the Ticino Valley Regional Park is that, despite its vast size, its boundaries ‘happen’ to coincide with green and grey structure that were already well-designed and well-equipped ; the word ‘happen’ must be used here as some municipalities in the valley opted to be included in this Regional Park while others did not, for reasons of local politics. In fact, the park would be improved by the inclusion of other municipalities, particularly on the Piedmont side of the river where the area granted to the Ticino Valley Regional Park is limited to a narrow strip along the river banks and nearby woodlands (an area of 6,250 hectares) in 11 municipalities.

### **Structure and landscape of a Regional Park**

A Regional Park is a consortium of Municipalities and Provinces, governed by an Assembly (Assemblea Consortile). The territory of the Park is governed by a Plan of Territorial Coordination (PTC) setting out restrictions and conservation criteria applicable to each typology zone.

I shall attempt a brief description of the landscape in the Ticino Valley Regional Parks of Lombardy and Piedmont : a sort of “green city” covering an area of nearly 97,000 hectares, in the form of a linear structure some 110 km in length and 7 to 10 km wide, centred on the River Ticino.

It is organised as follows :

#### **a. Woodlands and natural river banks**

In terms of planning legislation, the most protected areas, of the Park are the river banks and woodlands (their status being akin to that of historical cit centres). Their status as designated “Natural areas” also affords them protection under the National



Law on Protected Areas .

Most of the Park's woodlands (some 19,290 hectares) are concentrated along the river banks (the river bed occupies an area of 14,710 hectares). These woodlands and river banks fall into two main categories : at the northern end of the valley, where the river fast-flowing river is largely contained by high steep banks, Alpine and evergreens predominate ;thereafter, as the river bed widens and meanders through the floodplain, the vegetation is composed principally of hydrophyte plants.

The woodlands are partly composed of former feudal game reserves, areas of which remain in private ownership.

The river banks are densely forested from the source of the Ticino at Lake Maggiore to the city of Pavia. At the northern end (where the river is rarely overflows its high, steep banks even in spring), there are a few villages, some heliotherapy centres and several riverside resorts which tend to become fairly crowded in summer. Swimming in the river is dangerous owing to rapid current ; even so, people do swim there and unfortunately, some drown every summer.

One of the few remaining area of moorland is contained within the northern woodlands ; so too, is the international hub of Malpensa airport. From 1910 onwards, airports have been a constant feature of plans for the area bordering the Ticino valley woodlands : a military airport is sited there, and the disused Lonate Pozzolo airport, is located south of the Malpensa hub, where a third runway is planned.

#### **b. The river's lateral canals**

The entire canal network within the Park is protected by the Plan of Territorial Coordination (PTC). These waterways also fall under the jurisdiction of the various Water Authorities responsible for running the different networks: Consorzio Villoresi, Ente Nazionale Energia Elettrica (ENEL), Associazione Est-Sesia, among others. Any improvement or modification to the waterways must be approved jointly by the relevant Water Authorities and the Park Administration.

Seen in the perspective of the 'green city', the canal system represents the principal transport network. Water from the river Ticino has been channelled through canals to power mills since medieval times ; however, the canal system was built mainly for transport and irrigation. The most important canal of this kind is the Naviglio Grande (52 km), built originally in the 12th century to connect Lake Maggiore to Milan. This canal begins at Tornavento (a few kilometres downstream from the source of the Ticino, where the river remains navigable) ; it then runs south, almost parallel to the Ticino, all the way down to the city of Abbiategrasso, where it forks : an arm branches off southwards (the Naviglio di Bereguardo), while the Naviglio Grande continue eastwards to Milan. There, it feeds another canal, the Naviglio Pavese to Pavia. The Naviglio Grande was long used to transport heavy materials (likeas marble for the construction of Milan Cathedral, or firewood) and to irrigate the dry plain. From the 1800s, the Milanese nobility built several country villas there, with direct access from the city by boat ; a few small cities alsogrew up along the canal. The Naviglio di Bereguardo (19km) was used to transport salt from Venice to Milan

The Naviglio Pavese (30 km), connecting Milan to Pavia, was completed at the beginning of the 19th century ; it was used both for transport and irrigation.

The Ticino river also feeds the late 19th century Canale Villoresi, an irrigation canal that branches off at the Pan Perduto lock, north of Tornavento ;after running almost parallel to the river as far as Tornavento, it heads eastwards, through Milan, and terminates at the Adda River. The Canale Villoresi and the related canal system are controlled by the Consorzio Villoresi. The third major canal of the Lombard side of the river is the Industrial canal, which was routed from the Pan Perduto lock at the beginning of the 20th century. It feeds a network of four hydro-electric power stations between Vizzola Ticino and Turbigo (also the location of one of Italy's largest thermo-electric power stations. This last takes water for cooling from the Naviglio Grande . At this point, the electrical network continues on the other side of the river, with another canal routed to feed another hydro-electric power station near Vigevano. The last hydroelectric power station directly served by the Ticino river was built in the 1950s, with a dam-bridge at Porto della Torre, near Somma Lombardo. In that same period a regulation dam for the whole system was built at Miorina, between the Porto della Torre Dam and the egress of the river from the lake, at Sesto Calende. The Industrial canal and the hydro-electric power stations are controlled by Ente Nazionale Energia Elettrica (ENEL). All these canals are equipped with contiguous service roads, for maintenance and inspection. So the canals's service roads provide the entire park with a sort of cycle way trunk-route, some 70 km in length, running through woodlands north-south from Sesto Calende to Pavia, with the track alongside the Naviglio Grande leading right into the centre of Milan. This main north-south infrastructure incorporates 14 bridges across the River Ticino ;they are of various types (stone, iron, concrete, or pontoons) and date from the early 19th century onwards. Along its way, this network connects with a great variety of landscapes and townscapes, ranging from urban settlements (mostly historical centres), to unspoilt countryside (cf infra) or the industrial landscape of the power stations.

### **c. Countryside**

Rural area makes up the greater part of the park (54,530 hectares) ; they are concentrated in its central and southern sectors, on both sides of the river. Seen in the perspective of the 'green city', these rural areas represent the everyday fabric.

The landscape in these rural areas is dominated by the cultivation of rice and corn : fields punctuated by irrigation canals (especially in the area of rice ) and studded with farm buildings known as "cascina"; these are usually of the traditional courtyard type, set within the irrigation canal network. Some date back to the 15th century. Before agriculture was industrialised, these buildings often housed hundreds of farm workers during the rice harvest. Today, many cascina are disused, or have been converted for use as tourist facilities.

The park also contains two large monasteries: Morimondo Abbey, and Certosa di Pavia (the Pavia Charterhouse) both of them past centres of agricultural innovation . Morimondo Abbey was founded in the 11th century by French monks from Morimond.

The monastic community reclaimed fields near the river banks between Abbiategrasso and Bereguardo and introduced a cultivation technique known as “marcita” whereby the abundance of water was used to prevent the soil from freezing, so that several harvests could be produced each year.

The Certosa di Pavia was founded in the late 14th century by the Duke of Milan ; the monks used experimental cultivation techniques to tend vast areas of land. The Certosa was the final segment in the Duke’s Great Park (2,700 hectares, stretching northwards from Pavia and the castle). Deemed one of the earliest parks in Europe in the modern sense of the term; the Great Park had pleasure buildings such as the Mirabello, hunting grounds, fields and cascinas for testing innovative methods of agricultural production and a boundary wall some 22 km in length.

#### **d. Urban settlements**

Urban areas within the Park amount to 14,710 hectares in all, encompassing 47 cities and relative villages. Limits on urban growth laid down by the Plan of Territorial Coordination (PTC) must be respected by Master Plans for cities inside the Park. Seen in the perspective of the ‘green city’ these areas represent a sort of periphery.

In most cases, the population of these settlements ranges from under than 1,000 to 10,000 inhabitants ; the exception are Abbiategrasso (about 30,000), Gallarate (about 50,000), Vigevano (about 70,000) and Pavia (the largest, with about 90,000 inhabitants). Nearly all these cities are of medieval or even Roman origin ; most have historical centres with squares and churches dating from the Middle Ages to the 19th century and some have castles, too. The smaller cities are in immediate contact with ‘green structure’, but this inter-relationship is sometimes more problematic in the case of the four medium-sized cities. At Pavia, the urban fabric is perfectly integrated with the natural landscape of the Regional Park. The banks of the river Ticino remain sparsely built even in the historical centre core, and the city retains an intact image thanks to the old covered bridge and the street from it, which follows the south-north axis of the Roman city and leads straight to the castle and the former ducal Great Park (the present Parco della Vernavola). By contrast, uncontrolled urban sprawl during the 1950s, 1960s and 1970s on the outskirts of Vigevano has left the city centre effectively isolated from the Regional Park, despite the fact that the historical core is physically linked by a canal system. Similarly at Abbiategrasso, where parts of the old city wall survive and the former moat is now a public park (Parco della Fossa), the historic core has been cut off from the nearby canal system and the Regional Park by the city’s more recent outskirts.

These instances of urban expansion pre-date the designation of the Regional Park in 1974. Since then, the planning of urban development within the Park has placed greater emphasis on the quality of townscape in relation to rural and natural surroundings, and on promoting the restoration of the architectural heritage. The use of ‘green corridors’ to link the architectural heritage to ‘green structure’ has been explored in several (as yet unimplemented) projects.

