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SCATTER

Sprawling Cities And TransporT: from Evaluation to Recommendations

Deliverable 4.1: Work package 4.1

Review of measures aiming to tackle urban sprawl

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EXECUTIVE SUMMARY

The report presents the results of Task 1 and 3 of SCATTER WP4 “Review of measures aiming to tackle urban sprawl”

The Work Package has investigated the existing literature and a wide range of case studies with the intent to identify policy measures that can be effectively implemented to control urban sprawl and its related effects. The work for task 1 combines a literature review on innovative methods and practices with an analysis of case studies in order to overcome the sectoral approach of the former with the more integrated and operational approach of the latter. Task 3 presents a commented transcript of interviews carried out in the US with experts on urban sprawl and policies devised in that particular context.

Compared to existing and similar reviews (Transland and Transplus projects) WP4 has adopted an innovative approach based on the use of a reference matrix (see table 1) that identify policy measures at the crossing between issues and impacts resulting from sprawl and policy categories such as fiscal measures, land use planning instruments, housing and design in the private sector, transport, and other projects/actions in the public sector.

Using this approach throughout the analysis of the literature and case studies results can be structures as follows:

- Tackling land consumption: land consumption is mainly a result of low-density development, which is one of the key feature of urban sprawl both in Europe and in the US. Policy measures to limit consumption of land focus on two approaches: the setting of constraints to the extent to which a city can expand such as in the greenbelt and growth boundaries measures and the promotion of more compact, dense and possibly mixed use development. The preference assigned to one or the other approach depends often on the more general planning systems of the local and national contexts and to the possibility of the public authorities to enforce binding regulations.
- Mobility: key mobility problems related to urban sprawl are increased inaccessibility to employment and services and increased dependence on the private car over public transport. These are two somehow conflicting issues with regards to policy implementation since the former assumes the need to increase mobility of people and goods while the second portends the reduction of the overall need to travel. Case studies show how this apparent conflict can be resolved by integrating different policy measures that address the two issues. While higher accessibility can be provided for by a strategic planning of transport infrastructures focused on connecting isolated and segregated residential areas to employment and service centres, the integration of transport planning with land use planning can provide the spatial and functional urban structure that best accommodates the use of public transport. The need to reduce car usage and promote public transport is also addressed by a variety of “push and pull” measures targeting individual behaviours. Push measures focus on making car usage more costly (via parking reduction and pricing, road usage charging, fuel consumption taxing). Pull measures focus on making the use of public and alternative modes of transport, namely cycling and walking more attractive via bus and rail services improvement (more and more flexible schedules, differentiated ticketing systems), safer routes for pedestrians and cyclists, information and marketing campaigns.
- Decline of urban areas: in the US, urban sprawl is firmly related to the decline of core areas which tend to lose employment, economic activities and population against the development of peripheral areas. This is confirmed by the literature review in which the problem is addressed mainly via measures for urban centre regeneration. In Europe cities have not been subject, at least not with the same strength to the decline of their urban core. The analysis of case studies underlines this difference presenting a wider range of regeneration cases located in peripheral areas. Regeneration programmes in peripheral areas are often integrated with transport measures for the purpose of reducing the segregation of suburban residents.

All the case studies presented in this review show some degree of policy or institutional integration and coordination. Integration in these cases is a proper response to the acknowledgment that, regardless of the scale of the urban area and of the issues to be tackled, interactions between policies and between the different effects of policies must be dealt with. Integration is therefore recognised as a key success factor. The awareness of local authorities for the interaction of causes and the integration of policy measures was one of the main findings of WP2 that carried out a system analysis of urban sprawl by means of interviews with experts and local authorities representatives in the six SCATTER case cities.

This report presents results on the issue of policy measures integration while institutional integration and barriers overcoming, also discussed in WP2, will be addressed in task 2 of WP4 and reported in a separate document.

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1. INTRODUCTION

According to the SCATTER work programme, the WP4 has to produce a review of measures and policies tackling urban sprawl in Europe and the USA. Within the SCATTER framework WP4 aims at providing inputs to the selection of measures to be simulated in the next stage of the project, WP5. The selection of the measures to be simulated will be based on the relevance with regard to the findings of WP2 and WP3 and on estimates of their impacts and overall efficiency based on WP4.

There are three main components to the work package:

1. a review of polices addressing urban sprawl in Europe and the USA;
2. a review of institutional barriers and
3. interviews with US experts on urban sprawl.

The review intent to provide a description of various measures implemented in the case cities (Brussels, Bristol, Helsinki, Milan, Rennes and Stuttgart) and other European and US cities. The review of institutional barriers highlights possible barriers to implementation of policies. The interviews in the USA are intended to highlight ways of identifying sprawl on the ground, ways to mitigate the negative impacts of sprawl and to identify policy measures which may control the problem.

1.1. Structure of the report

The following report is the overall deliverable of tasks 1 and 3 of WP4. It is organised in three sections, which present:

- results from the review of the existing literature and documents covering the recent debate on the problems of urban growth and policy measures addressing these;
- a description of the policies and measures implemented in 11 case studies (5 of the six SCATTER case cities, 5 other European cities and Portland in the US);
- the abridged and commented transcription of the interviews conducted in the US with experts.

The first two sections of the report are highly complementary. While the first one cover mainly the UK and US literature on policy measures tackling urban sprawl, the case study analysis is geographically biased towards Europe. Both sections have based their investigations on the same overall analysis matrix (see table 1). While the first section provides as many different examples as possible of each type of policy presented in the matrix as an overlap between issues related to sprawl and policy field, the second section has adopted the same matrix as a preliminary description of each case study.

1.1.1. The bibliographic review

The literature review has classified the main policies dealing with urban sprawl, based on issues identified in WP1 and WP2, namely environmental policy, land consumption, mobility, adaptability of physical infrastructure and social segregation. The review has been divided into two parts: the first part provides an overview of the main concepts and policies addressing sprawl; the second part provides a detailed assessment of policies implemented in chosen cities.

It has been found that policies targeting sprawl are inseparable from policies, which deal with the problems of modern urban growth. There is a strong emphasis on integrated policies, which tackle a series of related issues, and a focus on a regional approach, as it is particularly common with urban sprawl to shift the problem from one local authority to another. The other overarching concept is the promotion of the compact city or a form of decentralized concentration. This need for the physical containment of growth, is also reflected in the mobility policies, which advocate the use of public transport, policies for urban revitalization and infill development. The main policy to improve mobility is to increase accessibility to jobs, shops and services by public transport, and to focus housing around

public transport corridors. In improving the adaptability of physical infrastructure, the development of mixed uses was the main method used, with the second focus of the literature being methods to increase the demand for core area housing. Reducing social segregation focused on methods of providing affordable housing through the market.

1.1.2. The review of case studies

The main idea that helped choosing the cases was to make a large overview of the policies and measures designed and implemented to tackle urban sprawl and/or related negative impacts. The selection had to reflect the results of the literature review but also provide a different perspective on existing policy measured based on the implementation mechanisms involved in the different contexts and case studies. Therefore this section of the report addresses research questions related to the implementation of policies and more in general to the planning practice in which they are embedded. How are policies implemented? Which are the main elements of the implementation process? Can we identify some success factors? Are new trends in the planning practice emerging, as a consequence of urban sprawl?

In order to select a limited number of significant case studies a preliminary list of potential cases has been built manly by investigating existing Internet databases and related EC projects. Criteria for the final selection of the case studies presented here have included

- the necessity to cover as many different European contexts and planning backgrounds as possible avoiding overlaps with the SCATTER case cities, also included in this review;
- the different demographic scales of the case studies in order to be able to cover a wide range of cases, from European capital cities to National Metropolitan regions, to medium-sized cities;
- the amount of documentation and literature available for each of the case studies.

Case study's reports have been drawn up according to a common analysis template. The structure of the template includes a description of the geographical, demographic and socio-economic context of the case study, a presentation of the planning system both at the national and at the local level, an overall description of the long term planning strategy adopted by the city, region or metropolitan area and a detailed description of the policy or policies of interest for this review. The latter accounts for the implementation of the policy focusing, when possible on the actors and financial mechanisms involved. In some cases, results and outputs of the policies are also provided.

This section of the deliverable also includes a comparative synthesis of the main key findings regarding implementation processes. Keeping into account the objective of WP4 to provide an input for the selection of policies and measures that will be simulated via modelling techniques in WP5, findings are focused on the interactions between the investigated policies. They also account for the role played by policy and institutional integration in addressing sprawl from the perspective of sustainability.

1.1.3. Interviews in the US

Interviews were held at Rutgers University – the State University of New Jersey – at New Brunswick, NJ on 4th March 2003 and conducted as an open seminar with Professors Richard Brail, Robert Burchell, and Reid Ewing. The seminar was also attended by Dr. Mike Lahr from the Center for Urban Policy, and three graduate students John Renne, Jianye Chen and Stephan Schmidt. The report in section three of this deliverable is an abridged version of the issues that were discussed.

Richard Brail is a Professor and Chair of the Rutgers University Department of Urban Planning and Policy Development and Director of Computer Resources at the Bloustein School of Planning and Public Policy. He set up this meeting with Reid Ewing, Bob Burchell, and Mike Lahr, key academic researchers in the US, if not the world dealing with issues involving urban sprawl.

Bob Burchell is Distinguished Professor at the Center for Urban Policy Research, is the author of 25 books and more than 50 articles. Professor Burchell, co-director of the Center, is

an expert on fiscal impact analysis, land-use development and regulation, and housing policy. Dr. Burchell co-authored the *Development Impact Assessment Handbook for ULI* - The Urban Land Institute. His major publications include *The Fiscal Impact Handbook*, *The New Practitioner's Guide to Fiscal Impact Analysis*, *The Adaptive Reuse Handbook*, and the *Environmental Impact Handbook*. He has served as principal investigator on more than $2 million in research spanning a twenty-five year career at Rutgers. One of these efforts included the Impact Assessment of the New Jersey State Development and Redevelopment Plan, an encompassing study of the growth management program adopted by the New Jersey State Planning Commission in June 1992. Similar 'costs of sprawl' studies have been done for the state of Maryland, the Lexington (KY) Metropolitan Area, the Delaware Estuary, the Southeast Michigan Council of Governments, and the South Carolina Advisory Commission on Intergovernmental Relations. His contributions to the National Academy Study *The Costs of Sprawl* (1999) are the seminal publication in this area.

Reid Ewing is Director of the Alan M. Voorhees Transportation Center at Rutgers University, overseeing the National Transit Institute and the Voorhees Transportation Policy Institute. He is also Research Director of the Surface Transportation Policy Project in Washington, D.C., the recognized US leader in transportation reform. He has been the American Planning Association's top selling author since 1996, with two books to his credit. He is the author of three other books and many articles on growth management, community design, and traffic management, and speaks and consults widely on these subjects. Before his academic career, he was a state legislator in Arizona, and before that, a Congressional staff member. His most recent books are *Flexible Design of New Jersey's Main Streets* (2002), *Traffic Calming: State of the Practice* (1999), *Land Use and Transportation Innovations* (1997), and *Best Development Practices* (1996).

SECTION 1

LITERATURE REVIEW

2. INTRODUCTION TO THE LITERATURE REVIEW

Urban sprawl has become an increasing priority on the urban agenda due to its contribution to unsustainable land use and consumption. Current patterns of development, combined with the changing economic and social context of European cities have resulted in increased land consumption; wider social and economic disparities between social groups; the spatial segregation of opportunities for employment, education and housing in urban neighbourhoods; a decrease in the quality of the urban environment, in the quality and quantity of green space, and in the physical and cultural heritage of the built environment; and problems with urban transport namely, increased use of the private car and decreased use of public transport, leading to pollution, traffic congestion, and reduced accessibility to services and economic functions of cities. Urban sprawl is to some extent the result of this changing economic and social context.

Urban sustainability has been high on the European Agenda, and a comprehensive list of work addressing sustainable development can be found in EEA-DG-JRC (2002). This concept can provide a general context for the evaluation of policies to combat sprawl. The concept of sustainability has a long history starting with the Brundtland Report in 1987, and since then several approaches to sustainability have been developed: the three main components are

- the economic approach: which focuses on maximizing flow of income while maintaining the stock of assets or capital which yields these benefits;
- the ecological approach: which focuses on preserving the ability of biological and physical systems to adapt to change;
- the socio-cultural approach, which focuses on maintaining intra- and inter- generational equity.

One of the more recent documents on urban sustainability is that of the EU Expert Group on the Urban Environment (European Commission 1996). This study takes a socio-cultural and ecological approach to sustainability, with a focus on improving the overall quality of life for people in the present and between generations, and for long-term environmental health. Income growth is thus balanced by a concern for future generations and environmental protection, and takes place only if it is within the carrying capacity of natural systems.

The key principles of sustainability are given as (European Commission 1996):

1. Environmental capacity: human activities should not exceed the environment's carrying capacity thresholds
2. Management of demands: policy processes should limit demands to within the limits of the natural environment rather than meeting demands which exceed this
3. Reduce the use of natural resources: use of environmental resources should increase durability, decrease need for resource use, increase the efficiency of resource conversion, avoid consumption of renewable resources which is faster than their replenishment and reduce need for non-renewable resources.
4. Diversity: increase the benefits gained from economic activity by multiple use and increased economic and social diversity
5. Equity: increase the equitable distribution of wealth

More specific frameworks for the development of urban areas have been laid out in Committee on Spatial Development (1999), which states that sustainable urban development should encourage

- control of the physical expansion of towns and cities
- a mixture of functions and social groups
- wise and resource saving management of the urban ecosystem

- better accessibility by different types of transport
- conservation and development of the natural and cultural heritage

Other frameworks for sustainable land use given in the European Sustainable Cities Project, the European Spatial Development Perspective, CEMAT, and Member State's Urban Exchange Initiative are listed in Expert Group on the Urban Environment (2001)

The decision to implement policy assumes that a problem exists and that it cannot be resolved by market forces. The urban sprawl literature has not always agreed on the need for public intervention, and this is summarized in the debate between Gordon and Richardson (1997) and Ewing (1997). Gordon and Richardson argue that the decentralized suburban development offers advantages to the individual in the form of reduced travel times and lower housing costs, as well as higher consumer satisfaction. Ewing points out that there are increased infrastructure costs, travel distances and loss of land due to sprawl. This includes debate over empirical evidence for increased resource consumption and increase in travel and congestion due to sprawl, but for the most part the debate over the problem of sprawl depends on whether the focus is on the individual or the community as a whole. Gordon and Richardson see sprawl as impacting on the individual, largely resulting in beneficial impacts, with little need for market intervention. Ewing, however, addresses the wider community whose needs are not meet by the market. He sees this form of growth as problematic with a need for government intervention.

In light of this debate it is also useful to outline the rational for government intervention which is explained by Stokey and Zeckhauser (1978) and some key issues to consider when applying policy to urban sprawl. Government may intervene for reasons of "efficiency" or "equity". The "efficiency" rationale applies to urban sprawl principally because of the non existence of markets for some goods such as the loss of environmental quality on future generations; "externalities" where the actions of one individual affect the welfare of another, for example, where use of the private car provides convenience for the individual but congestion on roadways; and "public goods" where the benefits accrue to the group as a whole, with the benefit to the individual being too small to provide an incentive to purchase, for instance the revitalization of the built environment. In terms of equity, the market may not provide goods equally to all areas or groups, which applies clearly to the issues of adaptability of physical infrastructure and segregation of social groups.

Policy solutions can take the form of attempting to improve the working of the market; implementing measures that require individuals and firms to behave in certain ways, such as greenbelts and planning laws; providing incentives that influence decisions of private individuals and firms such as housing vouchers; the direct provision of goods and services, such as social housing; and encouraging the private provision of goods and services, such as housing associations. The European Commission (1997) acknowledges that the trend in public sector and city management is less towards the direct provision of services, but while it emphasizes the importance of provision of "services of general interest" it does not state a clear preference for how these services are to be provided.

Current trends suggest that the growth of cities is likely to continue, however, the form and impacts of that growth can be directed through public policy. Once it is decided that a problem exists and that government intervention is necessary, the desired policy must be determined. It is useful to outline the general decision making framework, which is applied before implementing a policy. According to Stoke and Zeckhauser (1978) this involves:

1. Establishing the context: identify the problem and the objectives to be addressed
2. Laying out alternatives: examine alternative courses of action to the present
3. Predicting the consequences: what are the likely consequences of each alternative
4. Valuing the outcomes: deciding on the criteria used to choose each objective; deciding on the importance of each objective

5. Making a choice: some alternatives will fulfil certain objectives better than other alternatives and perform worse on other objectives. The choice of action will inevitably depend on a tradeoff of objectives.

When considering these steps it is particularly important to note the following:

Aims of policies: Any policy involves significant choices between conflicting objectives, groups and physical regions. A decision must be made as to the nature of the problem, the interest group being served and the geographical area targeted. No policy is neutral and will involve normative (and political) choices starting from the decided objectives, and the criteria for choosing those objectives.

Interactions of policies: Policies to achieve sustainable development, and combat complex problems such as sprawl cannot be viewed in isolation. Successful implementation of sprawl policies often depends on other related policies, and these often have impacts on sectors outside their orbit. This is particularly so in the case of urban areas, which operate as interconnected systems where activities in one sector have positive or negative feedback effects on other sectors. This view of cities as complex interconnected systems is hindered by the sectoral specialization of policy makers and departments in urban government.

Level of approach: To some extent urban sprawl can be dealt with at different spatial levels, for instance as a neighbourhood problem, a city wide problem, or a regional problem. It is important to approach the issue of sprawl at a broad enough scale so that the problem is addressed directly rather than being shifted to another locality or political jurisdiction. This is in accordance with the spatial policy discussed in Committee on Spatial Development (1999) which seeks to strengthen the metropolitan regions at an EU level. Policies therefore need to promote cooperation between cities and regions in economic competition, culture, education and knowledge and social infrastructure.

Successful policies to combat sprawl may be targeted at individual cities, but should be viewed as part of an interdependent network of urban centres and smaller towns, with the outcomes evaluated in terms of the effect on the polycentric network as a whole.

Policy Changes: The nature of policy intervention in the city has changed substantially, moving from the modernist model to more communicative approaches. The modernist model assumes the idea of cities as ordered, well functioning spaces, with demarcated and separated land uses, with little or no conflict between uses or users. This style of planning was large scale, interventionist, comprehensive and rational. The governing structure was seen as a centralized bureaucracy, with no input from the population. Planning and policy making was seen as a rational technical function, able to predict future outcomes, with order imposed by master plans which show little recognition of difference. As a scientific activity little attention was placed on the barriers of the political economy and the difference in power relations between interest groups.

This view of the city has moved to one of multiplicity and diversity. Cities were seen as fragmented and divided within themselves and in competition with each other. Urban policy moved from attempting to manage and control events in the city to a realization that urban policy makers have little leverage to implement the traditional master plan, and that it has little ability to adjust to changing social roles and economic changes.

This recognition of the pluralism in the planning arena led in the 1970's to advocacy planning. Planning moved from the ideal of value neutrality to an explicit recognition that planning was based on certain values and desired objectives. This was the politicisation of planning, where policy was constructed in terms of power struggles and conflict. Planners were seen as representatives of interest groups, and along with this was the idea that groups and individuals would have more direct say in the shaping of public policy. This has moved to an approach of 'communicative argumentation'. This approaches shows an increased recognition of the diversity and complexity of cities, and attempts strategic consensus building of the use of public spaces. It makes an attempt at public reasoning, which accepts a wide range of contributions, and ranges of valuing and giving meaning.

Planning in the late twentieth century has also been influenced by changes in attitudes to the city economy. In general there has been a move from the idea that the market should be regulated by policy to an acceptance of the unregulated market. At the start of industrial capitalism urban policy compensated for the problems created by providing welfare and infrastructure, particularly from 1945 to mid 1970's. Expenditure on public works reached a high point during this period, and was seen as a way of overcoming under consumption and unemployment during economic downturns. Urban policy also aimed to provide collective goods of infrastructure and services

The role of urban policy changed during the recession of the 1970's and the increase in supply side economics. The view of the market moved from one of inequality and disorder to one of order and efficiency which would provide a solution to urban problems. This neoliberal policy resulted in deregulation of the markets, and the aim of urban policy changed from intervention to facilitating the free operation of the market. This was essentially a shift from the 'politics of consumption' to the 'politics of production'. Welfare functions were downgraded and greater attempts were made to attract capital investment. In line with this were the increased privatisation of infrastructure and services.

3. POLICY MEASURES

This paper will first provide a review of policy measures currently in use to combat sprawl. A useful approach to organize these is through the issues resulting from sprawl, which is outlined in Table 1, the approach chosen is one of several frameworks that could be used to organize the policies used to tackle sprawl. However, the table addresses these through the impacts associated with sprawl. The main areas of concern are environmental quality, consumption, mobility, adaptability of physical infrastructure, and segregation of social groups. The table then lists the specific policies currently being used to address the issues of sprawl. These are categorized by policy type: fiscal measures, land use planning instruments, housing and design in the private sector, transport, and other projects/actions in the public sector. The section headings relevant to each policy are given in the table, primary policies for each issue are in non-italic text and secondary policies for each issue are in italic text. Specific policies which are discussed under a broader policy category are placed in brackets.

3.1. Environmental Impact

Sprawl has negative impacts on the environment through the influence of urban form and transport on energy use and environmental emissions. The sprawl form leads to increased auto use and auto emissions, higher energy requirements of space conditioning and lighting in low density single family homes, changes to air and water quality through use of lawnmowers, fertilizers and pesticides and higher levels of solid waste generation. and transfers farms, woodlots and open spaces to urban uses, affecting renewable resources, water quality, recreational activities and biodiversity (Anderson et al 1996). The automobile is one of the major sources of negative impacts on the environment, through its consumption of energy and auto emissions. In addition to changes in mode of transport, changes in urban form can result in reductions of these impacts. Firstly, increased energy conservation is possible by locating work and housing together, thus reducing journey trip lengths and enabling increased public transport use. Reductions in car emissions, mainly carbon monoxide (CO) and nitrogen oxides are enabled by preserving open space and dense vegetation within urban areas, which improves local air and water quality. Most of the environmental effects of urban sprawl can be addressed through policies targeting the other major issues of land consumption, mobility, adaptability of infrastructure and social segregation.