# Problems of green structure planning and management in Warsaw

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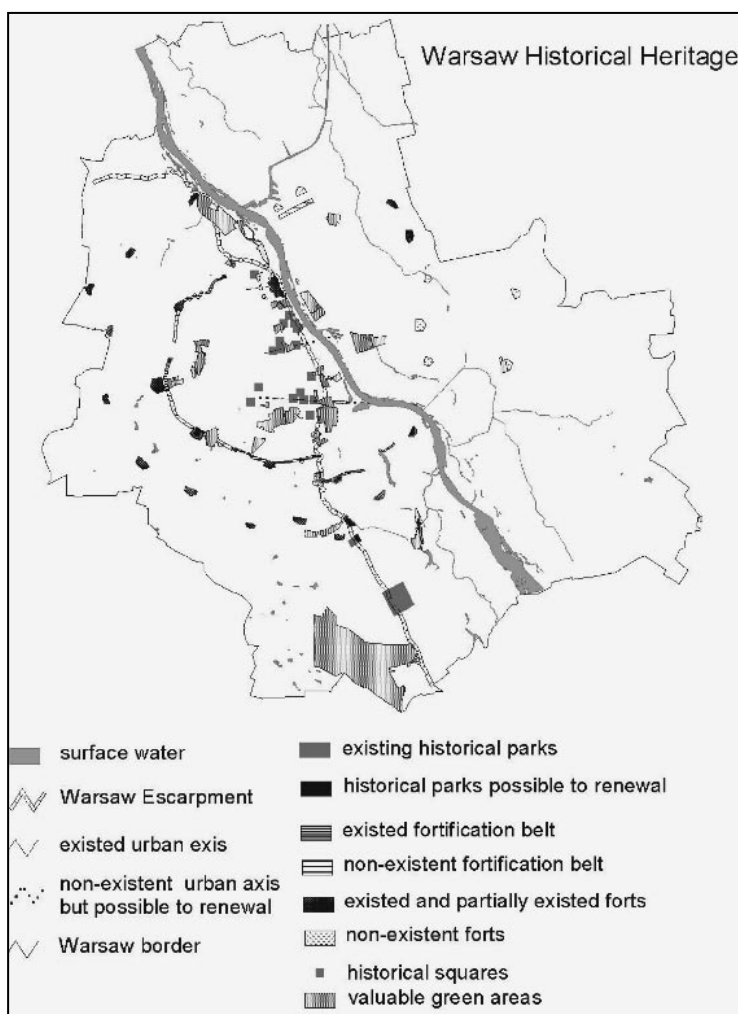
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## 1 Introduction

### Research context

Warsaw represents cities in Poland that in the last decade have been developed according to the rules and constraints of political and economic transformation. Warsaw's space reflects these processes, showing how changes in the rules of economic and spatial development, and management have influenced the physical structure of the city. The green structure of the city has also been affected by these changes. At the same time planners have been trying to work out development plans of the city according to the principles of



sustainable development, as in many other European cities. Likewise, the problem of the scope of urban space densification creates the most sensitive issue for discussion. Thus in Warsaw these two main driving forces can be observed: constraints created by transformation processes and attempts to follow contemporary European planning principles.

### **Issues and research questions**

Green structure has come under considerable pressure over the last 15 years. However, its contemporary pattern and problems of development have emerged as the result of other issues as well, such as: the history of the city's development, conditions of the natural environment, and planning and management practices. These practices themselves have been influenced by different discourses that appeared and subsequently disappeared, or have been already in force. Of course, the green structure problems in other cities could be identified on the basis of similar factors, but here we are focusing on their specific configuration in Warsaw.

A short history of the city's development is outlined below in order to understand certain aspects of the present shape of Warsaw's green structure. The natural environment, one of the crucial factors in creating green structure, is discussed in greater depth in Part B of this book (Kaliszuk E.). The following issues relating to the historical and environmental background are discussed:

- In the aftermath of World War II several important ideas had a strong influence on the development of Warsaw's green structure. Almost all of them had emphasised different aspects such as political and social issues (very important in the Communist period), then recreational, structural and subsequently ecological issues (Szulczewska and Kaliszuk, 2003). What is the overall effect of these ideas on contemporary green structure? How have they influenced green structure planning?
- The transformation of the Polish political and economic situation in 1989, combined with a worldwide evolution of the approach to urban planning and green structure as well, has been a tremendous influence on the quality of green spaces. This particular period in Poland has been characterised by an unstable political system, changing laws (including spatial development law), a lack of a good management system, and a changing ownership structure. In Warsaw these problems have multiplied not only because it is the biggest Polish city, but also because it is the only one that has been managed as an association of municipalities for several years. The management system changed two years ago and Warsaw, as for other cities, now constitutes one municipality. So the questions arise as to how these new circumstances have affected Warsaw's green structure planning and management; what sort of rules are needed in order to achieve effective green structure planning, development and maintenance?

Warsaw's case study presents problems rather than solutions, but their identification is the first necessary step on the way to improvement.

## 2 The Warsaw case

### **Landscape and urban development of Warsaw**

Warsaw, the capital of Poland, is located on the Vistula River in the central part of the Mazovian Lowland. Covering about 516.7 km<sup>2</sup>, Warsaw is the biggest city in the country. The population reached 1,707,400 in 2003 ([www.warszawa.um.gov.pl](http://www.warszawa.um.gov.pl)). Three main environmental elements affect the urban morphology of Warsaw, i.e. the valley of the Vistula River, the Warsaw Escarpment and a morainal plateau.

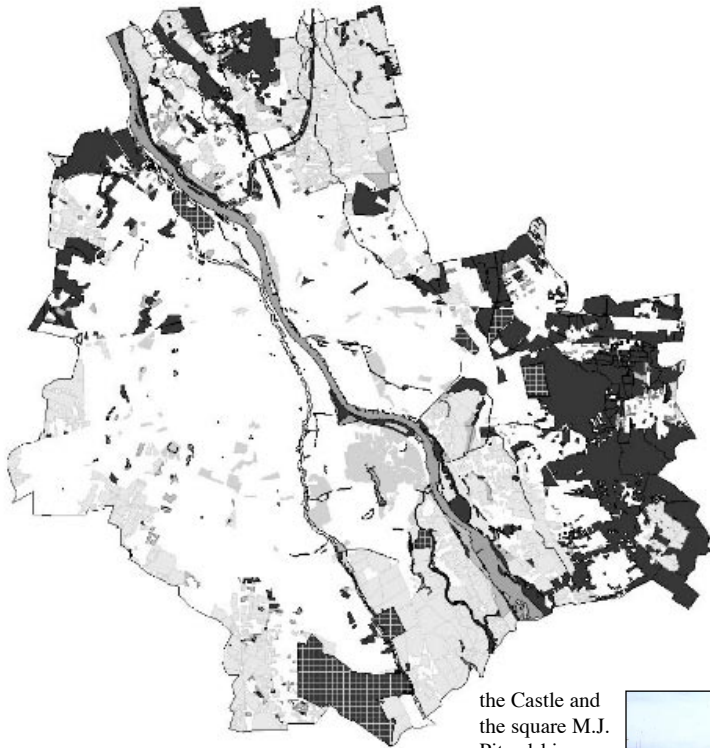
Warsaw's origins that go back to the turn of the thirteenth century represented densely built-up areas surrounded by walls (which still partially exist). It soon developed in a different direction, on the western side of the Vistula River.

The first significant element of historical green structure was established in the seventeenth century in a village located south of Warsaw. The Wilanów Palace and park was designed as the king's country residence. The natural conditions of Vistula terraces were used in a garden composition. Simultaneously, spatial and functional connections were developed, on the one hand with the city of Warsaw, on the other with adjacent villages and farms. All main roads from Warsaw to Wilanów were planned and designed with trees at the end of the eighteenth century (Kicinska, 1993). The vicinity of this residence was agricultural at that time and this continued to be mostly the case for years, even up today. Large forests existed along the Vistula River, the Warsaw Escarpment and to the south of Warsaw and parts of them have even been preserved until the present time.

The first major group of concepts that regulated the development of the urban fabric and the green structure was realised in the eighteenth century. That period is known as the golden age of the city's planning and architecture (Kicinska, 1993). Warsaw was transformed then into a modern European City. Two axes ordered the urban structure, the Saska and the Stanisławowska. The key elements of these axes have become the valuable features of today's green structure and they are regarded as an important part of Warsaw's cultural heritage (Saski Garden, Ujazdowski Park and Palace).

After this fruitful time, the development of Warsaw was limited by three partitions of Poland between the powers of Prussia, Russia and Austro-Hungary that lasted for 123 years. However, a significant but negative impact on Warsaw's physical development was made by the construction of two rings of fortification by the authorities of Tsarist Russia (Wilski, 1997). Besides forts (some with moats), roads and embankments were also constructed. Most of these elements have been retained up to now and some of them have successfully contributed to the development of green structure (Figure 1). The next crucial investments of the nineteenth century such as the Warsaw railway, water pipeline and sewerage systems have influenced Warsaw's environment positively. The first of these, the railway, has contributed to a contemporary ventilation system. Its vast, open areas extend from the central district to the suburbs and create one of the western ventilation wedges (circulation on the western side predominates in

# Warsaw Natural Heritage



-  open water
-  forests and bushes
-  meadows
-  cropland
-  non-cultivated areas
-  natural reserves
-  Warsaw Escarpment
-  city border

the Castle and the square M.J. Pilsudskiego in the centre, the Vistula viewed from the Library, royal residence of Wilanowa.



Warsaw). The water and sewerage systems were built according to plans elaborated by Lindley, the English engineer. They represent the first plans regulating ecological problems, environmental protection and the health of inhabitants (Wilski, 1993). The rapid growth of Warsaw's population and of its surface area at the beginning of the twentieth century made architects draw up systematic plans for its development. The tradition of contemporary green structure planning reaches back to that time when the concepts of the green open space emerged. The evolution of green structure planning and development is described below.

### **Green structure planning : evolution of discourses — evolution of green structure**

The first spatial plans for the city's development were drawn up at the beginning of the twentieth century and this document was the first one that introduced the idea of carefully designed green open spaces within a neighbourhood (Wilski, 1993). Since then different concepts have emerged regarding green spaces as aspects of *green structure* planning connected with the problems seen as particularly important or just 'in fashion' at a given time (Szulczewska and Kaliszuk, 2003). Thus, the present pattern of *green structure* in Warsaw should be considered as an effect of different discourses that influenced planning practice in the twentieth century. The most influential discourses, discussed in greater detail by Szulczewska and Kaliszuk, (2003), are as follows:

- **'Green Wedges'** – first referred to in the 1929 Master Plan for Warsaw. The goals: to link up recreational areas through the city, especially from the centre to the suburbs, and to safeguard proper air ventilation.
- **'Functional Warsaw'** – the theoretical concept drawn up in 1934 to emphasise the importance of the natural condition in the proper zonation of land use, including greenspace (mostly carried out on a regional scale).
- **'Parks of Culture and Leisure'** – an idea developed in the 1950s that emphasised the political and social aspects of green open spaces. Its goal: cultural entertainment for the public in the form of cinemas, amphitheatres, sport and recreation.
- **'Multifunctional Centres for Leisure and Entertainment'** – this idea was planned and partially implemented in the 1960s and 1970s; only a few centres have been developed since then and the land reserves for the others were retained until the political and economic transformation of the 1990s.
- **'System of Open Spaces in Cities'** – a theoretical concept of 1968 that emphasised a structural role of open spaces, including green spaces; it was



developed in 1974 and regarded as an important discourse/idea for green structure planning.

- **Standards and indicators** – accepted for green structure development in the 1960s and legally binding until the early 1980s. Their goal: to significantly influence the pattern, surface areas and functions of the greenspace in the city. **The hierarchical recreational system** stemmed from these established standards, in which green spaces comprised the neighbourhood, district, assembly of districts and the whole city, each with its own particular levels of recreational facilities provided to fulfil different needs; this system was abandoned in the 1990s.