Space	Issues	Policies				
		Fiscal	Land Use Planning Instruments	Housing and Design in the Private Sector	Transport	Other Projects/Actions in the Public Sector
	Environmental Quality	Policies tackling these issues are addressed under the issues of consumption, mobility, adaptability of physical infrastructure and segregation of social groups				
All	Loss of environmental quality to region					
All	Increased land pollution					
All	Increased air pollution					
Suburbs/Hinterland	***Consumption***	3.2.5: development impact fees	3.2.1: compact city, 3.2: decentralized concentration, 3.2.2: greenbelts and urban growth boundaries	3.2.3: compact building design(new urbanism, 3.2.4: cluster zoning)	*3.3.2: settlement around public transport corridors*	3.2.4 transfer of development rights, 3.2.4: purchase of development rights, 3.2.4: land banking
	High land consumption for housing development					
	Land consumption for infrastructure development					
	Higher local government costs					
	Higher housing and infrastructure development costs					
	Mobility	3.3.5: private car use (Versement Transport; location efficient mortgage high automobile taxes; high taxes on fuel)	3.3.1: accessibility, 3.3.2: settlement around public transport corridors	*3.2.3: compact building design(new urbanism, 3.2.4: cluster zoning)*	3.3.3: extension of the public transport network, private car use (getting the business in the right place), 3.3.4: parking (in lieu parking fees, shared car parking spaces, centralized parking, maximum parking limits, parking freezes, demand reduction, ABC policy	
All	Increased trip numbers, trip lengths and travel times					
Regional Centres	Increased congestion of radial roads					
Core	Rings of traffic jams					
Suburbs	Inefficient use of public transit due to low density development					
Core	Reduced accessibility of low income residents to jobs and serices					
	Adaptability of Physical Infrastructure	3.4.3: housing demand (location efficient mortgage), financing revitalization (tax incremental financing, capital allowances, incentive proerty taxation)		3.4.2: mixed use		3.4.2: mixed use
Core	Loss of economic activities / jobs in certain sectors and in areas of disadvantaged groups (urban centre)					
Core	Degradation of built environment					
Core	Loss of local tax revenues from urban cetnre					
Suburbs, Regional Centres	Inequitable distribution of services among subregions					
	Segregationof Social Groups	3.5: segregation of social groups (housing vouchers)	3.5: segregation of social groups (planning regulations)	*3.4.2: mixed use*	*3.3.3: extension of the public transport network*	3.5: segregation of social groups (inclusionary zoning, housing trust fund, accessory apartments)
Suburbs	Concentration of disadvantaged groups in suburbs (lowest income groups, minorities, elderly) and loss of middle class groups to core (families, first time home buyers from centre)					
Core	Concentration of disadvantaged groups in urban centre and less atrractive areas (lowest income groups, minorities, elderly) and loss of middle class groups (families, first time home buyers from centre)					
Suburbs	Shortage of affordable housing in suburbs					

Table 1: Policy Framework

3.2. Land Consumption

The key issues of land consumption as listed by the European Commission (1996) are land loss due to population and employment decentralization, and the threat to local services by out of town retail. This is in part the result of traditional land use planning which has emphasized the segregation of functions – home, work, retail – leading to single use developments, with an increase in travel demand, energy consumption and emissions. While solving the problems of the industrial cities of the early century this has lead to many problems associated with urban sprawl.

General guidelines for policies for urban land use have been given in Expert Group on the Urban Environment (2001). Among these are the recommendation for provision of market based instruments to influence land markets, including voluntary agreements and tradable permits in urban land remediation and reuse, and the use of taxes to discourage green field development. The other point which is particularly pertinent to this section is the emphasis on regional polycentric development. The EU in Committee on Spatial Development (1999) advocates inter urban polycentric development at the EU rather than city level, to promote complementarities between regions. This is in accordance with policies to tackle sprawl, as most of the negative effects of sprawl are regional in nature.

Advice is given at the city level, advocating:

"the concept of the 'compact city' (the city of short distances) in order to have better control over further expansion of the cities. This includes, for example, minimisation of expansion within the framework of a careful location and settlement policy, as in the suburbs and in many coastal regions. It will only be possible to stem the expansion of towns and cities within a regional context. For this purpose co-operation between the city and the surrounding countryside must be intensified and new forms of reconciling interests on a partnership basis must be found." Committee on Spatial Development (1999) p. 22

This highlights two reoccurring points in anti sprawl policies, the advocacy of the compact form and the need to take a regional perspective. The issue of the compact city as the desired urban form, deserves further elaboration.

3.2.1. Compact City

The compact city, defined in terms of higher density cities, with growth retained within existing town and city boundaries, has received strong support in UK planning. Claims are made for the compact city on the grounds that it promotes higher urban densities and smaller sized cities, which in turn lead to reduced travel distances, higher accessibility, lower fuel emissions, preservation of rural land, higher quality of life, with mixed uses and preservation of neighbourhood characteristics. This position, through the strategy of urban intensification, has been advocated in UK planning strategies. (Williams et al 1996).

Criticisms of the compact city usually fall under the categories of effects of urban intensification, revitalization of the city, social impacts and service provision and transport. Criticisms generally question whether the claims for the compact city are valid, and secondly whether it is possible to achieve this urban form given the growth rate of the city and the overwhelming trend to decentralization.

One critique of the compact city has been made by Thomas and Cousins (1996). The authors see this as an unattainable urban form, due to changing trends in employment, and transportation. In terms of employment there is an increased need for space, a desire to be close to a suburban workforce, and to high quality amenities, and a reduced need for proximity to other business due to advances in telecommunications. They see the compact city as resulting in higher levels of congestion, with increased travel times and lower speeds leading to higher fuel emissions. The radial pattern of transport, from the centre to periphery is disputed, with claims for more suburb to suburb trips and non work journeys which would

not be served by the compact city. However, no examination is made of the ability of the compact city to support higher levels of public transport use.

The other main criticism is the political feasibility of the compact city given the increased demand for larger spaces and thus increased decentralization by the public. One major difficulty with the compact city form is whether there is the capacity for the city to accommodate growth. These points are reflected in the views of (Breheny 1995; Breheny 1996; Breheny 2002). He critiques the advocacy of the compact city by the CEC Green Paper on the Urban Environment (1990). He sees the definition of the compact city in this document as radical, as the city is not expected to extend its periphery and is to remain contained within existing boundaries. Under this scenario, growth is to be accommodated through urban infill. Given the limited space for new development, the only possibilities are the use of derelict and vacant land of the use of urban green space. This is not usually advocated as it leads to a decrease in environmental quality.

Breheny explores in more detail the trend to decentralization, particularly the underlying causes of change in the 'space economy': longer distance commuting, residential preference for non-metropolitan areas, economic change in favour of peripheral areas, and employment decentralization. Urban sprawl is perceived as part of these more fundamental changes to economic and social functions. For instance, residential preference for non metropolitan areas is due to both a desire for the suburban lifestyle and the negative qualities of the urban areas in terms of congestion, crime, social deprivation and physical decay. Employment decentralization, and thus loss of economic function in the city core is due to the spatial division of labour in a company into core and production functions, with core functions locating in cities and production functions in cheaper decentralized locations.

He raises the point that centralization policies might lead to 'town cramming' in which urban areas are overdeveloped, leading to loss of green space and congestion, precisely the conditions which lead to the original decentralized planning movement of Ebenezer Howard and the Garden City. He advocates a position similar to the key and multiple village extensions where decentralization is channelled to existing suburbs and towns, which are able to support a full range of services and public transport, together with stronger urban regeneration strategies and intra urban environmental initiatives.

3.2.2. Decentralised concentration

"Compact city" is one of two main patterns of controlled growth, the other being "decentralised concentration". Five main forms of decentralised concentration have been identified (Breheny et al 1993): urban infill, urban extensions, key village extensions, multiple village extensions, and new settlements.

Urban Infill: is urban growth channelled to the boundaries of existing towns and cities. This can take the form of brownfield redevelopment, conversion of existing buildings or development of urban green spaces

Urban Extensions: is development on the edge of existing urban areas on green fields at the urban fringe. This is low density suburban sprawl

Key Village Extensions: urban expansion is channelled to selected villages through investment in infrastructure, with low growth in surrounding villages. There is a wider range of services with the catchment area being the surrounding villages.

Multiple Village Extensions: growth is channelled to all existing villages with development on the edge of the existing area or infill development. The Key Village and Multiple Village Extensions are developed in the UK context, however, this idea could be extended to small towns in more networked European regions. The policy of decentralized concentration is a similar concept applied at the regional level. In this case development is channelled to existing urban areas. It has the advantage of creating a balanced regional system with several sub centres as focus of regional economic growth and urban functions. This strategy is easier to implement in polycentric regions. Examples are discussed in European Regional Conference : European Metropolitan Regions (1999).

New Settlements: new development areas are created, in the past primarily through the New Town developments. The New Towns are often seen as an attempt to combat urban sprawl, however, the reality is more complex. In the UK the policy aimed to create eight new towns under the 1944 regional structure plan, with the intention of relieving poor housing conditions and overcrowding in major urban areas. The intention was to decentralize population from congested areas to self contained towns, and was not primarily for growth management. The towns, however, were intended to be self contained, with schools, services and a balance of housing and jobs. Most research on New Towns has not focussed on their role in a regional development strategy, but at the level of the town itself, examining their successes, variations and shortcomings. House of Commons: Transport (2002)

3.2.3. Greenbelts

Regardless of whether a compact city form or channelled decentralization is the ideal, some measure is needed to contain the growth of major urban areas. The most direct policy is that of the green belts. The green belt is one of the main policies used to minimize land consumption. It has a long history in the UK, with policies implemented since 1935. The main intention of the greenbelt policy is laid out in Great Britain Department of the Environment (1995). The main intention of the policy is to keep land permanently open in order to check the sprawl of built up areas, prevent neighbouring towns from merging into each other, to safeguard the countryside from the encroachment of built development, to preserve the setting and character of historic towns, and to assist in urban regeneration. A major point of decision is whether the greenbelt is to accommodate future growth or to be used to avoid further population growth. This is not clearly stated in the UK case, but the implication is that the green belt should accommodate future growth as far as possible,

> "they should be carefully drawn so as not to include land which it is unnecessary to keep permanently open. Otherwise there is a risk that encroachment on the Green Belt may have to be allowed in order to accommodate future development." Great Britain Department of the Environment (1995), section 2.8

However, where this is not possible growth is to be channelled to existing urban areas

> " …(aim) of channelling development towards urban areas inside the inner Green Belt boundary, towards town and villages inset within the Green Belt, or towards locations beyond the outer Green Belt boundary." Great Britain Department of the Environment (1995), section 2.10

A variation on the greenbelt policy is the urban growth boundary implemented in the US, which is a similar concept, but is drawn to accommodate growth for a specified period only (20-30 years) and is revised periodically. Pendall and Fulton (2002). The greenbelt in the UK is not approved for alteration except in exceptional circumstances. A tool used to control the pace of development is the urban service area, which is the area beyond which a cities infrastructure (sewer and water) does not extend. This is usually used to target growth into particular areas in a particular sequence, not to prevent development in the long term.

The success of the green belt policy in combating sprawl depends on the preservation of the greenbelt and the extent to which there is leapfrog development around the green belt. Preservation of the greenbelt requires a strong planning system, in the UK the green belt has been successfully retained, with only 5-10% of the land allocated for greenbelt in the 1950's being developed (Munton 1986). One important criteria for successful greenbelt policy is its implementation within a regional structure otherwise there is the risk of shifting sprawl from one area to another with development leapfrogging the greenbelt, leading to dormitory suburbs which are dependent on the central city for employment. This is especially important where the green belt is tightly drawn and restricts the growth of the city. In the UK context the

policy is often implemented with the idea that satellite cities will be created outside the greenbelt (Pendall and Fulton 2002).

The main side effect discussed is the impact of the green belt on house prices in the urban area. House prices are dependent on several factors: agricultural value, structure value, infrastructure value, present location value and future location value (Nelson et al 2002). The main impact of the urban growth boundary is on structure value, the opportunity cost of the resources used to construct the house. It is argued that green belts restrict the supply of developable land, raising its price and thus the price of housing.

Whether house prices increase *due to the growth boundary* depends on whether there is an increase in land prices and if housing density increases. Studies have found that the price of land does increases due to the UGB. However, this increase in land costs can be offset if increases in density occur by building houses on smaller lots. This however, assumes that housing demand remains the same (Nelson et al 2002).

Empirical studies of Portland, Oregon (also discussed as a case study in this report) have looked at the effect of the UGB on house prices, and illustrate some of these demand effects. Nelson et al (2002) found that while house prices have increased from 1991 – 1996, this increase is due to increased demand due to employment growth in the region and a speculative market due to the initial surge in demand. However, average lot size declined in the study area between 1991 to 1995 by 13.5% in Clackamas County and 20% in Multnomah County (Nelson et al 2002).

A separate study by Downs (2002) shows that house prices in Portland rose faster than the national average between 1990 to 1994 but that this was due to job and wage growth. Outside this period house prices were not found to rise significantly more than places without urban growth boundaries. He did find that very tight boundaries led to higher prices in the short term if demand for housing also increased. Nelson (2002) however, points out that often explicit policies are needed to increase the supply of housing through higher density development, permitting higher densities in suburban neighbourhoods, speeding up granting of development permits, and encouraging accessory dwelling units and building conversion.

3.2.4. Zoning techniques

Other techniques worth mentioning are zoning techniques, often used in weak planning systems with little ability to enforce stronger controls on development. These are used in areas where development is already allowed, and so should not be seen as a tool to prevent growth in greenfield areas. One major technique is cluster zoning which is targeted at suburban housing developments and attempts to group housing within a limited area and preserve the remainder for agricultural development. This process applies residential densities developed for the planning district, but will have higher densities and smaller lot sizes on individual sites. The main (often contradictory) views are that it can preserve agricultural land by providing land owners with an alternative to selling the entire farm, can provide a buffer between agriculture and residential development and that it merely preserves the rural character of the area but does not provide for a working agricultural landscape (Daniels 1997).

A major weakness of this tool is that it focuses on the individual site or development and does not take a strategic or regional approach, and so has limited success in preventing sprawl. It is unlikely to result in the preservation of agricultural land without larger scale regional planning. If used without a regional planning context it may actually encourage sprawl by promoting residential development in agricultural areas.

Where the technique is useful is in creating residential developments with larger areas of open space than traditional suburbs (Daniels 1997). Even the main proponent of cluster development, Arendt 1997) admits that this technique is best suited for suburban fringe areas where urban growth is planned and not as a conservation tool.

3.2.5. New Urbanism

Policies to preserve land consumption at the level of the individual housing development come in the form of new urbanist design, also known as traditional neighbourhood design and neotraditional design, and policies such as cluster development. These are primarily design solutions, which provide a new style of suburban development, and on their own cannot prevent sprawl, indeed many of these developments are often on green field sites. New Urbanist design is usually implemented in the North American context and is associated with the designs of Andres Duany and Elizabeth Plater Zyberk. The Duany/Zyberk design aims to construct new suburbs in the form of traditional small towns with a pedestrian scale, and clearly defined centres. The ideal is to have commercial and service centres within walking distances, mixed uses, and high density housing with a mix of affordability, produced through condominiums and town houses as well as detached single family housing. Specific design elements include a short block grid plan, with short streets, houses close to the street, houses fronted by porches and on-street parking. These ideas have not been realized in recent projects, which have resulted in typical suburban development, which although slightly denser than average are too low density to support mixed use or public transport, and have been built on greenfields at the urban periphery (Talen 2000). These developments have not provided affordable housing and tend to attract affluent home buyers. This is supported by reports on individual communities, according to Mccann (1995) the Kentlands neotraditional development in Maryland in1995 had a gross density of 5.2 dwelling units per acre, not the planned 4 to 54 dwelling units per acre. The design principles appear to produce more pleasant suburban developments, with a larger proportion of open space within the development, but have remained low density, single use suburbs.

3.2.6. Development Impact Fees

The main policy used to offset the cost of local government provision of infrastructure is the use of development impact fees. New developments require local governments to extend infrastructure in the form of water, sewerage, drainage, and community services. Where urban sprawl has occurred this has lead to expensive extension of services at great distances from existing development. This technique has been implemented in the US since the 1970's, requiring developers to pay for the proportion of new infrastructure generated by their developments. An impact fee program must be able to show that the development created by a new community creates a need for additional facilities, and that the new development will benefit from the facilities. The program is not appropriate as a means of financing existing deficiencies, and should not require payment of infrastructure and services beyond the level stated in existing planning standards. The actual process of calculating the proportion of development to be paid for by the developer is a complex one, and several formulas are given in Nicholas and Nelson 1988).

The main issue of concern is determining who pays the added cost of the impact fees, as this can be born by the landowner, the developer or passed on to the purchasers of new housing. The theoretical conditions which determines who bears the burden are laid out in the following table:

Supply and Demand Condition	Result
Buyers are insensitive to price changes and there are no barriers to entry by developers	Developers can mark up housing costs by nearly the full cost of the fee plus a factor equivalent to the cost of administering the fee. Buyers pay the largest share of the fee
Buyers are insensitive to price changes but there are barriers to developer entry	Developers will change their market orientation to higher income households. lower and middle income households will be squeezed out of the community and into nearby communities that are close substitutes. buyers pay the largest share of the fee

Buyers are sensitive to price change and there are no barriers to developer entry	In the short term, both buyers and developers share the burden. unless developers offset their share of the fee by reducing lot or dwelling unit size, quality, and amenities, or by reducing the cost of land purchase, their share of the fee burden will come out of profit. assuming capital is relatively mobile, developers will exit the market after they have sold their pre fee inventory. they will renter the market when demand raises prices to a level that restores profit to its pre fee levels. thus in the long term, buyers will pay the largest share of the fee, unless landowners reduce their price.

Table 2: Cost of Impact Fees (source: Huffman et al (1988) pg51)

Huffman et al (1988) suggest that ultimately developers pass the impact fees on to the buyers, through either higher prices, or lower quality housing, but there has been little empirical work on this issue. However, this technique is more equitable for existing residents, who are not required to pay for infrastructure and services which benefit new developments.

3.2.7. Other fiscal measures

Other techniques used to preserve agricultural land and open space are fiscal measures, such as the purchase of development rights, transfer of development rights and land banking. Purchase of development rights (PDR) and transfer of development rights (TDR) work by applying a conservation easement to the land which is acquired by a land trust or planning agency. PDR involves direct purchase of development rights from landowners, and TDR involves the setting up of a preservation area and an area receiving increased development. In this case landowners sell their development rights in the preservation area to developers in the receiving area. Land banking is essentially the fee simple purchase of land by a local government for use or resale at a later time. This method is more costly than the PDR and TDR programs.

These techniques have been used in the US context, and are often applied where planning control is weak. The technique is very successful in land preservation, but the main disadvantage of the PDR and land banking are the high purchase costs to the local authority. The TDR is less costly as these costs are borne by the land market, however there are high administrative and management costs. Information relating land conserved to costs indicates 205,000 acres preserved at cost of $400 million (Wright 1993). An interesting study of land banking in Europe is given by Enders (1986), which describes the setting up of a public real estate corporation, the EPBS, to help control development in the French Lower Seine River Valley. The regional plan required a land banking program with a cost of $4.5 -$6.5 million dollars. The jurisdiction of the EPBS covered the region under the plan, and was financed by a special tax named the ‘special infrastructure tax’, calculated as a percentage of the four direct taxes levied by local government. The tax rate is adjusted yearly depending on the amount of money needed by EPBS, but has a limit of 5% of the total of the direct taxes. The purchases of the EPBS are decided by the local government, and are resold only to local governments and the public sector. The program was seen as a success in enabling the purchase of land required to fulfil the Lower Seine River Valley Regional plan, and provides an example of how such schemes may be financed. The study again points to the need for these tools to be implemented within the context of a regional plan, if successful land conservation is to occur.

3.3. Urban Mobility

Key issues of urban mobility as listed by the European Commission (1996) are increased congestion of cities due to use of the private car, the separation of home and economic activities, which creates difficulty in the use of walking, cycling and public transport. This has subsequent impacts on air pollution, energy consumption and rise in $C0_2$ emissions. There is a corresponding decrease in accessibility, defined as the ability to reach necessary services, not by length of journey time. The main connection of transport to urban sprawl is its role in reinforcing inaccessibility and car dependence. This is partly due to the low densities of new development on green field sites which makes the provision of public transport difficult. Useful reports dealing with mobility are Parsons Brinckerhoof Quade and Douglas Inc. (1996), Transit Cooperative Research Program (2001)and work produced by the Transplus and Leda projects. This section will outline those policies which are pertinent to land use and transport.

3.3.1. Accessibility

Various measures have been put forward to improve the accessibility of housing, jobs and services. General guidelines for good practice have been set out by the Great Britain Department of the Environment Transport and the Regions (2000) which recommends the following combinations of land use and transport policies, which could help to reduce sprawl and its impacts. This document recommends locating housing and uses which generate high travel demand within existing towns and cities, followed by urban extensions and then around public transport corridors. The main aim being to improve accessibility to jobs, shops and services by non-car modes of transport; coordinate the location of urban growth with public transport improvements; and encourage greater intensity of development where public transport accessibility is good. Housing strategies which can be used to achieve this are outlined below.

3.3.2. Settlement around Public Transport Corridors

A major policy to increase access to public transport modes has been the development of housing along transport corridors and transport hubs, particularly rail networks and stations, in order to increase compactness and housing densities in these areas. The aim of the policy is to increase the use of public transport and to increase the mix of workplaces, residential areas, services, shopping, leisure and cultural facilities in the area. Design objectives emphasize a range of housing types, apartments, townhouses and single family homes on small lots. This policy is often combined with reductions to parking standards to encourage public transport use and discourage car use.

In some cases development is encouraged as a way to cover part of the costs of rail investment, as rail systems raise land value and on publicly owned land this can be a substantial revenue generator. Some of the problems with transport oriented developments outlined in Belzer and Autler (2002) are that they often achieve high densities but fail to create mixed use developments. Transport Oriented Developments have faced several difficulties most importantly, the difficulty of integrating the transport system, related transport routes and surrounding development. This development can serve as part of a broader regional strategy of decentralized concentration. However, the emphasis should be on function rather than form.

The impact of settlement pattern on car use has been looked at by Simmonds and Coombe (2000). The research examined a variety of scenarios in the Bristol area using a transport model developed by MVA consultancy for the Avon County Council. In the context of TOD, the most interesting scenarios are those termed A2, A3 and A4, which model respectively the concentration of employment in the part of the central area best served by public transport, concentrating housing closer to the centre along LRT lines, and concentrating employment and housing. Scenario A2 showed an increase in total volume of traffic and slight increase in commuting distance; A3 showed a 5% reduction in distance travelled by car and an increase in distance travelled by LRT; A4 shows an increase in commuting trip distance, and a decrease in shopping and other trip distances. There is a slight increase in traffic in the

centre. The authors conclude that a more compact land use strategy will have little impact on total travel demand and total car use, unless mobility is restricted in general. This is primarily due to the weak influence of proximity on travel choices.

3.3.3. Extension of the public transport network

The rail network is extended or linked to other transport modes as a way of revitalizing city centres and sub centres. These policies focus on connecting the suburbs and sub centres to the city centre and to employment centres, such as business parks and industrial sites. However, this should be combined with land use policies such as transport oriented development which increases housing concentration in a main centre or in sub centres.

3.3.4. Parking

The move away from auto dependency involves a combination of strategies focused around transport oriented urban form, parking, disincentives for car use and incentives for public transport.

Parking policies which are used as a disincentive to car travel and as a push to other modes of transport generally limit parking in the city centre. This should be balanced by ensuring that parking requirements are minimized but do not detract from development in the core or increase congestion, and that alternative modes of transport are available such as walking, cycling or public transport (Great Britain Department of the Environment Transport and the Regions (2000). This is also reflected in Urban and Economic Development Division (1999) which states that demand for parking should be determined not by generic standards but by building /development type and size, population and development density, availability of non car transport modes, and surrounding land use mix.

Specific policies with land use implications include (Urban and Economic Development Division (1999):

- in-lieu parking fees – in this case a fee is paid to the local government as an alternative to providing on site parking. The fees goes towards the provision of centralized off site parking by the local government.
- shared car parking spaces- parking is shared between uses with peak demand at different times of the day. This is most useful in mixed use areas or mixed use developments, where there would be a variety of uses with varying demands, such as office, retail and entertainment and where parking facilities would be in close proximity to each other.
- centralized parking - can be used to improve urban design and preserve the nature of historic communities. These sites are usually located at the periphery of the city, and the main concern is the proximity to facilities.
- maximum parking limits- these restrict the total number of parking spaces which can be provided, usually based on square footage of a specific land use. This is suitable where there are sufficient alternative modes of transport, and limits may be reduced with proximity to light rail stations. Associated problems are spill over of parking into residential neighbourhoods, and acceptability by developers, as such it is more suitable in areas with strong economies.

An extension of this is the ABC policy mentioned by Leda (1999) which sets maximum parking spaces for companies grouped into three categories: A locations with high quality public transport and limited car access are allocated the least spaces, B locations with good public transport and good car access are allowed more parking, and C areas with little public transport are allowed high levels of parking.

- parking freezes- the total number of parking spaces in an urban area may be set at a specified limit. This is viable where there are alternative modes of transport available and in areas with strong economies .
- demand reduction- attempts to reduce the demand for parking by subsidies for transport, paid by employers to cover the cost of employee's transport; cash out programs where

employees are given cash, equivalent to the cost of parking, for not driving to work, transport improvements, pedestrian and bicycle amenities, and vehicle trip reduction programs, such as facilitating car pooling

ABC policy- which sets maximum parking spaces for companies A locations with high quality public transport and limited car access least spaces, B locations good public transport and good car access more parking and C little public transport most parking, spaces are set by local authority and could be more closely tied to land use and public transport to limit car use and preserve space used by car parking, parking zones which put different restrictions on parking depending on local parking pressures, which provide different levels of parking for categories of consumers, commuters, residents, shoppers; transport levy on companies, integration of public transport and new development .

3.3.5. Private Car Use

One of the main problems associated with urban sprawl is the dominance of modal share by the private car, with its associated negative impacts on the environment, and traffic flow. Policies to reduce the use of the private car can target push effects, pull effects or a combination of both. Push effects provide a more detrimental environment for the private car, for instance parking restrictions, car bands, road pricing and speed management. Pull effects provide more incentive for use of alternative modes of transport, such as bus lanes, park and ride, cycle networks, increased bus service.

Any decrease in the use of the automobile would need to be accompanied by sufficient levels of public transport. This potential for public transport provision is determined largely by the underlying land use structure, in terms of location of land uses, density and urban design. Parsons Brinckerhoof Quade and Douglas Inc. (1996) have found that the urban forms most supportive of public transport are employment in a single main centre, compact regions with a limited number of sub-regional centres and sub- regional centres in rail transport corridors. The other major factor influencing public transport is density, the main factors being overall housing and employment density. Findings on residential density thresholds for use of public transport to travel to work are that below 20 persons / ha driving increases and below 30/ ha bus service decreases (Newman and Kenworthy 1989). According to Parsons Brinckerhoof Quade and Douglas Inc. (1996) as residential densities increase in the transport corridors vehicle kilometre travelled decreases. The effects of density are interrelated with employment centre size, corridor level urban structure, transport service characteristics and supply and price of parking. Namely, as CBD size increases light rail use increases, higher employment densities at stations along the route increases transport use, stations with parking and feeder buses have higher use, and similar results where parking is more accessible around stations.

The other main influence is land use mix, that is the number and type of land uses and the design of the neighbourhood. Mixed land uses are seen to encourage lower vehicle trip use and higher non motorized use such as cycling and walking, a more even spread of trips through out the day and week, and to provide opportunities for resource sharing, such as parking.

An important point is made by Parsons Brinckerhoof Quade and Douglas Inc. (1996) that the most effective transport policies to combat sprawl are integrated with land use decisions. This reinforces the findings mentioned above, that effective public transport use is influenced by urban form and density, and introduces the idea that public transport in turn influences the revitalisation of the inner city. The main measures are use of adequate density, mixed uses and polycentric plans; placing settlements along public transport oriented sub centres; adapting the public transport network to the urban structure to improve accessibility; the reactivation and redesign of stations to fit the urban context and improving linkages to other transport modes; and providing a mix of uses around stations

The following policies have been suggested by Leda (1999) as a means of improving public transport use and decreasing the use of the private car:

- high automobile taxes- taxes on the purchase of a new vehicle and car registration taxes when can decrease car use when set at a high enough level
- high taxes on fuel- can decrease discretionary driving and there is some evidence that longer term responses may alter location decisions in housing location and use of alternative modes of travel.
- Versement Transport- this provides a way to pay for public transport through a tax which is a percentage of the salaries on companies with over nine employees.
- Getting The Business In The Right Place: this policy ties public transport routes to offices and new neighbourhoods. It provides an alternative to car transport and also allows for reduced provision of car parking as offices are accessible by public transport.

3.4. Adaptability of Physical Infrastructure

One of the effects of urban sprawl coupled with the contextual changes in income and lifestyles, are changes in the type of housing and residential location. The result in most cases is that middle income families move out to the suburbs and poorer families and immigrants are concentrated in the inner cities, which leads to problems of economic disadvantage, unemployment and social stigmatisation. In general, policies which aim to address these spatial divisions promote links to public transport through housing located along major nodes which have good access to public transport; developments which contain a mix of land uses either on site or within individual buildings; provision of greener residential environments to increase the quality of the residential environment, improving the permeability of land for storm drainage and biodiversity, and improving the energy efficiency of housing. In addition, urban design should fit the wider context of the town, promote safety, public health, crime prevention and community safety; encourage efficient use of land , for example 30-50 dwelling units/hectare, with more intense development at public transport nodes, and increase flexibility in parking standards (Great Britain Department of the Environment (2000).

These ideas are common components of schemes for urban revitalization, which are used to address the spatial imbalance between the core and the suburbs. In order to assess the usefulness of such schemes it is necessary to examine the history of intervention in the city centre. The first such measures are found in the urban renewal policies of the 1930's to end of the second world war. These policies focused on slum clearance, removing low rise private market housing of poor quality and replacing it with flats in big blocks of public housing. Criticism was made of the cost of forced relocation for residents, the destruction of communities and of the housing design of multi story blocks which were not suitable for family life or low income families. The second stage involves neighbourhood rehabilitation in the 1960-70s, these programs focused on comprehensive rehabilitation programs rather than just housing, attempting to improve existing housing and increase the level of services, rather than demolishing and rebuilding. In the 80s the focus turned to economic revitalization. The two most well known examples are through gentrification, and public private partnerships. These often created economic improvement but did not lead to benefits for the existing residents. Important lessons from these policies are that successful revitalization should not promote residential segregation of lower income groups, that a single solution is not suitable for all areas, and should simultaneously provide for economic development and social equity, using a gradual approach which preserves existing structures (Carmon 1999).

3.4.1. Housing Demand

Before addressing specific policies for core area revitalization it is important to look at the demand for suburban housing, as housing location is one of the key determinants of successful revitalization. The main demand has been for low density suburban housing, however, there are several types of consumers preferring denser neighbourhoods. One of the major indicators of preference for housing is age group. According to Myers and Gearin (2001) survey of US households, young parents are attracted by high quality schools in suburban neighbourhoods, older adults are attracted by urban amenities, young adults prefer

access to shopping, and late to middle aged adults focus on public transport and access to shopping. The preferences for households are somewhat contradictory. Households with children favour pedestrian design but also easy auto use; households without children prefer smaller yards but require quiet and privacy, and households aged 50 or under prefer open space and pedestrian use but also larger lots and lower density, while those over 50 prefer smaller lots, easy auto access to commercial areas but are also more in favour of public transport and access to services. There is a demand for the amenities of suburban housing, but at the same time a desire for the potential urban amenities of pedestrian use, smaller lots, access to public transport and services. It appears that demand for suburban growth is likely to continue but that there is a target market for core area housing in the childless households, particularly older adults and young singles.

Lang et al (1997) explore a way to identify these groups using geo-demographic marketing. This technique uses lifestyle typologies based on demographic data and geographic data, to segment the population into groups. Target marketing can identify potential urban dwellers by focusing on consumer tastes in housing in particular areas, however, it does not explain why people move.

One policy which attempts to change the demand for housing location is the 'location efficient mortgage' (LEM) piloted in the US cities of Chicago, Los Angeles, San Francisco and Seattle. As described by Blackman and Krupnick (2001) this provides a higher mortgage for families choosing 'location efficient' areas, where employment and services are within walking distance or accessible by public transport. The LEM is insured by the federal housing administration in the event of default, and in theory default rates are offset by the decrease in automobile related expenditures, due to the transport efficient location. The LEM provides a 15-30 year fixed interest mortgages of up to $24, 0000 on a one unit house. A comparison with the traditional mortgage is given below.

Rates	Traditional Mortgage	LEM
Down payment	5-20% of property value	3%
Housing expense to income ratio	28%	35%
Debt to income ratio	36%	45%

Table 3: LEM compared to Traditional Mortgage (source: Blackman and Krupnick (2001), pg 636)

There has been little study of LEM's, but the two main issues are whether it will help to prevent sprawl and whether it will create an increase in the default rate, it is the later which has been the subject of discussion thus far. However, econometric modelling by Blackman and Krupnick (2001) shows that there is a higher probability of default, as the transport cost savings do not offset the propensity to default.

Policies focusing on the supply side aim to revitalize urban areas by improving the attractiveness of inner core areas primarily through mixed use development, with related policies of urban design, infill housing and traffic calming. The main aim is to encourage investment or reinvestment and relocation of housing in the city centre, mixed use is seen as one way to do this. The Transportation Research Board - National Research Council (2002) also highlights the importance of personal security and quality of public schools, as factors in attracting households and firms to move to the core area.

3.4.2. Mixed Use

Mixed use involves increasing the intensity of land uses, for example mixing housing forms and tenures, which increases housing density; increasing the diversity of uses by mixing compatible uses, for example, high density residential in commercial and office districts; and

integrating segregated uses for instance industry and other urban uses. This last feature is at the most extreme end of the concept, and may not always be suitable. In a study of Canadian cities Grant (2002) examines the success of mixed use. She examines the success of mixed use in Toronto, which is largely due to the focus on infill projects on old industrial sites, such as the St Lawrence neighbourhood, gentrification, and planned mixed use along transit lines. The policy appears most successful in large cities, where mixed use is supported by market demand, as similar initiatives in smaller Canadian cities met with little success. Mixed use has also faced opposition in the suburbs due to unreceptive markets, and areas allocated for mixed use in development plans have remained segregated with little change in affordability or increased economic vitality.

In addition to mixed use, one way of making the city core more attractive is through traffic calming. This is often part of measures to provide 'transit friendly streets', which establish a priority for public transport, reduce vehicle speeds, provide more accessibility for pedestrians, and improve the liveability of communities. Traffic calming measures include traffic management strategies, and physical design measures. These include centre city passes, truck restrictions, signal systems, parking management, road undulations, humps, rumble strips, speed tables, interrupted sight lines through S bends, and staggered parking.

Traffic calming according to Transit Cooperative Research Program (1997) has resulted in more efficient buses with better access as there is less competition over street space, and pedestrians have easier access to transit stops.

Issues of urban design are beyond the scope of this report, however, useful guides for urban design which meets the criteria of mixed use, with accessible public transport are provided by DDtlr (2001) and Department of the Environment Transport and the Regions (2000)

3.4.3. Financing Revitalization

Methods for financing urban revitalization have typically been through direct public expenditure and use of subsidies. This section will examine fiscal methods of financing revitalization, it is the use of tax based incentives to back up planning and regulation, and public sector intervention through the market. These measures attempt to offset the disincentives for private market investment due to poor conception of property market performance, slow rental growth and volatile land markets. The policies discussed in Mcgreal et al (2002) include:

- Tax Incremental Financing (TIF): which finances urban redevelopment through future increases in property revenue. It uses existing property tax revenue but reallocates the way it is used. The project areas which are eligible for the funding are set by law and the amount of tax revenue generated by the area is set as a baseline. The property tax base is then frozen in the district, usually for 20 years. Tax revenue collected over subsequent years is used to pay for redevelopment projects. Once redevelopment is completed, the tax district is removed and the local government is expected to regain its expenditures through the increases in property tax value due to the improvements made.
- Capital Allowances: allow reductions in corporation and income tax for up to a ten year period. As instituted in Dublin Mcgreal et al (2002) these allowed owner occupiers to offset all allowances in the first year; provided a reduced corporation tax of 10% in specific industries, implemented within enterprise zones; doubled rent allowances on commercial leases available to the tenant or a commercial lessee in an urban renewal area; and provide rate remissions relief for 10 years payable in relation to enlargement or improvement of existing commercial buildings.
- Incentive Property Taxation: is a two rate property tax with higher taxes on the assessed land value of a parcel, than on the building. The tax has the potential to influence land development if it is heavier than the speculative gain from holding the land against inflation. The advantage of this measure is that it provides an incentive to develop vacant infill sites, by reducing the amount of tax to be levied on improvements, thus increasing the revitalization of buildings in the city centre, and discouraging land speculation by holding unimproved land. Gihring (1999)

One of the main issues of urban revitalization is the role it plays in residential segregation through the process of gentrification. In a nutshell, as areas are improved, land and housing prices rise, pushing out low income renters. However, continuous upgrade of the housing stock is necessary and one strategy used is to gentrify areas which can be supported by the market but to allow deterioration of nearby neighbourhoods which displaced households can move to Council (2002). This has been seen as a short term solution, with a more appropriate long term approach being to raise the purchasing power of low income household through housing assistance.

3.5. Segregation of Social Groups

The physical effects discussed in the section on adaptability also result in concentrations of low income residents. The main solutions have been to remove this concentration by creating mixed income groups either through economic subsidies to supplement the market cost of renting or by direct provision of below market cost housing. The other less strategy is to encourage higher income groups to move to low income neighbourhoods. This generally occurs through the process of gentrification.

The main strategy to reduce segregation has been to increase the economic capacity of low-income households to meet housing costs, and to overcome the resistance of higher income groups to the movement of lower income households to their neighbourhoods. More recent trends have been to provide affordable housing through the market using market housing to subsidize affordable housing on the same site. This follows a rolling back of public sector investment in social housing, and a decrease in the public housing stock through right to buy sales (Malpass and Mullins 2002). Methods of reducing segregation are discussed below.

3.5.1. Planning Regulations

One method is to include policies about affordable housing in local and urban development plans. These should set required levels of new affordable housing, outline measures to achieve this, and suitable areas for affordable housing. The strategy set out in Great Britain Department of the Environment (1996), Great Britain Department of the Environment (2000), Department for Transport Local Government and the Regions (2002) is to promote a mix of affordable housing types, such as family housing and homes for smaller households, to avoid concentration of low income groups and to use low cost market housing as well as subsidised housing.

3.5.2. Housing Vouchers

Housing Vouchers are a direct housing subsidy paid to the tenant. The household pays 25-35% of the rent on the unit, and the government subsidy pays the difference. This form is most favoured by housing experts due to the lower cost of tenant based programs (Mcclure 1998). The suitability of tenant based programs depends on the supply of available units meeting minimum standards in the housing market, the level of participation from the target population and the social needs of that population. This policy has the advantage of being cheaper than project based programs, and can be used to reduce segregation in core areas, by enabling low income households to move out.

3.5.3. Other policies aiming to reduce the segregation of social groups

Other policies discussed in Transportation Research Board - National Research Council (2002) include:

Inclusionary Zoning: this requires developers of projects over a certain size to include a percentage of affordable units. The developer is compensated by allowing build at a higher density. This is strategy is of low cost to local government, allows for a mix of income groups but requires administrative costs if the units are to remain affordable, rather than being sold at full market price when families move.

Housing Trust Fund: uses real estate transfer taxes to subsidize rents within the area. It can also be used to fund housing vouchers

Accessory Apartments: allows residents in single family suburban areas to build accessory apartments, for 1-2 persons which adjoin the main dwelling.

4. CONCLUSION

This section provides an overview of the most innovative practices used to control the spread of urban sprawl and highlights the main debates in the literature. The theoretical discussion of policies in the literature is guided by the sectoral framework of research activity, however, in actual implementation, policies are more integrated, a point which is discussed in section 6.2.

4.1. Land Consumption

The focus has been on policies with a land use dimension, with the literature advocating the concept the compact city and related land use planning policies. The crux of the compact city concept is not so much the spread of urban form, as the creation of higher density cities. While there is debate over the attainability of the compact city focused around a single centre, there is an increasing consensus that some form of targeted development is the key to containment of urban sprawl, most often discussed in ideas of decentralized concentration and settlements around transport corridors. These policies are supported by less comprehensive policies of containment such as greenbelts and urban growth boundaries. The main point of emphasis is not so much on the effectiveness of such policies, which after fifty years of implementation, has been proven but whether such policies have the ability to accommodate physical growth in rapidly growing cities, and whether there are detrimental side effects namely, rising house prices which would conflict with the prevention of urban sprawl's impact on housing affordability. The effect of rising house prices can be offset by increasing housing density, but this is unlikely to occur through market forces and requires a system of integrated policy measures.

This concept of the compact city is most often applied to European cities which are supported by the necessary planning and regulatory structures. This provides a strong contrast to the tools used in weak planning systems where the emphasis is on control through the market, using fiscal measures and demand led strategies. The measures of new urbanism, and cluster zoning are the primary measures used to cut land consumption, but have been of little success in preventing urban sprawl. These are useful measures to improve the quality of suburban housing, but do little to restrict supply of low density housing.

4.2. Mobility

The literature cites the key mobility related problems of urban sprawl as increased inaccessibility to employment and services, and increased dependence on the private car over public transport. This reinforces the demand for suburban housing, the decline of inner urban areas, and the segregation of social groups. The discussion in this section focuses not so much on the details of specific policies, but on the land use planning impact. The policies in this section aim to increase accessibility to jobs and services, using a combination of incentives to increase public transport use and disincentives to private car use. One of the most widely discussed policies is that of settlement around public transport corridors, which is seen as a way to provide an incentive to public transport use and to promote mixed use development. The main emphasis is that the success of the policy lies not merely in the generation of housing around transport hubs, an approach that can exacerbate urban sprawl, but also in the creation of a mixture of uses – workplaces, services, shopping and leisure in the neighbouring area. Without this, inaccessibility and car dependence are likely to continue and the policy merely increases the spread of housing further out into the outer urban rings.

Other transport policies focus on disincentives to private car use, by restricting parking in the city centres, a policy which is usually accompanied by provision of alternative modes of transport and which must be monitored to ensure that it does not contribute to the decline of

city centre jobs and services, a side effect which only exacerbates the problem of urban sprawl. The other main method discussed in the literature is the use of fiscal incentives to decrease private car use, such as high automobile taxes, high taxes on fuel and the Versement Transport policy. For such policies to be successful they must be accompanied by an increase in levels of public transport. The ability to increase public transport is to some extent determined by levels of housing and employment density. This leads to one of the key points discussed in the literature, that land use and transport policies must be combined if the negative impacts of urban sprawl are to be tackled, with the most closely related being policies which increase public transport, mixed use and land use density.

4.3. Adaptability of Physical Infrastructure

The discussion in the current literature on urban regeneration strategies is focused firmly on the core urban areas. The policies in all cases attempt to reverse the decline of jobs, services and housing in these areas. There is little focus however on the reduction of suburban housing demand, as to some extent this is due to the broader, deeply rooted changes in the demographic and economic structure. The literature emphasizes that policies to increase demand for core area housing are more successful when targeting specific groups, namely childless households of older adults and young singles, who are attracted to urban amenities and access to public transport, but do not require the advantage of high quality suburban schools.

The majority of the literature focuses on increasing the attractiveness of the core areas through mixed use development. The core focus of the concept is on increasing the intensity of land uses and increasing housing density, housing forms and tenure types. The main tool used is change in the land use planning regulations to allow multiple uses and designation of mixed use districts in development plans. The policy appears to be most successful in large cities where it is supported by market demand for dense development, with little mixed use development occurring in smaller cities, despite changes to the regulations. While the literature, particularly the North American real estate literature discusses specific projects that would be suitable for mixed use, such as waterfront developments, etc., there is little emphasis on the more substantial issue of how to generate demand and provide incentives for developers to invest in such projects.

This is to some extent related to the financing of urban revitalization, the most common methods discussed are tax based incentives, such as tax incremental financing, capital allowances and incentive property taxation. There has been little examination of the success of these measures in offsetting the lack of private market investment, beyond one or two case studies. However, it appears that the main obstacle to mixed use development is exactly this.

4.4. Segregation of Social Groups

The dispersal of concentrations of low income residents is achieved through housing policies. The main trend has been a move away from direct public sector investment in housing provision to subsidies to the renter, through housing vouchers and housing trust funds and increasing the levels of affordable housing provided through the market using planning regulations, inclusionary zoning and accessory apartments. These difficulties facing local government authorities in financing urban policies and programmes are discussed fully in section 6.1.

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SECTION 2

CASE STUDIES

6. INTRODUCTION TO CASE STUDIES

6.1. Framework for the review

The main idea that helped choosing the cases was to make a large overview of the policies and measures designed and implemented to tackle urban sprawl and/or related negative impacts. The selection had to reflect the results of the literature review but also provide a different perspective on existing policy measured based on the implementation mechanisms involved in the different contexts and case studies. Therefore this section of the report addresses research questions related to the implementation of policies and more in general to the planning practice in which they are embedded. How are policies implemented? Which are the main elements of the implementation process? Can we identify some success factors? Are new trends in the planning practice emerging, as a consequence of urban sprawl?

Case study's reports have been drawn up according to a common analysis template. The structure of the template includes a description of the geographical, demographic and socio-economic context of the case study, a presentation of the planning system both at the national and at the local level, an overall description of the long term planning strategy adopted by the city, region or metropolitan area and a detailed description of the policy or policies of interest for this review. The latter accounts for the implementation of the policy focusing, when possible on the actors and financial mechanisms involved. When and where available, results and outputs of the policies are also provided.

This section of the deliverable also includes a comparative synthesis of the main key findings regarding implementation processes. Keeping into account the objective of WP4 to provide an input for the selection of policies and measures that will be simulated via modelling techniques in WP5, findings are focused on the interactions between the investigated policies. They also account for the role played by policy and institutional integration in addressing sprawl from the perspective of sustainability.

A major difficulty in the reporting and comparative analysis of case studies has been the (qualitative) evaluation of results, due to the unclear nature of the precise subject of the evaluation. This ambiguity can be attributed to two essential limits of the task: the first one is the almost complete reliance on second-hand (and sometimes even third) sources information. Information available through bibliographic and journal literature has always been pre-processed for some particular purposes, which do not necessarily match with the purpose of our investigation. Information available through local authorities' public sources (as for instance local and regional governments' websites) tends to (and understandably so) overestimate the success of the implemented policies. Secondly, the majority of the policies and measures investigated have not been in force long enough to provide sufficient results for a qualitative evaluation.

6.2. Selection criteria

In order to select a limited number of significant case studies a preliminary list of potential cases has been built manly by investigating existing Internet databases and related EC research projects. Both these sources have also been used in the second stage of the in-depth investigation on the selected case studies.