The discourses presented above are not in force any more, but their physical effects are evident in Warsaw's structure in the form of parks, neighbourhood greenery, ventilation wedges, etc.

The following two discourses have been adopted and are influencing green structure policy today:

- **'Urban Natural System'** – this concept has been promoted since the 1980s. It was developed as a consequence of implementing the ecosystem theory within the planning process, but it also underlines the importance of the preservation, conservation and creation of ecological systems so as to ensure proper living conditions for city dwellers through the setting-aside of space to enable nature to function (Szulczewska & Kaftan, eds., 1996).
- **'Sustainable city': 'green city' and 'compact city'** – these concepts both exemplify the more general idea of the 'ecological city' and have been applied recently in green structure planning in Warsaw; the idea of a 'green city' has an influence on the protection and development of the green structure, while the 'compact city' promotes an densification that develops built-up areas at the expense of greenspace.

These last two concepts have their advocates and opponents who form two coalitions fighting against each other during the process of contemporary urban planning and development, as well as in the development of green structure. The attempts at putting them into practice are seen in Warsaw's landscape, but they have rather negative influences. This aspect is explained in the following section.

### **Present problems and challenges**

Warsaw has faced many problems with the development and management of green structure planning, for the last 15 years during the so-called transformation period. These problems, as mentioned in the Introduction, have been caused by several

major factors: natural conditions, the historical heritage, the city's development as a consequence of different ideas, but most of all by the rapid and unexpected changes in the physical structure of the urban fabric resulting from the economic and management situation of the city.

The most important problems are described here:

Problem	Description
1. The way in which <i>the green city</i> and <i>the compact city</i> ideas are adapted to the reality of Warsaw	Many investors, politicians and town planners consider Warsaw to be too extensively built-up. Skorupski (2000) has submitted an argument that the first plans reserved great areas for green open spaces (mainly for recreation) without any possibility of assuring a budget not only for the development of green spaces but also their maintenance. The city that faced a very important task – the reconstruction of Warsaw after tremendous destruction in WWII – was not able to develop these areas appropriately. Thus green open spaces had been somewhat limited by the resultant development plans for Warsaw. The transformation period that started in 1989, combined with the worldwide evolution of an approach to urban planning – introducing the compact city among other ideas – had tremendous, negative influences on the quality of green spaces. The important achievement in the protection of green open spaces was the concept of the Urban Natural System implemented partially in the Warsaw Development Plans of 1982 (air ventilation and regeneration aspects only) and fully in the Warsaw Development Plans of 1992 and its amendment of 2001 (Kaliszuk, 2003). The latest version regulates the pattern and function of green structure for the whole city by means of appropriately written guidelines for the Urban Natural System (it is described in greater detail in Part B – Kaliszuk, E.). However, at the moment, following the political and administrative changes of 2003, this plan is not legally binding any more. This situation influences the development of Warsaw's green structure in very negative way. Some green open spaces, regarded by investors and some planners as undeveloped areas, are nowadays objects of great interest to them. They have enough power to force changes on the areas that were designated as the Urban Natural System in the previous plan. As a consequence, many controversial decisions have been taken concerning densification of built-up areas, especially within Warsaw's central neighbourhoods. The investors and planners use the argument of the compact city as a good one for urban development. More recently, the systematic reduction of the Urban Natural System areas can be observed.

### Comments

The key point of this problem is the debate as to *whether* and *how* planners and politicians should find a balance between the ideas of *the green city* and *the compact city* and how they should be implemented in such a large city as Warsaw. The problem

described above presents a good example of the conflict between these two concepts. The *Urban Natural System* represents the first concept in which its advocates try to safeguard the functioning of almost every green structure element. The trends of urban intensification exemplify the application of the second concept in which its supporters would like to see almost every undeveloped spot built on without considering such important factors as city size and population. What is important in the Warsaw example is that both concepts are, in fact, employed rather ideologically, with only small reference to their real scope, assumptions and guidelines and without any discussion between these two sides of the conflict.

Problem	Description
<p>2. The natural and cultural heritage endangered by the pressure of investments.</p>	<p>In the time of transformation many investments have been allowed, if not actually in the valuable areas that make the natural and cultural heritage of Warsaw, then in the vicinity (Figure 1 and 2). This negative process has gradually caused a deterioration of the city's valuable landscapes. One of the best examples of this is the Warsaw Escarpment – a critical structural element of the Warsaw landscape that is regarded as part of the very important natural and cultural heritage of the city. Along the escarpment there are well-preserved patches or strips of natural forests, magnificent historical parks and gardens, sporting and recreational areas, palaces and other historical buildings. The natural landscapes had alternated with the cultural landscape, but the city's development has led to significant landscape fragmentation along the entire Warsaw Escarpment. One of the fundamental reasons for this degradation is the lack of integrated protection of both the natural and cultural heritage (Kicinska, 2000). Some steps have been taken towards protecting the escarpment, but they are ineffective. A few nature conservation areas have been established since 1980 but only for some patches of forest. Indeed, they have strengthened the isolation of these remnants of the natural landscape. The areas in-between, which are very attractive, have been under huge investment pressure (for residential areas, multi-storey blocks of flats and office buildings). The natural and historical linkages of these conservation areas have been partially lost, while those that still exist are in danger.</p>

**Comments:**

The lack of a clear policy for the development of green structure and a lack of effective planning instruments makes the protection of valuable landscape areas very difficult, especially with the pressures of investment. Nowadays investors seem to win in Warsaw, as is evident in the townscape. Their opponents intervene only occasionally in controversial investments that impinge on the areas important from the point of view of landscape protection. Those who protest are mainly local inhabitants and users of deprived areas, supported by ecological NGOs. Also the Warsaw Division of the Polish Town Planners Society (TUP) took part in actions against building

over open spaces. However, such short-term actions do not facilitate the effective participation of local inhabitants in the decision-making process (both in terms of the development of their neighbourhood green space and the city). Chmielewski (2002) underlines this insufficient participation of local inhabitants in all planning decision-making. He explains this negative phenomenon as a lack of tradition of local community organisations that take part in green structure planning and development, as well as its maintenance. Up till now the only form of common action has been a protest against a development, for example, if the green open spaces are endangered. But as the examples show, this is a weak and still ineffective means of participation (see also Szulczewska, B., chapter 5).

<b>Problem</b>	<b>Description</b>
3. The natural heritage endangered by intensive recreational use	The second, indirect influence of intensive urban development in the vicinity of the valuable areas is an increase in recreational activities. There are many examples that illustrate these negative processes: 1. cyclists who prefer extreme riding conditions have partially remodelled the very form of the Warsaw Escarpment that was developed from geomorphological processes; 2. an open air swimming pool, used extensively in summer time, is located on the oxbow lake (Czerniakowskie Lake) – which has been protected as a nature reserve; 3. the recreational capacity of Kabacki Forest will be exceeded as a result of the construction of huge multi-storey blocks of flats in a district that is going to surround the forest, and by opening the first underground line with its last stop located by the forest, giving Varsovians easy access to this nice green open space (Kicinska 2000).

**Comments:**

The natural and cultural heritage in Poland is protected by the Act on Nature Protection of 2004 (this replaced the Act of 1991). According to this Act the same rules of protection apply to the protected areas both inside and outside the urban areas. The general character of these rules does not there is heavy recreational pressure on densely populated areas. This is especially true in the case of nature conservation areas where strict protection rules do not permit the development of recreational facilities (Szulczewska, 2002.b).

Problem	Description
<p>4. Unsatisfactory distribution of power and resources in green structure planning and management</p>	<p><b>Past:</b> As the only city in Poland for many years, Warsaw was an association of eleven municipalities. According to a general law on self-government, each municipality had rights to undertake independent decisions in certain fields – including spatial planning and the management of green open spaces. An independent Warsaw City Council had also been established and its role was to co-ordinate and control planning and development processes. In fact, the power of the local authorities was so strong that most decisions on green structure planning, development and maintenance had been taken almost independently by each of them. The negative effect of this political structure was seen in the Capital City of Warsaw Development Plan of 2001. Its guidelines were written as the result of negotiations among eleven local authorities and the City Council. When considering the green structure pattern and functions in the final form of the plan, certain green spaces vanished or their status was changed to reduce their environmental role. That procedure allowed investors to start their investments in the very attractive locations.</p> <p><b>Present:</b> Warsaw is one ‘organism’ consisting of 18 districts. While the planning power (including green structure planning) is totally in the hands of the City Hall, the development and maintenance of most green structure elements (parks, squares) are in the hands of each district. However it is up to the City Hall (City Council) to decide on the budget of each district and also the workforce.</p> <p><b>Future:</b> The clear relationships between the City Hall, the Voivodship Council and the districts have to be established in order to pursue a comprehensive green structure policy. Also new actors should be taken into consideration such as NGOs, investors (at the moment considered rather as ‘the bad guys’ from the green structure point of view).</p>

**Comments:**

The City Hall was to co-ordinate the activities of eleven Warsaw municipalities according to the so-called ‘Warsaw Act’ passed in 1994 in order to establish relationships between administrative bodies. Unfortunately, the division of responsibilities turned out to be vague and co-operation between the Warsaw municipalities and the capital city itself was far from harmonious. As a result of insufficient co-ordination of actions undertaken during recent years, many decisions involving investment were made without appropriate analysis of their importance for the whole city. Other decisions, often essential to improve the city’s functioning, were not made at all, or made after considerable delay (Chmielewski, 2002).

It is too early to assess how the new administrative arrangement has been influencing the city’s development, including green structure, and whether the new distribution

of power is going to be effective. But, on the basis of very recent interviews (they are part of an ongoing environmental protection programme), it should be stressed that not only formal relationships between Warsaw City Hall and Warsaw Districts are considered important; a few other issues have also been identified as being in urgent need. The following are the major ones: an exchange of information that refers to the ongoing decision-making process, a data base of Warsaw's environment with easy access for all actors involved in the planning and development processes and clear procedures for landscape planning and development. It seems that almost all the administrative bodies are in favour of one comprehensive green structure policy formulated at a central level, with a clear distribution of responsibilities, a workforce and funding. The policy would be formulated within Warsaw's City Hall, with the co-operation of two offices. The City Chief Architect's Office is responsible for preparing planning documents, while the Environmental Protection Office (in which the position of City Landscape Architect has been established) is responsible for the policy and management of the green structure. It depends on the City Hall how they make use of the possibility of influencing newly created agreements. Of course, the general lack of funds for maintenance and the development of green spaces (in 2002 only one park in Warsaw was regenerated) will be one of the biggest constraints in building on relationships, but a challenge at the same time.