Databases:

- SURBAN, database on sustainable urban development in Europe by the European Academy of the Urban Environment, http://www.eaue.de/winuwd/default.htm
- Local Sustainability, the European Good Practice Information Service, by the International Council for Local Environmental Initiatives (ICLEI), http://www3.iclei.org/egpis/

- Legal and regulatory Measures for Sustainable Transport in Cities (LEDA) databank, http://www.ils.nrw.de/netz/leda/
- Online Transport Demand Management Encyclopedia, at http://www.vtpi.org/tdm/
- Best Practices Database, by UN-Habitat programme, http://www.bestpractices.org/

EC projects

- TRANSPLUS, Transport Planning, Land Use and Sustainability
- TRANSLAND, Integration of Transport and Land Use Planning
- PROGRESS, Pricing Road Use for Greater Responsibility, Efficiency and Sustainability in Cities
- PROSPECTS, Procedures for Recommending Optimal Sustainable Planning of European City Transport Systems

Case studies were therefore chosen amongst the largest possible panel. Limits to the following review and analysis are mainly due to restrictions on the available sources of first hand information and to the predominant reliance on second hand and literature based sources.

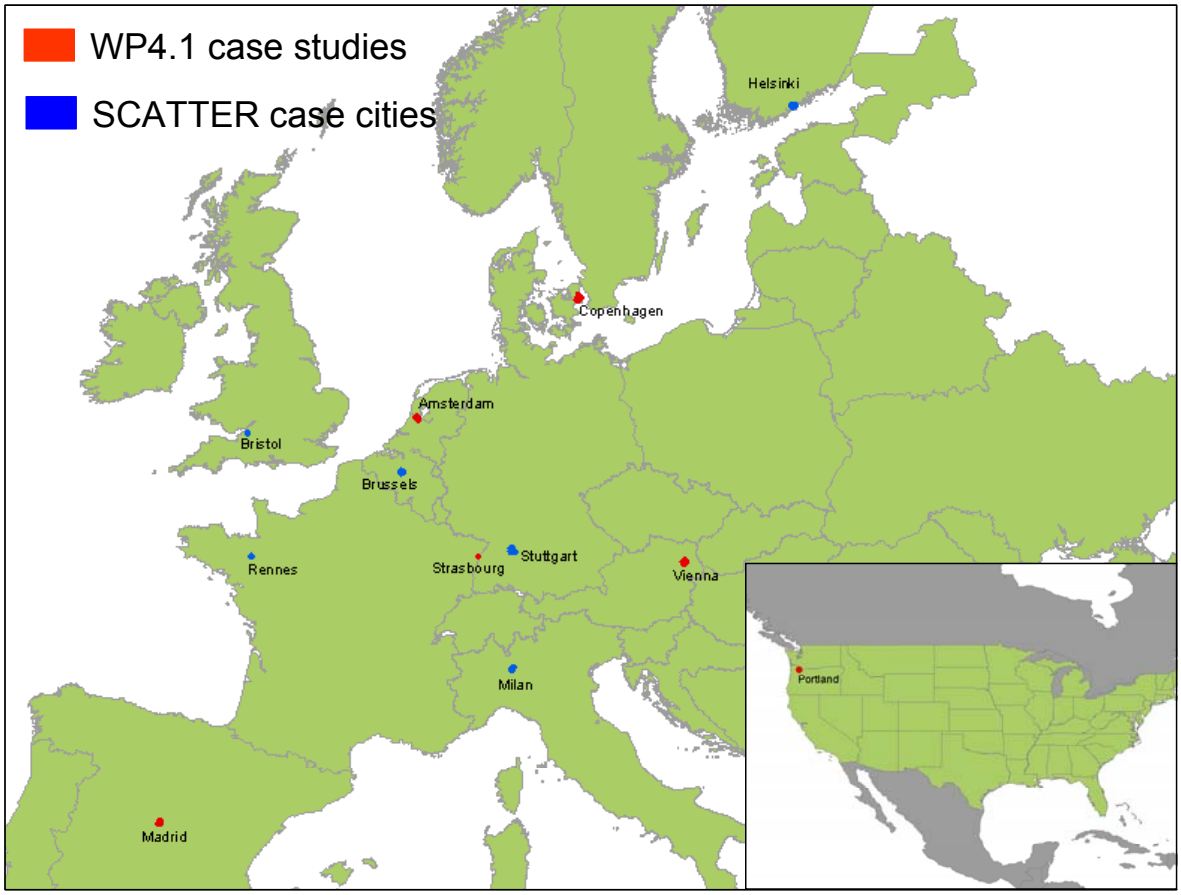


Figure 1: Geography of case studies

Criteria for the final selection of the case studies presented here have included

- the necessity to cover as many different European contexts and planning backgrounds as possible avoiding overlaps with the SCATTER case cities, also included in this review; the selection includes Austria (Vienna) Denmark (Copenhagen), France (Strasbourg), Germany (Ruhr region), Netherlands (Amsterdam), Spain (Madrid); one case study is located in the US, Portland (see fig. 1).
- the different demographic scales of the case studies in order to be able to cover a wide range of cases, from European capital cities to National Metropolitan regions, to medium-sized cities;

- the idea to cover as much as possible all the urban sprawl related issues discussed in the literature review section of this work package: environmental impact; land use and land consumption; transport and mobility; adaptability of physical infrastructure; social segregation
- the idea to have mostly cases of good practices but also cases of bad practices.
- the amount of documentation and literature available for each of the case studies.

7. KEY FINDINGS

As it has been said above, the qualitative evaluation of case studies remains difficult. In the following pages some aspects, which seems of interests in relation to the purpose of the WP are identified. These have been grouped under three areas that can be considered as answers to the following research questions: is urban sprawl and, in general, unsustainable urban growth promoting innovations in the planning practice? Which, among the available policies, are actually being implemented to tackle urban sprawl and mitigate land consumption and increasing traffic congestion? Which are the most interesting (and successful) features of the implementation process that should be taken into account?

7.1. Emerging trends

New forms pf planning practice are emerging which represent an adaptive response of local and regional authorities to the challenges posed by the changes in the scale and type of urban growth, demographic migration and economic activities relocation.

Differences in culture, political economy and administrative structures can explain the differences in comparative planning systems, and the regulatory mechanisms and authorities that determine the respective urban outcomes. In cases where urban sprawl and its impacts are the problem, the only application of tight land use control regimes, which has been the traditional way of containing urban growth, loses out against economic and political interests or just against the unpredictability of social and economic changes.

Increasingly, however we see efforts by local and regional authorities to structure and contain the impacts of urban sprawl by means of innovative ideas and measures that promote sustainable development. These include higher density mixed use and infill development, proactive containment of urban growth through the reduction of land available for development and its designation to green and public service uses, the adaptive reuse of abandoned industrial structures and brownfields, a wider range of alternative modes of transportation, public transport oriented urban development.

Besides innovating the contents of planning policies, public institution and organisations are also changing the practice, the “how to” of planning. This is the case for instance of three major changes:

- Increasingly, large cities and particularly metropolitan areas are faced with difficulties in financing urban policies and programmes. As cities lose population, activities and incomes they also lose their strength as promoters of development. In several cases the response of local administrators has been the abandonment of the traditional forms of welfare planning and the adoption of a more entrepreneurial approach characterised by the “planning-by-projects” practice;
- The increasing use of regional planning strategies coupled with local regulations and detailed plans in order to regulate urban growth and urban change; this practice is not always successful. It requires a long-term coherence of the regional framework. In cases when regional government doesn’t have the possibility to enforce binding regulations a large consensus from local planning authorities is also required. Strategic plans at the supra-local level are used as frameworks for the definition of local land-use and transport planning according to the criteria of balanced regional development both with regards to the spatial and economic dimensions. The degree to which the revision of local plans can

be achieved in a flexible and prompt manner can influence the successful achievement of strategic goals

- Progressive shifts from top-down to bottom-up approaches and from centralised to decentralised and collaborative planning. This is sometimes the response to the requirement of consensus building;
- Institutions building as response to the increasing trans-boundary and trans-sector nature of urban growth and development. Collaborative and bottom-up practices can lead to the establishment of temporary or long-term voluntary cooperation among different types of public and private actors and among different administrative levels, but new institutions can also be the result of more traditional top down approaches. Administrative institutions build coalitions to strengthen the role of public actors and interests in competitive environments ruled by market forces. In these contexts public coalitions can better plan their strategies towards more entrepreneurial or collaborative behaviours.

A further challenge for cities, which are undergoing processes of significant urban growth or change, is the necessity to balance the promotion of economic competitiveness (both against other cities in the metropolitan area or region and at the national or international level) with the control of spatial growth and its impacts (land and natural resources consumption, social segregation). In this field EU regulatory framework can play a key role.

7.2. Implementation of policies

Using the framework designed to organise the bibliographical review, we will present a summary of the policies implemented in the case studies and of the characteristics of the implementation processes. Actually, implemented policies differ from the ones discussed, from a theoretical perspective, in the review on at least two relevant elements: the first one is the fact that implemented policies always belong to some extent to an urban or regional development strategy within which they are integrated more or less strongly, with other policies. They are often designed as part of the strategy or as its operational arm and they are managed and sometimes even financed by a web of public, private and public-private sources. This policies would often be devoid of meaning and, most certainly, of effectiveness if deprived of their integration with other policies. The second element of difference is that policymaking and planning practice don't (only) work by the simple application of theories. Rather, it is strongly rooted in the historical, institutional, political and planning background of each case. This backgrounds decide what should or can be done to tackle urban sprawl or its related impacts and also how. They also limit the transferability of policies from one territorial context to another. More or less flexibility in plan making, fiscal regulations on land property, a higher or lower degree of power of public actor, the degree of centralisation or decentralisation of planning activities, a declining versus a growing economy: these differences can all influence policy design and implementation. Indeed the presentation of case studies takes these backgrounds into account. The main areas of concern in the implementation of policies are land consumption, transport and mobility, neighbourhood regeneration and policy integration.

Fiscal measures are a high concern of the SCATTER project as valuable push and/or pull instruments to direct the location and types of urban growth. However such policies are currently seldom implemented in European cities with the finality of growth control. This is sometimes due to the centralised structure of fiscal legislations sometimes just to a lack of knowledge of their potential as urban growth management tools. For these reasons, they are not listed in this summary of implemented policies.

7.2.1. Land Consumption

Land consumption generated by uncontrolled and unplanned growth and location of (mainly residential) urban functions is an issue of great concerns for local and regional governments preoccupied by the possible reduction of natural resources and of their environmental quality and by the increased costs of public infrastructure provision. Two are the most common approaches presented by the case studies: control of land consumption by a reduction of the

supply of land available for development and one based on promoting or imposing urban growth only in selected location and with selected land-use structure and density levels.

7.2.1.1. Reducing the supply of land

*Greenbelt*s and *green corridors* (Vienna, Copenhagen) are commonly used as instruments for the preservation of natural resources especially by those countries and cities with a long tradition of regulations for environment protection. The interesting feature in their implementation regards the use of "active protection" of these open and green spaces. The area reclaimed as greenbelt and green corridors are not left idling for an undetermined time, but planned and used as part of the city's supply of public services such as parks, sport facilities. In this way, local government can, on the one hand exert a long-term control and management of the areas and, on the other, promote consensus for the greenbelt policy. The areas to be included in the greenbelt and green corridors policies are sometimes acquired through the requisition of land, but most of the times they are areas already protected by national or regional environmental legislation.

By means of *land banking*: land is made unavailable for development and subsequently released according to scheduled planning. Land can be released for market purchase already equipped with basic infrastructure or not. Private developers can acquire development's rights only if their development project matches some publicly defined criteria, often based on sustainability principles such as social equity, minimum environmental impact, economic development. Land banks are either compulsory by law as in the Spanish constitutional law, publicly funded or self-financed via resale of land.

Urban growth boundaries, only used in the US, are mainly a boundary that separates urban from rural land or urbanisable from non-urbanisable land. In this sense, a part from being an instrument to control the outward expansion of cities they act as a scheduled programme for urban growth. This type of programming is often provided for in national planning legislations in European countries, without any reference to the concept of boundary but solely to identify areas where urban development can take place. These areas are identified in local planning instruments.

7.2.1.2. Selective location of land uses

Policies which regulate the location of land uses in order to reduce land consumption are, in some way, a particular form of more traditional zoning practices. They are specifically targeted to promote development based on the criteria of mixed land uses, high density. They also target the problem of accessibility and car dependency and in this sense can be grouped under the category of policies that promote a general reduction of car usage.

The practice of transport oriented development whereby urban growth is directed along transport axis or in proximity to interchange nodes such as railway stations, is rather different from the general theory and the policy must always be "customised" in order to be successful. Problems emerge for instance when this policies are not accompanied by the provision of dependable public transport service. Another issues of concern are the criteria used to determine the concept of "proximity" in the selection of location for economic activities. These criteria must take into account the need for economic activities to grow and at the same time be flexible with regards to the different types of economic activities that are required to locate in "proximity" of transport corridors and hubs. If these issues are ignored the targets of mixed-use development are hardly met.

Even when development is not directed specifically in proximity of transport infrastructures, the main success factor for the promotion of high density and mixed-use urban developments is the coordination among agencies and actors involved in the development process. Coordination of public and private agencies responsible for the location of economic activities has been the key factor in the case of Vienna. In Rennes the voluntary coordination of local authorities for the location of residential development and for supra-local density control has been based on an intensive and long term information campaign and consensus building.

7.2.2. Mobility

The policies implemented acknowledge the fact that while mobility must be eased and promoted both within and between urban centres, the use of cars must be reduced and the use of public transport must be increased as much as possible. Mobility is the key to the economic and social development of a region, but if mobility is only or mainly supported by private cars, environmental quality is deemed to be irreversibly damaged in the long term. This goes against the principle of sustainability that requires all three issues (social, economic and environmental quality and development) to be tackled.

7.2.2.1. Supply of infrastructures

It is commonly recognised (see also D1 and D2 of the SCATTER project) that the extension of transport infrastructure can be one of the causes of urban sprawl. However there are cases, also presented in this review, that show how spatially strategic *extensions of railway, light railway and underground infrastructures* (Vienna, Madrid, Strasbourg) can successfully support the development of a more polycentric structure by improving access to secondary urban centres and help to remove isolation of peripheral areas and centres suffering social deprivation and economic decline.

The realisation of *ring roads coupled with the supply of parking areas* that adopt park&ride schemes in connection with public transport nodes located outside the city centre are also a successful measures to reduce the number of cars entering the city centre therefore promoting a higher environmental quality of the urban core.

Similarly the supply of *bicycle and walking paths* can promote the use of these alternative means of transport in the city centre and in the close periphery. However these interventions can only be successful if accompanied by road safety measures, such in the case of Copenhagen.

7.2.2.2. Supply and/or organisation of services

In order to reduce car usage, it is necessary to provide end-users with an economical and dependable public transport alternative. Given the change of mobility patterns towards a regional rather than local and urban scale, the management of public transport must increasingly take into account the need to coordinate different scales and therefore different public transport networks and agencies. Coordination has been achieved in different ways in the case studies: the harmonisation of local and regional fares in the case of Madrid, the unification of public transport providers in a single agency in the case of Vienna, coordination of time tables between different modes of transport (rendez vous) at interchange nodes (Strasbourg).

Traffic management in favour of public transport by means of traffic light priorities, reserved lanes, computerised management of traffic flows, can also provide the framework within which public transport is more dependable.

Finally, measures based on incentives have also been successfully implemented to promote the use of public transport service. Transport-for-all marketing measures are based on the definition of a flexible design of fare systems, sensitive to the needs of different end-users (commuters, students, unemployed), to the different motivations for trips (shopping, work, flexible working timetables) and to seasonal events (Christmas shopping, sport and cultural events). Employees commuting management schemes require each employer to design a mobility management schemes for their employees and in some cases to financially support their employees' use of public transport.

7.2.3. Neighbourhood regeneration

Despite a common disbelief in the capacity of piecemeal approaches to control urban growth, regeneration programmes presented in the case studies owe their success to the containment of the scale of intervention. Both in the city centre and in peripheral areas regeneration is used to reduce social segregation and promote economic vitality. By so doing they provide the entire city with areas to accommodate demographic and economic growth that would otherwise need to locate in the suburbs. The scale of regeneration schemes is of

concern because the success of the projects is linked to two major issues: their financial feasibility and the public consensus (via public participation) generated by the projects.

Regeneration measures must, as much as possible, avoid eviction and relocation of inhabitants and economic activities and the onset of gentrification processes. These can be avoided by involving residents at all levels of the project from concept to urban design. Subsidies to purchase or rent of the renovated dwellings have also been implemented.

7.3. Integration in response to interactions

All the case studies presented in this review show some degree of policy or institutional integration and coordination. Integration in these cases is a proper response to the acknowledgment that, regardless of the scale of the urban area and of the issues to be tackled, interactions between policies and between the different effects of policies must be dealt with. Integration is therefore recognised as a key success factor.

7.3.1. Integrating land use, transport and mobility measures

Traditionally the interactions between land uses and mobility have been investigated on a theoretical level. The fact that the spatial and functional structure of an urban system influences the levels and types of mobility patterns is undisputable. Many difficulties remain in the identification of the impacts of transport planning on the structure of urban systems. Integrated land use and transport planning is therefore called for in order to deal with these interactions.

The case studies offer some interesting examples of how these interactions have been dealt with in order to successfully tackle urban sprawl. They show how the success of one policy measure can only be achieved by integrating it with accompanying measures. These sets of measures are sometimes implemented simultaneously, sometimes the latter are implemented in a second moment, in order to complement or increase the effectiveness of the former.

Greenbelt measures to control urban growth for instance would only end up relocating urban sprawl outside the belt if an accompanying policy for the regeneration of secondary centres outside the belt is not implemented. The requirement of a compact growth of all the centres of a polycentric region to avoid the sprawl of the main urban centre can only be met if accessibility to the different urban centres is improved by means of public transport. Greenbelt policies, *per se* are not successful in tackling urban sprawl but only in protecting a limited part of the natural resources surrounding the urban centre. Effective control of urban growth is only achieved by complementing the policy with regional development and an efficient public transport regional network.

In cases were urban growth is directed in the proximity of transport corridors and hubs for the purpose of reducing car usage, the supply of highly dependable public transport should be improved, otherwise cars will remain the most “economical” alternative for transport. Transport hubs can play a key role in attracting development and simultaneously reducing car use if great attention is given to criteria such as the calibration of the amount and cost of available parking spaces to make car use more costly and difficult; the flexible and accurate management of inter-modal exchange via timetables harmonisation.

7.3.2. Inter-institutional integration

Integration can also occur among different administrative levels, which exert their planning competences on the same area but at different scale. This is for instance the case of coordination among all the actors involved in the provision of public transport services within one metropolitan or urban area. Integration can be achieved between the private developers and the public planning authority for the selection of location for economic activities and for the definition of development criteria.

These issues will be discussed in more detailed in D4.2, which discussed institutional barriers to the implementation of policies to tackle urban sprawl and of the measures adopted to overcome these barriers.

8. VIENNA

8.1. Introduction

Vienna is one of Austria's nine Landers (Provinces) and is the country's administrative, economic and cultural centre. Vienna is home to Austrian businesses and foreign multinational corporations. The sectors represented include electrical engineering, consumer electronics, food, transport, mechanical engineering, and metal processing.

The City of Vienna municipality covers an area of 415 km2 and in 1996 had 1.620.000 inhabitants. Nearly half of the whole area is characterised by green areas (see table 1)

The population of the City of Vienna has been decreasing from the early 1970s until the mid 1990s. This trend was accompanied by sub-urbanisation processes which have been mainly influenced by a marked rise in the number of households as compared to population trends, a very low density of built-up space in the urban catchment's area and finally by an increase in the percentage of space utilised per workplace combined with the relocation of manufacturing and distributing enterprises in peripheral areas. In the course of the sub-urbanisation processes the City of Vienna has developed mutual contacts with its surroundings, an area with a radius of 40 to 50 km around the city. This area, which is known as the "Vienna Agglomeration" covers an area of roughly 5100 km2. It has no official administrative acknowledgement.

Up to a certain extent a process of re-urbanisation set in the late 1990's. This is mainly due to international immigration from neighbouring countries such as Turkey and ex-Yugoslavia and to national migration trends from poorer provinces such as Lower Austria and Bungerland. It is also a spatially and qualitatively differentiated trend. While the population in densely populated built-up districts tends to decrease, positive growth rates can be seen in districts at the peripheral areas, which have been subject to intensive housing construction.

As in most European cities, the spatial expansion of Vienna has occurred along the main transportation axis especially towards the south where the city's airport and main office parks are located.

From a qualitative perspective it can be noted that, as for most of the European major cities the population of the city centre is ageing and is slowly being substituted either by immigrants or by medium to high income households and individuals who have been attracted to the centre by the several regeneration projects. It can be expected that these trends will continue unless effective measures are taken at the regional level.

As a result of its historical development, however, Vienna has a monocentric structure; there are no sub-centres comparable to the historic city centre. The city and its metropolitan area are therefore fully involved in the positive and negative externalities brought about by the development of a European capital.

8.1.1. Economic indicators

During the 1990s, employment in the city of Vienna has decreased, but since 1996, the number of jobs has begun to rise again. In recent years, employment in manufacturing has decreased, while the share of services in total employment is increasing. Vienna remains indeed the largest service and commercial centre in Austria. Tourism is also playing an increasing role in the city's economy. The recent improvement in employment levels owes much to measures taken outside the city and even outside Austria. The liberalisation of the telecommunications market is deemed to have created about 2,000 high-value service sector jobs in the city since 1996. Air transport liberalisation is also contributing. At the same time, an unanticipated expansion of part-time employment is taking place in commerce and other service industries.

Land use	1979	1991	1996
Proportion of urban area in housing/residential use (%)	19.59	20.01	20.69
Proportion of urban area in commercial/industrial use (%)	5.46	5.54	5.92
Proportion of urban area in road/rail networks use (%)	12.71	13.50	13.74
Proportion of urban area in ports and airports use (%)	0.06	0.15	0.13
Proportion of urban area in mineral extraction, dump and construction sites use (%)	5.02	2.35	1.97
Proportion of urban area in sports and leisure use (%)	1.62	1.78	1.90
Proportion of urban area in green space use (%)	49.91	49.71	48.59

Notes: Proportion of urban area in green space use: data include agricultural areas, market gardens, gardens, woods, parks, and cemeteries

Table 4: Changes in Land Use coverage (source: The Urban Audit, 2000)

8.1.2. Traffic and Transport

Traffic flows within the inner city are greatly eased by a well-developed public transport system whose main feature, the Vienna Underground network, was expanded in recent years leading to a nearly 60% increase of its passenger for the period 1991-2001. Vienna is linked to its surroundings by a system of commuter trains (Schnellbahn), which connect the major urban centres located within a radius of 50 km with the capital. Intersections between Underground and Schnellbahn nodes as well as all the main railway stations also act as access points to the network of inner-city buses and trams.

In addition to public transport, passenger car traffic has also increased continuously, with above average growth rate in the hinterland. In 1997 the vehicle stock of Vienna equalled an average of 370cars/1000inhab whereas the corresponding values ion the hinterland is approximately 540 cars/1000inhab.

The overall transport infrastructures are mainly organised in a radial fashion with main routes departing from the city towards the secondary urban areas in the Vienna Agglomeration.

Commuting data reveal the close interactions between the city and its surroundings. 22% of the employed population (190,000 people), commute into Vienna for work, but only 30% of the commuters travel by public transport.

On a national and international scale the city is a transport junction on strategic north-south and east-west routes, with road, railway and air connections. However Vienna potentials as a transportation hub for eastern and western Europe is increasingly being challenged by traffic problems. The main commuter and international transport routes are already at their capacity limits. A further expansion of the Vienna City Airport is been designed as part of the airport area Master Plan.