Problem	Description
5. Constant changes in rules of the game	<p>The protection, development and management of green structure in Poland is generally regulated by three Acts:</p> <p><i>Act on Environmental Protection (2001)</i>: this was amended many times, especially in order to keep up with the European Union regulations. It requires planning documents (particularly at the local level) to solve problems relating to town and countryside development, taking green structure into consideration. It allows local plans to provide a balance between built-up and open spaces necessary for the preservation of a balance with nature.</p> <p><i>Act on Nature Protection (2004)</i>: this also replaced an Act from 1991 that had been amended several times. It offers protection for greenery in towns and villages, particularly trees and shrubs. It also formally defines the term green open spaces as spaces within built-up areas, which are designed for the following purposes: <i>recreation, health, education and aesthetics. In particular they consist of parks, squares, boulevards and promenades, playgrounds, botanical gardens, zoos, ethnographical gardens, horticulture and agriculture exhibitions, cemeteries, animal burial sites, barrows (tumulus), fortifications, domestic gardens and estate greenery.</i></p>

**Comments:**

Pursuing a green structure policy is complicated, not only due to these changes in

legal regulations, but also due to the changes in the Warsaw administration (described as Problem 3). These constant overlapping changes do not serve the development of green structure well. The latest version of the general policy was stated in a plan entitled Capital City of Warsaw Development Plan, Including Obligatory Guidelines for the *Warsaw Boroughs in Preparing Local Spatial Development Plans, of 2001*. When the rules of the game changed and Warsaw became one municipality, this plan was not in force any more. The new *study of the conditions and direction of spatial development within a municipality* and the *programme for the protection of the environment* are being drawn up at the moment. Both these documents are supposed to formulate a comprehensive, consistent green structure policy (among other development and protection policies), but the question arises as to how long they will serve as a basis for implementation.

### **Conclusion**

Some problems relating to green structure planning and management are much the same as in many European cities. The major one depends on money that can be spent on green structure development and maintenance. Another problem is caused by the densification of urban development such as the infill development that happens at the expense of greenspace, especially when badly maintained. The analysis of the problems presented in the above sections has concentrated specifically on Warsaw. The critical issue seems to be the lack of a clear and, above all, stable green structure policy – that would help to combine different aspects of the development and maintenance of green structure, such as greenspace and urban structure, greenspace and recreation, and greenspace and environmental problems, for example, water storage, wildlife traffic, etc. This integrated approach should be taken simultaneously on various levels from discourses, through policy and planning procedures, and finally through the development and maintenance process. The constantly changing nature of Warsaw's circumstances make the whole process of urban development, including green structure, fragment.

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# The Rome case study

## Strategies for green structure planning and maintenance

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### 1 Introduction

#### Research context

The unicity of the roman situation can be well exemplified by the exceptional concentration and the widespread presence of archaeological and historical, artistic and monumental evidences, located both in the central and suburban areas, by the environment of the roman Campagna and by the extension of the municipal territory. Rome indeed, with its approximately 128,000 ha of land, is the largest town municipality in Europe, and is the Italian city with the largest extension of agricultural land: 52,000 ha, representing 40% of its whole territory, and boroughs of very large extension.

One of the strategic choices of Rome Municipal Administration was the individuation and the protection of its Ecological Network, an articulated and functional system of areas with some naturalistic, agricultural and recreational importance. This Ecological Network was acknowledged by the “Piano delle Certezze” (Plan of the Certainties, 1997), a general variant of the existing Master Plan. Contemporarily, with the adhesion to the Agenda 21, following the “Paper on Rome environment state” and the establishment of the Forum Agenda 21, the “Plan of environmental action”, that contains the strategic lines for the Administration environmental program activities, was defined (2002).

The predictions of the new Master Plan improve and complete, for the extra urban territory, the lay-out already defined in the “*Piano delle Certezze*”, and increase, in the inner urban area, the environmental system, giving it the role of a network crossing also the new developments, guaranteeing all the connections among the areas that form it, with the aim to maximize the ecological effects.

The work, carried out by the various municipal offices, with the contribution of experts and researchers from the scientific and professional world, can offer a valid contribution to the COST C11 Action research.

### **Issues and research questions**

In Rome, many battles were fought to protect the open territory. The aim was to enhance its potentials to allow people enjoy the landscape, know and study important historical, artistic and naturalistic values. The means used for the most outstanding examples, as the “Parco dell’Appia Antica” or “Villa Borghese”, exemplify more or less the situation to be faced also in the other less famous cases. For the former, a debate was raised to international level involving well-known people in the cultural ground; for the latter, complex judicial events and long-term negotiations took place. The difficulty in the defence of the historical and environmental heritage against the building speculation has characterized the protection and acquisition of the roman green assets. A long political-administrative process, started between the 80ies and the 90ies, for the institution of natural reserves inside the city range, was brought to end only recently by a regional law (L.R. n.29.10.1997). Now the difficulties are related to financial aspects, due to the low budgets of local administrations, that are assigned for the acquisition, maintenance and conservation of such green structure.

Because of the expropriation indemnity values and the five year withdrawal of the obligations (as set out by L. 1187/68 and by Constitutional Court sentence 179/99), since the “Piano delle Certezze”, and even more with the new Master Plan, the Municipal Administration adopted a different approach for the acquisition of the public green areas necessary to fulfil the fixed standards. The expropriation is not anymore the only one at use, but also other tools that are less onerous and less time consuming, as different type of compensatory and equalizing processes, are now adopted by the Municipal Administration.

For the use of the land, inside the system of protected natural areas instituted by the regional law, various agreements with private people are foreseen. For the maintenance of the public areas, private investors are involved by the means of “a finance plan” (Il progetto di finanza).

As for the cultural approach, the new Master Plan can be taken as reference. It embraces indeed the most recent formulations on sustainable urban planning, indicating three strategic and structuring aspects: the environmental, the mobility and the dwelling systems, prioritising the environmental regeneration and the collective transport, reducing at the maximum the new urban expansion and aiming at the upgrading of the existing city. The strategy for creating an environmental system is based on the integration of primary and secondary components, constituted by different types of green areas, and components of completion to link them. These are to be implemented

by the enhancement of watercourses, and of their banks or shores, creating, where possible, cycle and pedestrian paths.

The new financial tools are already implemented and constitute tests to start a debate; the integrative approach of the new Master Plan is still theoretical, but it is already informing many actions of the Municipal Administration.

## **2 The Rome case**

### **Landscape and urban development of Rome**

Rome expanded on one of the most meaningful historic centre of the world, an area which concentrates also nowadays the biggest part of important city activities (political, administrative, cultural, commercial, and for leisure) The core is surrounded by a periphery developed first by property speculation, then by large settlements of public housing estates and finally by huge unauthorised settlements. Such irregular growth was caused by the inadequacy of the city to face a powerful urban migration phenomenon, which took place from half of the 60ies to the beginning of the 80ies. During this period the city population doubled, reaching now about three million people; the built area increased of about 20,000 ha, half of which were illegal residential buildings, covering also precious parts of the territory, distinguished by a beautiful landscape or by the presence of historic assets.

In the mid 80ies a process of legalisation of the spontaneous settlement, aligning local infrastructure and services to the standards, was started. Important public housing programmes were concluded and safeguard actions for rural areas were started, while the most urgent issues of environmental impact were tackled. In the mid 90ies the first integrated programmes of urban upgrading started, focusing on public housing settlements that lacked services and environmental quality, and presented social and economical problems (L.179/1992).

The innovative aspect of these programmes concerns the possibility of getting the necessary funding by private investors, granting them the use of “left over” public land for building mixed use buildings. This possibility will favour in turn the settlement of differentiated socio-economic entities and allow the perspective of triggering economic growth processes on site. The implementation phase is actually going on.

For the last twenty years, Rome did not seem to grow anymore, and there is no evidence letting presume a change in this trend, at least in the middle period. Actually of the rough 128,000 ha of municipal territory only approximately 40,000 are urbanised, while the green open areas are about 87,000 ha, about 67% of the whole surface. These constitute the ecological network of Rome; a whole of protected natural areas, urban green areas, flood-bed areas (Tiber, Aniene, and tributary canals) and farmlands. The productive farms are 1,900, with 410 ones engaged in livestock breeding (cattle,



Villa Borghese: I Giardini Segreti di Villa Borghese



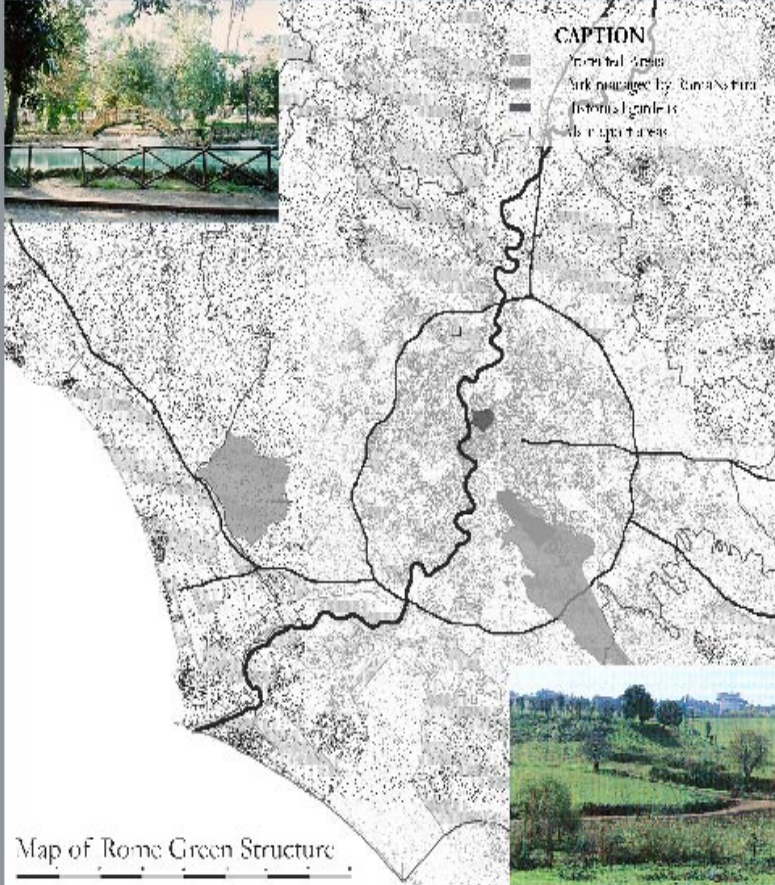
Villa Borghese: I Giardini Segreti di Villa Borghese



Villa Borghese: I Giardini Segreti di Villa Borghese



Villa Paganini



Map of Rome Green Structure

Parco dell'Appia Antica e della Caffarella

Parco dell'Appia Antica e della Caffarella



Farm at Castel di Guido



Parco dell'Appia Antica e della Caffarella



Parco dell'Appia Antica e della Caffarella

Parco dell'Appia Antica e della Caffarella

Villa Borghese: The Secret Gardens, (from the collection of: "Acquerelli del Comune di Roma. I Giardini Segreti di Villa Borghese"); Villa Borghese: Statues of Secret Gardens, (from: Di Giovine, M., a cura di, Guida al verde di Roma - Alla scoperta dei parchi naturali delle ville storiche e dei giardini pubblici, Comune di Roma), Punto Verde Qualità: via della Mendola (reprinted with the permission of: DFD Associati (Arch. Farcomeni e Dott. Corsini), Villa Paganini (from website), Map of Rome Green Structure (from town municipality), Caffarella Valley, Farm at Castel di Guido, (from the leaflet: "La tenuta di Castel di Guido"), Parco dell' Appia Antica e della Caffarella: Pavement of Via Appia Antica, Massenzio Circus, and Lozzi & Rossi Editori, s.d.

sheep, goats and pigs). The Municipality of Rome manages directly two farms: “Castel di Guido” and the “Tenuta del Cavaliere”, both in a biological way.