8.2. The institutional framework and planning system in Austria and Vienna

8.2.1. The national planning framework

In Austria, political representation and policy making take place on three levels: Bund (federal government), Land (state) and Gemeinde (municipality). The division of responsibilities among these three levels follows the principles of subsidiarity. This applies also to spatial planning. Spatial planning is a national task performed in coordination by the federal government, states and municipalities. However only municipalities are entitled to produce binding land-use and zoning plans. Since the federal government is not explicitly responsible for spatial planning a proper office was set up for overcoming the fragmentation of spatial planning and create a platform for coordination. The ÖROK (Österreichischen Raumordnungskonferenz, Austrian Conference on Regional Planning) is based on a

voluntary political agreement between the partners (federal government, 9 states and 2351 municipalities) and its main responsibilities lies in the production of the national scheme for spatial planning (ÖRK, 1991), which only acts as recommendations.

The federal government oversees several sectoral measures and planning activities with territorial impact. These include planning tasks related to the federal road network, the construction of public railway lines, regional economic policy. The federal government has the authority to determine the location and to acquire the land for any intervention, which falls under its responsibility.

Comprehensive spatial planning is the competence of the states. States are responsible for designing and passing spatial planning laws. Based on these laws, the state governments implement *state development plans* and *sectoral state plans* as well as *regional development plans* and *sectoral regional plans*. Development and Regional plans are binding for the municipalities' plans in that they define the goals to be achieved and guidelines for the drawing up of local plans. Development and regional plans have only been realised in part and the main product of states remains the state planning laws. More recently environmental concerns have started to become more present in the planning activities of the state.

At the local level three types of plans, regulated in the spatial planning laws are passed by the municipalities and they can all be classified as binding.

The *local development plan* is a strategic document containing guidelines for the development of the whole territory of a municipality and determines the steps for the pursuing of these aims on a general level.

The *zoning and land-use plan* determines the possible uses of land properties in a municipality. It describes the use of land for the whole territory and divides land into different use categories, namely building land, green land, traffic area and special uses. The plan is binding upon landowners and it influences the possibilities of future uses. In principle building works within the areas designated as green land is not permitted but the spatial planning laws often contain exceptions for projects, which are in connections with agricultural uses.

The *building regulations plan* is subordinated to the land use plan and determines the use of building land. It contains specific details as limits of building size and height, roads alignment and building densities. The plan also acts as a decree with binding authority upon building authorities and property owners. It is the reference for the granting of building permits.

Given that municipalities are ultimately the only public bodies responsible for delivering land-use plans in a legal framework that provide little or no coordination of land-use at the supra-local level, the results have manifested themselves through uncoordinated growth and misuse of land in suburban areas.

8.2.2. Protection of open space

More recently environmental protection has become a more and more important social and economic issue in Austria. Conservation measures are formulated not only by the federal but also by the state and municipal authorities; Due to historical precedent, public responsibilities for environmental and open space protection are allocated among various public authorities and regulated by various laws. Open and green spaces can therefore be protected not only under spatial planning legislation measure but also under the Forestry Act, the laws pertaining to waterways and river basins on the national level and the nature conservation laws at the state level. New restrictive regulations have been established for the prevention of air pollution, for traffic restriction, water supply, and waste treatment. In general an extensive conservation policy has been established.

Restrictions to the expansion of built-up areas have also been considered. This is due on the one hand to the financial constraints that limit the possibility for municipalities to invest in the development of building areas and on the other to the emergence of environmental concerns at all the administrative levels. These concerns that were set aside during the housing shortage in the late 1970s and 1980s have now led states towards the definition of settlements boundaries and regional green zones in supra-local plans which cannot be

overcome by municipal authorities. Moreover the focus of local government has shifted from development to redevelopment of brownfields and intensification of already built-up areas through the construction of multi-storey dwelling within urban areas.

8.2.3. The planning system and planning tools in Vienna

Vienna, according to the Austrian constitution, is at the same time a municipality and a state and for this reason local and supra-local spatial planning cannot be distinguished. The city doesn't dispose of a separate spatial planning law and all planning issues are dealt with in the Viennese Building Code. Vienna has therefore a special planning system providing for the Urban Development Plan (STEP, last revised in 1996), which serves as a framework and guideline for planning and administration. However the STEP is not a legally binding instrument; it is solely based on a resolution of the Vienna City Council and hence only carries a self-restricting effect. Some competences with spatial relevance are assigned to various sector of the municipal administration. the Vienna Traffic Concept (1994), the Vienna Greenbelt Concept (1995), the Vienna Waste Management Concept (1995), the Energy Concept and the Vienna Sports Grounds Concept can all be ascribed to the level of Sectoral State Plan.

In attempt to coordinate the planning activities towards common goals, the Planning Partnership East (PGO) was established in 1978 as a voluntary joint agreement among the governments of the states of Vienna, Lower Austria and Burgenland. The main goal of the PGO is to overcome the profound divergences regarding the degree of binding force of the framework planning concepts of the three states and to harmonise spatial development goals. The main tasks of this body lie in defining of joint regional development goals, in co-ordinating spatial planning projects, in representing joint interests in spatial planning vis-à-vis third parties.

The focus of PGO is mainly on the areas of traffic and transport, protection of green and open spaces, definition of principles for area development and construction projects. Since its creation in 1978 the PGO has played a fundamental role in the establishment and management of National Parks, in the shaping of the Unified Public Transport System (VOR) in 1984, in the harmonisation of the three state traffic plans in an overall master plan. It has also supported and helped the development of the joint Schnellbahn system for the Vienna Agglomeration.

The most important outcome of the PGO activity has been the so-called "Settlement Scheme for the Eastern region" in 1995 (SKO, Siedlungspolitisches Konzept Ostregion) for the implementation of a decentralised concentration settlement principle in the area of the three states. According to this principle the growth pressure is to be deflected from the immediate environs of Vienna towards the historical urban centres. The SKO therefore provides for the development of medium-size urban centres beyond the immediate vicinity of Vienna and at the same time aims at curbing the sprawl trends in the urban periphery. The backbone of the SKO lies in the future expansion of the regional train network. It is important to point out that measures proposed in the SKO can only become effective through their incorporation in the state planning laws and subsequently in the local land-use plan and building regulations.

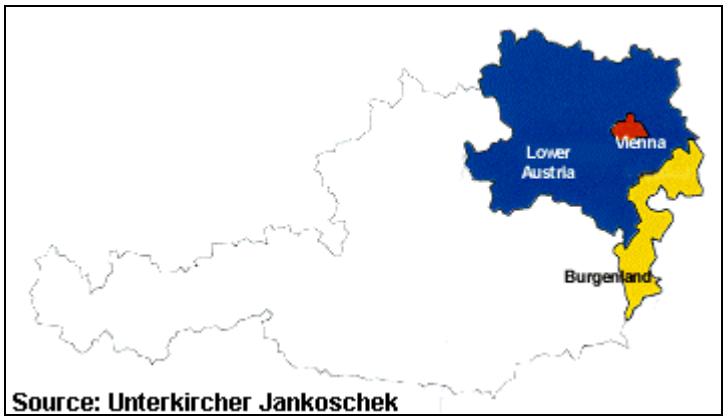


Figure 2: The area covered by the PGO (Planungsgemeinschaft Ost)

8.3. Causes of sprawl

The growth of sprawl-type settlements in the Vienna region can be ascribed to at least three different processes. In the first place there is the role of socio-demographic trends. As mentioned above the number of dwellings between the 1970's and the early 1990's has grown at a rate that is not comparable to that of population. This can be attributed to the changes in the composition and lifestyles of households towards one or two person households especially among the elderly and young couples and a growing preference for detached houses and more living space. These trends have been accompanied, especially until the mid 1990's by a somewhat "loose" approach in the definition of building areas in the STEP of 1984, which has resulted in a preoccupying erosion of the green areas in the city's environs. On the other hand in the two decades from the mid 1970s to the mid 1990's new dwellings have been built inside green areas because of special regulations in spatial planning laws, which permitted the realisation of new buildings related to agricultural activities. Several landowners have exploited this gap in the planning legislation to build second and tourism houses.

Besides the demographic trends, which can be observed in several other European cities, the development of sprawling suburban areas can also be attributed to some particular aspects of the planning system, notably the lack of coordination among local authorities in terms of spatial planning and development strategies in general, and the traditional process for the production of built-up areas in Austria which strongly depends on landowners.

Lack of coordination among local authorities in Austria has historical roots and can be attributed mainly to the high level of autonomy granted to them by the federal laws. All territorial authorities in Austria have the power to implement measures in the sphere of public business administration. These include economic activities such as land purchase, investment incentives and, more in general activities aimed at the economic promotion and development of their territories. Different municipalities in the same region often carry on parallel and competing promotional activities to encourage private investment. Moreover the system of local taxation is such that the main source of revenues for local authorities for the promotion of these activities comes from either the municipal tax on payrolls or from the quota of federal taxes redistributed according to the number of inhabitants. These system has soared the competition for more employment and more population among cities.

In the city of Vienna these trends towards the concentration of economic and therefore population growth have been stronger than in other parts of Austria due to the peculiar administrative position of the city, which is both a municipality and a state and therefore surrounded by municipalities, which belongs to a different state. However. the further growth of Vienna according to the criteria of sustainability cannot be achieved without the full joint collaboration of these surrounding authorities. Sustainability and environmental concerns have been one of the major forces behind the development of a more collaborative approach among the states of Vienna, Lower Austria and Burgenland.

A second cause for the sprawl of Vienna and Austrian cities in general can be identified in the “production” of built-up areas. Despite the growing attention for the protection of open and green areas demonstrated by the design and implementation of more restrictive measures for their use, the implementation of land-use plans is hampered by a legal system according to which, while the supply of building land can be regulated by the public authority, property owners cannot be forced to develop their properties. Often the betterment effect of the change of zoning from green to building areas in connection with the lack of an obligation to build or the lack of a taxation of such betterment effects, leads to the situation that a large part of the areas zoned as building land is often used as an assets by the land owners. The final result of these speculative games is that local authorities are often forced to face problems of rising land and housing prices and increasing unmet demand, to which they can only respond by the further erosion of green areas and the development of state or municipality owned land in order to meet the demand for the location of housing and economic activities.

New regulations have been designed which sanction landowners for not developing areas designated as building land within a certain amount of time, however these regulations are seldom applied for political reasons. Of all Austrian major cities, Vienna is the only case where expropriation of land has been made possible in order to overcome such situations.

8.4. Overall description of the planning strategy

The land-use and spatial development strategy for the City of Vienna is set by the Urban Development Plan first designed in 1984 and than revised in 1994 and 1996 and by the SKO Settlement Scheme for the Eastern region. The revision of the strategy in 1994 was made necessary by the coming to life of the SKO in 1995 and by the need to coordinate the Vienna development strategy with the planning schemes of the other two states involved in the SKO. Lower Austria and Burgenland have also gone through the revision of their planning legislations and state development plan during the same years.

In order to pursue the principle of sustainable development the Vienna Region has set the following strategies:

- balancing the overall spatial structure through decentralised concentration following a model composed of development axes and centres and of inner-city urban (re)development;
- enforcement and maintenance of environmental, social and economic vibrancy of the urban centre;
- integration of local and regional transport networks and safeguarding of mobility for all by public or environmental friendly transport systems;
- coordination of regional economic planning and development.

Both the STEP and SKO pursue the principle of sustainable development mainly through land-use and spatial strategies. For this reason, their successful implementation significantly relies on the realisation of other sectoral plans, specific measures and situated interventions.

8.4.1. Balancing the overall spatial structure

The two main planning instruments behind this strategy are the SKO and the STEP. They both try to limit processes of suburban development by controlling the supply of building land, by removing some of the main causes of sub-urbanisation (such as the skyrocketing land consumption perpetrated by shopping mall and commercial centres in the immediate periphery) and providing viable alternatives for housing and economic activities location. All the measures and plans aims at developing a more polycentric structure both at the regional and at the intra-urban level.

The SKO focuses on the selection of growth centres in the wide Vienna Region to ease the pressure on the immediate vicinity of the city, the strengthening of the selected urban centres; the expansion of the public transport network, including the Schnellbahn; the protection of green corridors and open spaces in the region.

The STEP in complementary to this plan and its main objectives are the preservation of the historical centre of Vienna, the prioritisation of inner-city urban redevelopment, and transport oriented new developments, preservation of the greenbelt and of radial green wedges to reach out into the city centre.

One of the main point in both planning instruments is the control of the supply of development and the protection of open and green areas. This goal is pursued in two different ways.

The first one involves the removal of areas (mainly green areas, woodlands, water bodies and wetlands) from the amount of land available for development. Green areas however are not left idle but are transformed into recreational areas. To protect open spaces in the surroundings of Vienna and transform them into recreational areas a special association between the Vienna and Lower Austria states was founded in 1974. Since then the association has been able to protect several natural areas and has turned them into national parks such as the Danube Wetland National Park. In the southern periphery of Vienna, where the pressure of urban sprawl has been greater than in other areas, the “Landscape Concept for the Vienna Region, South Periphery” has been conceived as a cooperation of the three states. (see Wienerberg City, Best Practice Database)

With the second approach the City of Vienna has adopted an innovative (for the Austrian planning system) practice of land management achieved through the purchase, development and resale of properties whose development is in the general interest and conforms to the objectives of the STEP. This practice is referred to as “optimised land and urban development management”.

8.4.2. An environmental, social and economic vibrant urban centre

The goal of enforcing and keeping a vibrant urban centre has been pursued by the implementation of sectoral plans focused on the improvement of the environmental quality of the urban centre and of a regeneration scheme characterised by the concept of “soft urban renewal”.

Sectoral plans specifically targeted towards environment protection are the Vienna Waste Management Concept and the Vienna Energy Concept, which focus on mitigating the impact of human activities on the urban ecological system.

Environmental protection is also pursued through the Vienna Traffic Concept and the Integrated Parking Space Management, which extend over a large, contiguous area in the densely built-up urban districts of Vienna. The traffic plan focuses on public transport and on the development of pedestrian and bicycle infrastructure within the boundaries of the areas served by the parking management scheme. The traffic plan has been able to effectively reduce the traffic volume and increase the shift to public transport. The management of parking space is coordinated by a wok group, which consists of representatives from commercial activities, garage operators, automobile associations and the City Council. The main goal is to provide the ring around the inner city with a wide range of options for parking as well as detailed information of the available options to car users. Parking space within the boundaries of the inner city will also be progressively reduced.

The “soft urban renewal” scheme focuses on a citizen-friendly preservation and improvement of older and inner city neighbourhood with high population densities. It pursues the objective of linking affordable housing with an economic use of resources and preservation or development of mixed-use areas. Re-conversion and upgrading of the existing urban structure is counter-posed to demolition and new building. The scheme places residents in the forefront so as to minimise the side effects of regeneration projects such as the eviction of residents and their subsequent migration towards the periphery.

The scheme also focuses on substantially upgrading the environmental quality of neighbourhood and the ecological performance of individual buildings. In order to pursue these goals, assignment of subsidies for redevelopment now include also social, technical, environmental and urban criteria.

The most interesting and successful example of the “soft urban renewal” approach is the Vienna Gurtel Plus project partly funded by the URBAN Community Initiative Program where the principles of citizen and environmental friendly regeneration have been applied at a very large scale, on an area of 626 hectares.

8.4.3. Integration of local and regional transport networks

The unified public transport system for eastern Austria, "Verkehrsverbund Ostregion" (VOR), which was established in 1984, is an exemplary co-operation of transport providers and extends beyond the municipal boundaries of Vienna, involving, since 1988, bus operators in Lower Austria and Burgenland. Recently the system has been expanded to include northern and central Burgenland. The main elements of VOR lie in a unified tariff system, the permanent improvement and integration of services as well as in the division of cost and revenue according to the VOR establishment and financing agreement. The society is owned by the Federal Republic (50%) and the three states Vienna (30%), Lower Austria (15%) and Burgenland (5%).

The second area of cooperation among the three states is the plan for the extension of the Schnellbahn network, which plays a fundamental role in the implementation of the decentralised concentration scheme (SKO). The “Schnellbahnkonzept Region Wien” (Concept for the Commuter Train) is currently being implemented in connection with the expansion of the Vienna Underground system. While the latter promotes quick and smooth transport in the inner municipal districts, the former mainly serves as a feeder line for passengers from the surrounding region. The implementation of the system is largely a competence of the Federal Republic (with the Federal Ministry of Science and Transport representing the Republic as owner) although the works have been fine-tuned and co-financed by the provinces of Vienna and Lower Austria.

8.4.4. Coordination of regional economic planning and development

In this context, the most important activity is the active co-ordination of the sectors of housing and business location. Special attention is also given to infrastructure development. These objectives are met by the Vienna Business Agency (WWFF) and the Vienna Land Provision and Urban Renewal Fund (WBSF).

In the sector of economic development and economic activities location, three organisations are active in the region: Vienna Business Agency, EcoPlus in Lower Austria and WIBAG in Burgenland. These bodies work together with the Austrian Business Agency (ABA), which acts as “Austria's official location consultant”. This organisational structure provides a suitable basis for broader and deeper co-operation in the location of business and industrial activities, assessing criteria such as location assets, infrastructure requirements. In addition, these organisations also are preparing harmonised database and information systems and availability of land, thereby harmonising the planning and implementation work (Infrastructure Commission)

These instruments are to provide an urban structure that corresponds to the development goals and at the same time creates optimum synergy by providing the required quality infrastructure.

8.5. Optimised land and town development management for Vienna

8.5.1. Issues and Objectives

As a result of the geopolitical upheaval in 1989 and the opening up of the borders to the Central and East European reform states, the Vienna region faced a dramatic increase in population (approx. 120,000 more inhabitants within a few years) and the subsequent increase in the amount of subsidised construction of new residential buildings from approx. 5,000 to 10,000 annually.

Since 1984 a more comprehensive and up-to-date land and urban development management system has been in existence in Vienna, which can be classified according to the principles of a private-public-partnership model. This management system is based on

- The urban development plan (STEP 94) oriented towards the principles of sustainable development
- A property management scheme for the provision, development and transfer of land for industrial settlements and subsidised housing.

The objective of the management system is to achieve an improved balance of urban development objectives, infrastructure development and the implementation of housing and economic programmes, by means of:

- Allocation of sufficiently large areas of land for subsidised housing at adequate prices within the land-use framework of the urban development plan.
- Setting of criteria for the implementation of housing construction projects such as location quality, contribution to urban development, cost of social and technical infrastructure, environmental impact.
- Purchase, development and assignment of land for industrial enterprises, management consulting and increased efforts to attract new enterprises
- Creation of a cadastre of industrial land including suitability monitoring as a basis for targeting urban development and economic policy-making
- Greater efficiency in the development of industrial land through improved fine-tuning of infrastructure investment, property management, planning activities etc.

The harmonisation and coordination of housing and industrial development and location constitute an attempt to combine, on the one hand, quality of life with adequate income possibilities and reduce, on the other hand, the development pressure on the periphery.

	VIENNA CITY REGION							
Space	**Issues**	**Main Principle of Sustainability**	**Broad Policy Goals**	**Policies**				
				Fiscal	**Land Use Planning Instruments**	**Housing and Design in the Private Sector**	**Transport**	**Other Projects/Actions in the Public Sector**
	Environmental Quality	ECOLOGICAL: Reduce use of natural resources;			greenbelts	infill development; brownfield development; concentrated development	energy efficient travel; increased public transport	greening the city
All	Loss of environmental quality to region							
All	Increased land pollution							
All	Increased air pollution							
Suburbs/ Hinterland	***Consumption***	ECONOMIC AND ECOLOGICAL: Reduce use of natural resources	limit outward movement of growth, revitalize urban centres, improve environmental quality	development impact fees, subsidies for economic and housing development in selected areas	decentralized concentration, new towns, greenbelts	compact building design(new urbanism, cluster development) *infill development*	*focus development near transport hubs*	transfer of development rights, land banking, *brown field redevelopment*
	High land consumption for housing development							
	Land consumption for infrastructure development							
	Higher local government costs							
	Higher housing and infrastructure development costs							
	Mobility	ECOLOGICAL: Management of demands; r	reduce number of car km travelled, increased access to jobs and services of low income residents	Versement Transport; location efficient mortgage	focusing development near transport hubs	*reduced demand for suburban development; compact building design (new urbanism, cluster development, infill development);*	increase dependable high quality public transit, policies decreasing auto use, parking policies, HOV lanes,	*car free neighbourhoods*
All	Increased trip numbers, trip lengths and travel times							
Regional Centres	Increased congestion of radial roads							
Core	Rings of traffic jams							
Suburbs	Inefficient use of public transit due to low density development							
Core	Reduced accessibility of low income residents to jobs and serices							
	Adaptability of Physical Infrastructure	SOCIO-CULTURAL, ECONOMIC: Equity		decrease demand for suburban housing (tax on new buidling in the periphery, tax incentive for new home owners locating in urban centre); incentive property taxation		increased demand for core area housing (neighbourhood traffic calming, infill development)		core area revitalization (brownfield redevelopment, mixed use development)
Core	Loss of economic activities / jobs in certain sectors and in areas of disadvantaged groups (urban centre)							
Core	Degradation of built environment							
Core	Loss of local tax revenues from urban cetnre							
Suburbs, Regional Centres	Inequitable distribution of services among subregions							
	Segregationof Social Groups	SOCIOCULTURAL: Diversity; Equity	increase choice of housing for low income groups, revitalize urban centre	rent housing vouchers/subsidy; tax transfer between areas		*increased demand for core area housing (infill development);*	*dependable high quality public transit*	social housing; *core area revitalization (brownfield redevelopment, mixed use development)*
Suburbs	Concentration of disadvantaged groups in suburbs (lowest income groups, minorities, elderly) and loss of middle class groups to core (families, first time home buyers from centre)							
Core	Concentration of disadvantaged groups in urban centre and less atractive areas (lowest income groups, minorities, elderly) and loss of middle class groups (families, first time home buyers from centre)							
Suburbs	Shortage of affordable housing in suburbs							
	Main issues							
		STRATEGY						
		DETAIL ANALYSIS						

Table 5: Issues (in light orange) and policy areas of the Vienna planning strategy (in light grey) and case policy (in dark grey). The same colour coding is used in all the case studies

8.5.2. Organisation and management structure

While the Vienna Business Agency (WWFF) was founded in 1982 the Vienna Land Provision and Urban Renewal Fund was established in 1994 to support the implementation of the STEP. In the same year the Infrastructure Commission was appointed to provide additional

fine-tuning of the location strategies. In 1997 the Commission for the Optimisation of Land Management (KOG) was founded to harmonise the activities of all authorities concerned with land management but hitherto not yet sufficiently involved in the general development.

In order to ensure and develop further the high standard of quality of new construction of housing which is sponsored in Vienna on the one hand, and the simultaneous lowering of the costs of housing construction, in 1995, within the framework of the WBSF (Vienna Land Provision and Town Renewal Fund) the mechanism of building contractor competitions was introduced for those larger areas of land which, for the purpose of sponsored housing construction, have been passed on by the WBSF to builders of residential accommodation.

The above-mentioned institutions co-operate towards the objective of optimised land and urban development:

Infrastructure Commission (answerable to the Chief Executive Office-City Planning Bureau) sets the priorities for the implementation of housing construction projects according to criteria of location quality and infrastructure requirements.