The urban public “green heritage” adds up to more than 3,000 ha; in the last ten years increased of 24%. Its composition and articulation are very complex. There are indeed: historic villas, an inheritance of the noble families; gardens, not planned for mass use, that present problems of conservation; large rural areas with important roman vestiges, turned into large urban parks; a spread texture of small and medium size equipped areas, that constitute the main public residential green, and finally the street green: squares, flowerbeds, median strips, hedges, lines of trees etc.; all areas that support most of the anthropic pressure.

The master plan previously defined the green areas on the basis of a standard number of square meters per person. In the last one, the reference parameters for the urban standards were reviewed, but above all the standards themselves were all checked at local level, borough per borough, and evaluated in terms of quantity and quality. The aim is now not only functionalist but also environmental; in the design all the green areas are connected, making the parks entering the core of the city.

### **The protected natural areas of Rome**

In the Roman Ecological Network, the natural protected areas play a prominent role for the city’s environmental policies; they constitute indeed a real system, formed by 18 land parks, of remarkable dimension too, and 1 sea park; they sum up 40,000 ha (31% of the whole municipal area). They are mainly located in the outskirts but enter also into the most central zones. Some of them (8) were instituted thanks to the regional law (L.R.29/97), issued in conformity to a national law (L.394/91), and are managed by a special body: Roma Natura, created by public law, provided with administrative, financial and property autonomy. Roma Natura is in charge of management for 14,000 ha of immensely rich territory, where archaeological vestiges, monuments, villas and farmhouses represent only part of its value. Extraordinary is also the flora and fauna richness in the whole roman ecological network. Spontaneous vegetal species are 1,300 (1/5 of the Italian flora), insect species 5,200, vertebrate species 160, of which 21 amphibious and reptile (70% of the species of the Lazio region), 115 birds, of which 75 nesting (50% of the species nesting in Lazio) and 26 mammifers (90% of the species present in Rome Province).

### **The Environmental action plan**

For the fulfilment of the Local Agenda 21, the Municipality of Rome had to define the Environmental Action Plan; a plan to be made and implemented with the consensus of the various stakeholders of the involved territories. To this aim various activities were started. A frame of the strategies to be used for achieving a sustainable development was elaborated, containing general and operative goals, action lines and indicators for their monitoring. A consultative Forum, composed by representatives of the

community, was constituted; it produced a document, that was integrated to the previous framework to constitute the “Environmental Action Plan” (Piano di Azione Ambientale).

The whole programme of the Municipal Administration defines a new model of sustainable city, which issues are: the land saving, by favouring reuse and renewal of the vacant or built sites; the cycle/pedestrian mobility and public transport promotion, by favouring non polluting and non energy consuming means; the environmental consistency of the technological infrastructures, by mitigating and reducing impacts; the expansion of the public and private green spaces, by the implementation of an “ecological network”; the regeneration of the water resource by guaranteeing the urban soil maximum possible permeability and by paying attention to the aquifer vulnerability; the regeneration of the air resource by limiting the town planning loads and by increasing the biomass; the regeneration of the contaminated soils; the garbage collection and disposal, by promoting prevention and recycling measures, and the progressive tip closure; the acoustic pollution control, by integrating the “acoustic zoning” in the plan norms.

### **The new master plan**

As already mentioned, the new Master Plan re-organizes the environmental system as a network. Not anymore only a “green wheel” formed by regional parks and agricultural land, which spokes enter to the core of the city, but a more complex and circumstantial layout, that involves the consolidated urban texture and the new transformations of the city. The new Plan will double the public green areas, its final target being about 7,900 ha, so that the average theoretical standard for the whole city territory will be 23,7 sqm meter per inhabitant. Besides the parks and the public green areas, the Plan includes private green areas (about 2,000 ha), which will increase to 10,000 ha the whole surface of green in Rome.

The Plan confirms the minimum standards already fixed by the previous plan, on the base of a ministerial decree (DM 1444/68): for services and facilities at residential level, 22 sqm/inh (roughly 13 sqm/inh for green areas, 6,5 sqm/inh for services and 2,5 sqm/inh for parking); for services at city level, 17,5 sqm/inh (15 sqm/inh for green areas, 2,5 sqm/inh for services). The Plan stresses the issue of standards revision and proposes, after careful quantitative and qualitative analyses, a parameter that equalizes 120 cubic meters to a new room and to one inhabitant settling. The forecasts of new settlement, that have to be verified with the town planning standards, were computed on the basis of this parameter. This computing put into evidence that a huge amount of public green areas was still to be acquired; the actual standard for the whole city is indeed 15,8 sqm/inh. This realization imposed to choose other acquisition modes besides expropriation and free cession, in particular, as already mentioned, the “compensative cession”. This means the possibility for transfer of the construction

right from one area to another, in agreement with the real estate owners.

A specific study was carried out to highlight the different kind of existing public urban green areas. The distribution of the new Plan green standards in the various parts and boroughs of the city was defined, with the aim to re-balance the most dense and scanty ones. The setting of new green spaces and the specific solutions were determined with regards both to the balance of the large areas and to the lacks within the districts. To this aim, the new Master Plan introduces also a quality choice based on the interchange among various public destinations; it fixes an inclusive standard for “Public areas and public services on a local level”, defined as quantity but open as choice of type of facility, that the urban management authority will choose, depending on the district town planning situation.

The new plan considers, besides the usual classification of green spaces (Historical villas, Open spaces, Shaped gardens, Green spaces formed by built up areas, Decorative green, Spaces mostly equipped for sport and leisure, Fluvial green with naturalistic character, Private green spaces with historic, morphologic, environmental value, Private green) also other specific types of green, with various levels of use and of protection: “Private green with ecological value”, areas with a high covering of lawns, shrubs, trees in which privately managed sport and leisure facilities for the districts dwellers can be located; “Private equipped green” with an almost totally green setting, aimed at performing a landscape and ecological function, that can host also private facilities of public use; “Environmental belts along roads and railways”, aimed at mitigating the mobility infrastructures landscape and acoustic impact, and dimensionally apt to become real green zones usable, in part, also by the community.

### **The maintenance**

Maintaining roughly 4,000 ha of public green areas is nowadays a financial challenge, since the resources are insufficient, both as staff (500 gardeners, 250 assistants, 25 technicians) and in budget (about half of the required). The problem will increase as the heritage increases with the new forecasted acquisitions.

This is why the council has recently decided to involve private investors by means of the “Progetto di finanza”. This project financing has various levels of application: from small commercial activities (kiosks for newspaper, drinks, food etc.) whose managers will care for the maintenance of small areas (1,500/2,000 sqm) to play and leisure activities for children, whose managers will care for the maintenance of larger areas (5,000/8,000 sqm) and multifunctional centres (sport facilities, theatre, cinema, shows, shops etc.) whose managers will care for the maintenance of very large areas (250,000/300,000sqm). The process follows various steps. The Town Municipality technical offices choose some public decayed green areas, to be re-qualified, preferably located in districts lacking services and/or facilities, and issue

a competition for presenting use proposals. The private investors who make the best proposals, in agreement with the municipal programmes, can build on some part of the public land a facility; the Town Municipality, on its side, gives both the use of the land for 33 years (renewable) and the building permit for free; it moreover gives a priority lane to the case and organizes by some banks, as guarantee, a subsidized loan. The Municipality remains the owner of the land and of the facility. The private investor, on his side, builds and manages the facility, keeping the whole profits, caring for the related green areas and opening it to the public.

The city council has activated also other forms of collaboration with end users and blocks of flats administrations for guaranteeing the cleaning and maintenance of small green areas. In this case, the technical offices organize the work and the upkeep, case by case.

The aim of these new forms of financing concerns the maintaining of at least 10% of the whole green heritage of Rome (up to date about 400 ha) without using the public budget.

### **3 The visit**

On the occasion of COST C11 Meeting in Rome, a workshop and a technical visit were organized by the X Department “Environmental and Agricultural Policies” of the Municipality of Rome, with the aim to highlight the new trends and policies for the green areas planning and management. The choice of the places was made to give an idea, in one day visit, of the various green areas characterizing the city and of one of the green wheel spokes entering it. The itinerary started from the heart of the ancient Rome and ended in the baroque city, passing by the countryside.

#### **The “Parco Archeologico Centrale”**

The idea of an archaeological park was born at the beginning of the 19<sup>th</sup> century with Napoleon’s idea of the “Jardin du Capitole”. Also if in different ways and in different times, the archaeological areas were restored: the Roman Forum and the Palatinum (1890-1925), the “Passeggiata Archeologica” (1918), the Terme di Caracalla and the “Passeggiata dei Fori Imperiali”, and now a new excavation phase is at work. The various sections of this Park, partly interlaced, will become a large layout of museum paths, unique in the world that will connect the Capitolium to the Antique Appia Park. Gardens, boulevards, “Horti” (antique roman orchards), green settings and plantations alternate to paved lanes and remains of various roman periods. “Via dei Fori Imperiali” one of the central axes of the area, is only dedicated to pedestrians on Sunday for some parts of the year.



### **The “Parco dell’Appia Antica”**

In Napoleon time, Pope Pio IX, to enhance the catacomb systems and the basilicas, launched an upgrading plan for the Appia Antica: *’Regina viarum’*.

The Park, already a protected area of regional interest (1988), was widened thanks to Caffarella and Aqueducts Parks (L. R. 29/97). The property (3,500 ha) is mainly private, and is entrusted to “Ente di Gestione del Parco dell’Appia Antica” (1998).

The area includes the Via Appia, 16 km long, and a huge number of evidences of countryhouses, nymphaeums, tombs and a temple in the beautiful setting of the Campagna Romana. The aim is to protect the monumental heritage, the landscape, and to avoid unauthorized building. The Park represents a biological corridor with great regulating potentials for climate and air pollution.

### **The “Parco della Caffarella”**

The Caffarella Valley, a national monument (L. 1497/39, 1089/39, 431/39 and L. R. 66/88), is an ancient place of myths and legends. Its name comes from the estate built in the 16<sup>th</sup>c. Into the valley, crossed by Almone river, woods of ilex and oak take turns at cultivated fields and pastures, with medieval and modern farmhouses, showing the typical *Campagna Romana* landscape. The Park is an historical, archaeological, environmental and landscape whole system.

Azienda Agricola Castel di GuidoThe Farm, a very old setting located in the countryside, is a protected area of mixed property (2000 ha). The main cultivations are cereals: grain, corn and hay, while cattle-farming comprehends Friesian (250) and Maremma (450) cows. Cheeses and meat are directly sold on the spot. The choice of a biological agriculture, underlines the Municipal Administration will to grant an urban ecosystem. Inside the Farm, since 1999, there is a faunistic Oasis for birds of 250 ha.

### **Villa Borghese**

In 1903 the Villa, built by Cardinal Borghese at the beginning of the 17th c., was opened to the public by Rome Municipality. The prompt upgrading works made by the Town Municipality were interrupted in the 30ies; some interventions aimed at facilitating car traffic distorted it. In the war period, other utilitarian changes occurred. The following long restoration work is visible just now. The Villa, a protected area, of public property, occupying 85 ha., contains a lake, fountains, buildings, monuments and a huge number of estimated statues; it offers precious spaces such as the Secret Gardens, restored with rare and exotic flowers, untouched views of roman countryside, with planes planted in the 16<sup>th</sup> century, and English gardens. A project (1997) established the Villa as a “Museums Park”; in fact it hosts famous exhibition buildings and cultural foreign academies.

### **Villa Paganini**

A typical district garden, about 2,5 ha, once a vineyard (16th c./19th c.), then



Via Appia Antica Park : pavement, Roman testimonies, view towards recent suburban settlements, pine trees



transformed in a countryside villa, decayed because of many changes of property. In 1890, under the pressure of building sprawl, the park was divided and partly built with small houses. In 1934 Rome Municipality bought the remaining part to make a public garden and a school. The garden has been restored in 2003/04 to recover its botanical and architectural values, and to bring the necessary amenities.

**Punto verde qualità Via della Mendola**

The green area (24,5000 sqm) an application of “Progetto di Finanza” (2003), lays in

a modern, up middle class residential district; it is a hinge between two districts and is characterized by a very steep land. The facility contains some shops, a restaurant, a swimming pool, a gym and a kind of kindergarten, where children can go and play, being surveyed, plus three multifunctional grounds. An equipped health path is open to the public as a garden next to the facility. The manager maintains the whole green area, is happy with the accommodation and has asked to develop further more the place, implementing a cycle path to connect it to the other adjacent district.

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# OSLO, a vision for a sustainable future

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## Introduction

The city is the first municipality in Norway, with a population of 527.000 inhabitants on 45 400 hectares (density : 11,6 persons per hectare).

Oslo has a vision for a sustainable future embedded in the Strategy for Sustainable Development, adopted by the City Council in June 2003: *‘Oslo shall be a city in sustainable development, characterized by economic, social and cultural growth within nature’s ecological sustainability. We shall pass the city on to the next generation in a better environmental state than we ourselves inherited it.’*

The European common indicators on environment and sustainability show that the environmental qualities of Oslo are improving, and that Oslo is a city on the path to sustainable development. This does not, however, mean that Oslo is a sustainable city yet.

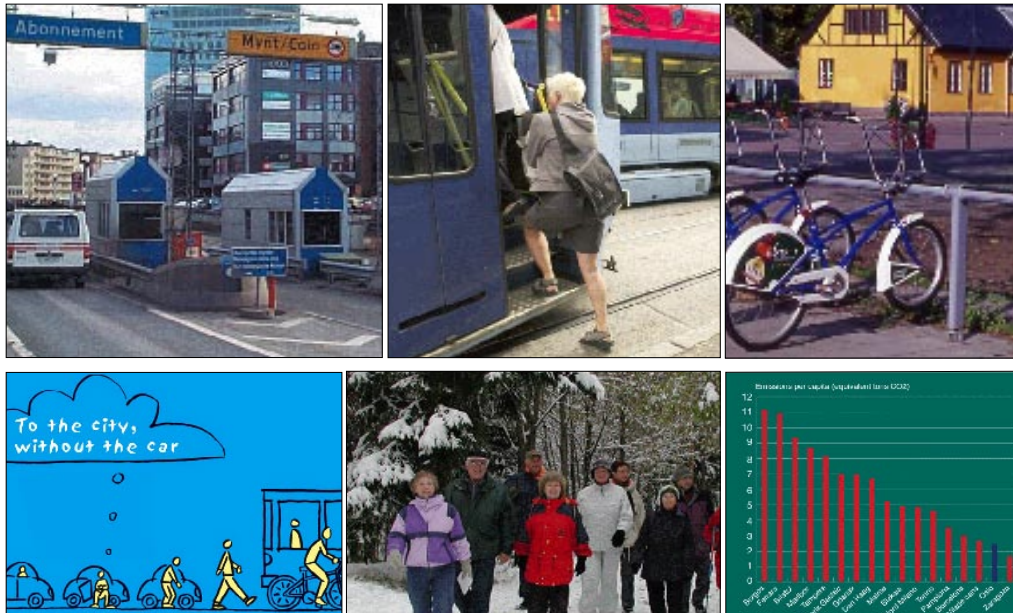
The ecological footprint analysis tells us that the City has ecological footprints more than double the size of the global average. This is mainly due to the resource-demanding lifestyle and consumption pattern of the inhabitants.

Oslo also has other challenges concerning environmental protection, social equity, crime prevention, health promotion, cultural integration and municipal finances, just like most large cities. The main question is, however, what actions are taken; and does it help us in the direction of sustainability?

Oslo’s main quality may be in adopting a broad approach to the work for sustainability.

Some aspects are, however more important than others, and we will focus on the following three aspects of the work and achievements which are of paramount importance to Oslo’s sustainability:

1. Urban Ecology
2. Global responsibility
3. Local democracy and community involvement



1, entering the toll road 2, 3, 4, 5, 6, promoting public transport, cycling and walking has contributed to a significant reduction in climate gas emissions (Oslo in blue on the picture). 7, 8, 9, Oslo redeveloped the river corridors as a vital part of the city's green structure. For the River Akerselva, new functions were found for old industrial buildings and measures to improve the water quality mean salmon can spawn again.

## **1 Urban Ecology : Why is the blue-green structure so vital for the ecology of the city ?**

Oslo cares for its urban ecology, and has done so for many years. Preserving and working with nature, not against it, is a central principle in our Urban Ecology Programme.

Oslo is surrounded by green forest hills and the blue Oslo fjord, and the citizens of Oslo live in close contact with nature. This is the result of a favourable natural setting and a love of nature, and popular support for an active nature protection policy.

Oslo has invested in preserving its natural capital; two thirds of the area within the city boundary is forest, parks and lakes. This constitutes both 'green lungs' and the drinking water sources. The city forest is managed according to sound ecological principles and is widely used by the general public. The city forest and parks also play a vital part in the biological diversity in the city, which comprises up to two thirds of all biological specimens found in Norway.

Over 1,000 moose, roe-deer, beavers and lynx roam the city forest, together with thousands of recreation-seeking citizens in the afternoons and weekends.

The city forest is widely used by schools for educational purposes: classes in some schools spend one day per week in the forest or other outdoor locations.

The city forest is now protected as a 'green belt' against urban development, which instead takes the form of densification in former industrial and traffic areas, especially where there are links to the public transport system.

To the south Oslo borders the Oslo fjord. It has not always been clean, but heavy investment in sewers and two large sewage treatment plants has made the fjord once again popular for swimming, fishing and sailing. The Bekkelaget sewage plant was built into a rock at a cost of 100 million euros. Plans are being made for removing sludge with a high PCB content from the inner harbour basin. This will facilitate the realisation of the Fjord City Plan, opening some parts of the Oslo sea front to the public for recreation and urban redevelopment by moving part of the port activities. Urban development close to the largest public transport link in the country will favour the city environment. The City Council has also set strict criteria for the use of renewable energy in the area under development.

Connecting the forest with the fjord, nine rivers run through the City's built-up area, although not all of them are clean yet. But they will be in a few years time. The river corridors are a vital part of the City's green structure. The establishment of the Aker River Environment Park, where the salmon is back spawning, has formed a model for the other rivers. To stimulate the politicians and the administration in this effort, the Oslo River Forum was established by a group of enthusiastic pensioners, two of them having received the Oslo Environment Prize. The City has now established a forum

for co-ordinating the work of the different municipal agencies concerned, with the Oslo River Forum as an active partner. Plans are now being made to re-open closed stretches of some of the rivers. The first re-opening will take place in 2005 with the creation of a natural swimming pond, including a waterfall and adjacent recreation areas.

Together, the forest, the parks, the lakes, the rivers and the fjord form a blue-green web and ecological infrastructure in and around the city fabric which is vital both for the wellbeing of our inhabitants, and for the sustainability of our city.

## **2 Global responsibility : How come Oslo has such low climate gas emissions and why does the City work to reduce them still further ?**

Climate changes represent one of the most important challenges for the sustainability of mankind and the City of Oslo has taken on the responsibility to contribute to this global challenge. Oslo has today very low climate gas emissions, slightly less than 3.0 tons per capita, which compares with the average emission levels of China and Brazil. The main contribution of the City to the global climate is, therefore, to maintain its low level of climate gas emissions. Another goal is to reduce the emissions according to the national obligations set in the Kyoto Protocol and long-term goals of the United Nations. The following section focuses on the reasons and policy behind the low emissions, and what is being done to reduce them further.

For many years two thirds of the energy consumption in Oslo has been supplied by electricity produced by hydroelectric power, which is a sustainable source of energy. The City of Oslo is also a producer of hydroelectric power through its ownership in the Oslo Energy Company. Oslo uses electricity both for stationary energy use in buildings (including heating), and in transport.

Two thirds of the public transport system runs on electricity. This includes trams, trains and the metro and our public transport company has had a passenger increase of 20% since 1990.

The City has some 50 electric cars in service and aims to increase the share of cars with no or very low emissions to 50% by 2008.

To reduce climate gas emissions from car transport in the City the metro system is being modernized in order to capture more passengers. The Toll Ring for cars entering the city both reduces the car traffic by around 10 %, and finances part of the expansion of the metro lines.