Vienna Land Provision and Urban Renewal Fund (WBSF) manages the purchase, development and assignment of land for subsidised housing projects and urban renewal management

Vienna Business Agency (WWFF) also manages the purchase, development and assignment of land for industrial enterprises, management consulting and increased efforts to attract new enterprises

Commission for the Optimisation of Land Management deals with the harmonisation of the co-operation of the above-mentioned funds and municipal institutions as an operative facility. The first activity of the commission has the preparation and monitoring of an industrial land allocation programme.

Building developers and enterprises are important partners in this complex process.

8.5.3. Instruments of realisation, financing

The institutions described are funded out of the municipal budget of the City of Vienna, and are largely self-financed through the resale of land purchased by them. They have been operational since 1994. They are funded from the municipal budget of the City of Vienna, with WBSF and WWFF largely self-financed through the resale of land purchased by them.

8.5.4. Outputs and Results

The major activity of the WBSF is the procurement of land and project development. About 43.000 new subsidised flats until today have been constructed on land provided by the fund. Within the scope of quality provision in subsidised housing projects ten public housing development competitions with a volume of about 6.600 flats have been carried through until now. More than 570 housing projects were assessed by the land advisory board, of which approximately 350 projects with about 33.000 housing units were being recommended for assistance.

Details of what has been achieved by the Infrastructure Commission and the KOG include:

- better coordination and a more integrated view of the provision of land through the two funds, taking into account the goals of town development and of provision of infrastructure,
- increased awareness of approaches which protect resources (e.g. the mobilisation of unused land on good sites, the utilisation of existing infrastructure),
- faster, more targeted implementation of plans,
- a better information system regarding the establishing of residential buildings and enterprises and the costs of these,
- a marked reduction in the costs of infrastructure for local government, while simultaneously ensuring the building of residential accommodation.

9. MADRID

9.1. Introduction

Spain is a country of late industrialisation and therefore late urbanisation. Processes of migration from the rural areas towards the main cities started at the beginning of the XX century but it wasn't until the late 1960's that such processes actually impacted on the Spanish urban structure. At that time, while in many European countries the urban population was already the majority, over half of the inhabitants of Spain still lived in localities with fewer than 20,000 people. Urbanisation has been a fast and dramatic process in Spain, which has affected the country's urban system as a whole. The major consequence has been the formation of metropolitan areas.

After 1975 the accelerated rhythm of growth decreased considerably. As a result, the relative weight of the quota of population living in municipalities of over 100,000 stabilized (growing only from 40.4 to 41.5%). Municipalities of over 500,000 even faced a moderated population decrease (see table 1) and the first trends in the formation of hinterland suburbs became visible.

Today large cities in Spain tend to progressively integrate new territory, extending their zone of influence and employment catchment's area. The central areas, the cores of the metropolitan areas are losing their primacy against the peripheries of the urban regions due to the absolute or relative decentralisation of both population and commercial and industrial activities. These phenomena however are slowly combining to further the reduction of differences between central and peripheral areas of metropolitan agglomerations, which were caused by the exceptional speed of the urbanisation process in terms of amenities, infrastructure, and living conditions.

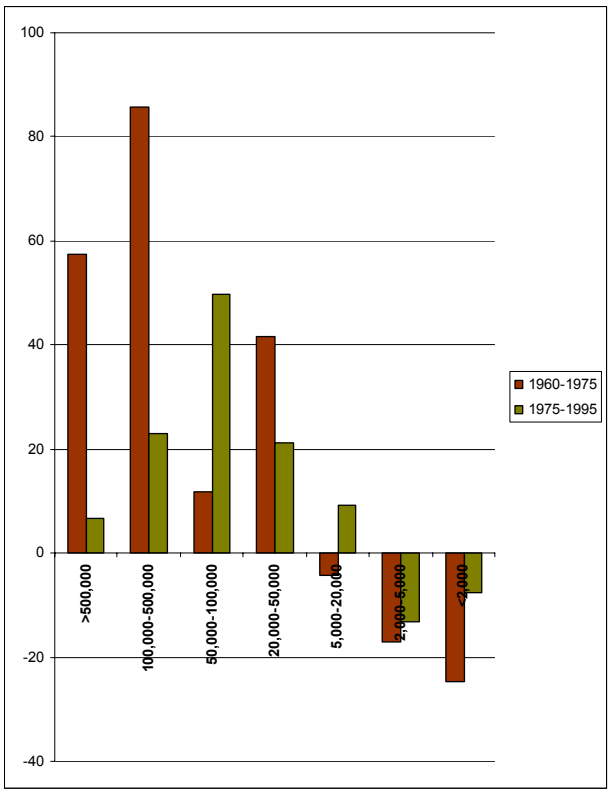


Figure 3: Population growth in Spanish cities (1960-1995)

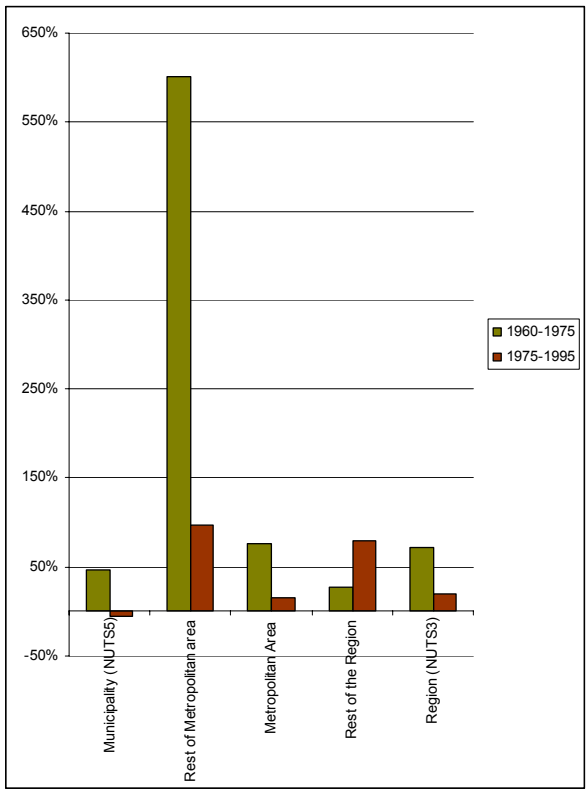


Figure 4: Population growth in the Madrid Region (1960-1995)

The city of Madrid and its metropolitan area represent no exception to these trends (see table 2). Today Madrid is perhaps the most central-city dominated metropolitan area in Europe with nearly 60% of the population living in the city. The remaining 40% live in 178 surrounding municipalities, none of which exceed 2000,000 inhabitants. Indeed, despite the large size of the central municipality (605.8 kmq) the city not only integrates the labour market of the strict metropolitan area (which include the 27 municipalities of the Comisión de Planeamiento y Coordinación abolished in 1983(1942 kmq), but it is also showing a tendency to expand its influence to the region as a whole (178 municipalities, 7995 kmq), and even further, towards Guadalajara and Toledo, The result is that the whole Autonomous Community of Madrid is increasingly becoming a metropolitan reality.

9.2. The formation of the Madrid metropolitan area

These spatial patterns of growth in Madrid and its surroundings are a prolongation of the general tendencies produced during the course of the century and find their reason both in socio-economic factors and in the role played by planning interventions.

The formation of the Madrid metropolitan region is heavily rooted in the development patterns of the early 1900 when the first signs of industrialisation in the Madrid urban area attracted migratory trends from the rural areas of the country. This early migration flows and the subsequent waves impacted significantly on the capacity of the housing market and of the public system to provide homes and basic infrastructure and services for all the newcomers. The small urban centres, especially to the south of Madrid, which received the lion's share of migratory flows, were extremely inadequate to receive such growth, in terms both of public services and of transport infrastructure. The result was therefore the rise of an unplanned, often self-built and chaotic periphery, which has increasingly accumulated deficiencies in the provision of basic standards like infrastructures, social services, and green areas. This trait of Madrid as a city divided between planned and unplanned development has remained until the mid 1980's when the city has recognised its role as the core of a wider metropolitan region and has started to design strategic and land-use planning tools that embrace its whole territory. Indeed the 1960's Plan General de Ordenacíon Urbana and Plan General de Ordenacíon del Área Metropolitana contributed to increase the character of Madrid as a socially and functionally segregated city. These plans had two main drawbacks: the first one is that they were very short sighted in their definition of the area that had to be subject to metropolitan planning regulations, therefore living much of the rest to the speculative land market. Secondly they adopted a loose approach in the regulation of land-use changes, mainly from rural to urban, favouring land consumption and land fragmentation. Moreover the rigid and hierarchical structure of the Spanish planning system of plans has not favoured inter-institutional cooperation or even regional planning. The current imbalances in the spatial structure of the city with the northwest areas of low density single family dwelling and the south east of high rise and high density dormitory neighbourhoods (the so-called vertical slums) have also their origin in the decision taken at the beginning of the 1900 to build the first railway in the south of the city therefore favouring the development of industrial areas and of the working class housing settlements.

In combination with the "late industrialization" of the 1950's and 1960's, a qualitative transformation of the city centre of Madrid took place. The city readapted its built environment in order to accommodate the increasing service activities and the expansion of government services. The financial complexes along the Paseo de la Castellana and adjacent directional axis like Calle Príncipe de Vergara were completed just the north of the city centre. This, at the same time, meant that the industrial south accommodated an important part of the industrial jobs and low-income population - mostly labour immigrants from rural areas of Spain. This led to a system of "workers' suburbs" and "dormitory towns" over the previous structure of small rural settlements, accommodating up to 1.5 million inhabitants. Only some years later, during the economic boom of the 1980s, more flexible production sectors, as well as financial and business services moved to the north, along with low density housing schemes for high income households. During that time the historical

imbalance between the city centre and the urban periphery was reconverted into an imbalance between the northern and the southern part of the region, the North representing the upper tier of highly paid managers, professionals and technicians living in well-equipped suburbs, and the South representing the lower tier composed of low-skill, low-wage workers, accommodated mainly in high-rise housing estates, which showed serious deficiencies of primary infrastructures, general facilities and recreational space.

The rhythm of demographic growth in the metropolitan area has largely stabilised since the 1980's but this apparent stagnation conceals pronounced differences in the spatial redistribution of population within the area. The growth occurring in the metropolitan belt does not concentrate within the larger urban centres of the region. These centres are, in many cases, experiencing problems maintaining their own population. The growth tends, rather, to occur in smaller centres and areas characterised by dispersed housing, such as ribbon development along the La Coruña road to the west of Madrid. The shift in demographic growth is therefore not only from the metropolitan centre towards the more peripheral areas but also from all the more densely populated areas and larger towns towards more sparsely populated areas and smaller towns and developments (see table 2). These location patterns are the source of decentralisation processes and of the birth of the new low-density peripheries. Since the late 1980's and more significantly during the 1990's the peripherisation of the metropolitan area has also been caused by a crisp change in demographic trends similar to that happening in other European cities. The demand for housing has largely increased due to the coming of age of the generations born during the baby boom of the 1960's. This factor has been accentuated by a decrease in the average household's size. The resulting growth of demand has coincided with a significant increase in house prices and rents in the core areas of the city, so that a significant share of the population experience difficulties in acquiring or renting a home in the city or in its close proximity. It has been estimated that in 1996 prices in the Madrid municipality were 1.65 higher than in the hinterland. This scenario has been aggravated by a phenomenon typical in Spain and in Madrid as well, which is the high proportion of secondary residences and unoccupied dwellings and by the growing number of housing properties in need of rehabilitation both in the city and the close periphery. Finally the strong specialisation of the core of the city as a commercial centre has progressively displaced the financial centre and evacuated its population towards the north and west of the city. Even though such trends have not generated gentrification processes as strong as in the rest of European cities they have been strong enough to give rise to urban sprawl. It must also be noted that low-density residential developments are seen by private developers as a response to the increasing cost of land and as a means of reducing construction costs and increasing sale revenues. The consequences are the emergence of problems typical of other European cities such as high consumption and fragmentation of land and increasing need to commute and traffic congestion generated by privately owned cars on the road network, mainly formed by historical radial routes.

9.3. Spanish institutional framework and planning system

The Spanish case is particular in the European context given that it has only recently progressed towards a democratic government after the end of the Francoist dictatorship in 1975. The administrative structure is characterised by a high fragmentation of the territory and the complexity of the institutional structure. The new Constitution of 1978 has changed the territorial and administrative model of the country. The model adopted is more decentralised and has introduced 17 regional communities each with its own autonomous government. Autonomous Communities have significant legislative and executive powers in a wide range of areas, from housing, transport, urban and regional planning, agriculture, health, education, social welfare and culture. Individual autonomy statutes regulate their powers and activities. They have power over the two existing local levels: the provinces and the municipalities. Power and competencies adopt therefore a pyramidal structure which include the State, 17 Autonomous Communities, 52 Provinces and 8077 municipalities.

The 1985 Local Government Act, which represents the implementation of the constitutional specification of the administrative structure, contemplates the possibility for the regions to create administrative bodies for the metropolitan areas. This possibility was provided for in response to the increasing supra-municipal nature of the urban structure of the large Spanish cities. However, as the regulation of local government falls under the jurisdiction of the autonomous communities, the application of this possibility depends on their governments' decision. These bodies have been reluctant in taking steps in this direction, so that with few exceptions (such as Madrid and Bilbao) large cities in Spain still lack a metropolitan level of government. Indeed most of the existing metropolitan government have been progressively abolished since the establishment of the administrative reform.

9.3.1. Planning legislation and regulations

The Constitution assigns responsibility for spatial planning to the Ministry of Promotion and Development (former Ministry of Public Works, Transport and Environment), to the autonomous communities and to the municipal authorities.

The central government promulgates the national planning law, which acts as a framework for planning. The most recent version of the law (Ley Sobre Régimen del Suelo y Valoraciones) was enacted in 1998. Planning and land use powers and competences are the responsibility of autonomous community and therefore the national legislation only act as a framework and as a regulatory environments for subject which have influence on land-use planning. The main objective of the law is to ensure a proper, balanced and sustainable use of the territory. The principles of an equal distribution of benefits and costs of development and of the obligation to guarantee proper housing to all citizens underlie this objective. The law includes regulations for land market, land evaluation, acquisition and, when necessary compulsory purchase from landowners. Since 1992 these regulations have been introduced in order to overcome the traditional dependency of actual urban development on the initiative of private owners and promoters and to oblige them to fulfil the requirements and timing of the existing and binding planning documents. The legislation also sets fixed rates of developers' profits originating from the development of sites in accordance with the local planning instruments. In order to achieve equitable returns among all the landowners and/or developers involved, the law imposes a process of land re-parcellisation prior to development. In the course of the parcellisation, part of the area is freely given to the municipality, which will be used for service provisions.

Other subjects related to planning and land management that fall within the competence of the State include housing, environmental assessment and conservation laws, infrastructure policy (only with respect to the national road and rail network).

With regards to housing, even though autonomous communities are entirely responsible for this policy, the Ministry of Promotion and Development is responsible for monitoring the situation to ensure that the general conditions calculated to make housing accessible to all citizens are achieved and maintained. The Ministry must draw up every four years a Housing Plan (Plan de Viviendas), which establishes the methods for granting loans and subsidies to aid prospective home buyers, for supporting the development of land suitable for construction and the renovation of real estates. The plan is implemented by the autonomous communities by means of annual housing schemes. The right to a decent housing is recognised by the Spanish constitution and therefore it is a responsibility of public government to provide for it. In order to facilitate the provision of housing, Spain has adopted a national policy for the formation of a Patrimonio Municipal de Suelo (municipal land banking). This policy obliges local authorities with more than 50.000 inhabitants to establish land banks at the municipal level. Such land banks can incorporate land classified as non-developable or developable but not programmed for development. This land is destined for the construction of housing under subsidised regime or to other uses of social interests. Land banks also are used to support the correct development of urban areas and the adherence of private planning initiatives to the provision of land-use planning.

The last Housing Plan, which establishes housing needs and subsidies for the period 2001-2005, has introduced a new regulation that should promote a more efficient performance of autonomous community. According to this regulation the state will retain 25% of the available budget for housing and redistribute it to those communities, which have been able to deliver their planned share of the housing stock faster than the other communities.

The *Autonomous Communities* edit their own land planning laws and have full and complete powers over all issues of urban, regional and land-use planning. These are prepared in order to control and regulate those matters, which have been according to the Spanish constitution transferred to the communities. In absence of a regional law the national law is applied. *Local authorities* are obliged according to the national planning law to adopt and revise, every four years, structure planning and land-use regulations, which must cover the totality of their territories. Regional planning instead is not obligatory.

9.3.2. Planning instruments

Plans in Spain have a pyramidal configuration following the principle of framework control. This means that plans at the lower level must not contradict planning decisions at the higher level. All plans are immediately binding once they have been approved by the competent body. It is in the power of regional governments to approve the majority of planning instruments drawn up by local government. Although the planning system is rigid in concept and totally regulated by law, it is flexible in its management allowing it to adjust to changing economic, demographic and market conditions. However, due to the length of the processes for the drafting and approval of planning instruments, the response of the planning system is often substantially delayed, causing maladjustment to the existing conditions.

In practice, the last 10 years have seen a progressive emergence of strategic and supra-local planning instruments provided for in a new generation of regional planning laws. This changed was becoming more and more necessary to overcome the limits of the Spanish planning framework due to the absence of a proper metropolitan level for planning, the pre-eminence of local municipal planning and the growing supra-local nature of urban areas.

The *central government* lacks the competence to approve regional or local plans and only has power to approve the Plan Nacional. However since this instruments has been established in the 1992 national planning law, no attempts have been made for drawing up a national plan. The instrument with the broadest scope for the spatial organisation of the whole territory, which has been drafted in 1994 id the Plan Director de Infraestructuras" (Infrastructures Master Plan) and revised in 2000. The plan, which lasts from 2000 to 2007, is the first attempt to create a strategic planning framework for all types of infrastructures throughout Spain.

Supra-local plans in Spain are not prescribed in the national law and their contents and even existence depends on the different regional laws drawn up by the autonomous communities.

General and detailed land use planning is the responsibility of *municipal authorities*. There are three types of general instruments:

- The General Plan which is the main zoning instrument for the municipalities, and, according to the Spanish legislation classifies all land into urban, developable and programmed, developable but not programmed, non-developable, and non developable and specially protected.
- The Complementary and Subsidiary Norms which can either regulate those aspect which are not provided for in the General Plan or act as a substitute of the Plan in municipalities where the latter has not been drawn up (Subsidiary norms are usually drawn up at the province level).
- If no General Plan and no Subsidiary Norms are available, municipalities can resort to the Urban Delimitation Projects, which limit the possibilities for development in all the areas not classified as urban.

Detailed planning comprises three main instruments:

- the Urban Actuation Programmes (PAU), give detailed provisions for the development of the areas classified as developable but not programmed.
- The Partial Plans cover all the areas classified as developable and programmed. They can be started out by both private and public initiatives.
- The Special plans which have different contents according to their objectives. These range from landscape or environmental protection to regeneration or preservation of urban areas and buildings. The latter are also the main instrument for the protection and conservation of the built environment and have played a major role in the safeguarding of many historical areas in Spanish cities.

9.4. The Autonomous Community of Madrid

Compared with the other Spanish metropolitan areas and autonomous communities the case of Madrid is rather different. First the city of Madrid, being the capital of Spain, has always received a particular attention from the central government both in terms of infrastructure provision and economic support. Studies have shown that Madrid is the Spanish autonomous community that receives more funding for transport network and infrastructures. At the same time this position has given the government of the city the possibility to strongly influence the design the planning legislation. As a matter of fact, the three editions of the planning law (of 1946, 1976 and 1992) were written in large part by Madrid's planning directors and were influenced by each of Madrid's city and metropolitan and city plans.

Secondly both the city and region of Madrid have gone under several administrative reforms: from the enlargement of the municipal area (from 66 to 607 Kmq) through the amalgamation of the surrounding municipalities in the 1950's, to the formation and subsequent abolition of a Metropolitan area, and finally to the establishing of the Regional Government in 1983. The creation of the Autonomous community of Madrid had legal and political consequences. First of all the limits of the new region included the same territory as the province of Madrid. Following the constitutional law, the Provincial Council was absorbed by the Autonomous Community in order to avoid a duplication and overlapping of institutions. The tasks of the province (basically the coordination of municipalities) were assumed by the regional government. Secondly, the regional government dissolved the Metropolitan Area created in 1964. The actual metropolitan area, which at the time was increasingly extending, ended up lacking a metropolitan government. However the notoriously complex administrative system, resulted simplified in the Madrid Region and reduced to only two levels: the autonomous community and the municipalities. However up until 1985 Madrid has been rather unaware and reluctant to recognise its role as a metropolitan region and the changes that were occurring in the spatial structure and in the spatial distribution of population and productive activities.

The Madrid Metropolitan Area Planning and Co-ordination Commission (COPLACO) had never succeeded in drafting a metropolitan plan. Democracy brought with itself a deep change of heart in the role of the now democratic public institutions. The first regional planning law for the region of Madrid was enacted in 1985. It specified three types of planning instruments, the Regional Planning Guidelines that were meant to guide local planning, the Co-ordination Action Programmes short-term investments for development activities and the Physical Environment Management Plans. None of these instruments was ever designed or implemented but for the first time Madrid was starting to uncouple from the traditional top-down approach of the Spanish planning system and to develop a planning framework more suitable to embrace the necessary changes towards a more cooperative, negotiated and bottom up approach.

In 1995 a new planning law was adopted. This legislation, which is aimed at integrating and making compatible regional and town planning, sets up two bodies: the Commission for the Co-ordination of Regional Action and the Council of Regional Policy. The law provides for two main regional planning instruments: the Regional Strategic Plan and four sub regional strategies for the different areas surrounding the city. Both are discussed below. In 2001 the

CA has approved a new Land Use Law (Ley de Suelo), which takes into account the fact that the processes of urban management and land-use change in the region require a wide political and social consensus. The new legislations have modified the practices and procedures for urban development at the metropolitan scale and have introduced the practice of concerted actions (concertación) by means of which local authorities, planners, key economic actors and community groups participate in the definition of priorities in the urban development of the region. The outcomes of these participatory actions are called convenios. They act as "contracts" and are legally binding for all the parts involved.

The AC plays an important role in regional development. Spatial planning, housing, transport and other regional infrastructures are its main activities and take up the majority of the regional budget. The Department of Public Works, Urban Planning and Transport comprises different offices and institute such as the IVIMA (Madrid Housing Institute), the IRIS (Institute for Relocation and Social Integration) and the Arpegio (a public development agency).

9.5. The Madrid Regional Strategic Plan

The overall strategy for the Madrid regions dates back to 1987 when the political programme "Madrid Región Metropolitana" was devised by the regional planning authority. The strategy took shape in two ways: the Regional Strategy Plan and the zone strategies for the eastern, western and southern sectors. The latter has been so far the more successful and has come to be known as the Gran Sur. Both the overall and zone strategies had to be implemented by means of three instruments: *regional infrastructure investments*, public *development projects* carried out by the Arpegio development agency and the *convenios*, contracts between regional and local authorities to coordinate the implementation of the local projects and strategies.