The building of c. 100 km of cycle lanes and roads has increased cycling in the city and our City-Bike project offers 1,200 bikes for users in the more central parts of the city. Over 75 % of school children in Oslo walk or cycle to school.

Oslo has developed a district heating system for the city which contributes to signifi



cant reductions in climate gas emissions from both stationary energy use and from waste.

Household waste is burned for energy use in the district heating system, thus eliminating methane emissions from alternative landfills.

The City Council has established an Energy Efficiency Fund of c. 100 million euros where the interest or yield is used to stimulate and support energy efficiency campaigns and projects, amounting to the equivalent of 700 GWh over the last 10 years. This represents the output of a medium sized Norwegian hydroelectric power station. The fund also supports projects involving change to alternative sustainable energy sources such as bio-fuel and passive heat sources like rock or sea combined with heat pumps. Five of our schools and one nursing home now use geo-energy. The largest geo-energy or rock store project for heating and cooling in northern Europe is under construction in Nydalen.

In spite of a low level of emissions the situation is not totally satisfying. We want to reduce the emissions further and phase out the use of fossil fuels where there are viable alternatives. To be able to obtain substantial results we have to seek solutions in a regional context. In the year 2000 Oslo took the initiative to develop regional co-operation through a common Climate and Energy Strategy for the Oslo region and the strategy was adopted by Oslo and the Akershus and Buskerud counties last year. This strategy has now been followed up by a regional Climate and Energy Action Packet. This is in partnership with relevant national agencies and the most important energy producers, transporters and users in the region. The Action Packet is planned to be put into practice from 2004.

### **3 Local democracy and community involvement : Why are the City Districts so important for the sustainability of the city ?**

Oslo believes in the principle of subsidiarity and has decentralized important parts of the City's functions to its 15 urban districts, each with a population of 20,000 – 40,000 inhabitants.

The main goals of the Urban District reform are:

- Decentralisation of political power and democratisation of local management
- Better service for the public
- Better quality of the municipal services
- More efficient use of the municipal resources
- More meaningful working conditions for employees.

Each Urban District has a political Urban District Council of 11 members, which governs the Urban District on behalf of the City Council. Four Districts now hold direct elections to their City District Council in order to investigate whether this will raise the democratic activity in the city. If the experiences are positive, the rest of the City Districts might do likewise. The District administration is headed by a Director and their staff (50 % of the Urban District directors are women). The Districts are not only financed according to local population size, but also according to the social and health challenges facing the local population. The Districts with the most serious poverty and social equity challenges consequently gets the largest budgets by far. This has contributed to prevent a larger gap between the different socio-economic groups during the last 10 years, in spite of a relatively large immigration from the non-western world. The City Districts run a variety of service units and institutions, such as kindergartens, homes and care units for the elderly and disabled, youth clubs, senior centres and health centres.

In addition to their core tasks the City Districts have freedom to engage in different projects and actions tailored to their needs. Here are a few examples which may illustrate the variety and character of their work:

Seven Districts have participated in our Green Municipality Programme, piloting environmental management in the administrative organisation, and 14 kindergartens have been certified according to the Environmental Lighthouse certification system. This programme is now extended to include the whole municipality.

Some Districts have educated their own Environmental Lighthouse certifying personnel to certify local businesses and exchange certifying services with other districts. Several Districts practise Green Procurement and use cycles or electric cars for transport in their services.

The City Districts have appointed Local Agenda 21 contacts and some have recruited expert staff to work with LA 21 in the district. Six Urban Districts have established a Local Agenda 21 forum with participation from local organisations and businesses, and prepared and adopted their own LA 21 plans or programmes. Many Districts support local volunteer LA 21 initiatives practically and financially, and focus on environment and other LA 21 challenges in their City District Day arrangements.

Three Oslo inner east districts are participating in a 10 year Urban Development Programme for urban renewal, social inclusion and cultural integration. The programme is carried through in partnership between the City Districts, the City and the Ministry of Local Government. The Programme funds a series of actions including physical improvement of housing and urban spaces, multicultural youth clubs and employment training for youth, primary medicine workshops for immigrant women, free kindergartens for immigrant children and support teaching in multiethnic schools.

The former District of Romsås, now Grorud, has established a pioneering project called "Exercise in Romsås" to improve health conditions and lower the mortality rate of the population. The primary goal is to help vulnerable groups in the local population to change their lifestyle in a positive direction through physical activity. The project initiates both fitness-to-music groups indoors and outdoor walking groups. Doctors in the District can prescribe exercise on a 'green prescription' as an alternative or supplement to medicine.

### **Oslo reinforces its commitment to sustainable development**

The commitment to sustainable development is not on the wane. On the contrary, during the last year the City has adopted several major White Papers increasing the City's involvement:

- Report to the City Parliament 1/2003: 'Strategy for Sustainable Development' including Urban Ecology Programme for the period 2003-2014.
- Proposition to the City Parliament: 'Strategy for Biodiversity in Oslo'.
- 'Oslo in Motion'; a strategy for health, promoting outdoor recreation and sports.
- 'Oslo Extra Large – a city for all'; a strategy for tolerance and integration.
- Report to the City Parliament 3/2003: 'Green Municipality', a programme for an Environmental Management System, imposing environmental management on all parts of the municipal administration and services.

In addition, the City Government is preparing a Master Plan for the City, with strategies for urban planning, city economy, housing, employment, and social and cultural development that will supplement the sustainable strategy.

Equally important to the adoption of these political documents is the adoption of the Earth Charter, with its values and principles for a sustainable future. Oslo is the host city of the Nobel Peace Prize and the annual ceremony takes place in Oslo City Hall. Formerly awarded the Nobel Peace Prize, Mr. Gorbachev is today co-chair of the Earth Charter Commission, and one of the authors of the charter. The adoption of the Earth Charter is, therefore, a strong symbol of the global commitment to both peace and sustainable development, since these belong together.

Oslo received the European Sustainable City Award 2003- see [www.oslo.kommune.no](http://www.oslo.kommune.no)

# Green structures of Ceske Budejovice, Czech Republic

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## **Introduction**

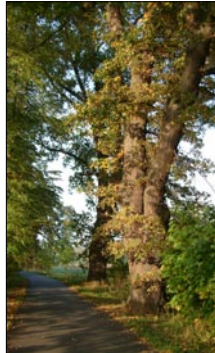
The central European town of Ceske Budejovice is situated in the South Bohemian Basin. Locator Hirzo, a very experienced architect, sorted out the environment for the strategic plan to enforce the royal sovereignty in South Bohemia. The town was founded on the confluence of the Vltava and the Malse rivers in 13th century. Both the rivers and also man-made Mlynsky stream provided adequate natural defence against the enemy.

Nowadays the city is the centre of Ceske Budejovice district spreading on the area of 1,626 km<sup>2</sup>. The administrative unit comprises 107 municipalities with 178,140 inhabitants. Population density represents 110 inhabitants per 1km<sup>2</sup>. In contrast to this, population density of the urban agglomeration, where there are 99,521 inhabitants on the area of 55.54 km<sup>2</sup>, represents almost 1,800 inhabitants per 1km<sup>2</sup>. These figures show the enormous pressure in the direction of commercial use of the land, many times at the expense of green structures.

C. Budejovice surrounding includes a wide range of versatile green areas from protected areas (biosphere reserves Trebonsko and Bohemian Forest, protected landscape area Blansky les) to wetlands, ponds, deer parks and man-made parks. The typical landscape with forest, shelter belts, ponds, parks, deer park, gardens and historical monuments is situated in the vicinity of the city downstream the Vltava river. Within pedestrian accessibility, the historical town of Hluboka or Opatovice village, a candidate on UNESCO's World Heritage List, are situated.

## **Particular driving forces and diversity**

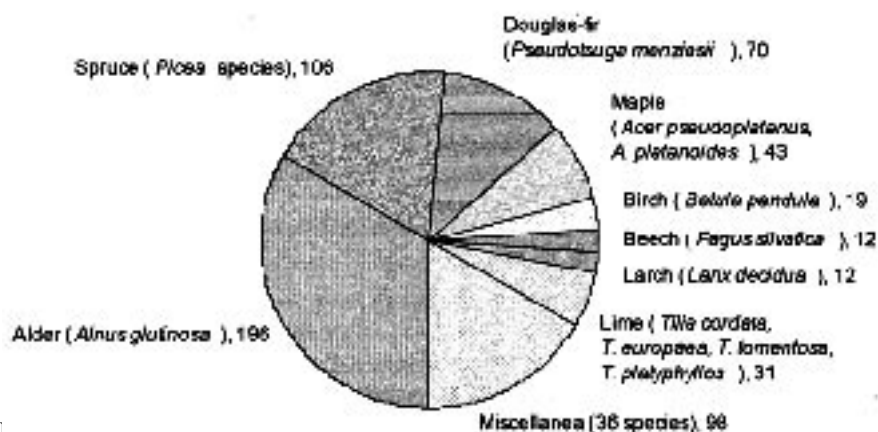
The green structure was shaped up during historical attempts of land, water and other resources utilization under natural conditions of alluvial plains of the Vltava and the Malse rivers. The contemporary driving force for particular areas is the focus of the city environmental planning and management on the following greenery components:



place of King Premysl Otakar II and town hall, tower houses of quarter Vitava, mowing in Stromovka park, children in willow crown, ravens nesting in sycamore trees, Vitava and Malse rivers close to the town centre, Vrbenske rybnik pond area, ederly people are enjoying green spaces, bicycle path along the Vitava river and connecting Vienna to Prague, park Na Sadech.



Fig. 2. Numbers of dead and heavily damaged trees and shrubs registered after the flood, drought and drainage impacts in years 2002-2003. (Stromovka park, Ceske Budejovice, CR, 587 individuals recorded between 9th -11th of August, 2003; data received in cooperation with J. Möllerova, Czech Agricultural University, Department of Dendrology, Prague)



On the basis of the content analysis of the regional press in South Bohemia<sup>1</sup> we can state that nearly 90% percent of citizens use the greenery of the city Ceske Budejovice. People do not perceive the problem of public greenery as urgent and mainly observe if the greenery is in good shape.

During the evaluation of questionnaire answers (Kusova et al, 2004) it was found that C. Budejovice is perceived as a “green town” by the inhabitants. More than 4/5 of them use the greenery for their leisure time in passive and active ways and more than 2/3 are contended with the quality. The inhabitant is interested in clean, tidy and well-maintained greenery. About 7 % of respondents perceive the greenery of the city as a scene or show that might distract or relax the mind or diversify the urban stereotyped environment. 6% of respondents would improve the green structure connectivity and the same number recommend „more benches“. 22% suggested better

1. Contentment with urban greenery of the city inhabitants. Ceske Budejovice (CR), 2004. (Results of the poll commissioned by ILE AS CR (Kusova et al, 2004)

management, e.g., more waste bins, more public lavatories. 5% speculated about „better anticipating of needs and wishes of / between individual area users“ or „careful approach to other greenery users, also by dog keepers“

The diversity of eligible green structure forms and management informally helps to span the misleading and constrained idea of the town culture that greenery is untouchable and safe only when observed from pavements, behind car windows, etc.

The environment connectivity and contextuality perception for a visitor/green structure user is supported by well situated bicycle lanes that facilitate connection between the historical centre, greenery in the built areas, greenery under nature conservation and areas for leisure time in the city suburb and vicinity. The diverse areas proximity, walking and biking distance during a trip offers important experience for active visitors; it is an important informal lecture of cultural continuity of urban landscape changes and maintenance.

### **Visited sites of Ceske Budejovice**

The quality of particular city areas and their green structures is introduced on the examples of four sites situated along the river Vltava and anthropogenic gradient between the city historical centre and a small historical town Hluboka in the vicinity of C. Budejovice.

#### **Park Na Sadech**

The central park Na Sadech was designed by the garden architect Rudolf Vacha (1825-1899) and situated behind the historical town fortification destroyed in the 18th century. The area is 3.5 ha. At the date, the park belongs to the city conservation area proclaimed in 1980. A. Lanna's memorial, playground for children, a fountain, a cafe and proximity of important services, administrative and shopping centres contribute to the site quality. According to Kusova et al. (2004), 15% of the city inhabitants obviously visit the park.

After the year 2002 an essential reconstruction of the park was undertaken. Besides paving the paths, greenery adjustment, locating appropriate spots for benches and waste bins, reconstruction of fountains and their illumination it also included the renewal of greenery patches. New pavements are better accommodated to the vegetation. The roots are supplied with water by means of drainage layers along the paths and by watering.

In the course of the reconstruction, a half of bushes and a tenth of trees disappeared from the stands. The core of the park, consisting of lime trees, chestnut trees, maples, sycamores, elm trees, rosebays, azaleas and magnolias remained unchanged. Acacias, lilacs, hawthorn and honeysuckle bushes, bird cherry trees and other less valuable, diseased or incidentally emerged trees were cut down to be replaced with original, grown-up wood species.

Since 1980 the raven colony(ies) add the local colour to the park and trouble the public, at least by their noisy crowing contributing to traffic noise in the surroundings.

The flowers in this central park suffer from vandalism. Almost one third of the park



flowers are destroyed by vandals, and therefore the firm attending the flower beds must repeatedly renew the damaged canopies.

### **Park Stromovka**

Stromovka is the largest park in C. Budejovice with the area of 68 ha. It was established in 1950s and 1960s as team work of volunteers and inhabitants. The environmental management has improved since 1990s: new paths, cycling trails, benches, playgrounds, pond Bagr. The park is frequently visited by all age and social groups of inhabitants. According to Kusova et al. (2004), 43% of the city inhabitants obviously visit the park. Since 1992 the Stromovka park has been registered as an important landscape component according to the Act 114/1992 on nature and landscape protection. It has been delineated as a regional biocentre within the system of ecological stability of the landscape. Sometimes it is referred to as the „green lungs of the city“. In the park, since 1993, a Sculpture Symposium Stromovka has taken place every year and several open spaces took advantage of sculptural decorations.

In the park, about 270 species of fungi were found in 1995. In 1997 the research of birds showed 60 species, 53 of them were nesting in Stromovka; abundant species are warbler, blackbird, chaffinch and great tit. In 2002-2004 during the COST C11 monitoring 356 plant species were recorded; Canadian poplar, weeping willow, silver birch, black alder, lime trees and maples are common in tree canopy. At the end of 1980s the reconstruction of tree composition was realised and oak, beech, maple, lime, pine and spruce were added to form the future design.

According to the Regulation plan, a bridge for walkers and bikers was built (for better accessibility) between the Vltava river banks. Just after a reconstruction is the bridge for walkers and bikers across main road that splits former Stromovka area into two separate patches. Stromovka is easily accessible from the historical centre at the date.

In August 2002 Stromovka park was afflicted with floods which changed this area into a marshy lake. The suburban recreation zone became inaccessible and the stagnant water was a large incubator of gnats. To drain the area and restore the original conditions, the municipality had to invest more than 5 million CZK. The investment also covered the construction of a system of open ditches for the area drainage. After two extreme severe impacts, i.e., flood (year 2002), dry and hot summer (year 2003) and drainage (year 2003) nearly 600 trees and shrubs were heavily damaged or dead (Fig. 2).

Stromovka park is attended exclusively by the Municipality of Ceske Budejovice. The articles in press in the period 2000 – 2002, which were related to the park, mostly mentioned the disputes on property rights between the municipality and private owners. The disputes ended up in the decision of the municipality to stop attending the greenery on private land and continue on state and municipality property. Apart from the fact that an unattended park patches look ugly the flowering grasses may increase the threat of allergies.

### **Quarter of slab and tower houses Vltava**

The area was built up during 7th and 8th decennia of the 20th century as slab and tower houses concentration on the left side of Vltava river (4 133 flats, 68.5 ha, architects: Vyhnánek and Kubík).

The housing construction was realized in flat open area on former agricultural land of the river alluvium. The houses are built in rows and in that way the greenery follows similar rectangular and line system. The uniform built up area and the uniform age structure of plantations does not allow orientate the area user very well.

The green structures were embedded after finishing the buildings. The lawns based on several grass species were established on made-up ground and young trees and shrubs were planted. Older trees, obviously oaks, were preserved in several patches. At the date, the plant species numbers fluctuate surprisingly between 15-40 and more per a managed habitat. The richest species assemblages were found under the trees frequently used by birds, obviously blackbirds, magpies, doves and sparrows as rest stops; species rich are also the habitats of former garden beds or near the dog keepers' and walkers' tracks.

In August 2002, lower habitats of the area were flooded without remarkable impacts on the young greenery structure.

Restoration of the older built up area is in progress and is destined for remedy of environment quality, including tree densification, microclimate enhancement and re-filling the barrier plantations. The municipal subsidy was aimed at constructing playgrounds, renewing decorative greenery, attending public spaces, car parks and bike paths and sidewalks maintenance. On the area of 650 m<sup>2</sup>, the city hall founded first dogs' park that has ever existed in its territory.

The children who would like to grow some plants and do not have any opportunity to do so are offered a chance in the Centre of ecological and global education Cassiopea. They can grow plants of their own in the newly established bio-garden.

### **Vrbenské rybníky pond area**

The area of Vrbenské rybníky is a unique seminatural and landscape complex situated in the north-west of the city of České Budějovice, about 4 km from the city centre. According to Kusová et al. (2004), 14% of the city inhabitants obviously visit the area. The ponds were built in the 15th and 16th centuries. At the date, they are managed as the nature reserve Vrbenské rybníky declared in March 1990 and comprised the area of 246 ha. It includes 4 medium-size ponds, the meadows bordering with the ponds and the stands of wetland alder-trees habitat unique by its area in central Europe.

In August 2002 the area was impacted by floods without any substantial response of greenery, while the fish farming was spoiled.

The natural reserve is unique for its high concentration of various species on a small area located very near to the city. In 1993 there was established the educational path

„Along the dikes of Vrbenske rybniky ponds“, concentrating on botany, zoology and ecology. The path is for bikers as well as walkers, it measures 2.5 km and the information is presented on ten boards.

Most land in the nature reserve is the property of the city of Ceske Budejovice and the management is provided by the organisation Forests and Fishponds of Ceske Budejovice Ltd. The ponds are managed in the same way as traditional carp ponds for the production of marketable fish, just with some restrictions given by the reserve status and management plan. The same organisation looks after the alder-tree area, which is used as a pheasantry for breeding pheasants and letting them out for hunting purposes.

Considering species diversity and population abundance of many water fowl species, the reserve belongs to the most valuable localities in South Bohemia. In the course of the 20th century, 191 bird species were found here and nesting was proved in 93 species.

Vrbenske rybniky territory is a birds' paradise for visitors. People can watch e.g. birds mating, nest building and water fowl family life at a short distance.

In the reserve there were found more than 900 species of butterflies during 20 years of survey (Pykal, 2004). The mown meadows bordering with ponds host rich meadow vegetation including some more scarce and spectacular species. 398 plant species were registered by Albrechtova (1998).

The area, considering its high habitat and species diversity, definitely belongs to the most valuable fishpond localities in South Bohemia. Therefore the territory was proposed to become part of the bird area (Special Protected Area), which is currently under preparation as “Ceskobudejovicke rybniky“ according to “Birds Directive”, and, together with the adjacent former military training platform, also as a proposed “Site of Community Interest” according to “Habitats Directive” of the European Union.

The mentioned steps should contribute to the preservation of natural-scientific and landscape-forming values of this territory, which also serves the recreational purposes of the inhabitants of two largest residential parts of the city. Though the numbers of people along the ponds dams are high from spring to autumn, no negative impact on water birds has been found.

The territory is often visited by the students of biology from all types of schools – beginning with basic schools up to the University of South Bohemia and its Faculty of Agriculture or the Faculty of Biological Sciences.

### **Several aspects of Ceske Budejovice urban planning**

Planning guided the town spatial structure from the town origins in the 13th century. By the seventies of the 20th century, the town was “shaded of” megalomaniac general trends. In comparison to Mayer (2000)

Many historical concepts and ideologies that were summarised by Mayer (2000) can be observed in resulting green structure patterns developed under local environmental driven forces and the social-driven aims.

In general, the present patterns manifest the idea that local environment and available open space is crucial to a sense of enjoyment of city life, conservation diversity, incorporating the characteristic nature features into the sense of genius loci, managing the green structures peculiarity and contextuality.

The planning of the areas quality and diversified management eventuate in diversity of green structures for leisure and education. It is essential for changing green structures to allow a visitor to experience the differences between environmental comfort along a short distance gradient or during a few hours of walk.

The future of green structures space distribution is predetermined by a final version of Master Plan (2000). In the plan, the important vegetation forms are components of green axis connecting (isolated) urban habitats between each other and within landscape ecological systems. The projects secondary to Master Plan are based on the latest instrument of landscape planning in the CR, the Territorial System of Landscape Ecological Stability (Bucek et al., 1996; Ministry for Regional Development, 1997).

At the date, the flood impact is discussed in the view of construction regulations and provisions and will eventuate in the changes of the latest version of Master Plan.

The environmental planning and management is supportive to urban planning of greenstructures.

In long the term perspective good general remedies will be received when the state policy of the environment is considered (Ministry of the Environment of the CR, 2004) and environmental aspects involved in the first steps of Master plan and Regional plan development.

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