The Regional Strategy Plan establishes the basic elements for the organisation and structure of the whole territory of the region. Its objectives are strategic and the Plan is the frame of reference for all the other regional planning instruments or plans. The Plan has been formulated as a framework for the development of actions (convenios) in the region. It is not therefore a plan with specific aims, but rather provides a common ground for the harmonisation and co-ordination of all the local and regional planning actions. It is a flexible plan-adaptable to altering circumstances and revisable on a continual basis-of 20-year range, but open-ended in that it obliges proposals to be modified according to changes in the external circumstances or depending on the variation of demand or established forecasts.

The strategic criteria set forth in the Plan are the following:

- Territorial and social equilibrium.
- Protection of the environment
- Sustainability of development.
- Rationalisation of the pressures that insist on the territory.
- Valorisation of the urban heritage and re-use of already developed property
- Improve relations between urban functions.
- Social, economic, and energy rationalisation of the transport supply.
- Co-ordination of the actions among the different authorities.

The general objectives of the regional proposal are:

- To contribute to generating the patterns and the processes that promote the region as an emerging area of international agreement.
- To improve the quality of life in the region, not only for the present, but for future generations as well.
- To guarantee the conservation, improvement, and valorisation of the regional heritage in all its dimensions.
- To enable underprivileged groups to have access to housing and jobs, helping to prevent social exclusion

The regional model is based on an intermeshed structure comprising infrastructures and open spaces. The mesh is the frame for the identification, analysis and further development of what the plan calls Units of Balanced Development (Unidades de Desarrollo Equilibrado). UBDs are intended to achieve the main objectives of the housing strategy by decentralised concentration. The concept of decentralised concentration in the plan also imply the reduction of the need to travel by developing UBD where the functions of working and living can be in close proximity. This concept however has never worked in practice. The cause is mainly the preference of Spanish households towards home ownership rather than rental. As a result an increasing share of the Madrid population is ever more reluctant to any form of relocation.

The regional strategy plan has been criticised mainly for adopting unclear, generic and scarcely differentiated objectives, for the lack of priorities in the definition of policies and for disregarding the existing spatial structure and trends and imposing a totally artificial spatial framework (the intermeshed structure). Moreover the identification of geographical areas in the Regional Plan conflicts both with the reality of the region and with the identification of the zones in the zonal strategies.

9.5.1. Housing

The Plan envisages the construction of 500,000 dwellings over the next 20 years. The number of dwellings in the plan is based mainly on statistics regarding the diminishing size of households, which has dropped from 3.06 members per household to 2.46, along with a change in the average built area per inhabitant from 21.5 to 25 sqm. The older age at which families are formed is also interpreted as a sign of increasingly limited accessibility to the housing market. Housing needs, which are income related, amount to 70% of subsidised housing. The plan doesn't differentiate in terms of residential densities. Indeed it supports an increase of sqm/inhab. This decision, which is a possible factor of sprawl rather than a way to control it, is based in the need to overcome the housing sector's historical deficiencies, among which overcrowding, and to provide for a better and affordable living environment.

9.5.2. Productive Activities

The function of the Regional Plan in economic development consists, fundamentally, in detecting long-term (20 years) needs for the development of the region, with two clear objectives in mind: job creation and fostering the competitiveness of the Community of Madrid in the European context. Thus, the ultimate aim of the Plan is to prepare the region so that it meets the necessary conditions. On the one hand, by classifying exactly the land that is needed in accordance with the estimates; and on the other, through balanced planning of growth through environmental improvement, residential settlements, infrastructures, and facilities that generate a balanced regional fabric that is easily accessibly and therefore improves the opportunities in the region. The plan for productive activities adopts a model of polynucleated metropolitan area by supporting economic development projects in the main urban centres surrounding Madrid and connecting them to the city with fast and dependable public transport. The aim is to correct the problems of congestion and functional disparities originating from the monocentric structure of the region. Most of the areas selected as the location of new publicly financed productive areas are located in the south and east of the region in order to counterbalance the existing development trends of office centres in the north. The projects are carried out by the Regional Development Agency, Arpegio

9.5.3. Infrastructures

The Madrid Regional Plan forecasts a demand for 500,000 new homes over the next 20 years. This new growth will take place mostly within the metropolitan region, and mainly around existing population centres. This will result in increased demand for the use of the existing transport system. In order to prevent this population being dependent on the private motor vehicle, which would result in a total collapse of the regional highway system, these new homes will have to be connected to the suburban railway system. The increased use of the commuter train transport system forecast for the next 20 years will need to be addressed

by a specific infrastructure plan. In response to this increased pressure on the transport system, the Community plans to build transport infrastructure that integrate all of the region's public transport systems. The plan also refers to a more uniform and more dispersed spatial distribution of jobs and houses as an instruments to reduce traffic congestion and overloading of major radial network. In this case dispersion doesn't translate into sprawl, at least not in the intention of the planning authority but into the concept of polycentric spatial structure mentioned above.

At present the different public transport systems are coordinated by the Consorcio de Transportes de Madrid (CTM, Madrid Transport Consortium) which came into existence in 1986 to combine the efforts of public and private institutions related to public transport for the purpose of coordinating services, networks and fares. The CTM comprises the National Government, which owns and manages the suburban railway system, the Autonomous Community of Madrid, the Municipal governments along with public and private companies.

9.5.4. Major Regional Projects

Castellana Extension Project

The Prolongación de la Castellana is a mixed-use estate development, which extends towards the north periphery of the city along the Paseo de la Castellana. The project is carried out by a consortium comprising the Ministry of Promotion and Development, the Autonomous Community of Madrid, the Municipality of Madrid, the Spanish Railways and the DUCH a private associations of developers and businesses. This is the most ambitious project for the city of Madrid. However it has been criticised for its mainly speculative character. 90% of the new houses that will be built in the area will be put on sale as "free houses" not subject to any subsidies. Critics are worried that this project will reiterate the existing disparities in the region between the rich north and the poor south.

9.6. The regeneration of the Gran Sur

The Gran Sur is the most important of the three sub-regional strategies. Its aim is to organise all future development in the area within a single framework. The south of Madrid had received the highest share of population and urban growth during the 1970's and 1980's. In the 1990's the area counted for nearly 1 million people and began to develop its own approach to urban planning. The seven cities located in the southern district began to compete with each other for the location of new development. Urban growth was "dominated by the logic of real estate market"(Healey, 1997). The Gran Sur strategy was devised by the regional government in order to overcome the negative impacts generated by the lack of inter-institutional cooperation. The main goals of the strategy were to diversify the local economy by increasing the share of commercial and tertiary activities to the existing (and often declining) industrial sites, to increase the environmental quality by the realisation of regional parks and to convert dormitory suburbs into self-sufficient communities.

	COMMUNITY OF MADRID							
Space	**Issues**	**Main Principle of Sustainability**	**Broad Policy Goals**	**Policies**				
				Fiscal	**Land Use Planning Instruments**	**Housing and Design in the Private Sector**	**Transport**	**Other Projects/Actions in the Public Sector**
	Environmental Quality	ECOLOGICAL: Reduce use of natural resources;			greenbelts	infill development; brownfield development; concentrated development	energy efficient travel; increased public transport	greening the city
All	Loss of environmental quality to region							
All	Increased land pollution							
All	Increased air pollution							
Suburbs/ Hinterland	***Consumption***	ECONOMIC AND ECOLOGICAL: Reduce use of natural resources	limit outward movement of growth, revitalize urban centres, improve environmental quality	development impact fees, subsidies for economic and housing development in selected areas	decentralized concentration; new towns, greenbelts	compact building design(new urbanism, cluster development) *infill development*	*focus development near transport hubs*	transfer of development rights; land banking, *brown field redevelopment*
	High land consumption for housing development							
	Land consumption for infrastructure development							
	Higher local government costs							
	Higher housing and infrastructure development costs							
	Mobility	ECOLOGICAL: Management of demands; r	reduce number of car km travelled, increased access to jobs and services of low income residents	Versement Transport; location efficient mortgage	focusing development near transport hubs	*reduced demand for suburban development, compact building design (new urbanism, cluster development, infill development);*	increase dependable high quality public transit, policies decreasing auto use, parking policies, HOV lanes,	*car free neighbourhoods*
All	Increased trip numbers, trip lengths and travel times							
Regional Centres	Increased congestion of radial roads							
Core	Rings of traffic jams							
Suburbs	Inefficient use of public transit due to low density development							
Core	Reduced accessibility of low income residents to jobs and serices							
	Adaptability of Physical Infrastructure	SOCIO-CULTURAL, ECONOMIC: Equity		decrease demand for suburban housing (tax on new buidling in the periphery, tax incentive for new home owners locating in urban centre); incentive property taxation		increased demand for core area housing (neighbourhood traffic calming, infill development)		core area revitalization (brownfield redevelopment, mixed use development)
Core	Loss of economic activities / jobs in certain sectors and in areas of disadvantaged groups (urban centre)							
Core	Degradation of built environment							
Core	Loss of local tax revenues from urban cetnre							
Suburbs, Regional Centres	Inequitable distribution of services among subregions							
	Segregationof Social Groups	SOCIOCULTURAL: Diversity; Equity	increase choice of housing for low income groups; revitalize urban centre	rent housing vouchers/subsidy; tax transfer between areas		*increased demand for core area housing (infill development);*	*dependable high quality public transit*	social housing; *core area revitalization (brownfield redevelopment, mixed use development)*
Suburbs	Concentration of disadvantaged groups in suburbs (lowest income groups, minorities, elderly) and loss of middle class groups to core (families, first time home buyers from centre)							
Core	Concentration of disadvantaged groups in urban centre and less atrractive areas (lowest income groups, minorities, elderly) and loss of middle class groups (families, first time home buyers from centre)							
Suburbs	Shortage of affordable housing in suburbs							
	Main issues							
		STRATEGY						
		DETAIL ANALYSIS						

Table 6: Issues and policy areas of the Madrid planning strategy and case policy

The strategy is based on three key spatial elements:

- the regeneration, especially with regards to housing and living environments, of the urban centres of Leganés, Getafe, Alcorcón, Móstoles, Fuenlabrada, Parla and Pinto and of the southern districts of the periphery of Madrid;
- the realisation of several large-scale mixed-use development areas along or at the major nodes of transport infrastructure. The majority of these projects are coordinated by Arpegio. Infrastructures construction and land clearance are financed by the public sector while offices and residential developments are financed by the privates.
- the realisation of the Metrosur, a branch of the Madrid underground service that connects the seven cities of the southern district together via a circular line and to the city centre via the extension of an existing line. The project is financed by the Madrid Transport Consortium and is currently under development. Funding for the project are mainly from the national government which is one of the partners in the Consortium

The regeneration of the housing stock in the southern district of Madrid has become an exemplary case of social sustainability and public participation. The process has developed during the last twenty years and activities have ranged from the provision of new houses, the regeneration of the existing stock and the equipment of the regenerated suburbs with basic infrastructures and service facilities. The regeneration scheme, which dates from the end of the 1970 to the mid 1980s is characterised by the involvement from the very beginning of neighbourhood movements. The high level of participation was originally the response of the local communities against a major households relocation scheme devised by the Autonomous Community in order to renew the poorest residential areas of the municipality of Madrid. As a consequence the main component of the regeneration practices has been the preservation of the local residents in their own neighbourhood during and after the process. The neighbourhood were eventually involved into the entire planning process and in the design of the Gran Sur strategy plan. Another important outcome of the neighbourhood

movement was the establishment of a commissions for the control of construction to monitor the building processes.

In some cases, such as in the districts of Villaverde, Usera and Fontanarron, the regeneration process hasn't stopped at the provision of better dwellings but has advanced to a phase of investments and integrated programmes for social and economic re-qualification. Investments are mainly public (mainly from the Autonomous Community, but also from the local municipalities and from the central government) in the case of social programmes and mainly private in the case of economic development. The main instruments adopted for the implementation of the latter programmes are the *convenios*.

9.7. Qualitative Evaluation

As a result of this strategy and of the related development projects the Gran Sur has become an environmentally and economically attractive area, which effectively acts as a location alternative to the centre of Madrid. A negative outcome has been the increase in land and house prices in the areas. As a consequence the share of public and subsidised housing new developments in the area have been decreasing.

10. COPENHAGEN

10.1. Urbanisation processes in the Greater Copenhagen

The metropolitan region of Copenhagen grew until the mid 1970's, when its population reached 1.75 million. In the last 20 years the population has slightly declined in the metropolitan region. Three distinct housing patterns are associated with the cycle of growth and decline in the region:

- A compact development of the industrial city with dense and unhealthy working class neighbourhoods (late 1800);
- Welfare state intervention and subsequent improvement of housing standard
- Suburban developments from the 1920 and accelerated after the Second World War. Decrease in housing density, rise of the semi-detached and detached housing model.

At present the spatial structure of the metropolitan areas consist of a central area of compact and multi-storey buildings with considerable proportion of older and small-sized houses built before 1945; a periphery of low density housing in the north and north west of the city and a mixture of detached housing and flats in public housing estates built from the late 1950's to the 1970's in the south-western and western periphery. In the city of Copenhagen housing areas consist mainly of residential blocks, while single-family houses only have a share of 7% of the buildings. The population of Copenhagen consists of a relatively high proportion of elderly and young people.

The post war expansions have developed mainly outsides the boundaries of the municipality, under a regime of virtual administrative chaos and lack of a statutory regional planning framework which allowed local authorities to design and implement local policies according only to their own interests. This resulted in an uncoordinated suburbanisation, which developed mainly in the period 1940-1980. This phenomenon has had a strong impact on social segregation in the Greater Copenhagen. Approximately 240,000 new dwellings were built during these four decades and nearly 350,000 people, mainly young households with children, stable jobs and increasing incomes, left the two central municipalities and moved to the more modern housing estates in the suburbs. Levels of segregation are, however, relatively contained if compared with that of other European cities. This is the result of the of the strong welfare state policies implemented since the 1930s which have guaranteed growing living standards for all citizens and prevented the increase of social and economic contrasts and the emergence of a concentration of lower classes in depressed areas.

Parallel to the suburbanisation processes, the structure and location of industrial employment has changed. The volatile trends of employment figures disguise dramatic changes during the post war period and especially in the last 20 years. The main feature is a sharp drop of manufacturing employment, which halved in the period 1950 – 1990 and an extraordinary increase of the service sector, especially public service due to the expansion of the welfare state. Since the late 1980 the expansion of public services has stopped and private services like banking, insurance and professional activities have expanded. The substitution between industrial and tertiary activities has occurred in a spatially biased fashion: the central areas of the conurbation have suffered and are still suffering the highest impact of job loss and long term unemployment, while the external municipalities of the region have been able to attract new jobs and activities. While the average unemployment rate in the central Copenhagen is the highest in the entire nation, unemployment in the suburbs is the lowest in the country.

The loss of population and jobs in the period from the mid 1960s to the late 1970s couples with a financial reform that worsened the local economy left the municipality of Copenhagen to struggle with increasing social needs from an aging and economically weakening population and with decreasing taxable incomes. This has resulted in an increasing dependency on national financial support and more lately in the adoption of a more entrepreneurial development policy, including the sale of municipal properties, such as the brownfields areas of and around the harbour front, to private developers.

10.2. Institutional framework and planning system in Denmark

The spatial planning policies of the Danish government are mainly expressed in an obligatory national planning report submitted to parliament by the Minister for the Environment after each national election. National planning includes topics and projects in spatial planning that are considered of national significance. Even though the national government can intervene in regional and local planning to secure the achievement of national goals it is not its responsibility to approve local and regional plans. The national level of planning uses a variety of instruments to achieve national goals. The minister can issue directives to locate specific activities and thereby determine part of a regional or local plan, such as the path of a main motorway or infrastructure. With regards to transport planning the national government through the ministry of transport draws up the “transport policy action plans” which include consideration of the transport sector as such and on the relationship between the different modes of transport . However no full-integrated transport planning has been carried out so far at the national level.

On the regional level, 16 counties cover nationwide and provide a planning framework for land use in Denmark. A regional plan must contain guidelines for land use and a report accounting for the premises on which the plan is based. On the municipal level, 275 municipalities cover the whole territory. Municipal plans include a report, a structural plan and a framework plan for detailed local planning, which is also carried out by the municipalities. The structural plan provides the objectives for land use and the design guidelines for each use. It also coordinates sectoral planning and budgets. The framework plan lays out land uses in more detail and encompasses the design of transport facilities. The instruments included in the municipal plan govern urban renewal, policies on attracting commercial development or on environmental improvement. The assure the coordination of municipal activities. Municipalities are also responsible of local plans, which determine and deliver the development provided for in the structure plan. The regional government must ensure that the proposed municipal and local plans comply with the national planning directives and the current regional plan.

10.3. Spatial and transport planning in Copenhagen

Metropolitan Copenhagen is divided into 50 municipalities, of which the central boroughs (the municipalities of Copenhagen and Frederiksberg) both have the status of municipality and county. The municipalities are grouped into three counties. Reforms of the administrative structure have been attempted several times without result. Since the two central boroughs only cover a small share of the urban area, not even the pre 1940 urban area, most of the urban growth has occurred outside the boundary of the city of Copenhagen. In order to coordinate the growth of the Copenhagen Metropolitan area, attempts at regional planning have started as early as 1947, although only on a voluntary basis. The absence of binding regulations allowed those local municipalities who were less satisfies with the guidelines of the plan, to simply ignored them.

For this reason, both the 1947 regional plan (the “finger plan”) and the Preliminary outline plan of 1960 were superseded by the rapid and uncontrolled urban development of the 1950s and 1960s. These plans however stressed the need for a more stable cross-border cooperation. The following regional plans (the “Structure Plan” of 1972 and the “Regional Plan” of 1989) were made by the Greater Copenhagen Council (Hoverdstadsrådet), which received formal status as the public planning authority in 1973.

After the Greater Copenhagen Council (GCC) was abolished in 1989 regional planning has been carried out by five regional units: the City of Copenhagen, the City of Frederiksberg, the County of Copenhagen, the County of Frederiksberg and the County of Roskilde. Each of those five regional units made their own 1993 Regional Plan based on the main guidelines outlined in the common 1989 Regional Plan for the Greater Copenhagen Area. Each of them is now working on a revision. Besides the five regional plans there are fifty Municipal Plans covering the whole Greater Copenhagen Area.. After the dissolution of the GCC the

municipality of Copenhagen has assumed responsibility for certain regional tasks for the central parts of Greater Copenhagen and the neighbouring areas of the region of north eastern Zealand.

10.4. Overall description of the planning strategy

10.4.1. The Greater Copenhagen Regional Plan

For almost 50 years the development of the greater Copenhagen metropolitan area has been based on the concept of the "finger city" to control urban growth. This urban concept promotes the use of public transport and the protection of green space between the fingers. The modifications and refinements of this theme through the years all show a clear development in one consistent line.

The original “finger plan”, the 1947 regional plan for the Copenhagen area, defined an urban structure shaped like a hand with five fingers. The strategy to restrict new urban development to locations along the existing railway lines aimed at making the use of public transport, especially railways, attractive, and at preserving the green spaces between the urban areas encouraging these areas to penetrate towards the city centre.

The Regional Plan of 1989 has embraced the principle of radial and public transport oriented development after its abandonment in the previous two plans. This plan for the first time underscores the importance of an efficient system of public transport services and not only of infrastructure provision. To reduce the use of and the pollution from private cars, to minimise the social costs of transport and to raise access to functions of regional importance, the plan introduces a principle of accessibility known as the principle of “proximity to stations”. All regionally important functions, namely functions that will attract people from outside the local area, have to be within walking distance of a station. The location strategy of the 1989 recognises the ongoing restructuring of the industrial sector and its needs for a huge amount of office space. This includes a number of building sites supplied of infrastructures.

While the first three regional plans were mainly static in the sense that the planners expected development to fill out the plans, this later plan is dynamic. It is not a land-use map but rather an interrelated set of principles for location and development of different types of land uses.

10.4.2. The Copenhagen Municipal Plan

In the early 1990s, the reform on planning authority distribution and a law on a permanent link between Denmark and Sweden over the Øresund led Copenhagen to design a new Plan of the City and the County of Copenhagen. The 1993 plan for the Municipality/County of Copenhagen is prepared and consistently maintained over a long period. In the plan itself transport planning and landscape planning are essential aspects and many relevant partner organisations are involved (horizontal integration). On the other hand, vertical integration is also practiced: interregional cooperation in the Øresund Region with Sweden and the 1989 Regional plan of the greater Copenhagen Area is elaborated in many municipal activities. Long terms objectives of the plan are the improvement of living conditions in the city (pollution reduction, green spaces) and the coordination of urban growth with more decentralised land use and a compact city. Two municipal activities, which are closely linked to the regional framework concept, are:

- Areas around stations: this theme considers locations around stations essential for traffic control and urban development. The concept is that industries and especially offices should be located there to promote public transport and to reduce reliance on private cars. Priority areas for urban development and renewal have been defined near stations and major bus terminals.
- Green city: the conservation and development of green spaces and public gardens with an ecological function. The limitation of the space taken up by parking areas is one means of achieving that. The green wedges between the fingers of the city contain a lot of green area and are protected.

- General travel management policy. The policy involves computerised traffic management, the development of public transportation, a cycle network and a parking policy.

Other more localised goals of the plan are:

- enhancing and transforming the growth of the city in the harbour area
- restoring and maintaining the historical quality of specific city districts and their diversity

10.5. General travel management policy

	COPENHAGEN							
Space	**Issues**	**Main Principle of Sustainability**	**Broad Policy Goals**	**Policies**				
				Fiscal	**Land Use Planning Instruments**	**Housing and Design in the Private Sector**	**Transport**	**Other Projects/Actions in the Public Sector**
	Environmental Quality	ECOLOGICAL: Reduce use of natural resources;			greenbelts, green corridors	infill development; brownfield development; concentrated development	energy efficient travel; increased public transport	greening the city
All	Loss of environmental quality to region							
All	Increased land pollution							
All	Increased air pollution							
Suburbs/ Hinterland	***Consumption***	ECONOMIC AND ECOLOGICAL: Reduce use of natural resources	limit outward movement of growth, revitalize urban centres, improve environmental quality	development impact fees, subsidies for economic and housing development in selected areas	decentralized concentration, new towns, greenbelts	compact building design(new urbanism, cluster development) *infill development*	*focus development near transport hubs*	transfer of development rights, land banking, *brown field redevelopment*
	High land consumption for housing development							
	Land consumption for infrastructure development							
	Higher local government costs							
	Higher housing and infrastructure development costs							
	Mobility	ECOLOGICAL: Management of demands; r	reduce number of car km travelled, increased access to jobs and services of low income residents	Versement Transport; location efficient mortgage	focusing development near transport hubs	*reduced demand for suburban development; compact building design (new urbanism, cluster development, infill development),*	increase dependable high quality public transit, policies decreasing auto use, parking policies, HOV lanes,	*car free neighbourhoods*
All								
Regional Centres	Increased trip numbers, trip lengths and travel times							
Core	Increased congestion of radial roads							
Suburbs	Rings of traffic jams							
Core	Inefficient use of public transit due to low density development							
	Reduced accessibility of low income residents to jobs and sences							
	Adaptability of Physical Infrastructure	SOCIO-CULTURAL, ECONOMIC: Equity		decrease demand for suburban housing (tax on new buidling in the periphery, tax incentive for new home owners locating in urban centre), incentive property taxation		increased demand for core area housing (neighbourhood traffic calming, infill development)		core area revitalization (brownfield redevelopment, mixed use development)
Core	Loss of economic activities / jobs in certain sectors and in areas of disadvantaged groups (urban centre)							
Core	Degradation of built environment							
Core	Loss of local tax revenues from urban cetnre							
Suburbs, Regional Centres	Inequitable distribution of services among subregions							
	Segregationof Social Groups	SOCIOCULTURAL: Diversity; Equity	increase choice of housing for low income groups; revitalize urban centre	rent housing vouchers/subsidy; tax transfer between areas		*increased demand for core area housing (infill development),*	*dependable high quality public transit*	social housing; *core area revitalization (brownfield redevelopment, mixed use development)*
Suburbs	Concentration of disadvantaged groups in suburbs (lowest income groups, minorities, elderly) and loss of middle class groups to core (families, first time home buyers from centre)							
Core	Concentration of disadvantaged groups in urban centre and less attractive areas (lowest income groups, minorities, elderly) and loss of middle class groups (families, first time home buyers from centre)							
Suburbs	Shortage of affordable housing in suburbs							
	Main issues							
		STRATEGY						
		DETAIL ANALYSIS						

Table 7: Issues and policy areas of the Copenhagen planning strategy and case policy

Since the abolition of the “Greater Copenhagen Council” travel related problems are addressed at the level of the municipality within a framework of informal cooperation with the two other counties of the conurbation.

The city of Copenhagen has adopted an *overall travel management policy* to improve the quality of transport, the urban environment and city life in general. The policy is organised around the following strategic objectives: introduction of computerised traffic management to minimise time spent travelling; development of public transport and a bicycle network; and introduction of hierarchical parking systems. Particularly noteworthy is the fact that environmental criteria are taken into account in the development of the travel management policy. The policy aims at reducing the use of private cars and at increasing the share of trips by public or environmentally friendly means of transport without having to increment the supply of road and rail infrastructure. The main goals are:

- limitation of noise and air pollution
- promotion of a balanced development of the different transport modes by favouring the use of bicycles and public transport
- safeguarding accessibility and the mixed social and economic functions of the historical city centre
- protection of the residential districts from negative traffic impacts

- reduction of traffic congestion

The computerised traffic management involves the management of traffic primarily on the existing road network; controlling traffic flows through zoning; and providing parking areas at the entrances to the city. In combination these traffic management elements have enabled the abandonment of planned projects for new infrastructure. The development of public transportation has involved the improvement of the existing bus network through measures including reserved lanes and traffic light priority, rather than construction of major public transport infrastructure. The development of the bicycle routes involves the construction of approximately 300 km of cycle paths, including fast cycle lanes.

The new parking policy is based on a concept of a hierarchy of priorities whereby public transport and short stay parking have the highest priority while long stay parking, especially for non-resident has the lowest.

The general travel management policy has been developed at the municipal level, with informal cooperation with the two counties of the conurbation, although the policy is implemented principally by the municipality. The policy is defined in plans for a period of four years with each new phase submitted to public evaluation, thus facilitating public involvement. Within the context of the general travel management policy the bus company prepares plans for public transport for the entire conurbation.

10.6. Output of the policy

10.6.1. Success of travel management policy

The success of Copenhagen's travel management policy may be judged against the scale of its road infrastructure network which is no larger now than it was in 1970, and traffic volume, measured in terms of kilometres driven per year which has reduced by some 10 % below the 1970 level.

Overall, 30% of home to work trips in the summer season are by bicycle, compared to 37% by public transport and 30% by private car. As a reflection of this modal split car traffic measured in terms of kilometres driven per year has reduced by some 10% below the 1970 level.

The Copenhagen planning system has, to a certain extent, been successful in favouring public transport and reducing average travel time. Car traffic to the city of Copenhagen today is at a lower level than in 1970. The decentralisation and development of secondary centres has also been successful, giving the population of the suburbs better access to jobs and services. As a result, traffic and related congestion and pollution, in the centre of Copenhagen is under more efficient control. Besides the green wedges between the fingers are protected. However the plans have not been successful in all respects. A recent survey of office construction in the Greater Copenhagen area reveals that only about half of the office floorage built between 1980 and 1990 was actually developed in the priority areas near the stations.

10.7. Qualitative evaluation

10.7.1. The need for long-term coherence

The Copenhagen example of regional and municipal land-use and transport planning shows that long-term consistency in planning is an important factor. In spite of modifications and changing planning objectives, the main planning concept of the radial growth has been maintained. It is because of this consistency that the integration of land use planning and public transport planning could be achieved. Recent planning themes such as the concentration of working areas around stations and the development of green and ecological zones fit well within this main planning concept. The lesson is that environmental policy should be based on consistent and sustainable land use plans and principles.

10.7.2. Problematic areas in relation to the principle of “proximity to stations”

According to the “proximity to stations” principle, without easy access by public transport, office development is in practice impossible. This principle has raised several critics, which have underlined that although this is a reasonable principle from an environmental point of view, it also reduces the possibility of making plans for industrial areas. Consequently, alternative solutions have been suggested. Among these there is a proposal for incorporating more areas in the principle of “proximity to stations” since the one currently classifies as such (1 km radius from the railway station) do not offer sufficient industrial capacity to meet the demand. Another proposal suggests the development of a clearer and broader definition of the activities falling within the principle of “proximity to stations”.

11. STRASBOURG

11.1. The city and urban areas of Strasbourg

During the last ten years Strasbourg has undergone sustained population and employment growth. The city of Strasbourg counts today on 557 000 inhabitants against 518 000 in 1990 (+7,5 %). Indeed, during the last decade, 20000 jobs (most of them in the public sector) and more than 30000 new dwellings were created in the urban area. These features have made Strasbourg, one of the youngest cities of France. Young technicians and young graduates are attracted there by a strong dynamics of jobs creation and housing development.

The urban area corresponding to the Urban Community of Strasbourg is today a polycentric metropolis characterized by a spatially balanced distribution of its urban centres. The metropolitan area has grown continuously during the XIX century, hardly interrupted during the Second World War. This growth was accompanied by an expansion of the urban area that led the agglomeration to gradually integrate the closest neighbouring municipalities.

Since the mid 1970s demographic growth has unevenly distributed in the area of the Communiteè Urbain. Population is decreasing in the core and pericentral districts of Strasbourg accompanied by the renovation/rehabilitation projects in these areas, while the population of the suburban districts and municipalities is steadily increasing. Strasbourg therefore evolved from a model of concentrated development, clearly delimited in space (the city), to a model of more extensive and slackened development, with the fuzzy limits, integrating the strongly urbanised rural areas and its surrounding countryside (the urban region). It is estimated that from 1968 to 1990 more than 35000 inhabitants left the urban agglomeration to locate themselves in the surrounding countryside. Part of them simply escaped from the downtown area and its discomfort, while others left a housing model based on rented flats in multi-storey buildings in search for an individual house set in a rural ambient, prototype of the French and Alsatian dream.

The spatial development of the city is linked to the demographic growth. Unrestrained growth of population and urbanization in the metropolitan area has occurred along some privileged directions: towards Ried until Herlisheim to the north, along the southern axis until Fégersheim-Eschau, Kochersberg to the west, and towards the southwest, along the Beetle until the piedmont of the Vosges. An isochrone of 25 min from the centre of Strasbourg can represent the limit of this zone of loose growth, a semicircular area because of the presence of a border (river) along the east side of the urban area.

From the regulatory point of view, these expansions are carried out mainly as grouped interventions both publicly led, such as the Zone d'Urbanisation Prioritaire, Zone d'Aménagement Concertée (Zones of Priority Urbanization, Zones of Concerted Development) and privately led as the lotissement (allotment projects) Detached houses dominate in the periphery, while housing typologies are more varied in the suburban centre of the agglomeration (collective estates of all sizes or bi-family houses). Infill projects are also carried out, sometimes through the recycling of brownfields: that was the case, for instance, of the army grounds of the Esplanade, dismissed in the 1960s, or of the old industrial docks of the port on the Rhine, which will be transformed into urban fabric with a mixed use development including housing, office and commercial spaces.

11.2. The Communiteè Urbain de Strasbourg

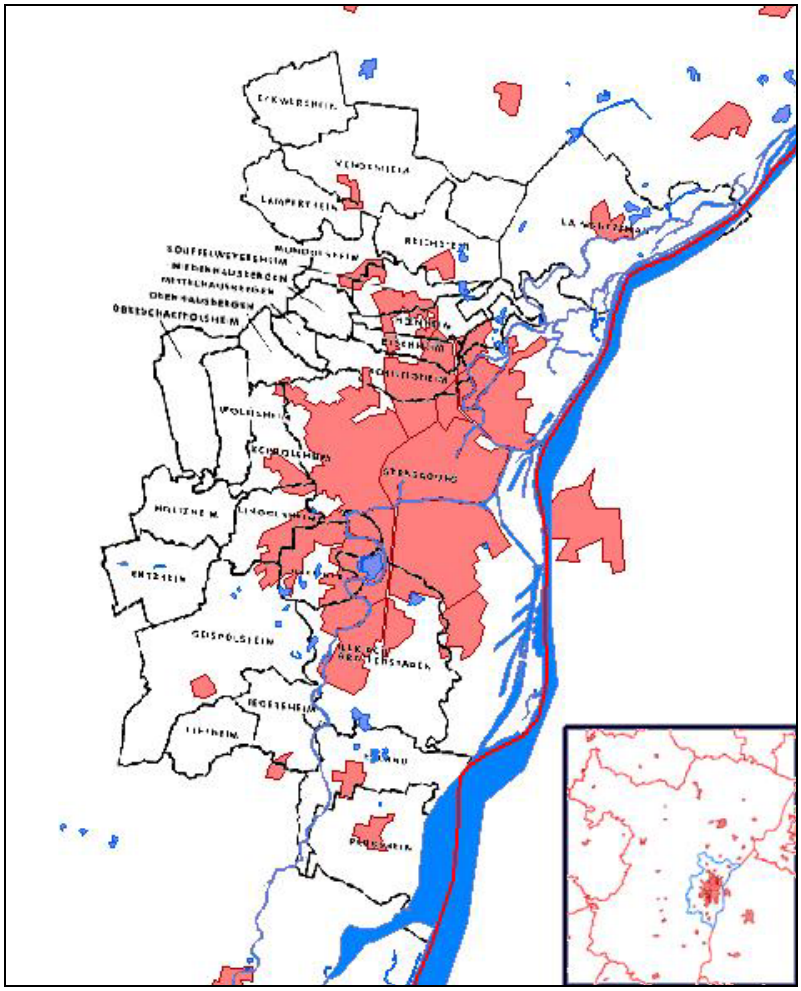


Figure 5: Map of the administrative structure and urban area of the CUS

Instituted in 1966, the Urban Community is an inter-commune form of cooperation, which introduces the concept of financial solidarity and pursue of common interests. While preserving the independence of the communes, it ensures a better management and opens a wider horizon of developments in the fields that come under its responsibility. The organization of the Urban Community mirrors that of the individual communes: the president of the Community corresponds to the mayor, the vice-presidents and the secretaries have the role of the councillors, and a council of community whose members elect the president and the vice presidents correspond to the town councils.

The Urban Community takes on a certain number of obligatory and optional competences in place of the members of the Community and is also a significant partner of the State government in fields not directly under its juridical responsibilities. Two main fields of intervention can be distinguished: the public management and the supply of public services:

- development of the master plan, the development plan (POS) and the constitution of land reserves;
- the creation and urbanisation (through provision of basic infrastructures) of the zones of concerted development (ZAC): residential areas and industrial zoning.
- the contribution to and the equipment of schools
- fire control and first-aid organizations
- the public urban transport and car parking services
- the roadway system and indication

▪the economic and scientific research development

11.3. The Urban Mobility Plan

The French general law on transport (“LOTI” law), upgraded by the air quality and rational use of energy (“LAURE” law) and the law for urban solidarity and renewal (“SRU” law), asks to the urban transport organisation from conurbations of over 100 000 inhabitants to implement an urban mobility plan (“PDU”) which defines the principles of organising the transport of people and goods, traffic and parking policy in the urban area. The PDU must guarantee the sustainable harmony between mobility, health and the environment.

	STRASBOURG							
Space	**Issues**	**Main Principle of Sustainability**	**Broad Policy Goals**	**Policies**				
				Fiscal	**Land Use Planning Instruments**	**Housing and Design in the Private Sector**	**Transport**	**Other Projects/Actions in the Public Sector**
	Environmental Quality	ECOLOGICAL: Reduce use of natural resources;			greenbelts	infill development; brownfield development; concentrated development	energy efficient travel; increased public transport	greening the city
All	Loss of environmental quality to region							
All	Increased land pollution							
All	Increased air pollution							
Suburbs/Hinterland	***Consumption***	ECONOMIC AND ECOLOGICAL: Reduce use of natural resources	limit outward movement of growth, revitalize urban centres, improve environmental quality	development impact fees	decentralized concentration, new towns, greenbelts	compact building design(new urbanism, cluster development) *infill development*	*focus development near transport hubs*	transfer of development rights, land banking, *brown field redevelopment*
	High land consumption for housing development							
	Land consumption for infrastructure development							
	Higher local government costs							
	Higher housing and infrastructure development costs							
	Mobility	ECOLOGICAL: Management of demands; reduce use of natural resources	reduce number of car km travelled, increased access to jobs and services of low income residents	Versement Transport; location efficient mortgage, public transport tariff integration at metropolitan area level, high automobile taxes	focusing development near transport hubs	*reduced demand for suburban development; compact building design (new urbanism, cluster development, infill development);*	increase dependable high quality public transit, policies decreasing auto use, parking policies, HOV lanes,	
All	Increased trip numbers, trip lengths and travel times							
Regional Centres	Increased congestion of radial roads							
Core Suburbs	Rings of traffic jams							
	Inefficient use of public transit due to low density development							
Core	Reduced accessibility of low income residents to jobs and serices							
	Adaptability of Physical Infrastructure	SOCIO-CULTURAL, ECONOMIC: Equity	increase choice of housing location ; improved urban design; revitalize urban centre; improve environmental quality	decrease demand for suburban housing (tax on new buidling in the periphery, tax incentive for new home owners locating in urban centre); incentive property taxation		increased demand for core area housing (neighbourhood traffic calming, infill development)		core area revitalization (brownfield redevelopment, mixed use development)
Core	Loss of economic activities / jobs in certain sectors and in areas of disadvantaged groups (urban centre)							
Core	Degradation of built environment							
Core	Loss of local tax revenues from urban cetnre							
Suburbs, Regional Centres	Inequitable distribution of services among subregions							
	Segregationof Social Groups	SOCIOCULTURAL: Diversity; Equity	increase choice of housing for low income groups; revitalize urban centre	rent housing vouchers/subsidy; tax transfer between areas, social housing subsidies,		*increased demand for core area housing (infill development);*	*dependable high quality public transit*	social housing, *core area revitalization (brownfield redevelopment, mixed use development)*
Suburbs	Concentration of disadvantaged groups in suburbs (lowest income groups, minorities, elderly) and loss of middle class groups to core (families, first time home buyers from centre)							
Core	Concentration of disadvantaged groups in urban centre and less atractive areas (lowest income groups, minorities, elderly) and loss of middle class groups (families, first time home buyers from centre)							
Suburbs	Shortage of affordable housing in suburbs							
	Main issues							
		STRATEGY						
		DETAILED ANALYSIS						

Table 8: Issues and policy areas of the Strasbourg planning strategy and case policy

The Urban Community of Strasbourg has defined a concerted plan for a less land consuming urban development, which integrated the mobility of people and freight, and economic development. The policy for mobility occupies, within this framework, a privileged place. Its articulation aims at harmonizing, in a coherent and durable way, the various modes of mobility, with a concern of social cohesion and quality of life.

The various mobility modes in the agglomeration - public transport, bicycle, walking, and individual car usage - are considered in a complementary way, in order to balance their relative importance and to multiply the alternatives.

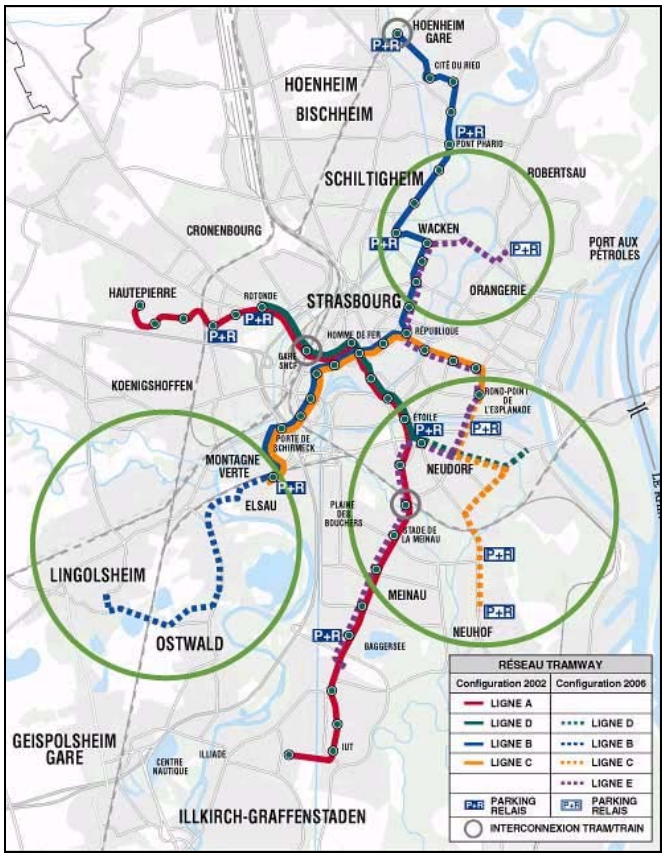


Figure 6: Existing and planned network of the Strasbourg tramway service

The restructuring of public transport involves the creation of a network tram, the re-deployment of bus services and, as a corollary, a controlled management of traffic and parking. The extension of the pedestrian precincts and the refitting of the road system have also been considered to include pedestrian and the bicycle mobility as a means of transport. The policy measures developed, privilege inter-modality - including railway transport - in order to create true alternatives to a patter of mobility exclusively based on car usage.

11.3.1. Public transport

According to a survey on households mobility carried out in 1988, 74% of the trips in the agglomeration were by car, against 11% by public transport. In addition the research recorded, in the previous 20 years, an annual growth of automobile trips of 3%. The city was and is not designed to absorb such flows and the related impacts such as pollution, noise, traffic jams and reduction of space. It was thus essential to balance the share among the various modes of transport in the city in order to preserve at the same time the quality of life and the mobility of the people. In 1997, three years after the construction of the new tramway, a new survey highlighted an increase up to 43% for the share of public transport in mobility. The population group aged 35, in particular, responded favourably to the increase in the offer of public transport. The districts served by tram saw a significant increase also in the share of pedestrians and the cyclists.

The tram, which has been designed to be the very backbone of the transport system in the city, is also helpful in reorganising commuting patterns and to make the rest of the public transport system more effective. At the same time, the laying of the tramline has been an opportunity to redefine public space.

Due to its innovative and non-polluting nature, the tram offers all passengers increased comfort and improved service. It is today a dependable and regular means of transport with a frequency that varies according to demand.

The 23 stations along the 12,6 km of the A and D tramlines serve 105,000 inhabitants —

every day, about 100,000 trips. This number doubled when, at the end of 2000, the 24 stations of the B and C tramlines became operational (90,000 passengers a day). The success of the tramline prompted the development of a network effect and facilitated the expansion of the bus network to include regional routes. Today, the tram network reaches about 50% of the city's population and 65% of the conurbation's employees within a radius of 400m.

As soon as the tram became operational, CTS (Strasbourg Transport Company) bus lines were re-routed in order to ensure complementary service between tram and bus and in order to improve frequencies and the number of areas accessible by public transport. The exchange nodes facilitate bus/tram transfer. Bus and tram fares are the same.

An elaborate programme to optimise the bus network was put into action:

- Changes made to bus stops in order to make them more accessible to the handicapped
- Upgraded fleet: Lowered floors, air-conditioning, gas-fuelled buses
- Improved schedules, reserved bus lanes, priority at traffic lights in order to improve their punctuality.

A set of marketing measures, encouraging passengers to take the tram and other means of public transport, have been taken. They include:

- Various subscription formulas: weekly or monthly, special tariffs for groups, various other fixed price tickets meant for specific target public (children, pupils, students, employees, the elderly, tourists etc.);
- Other types of tickets related to specific events or specific seasons in the year: Fair, fun fairs, retail sales, summer activities for young people, Christmas shopping, sport and cultural events, football matches;
- Tickets valid on the regional railway network and inter-urban coaches as well as on city transport;
- Day tickets at a fixed cost are available for car drivers using the "Park and Relay" car parks set up at the entrances to the city;
- A combined season ticket gives access to a car-sharing facility for commuters who travel occasionally;
- During off peak hours, bicycles can be brought on board of tram trains, free of charge.
- Tram also fulfils a social role: job seekers, for example, pay a lower rate and have as much mobility options

11.3.2. Bicycles

The Community of Strasbourg has recognised the bicycle as a means of transport particularly adapted to the mobility within the urban core and for trips shorter than 3 km. Its regular use depends however on the guarantee of an a high level of safety of the mobility system and on the installation of measures for the prevention of thefts. In order to increase its use, the Community of Strasbourg has developed a bicycle network of more than 400 kilometres, improved road signs, and adopted various measures for the prevention of thefts. Vélocation (bike rental) sites were opened, largely used by the visitors as by the inhabitants. These sites are complete with equipment such as parking racks, lockers, changing rooms and showers. Lastly, the positive image of the bicycle is improved through regular demonstrations.

11.3.3. Pedestrian

Ever since the commissioning of the tramline, changes made in the road system have always taken into account the importance of pedestrian mobility. The pedestrian area of the city centre has been considerably extended. In addition to this, the speed limit is set at 30 km/h in the entire Grande Île. The transformation of Place Kléber that originally carried a load of through traffic of 50000 vehicles/day has made it possible for the area to act as a connection element that joins the existing pedestrian areas. Pedestrians, bicycles and tram coexist in

perfect harmony as of today.

This approach, whereby the pedestrian is given utmost importance in the city, has been extended to other squares of the city and to various suburban areas and villages. The expansion of areas where the speed limit is set at 30 km/h, as well as different road configurations, to reduce driving speed (especially on major roads and close to schools), make the city safer for pedestrians.

11.3.4. Reduction of car usage

The CUS has designed a certain number of measures to mitigate the impacts of the increased number of circulating vehicles. They include the creation of ring roads and the supply of new parking infrastructures and services. The ring roads created from 1992 have made the city centre and car parks more accessible whilst curbing through traffic. At the same time, the number of car parks has been increased. These includes both short stay car parks in the city centre as well as "parking relais" (P+R) services which consist in establishing parking areas at the edge of the urban agglomeration to prevent the cars from entering the city centre.

Figure 7: Pedestrian areas (in yellow) in the centre of Strasbourg

The four ring roads give access to the areas around the city centre where the parking zones are located. The main raison d'être of these roads was to curb north/south through traffic. This had the immediate result of reducing the number of the vehicles entering each day the city centre from 240000 to 200000. The measure was reinforced in 1999 by creating an alternative route through the northern banks and closing the east/west route to traffic flows. Through traffic was thus diverted towards motorways and external boulevards.

The supply of parking areas and services in Strasbourg is based on the following principles:

- Avoid building car parks in the city centre;
- Reallocate public space - squares, pavements, narrow roads etc. - to their initial purposes;
- Increase the number of P+R car parks by coupling the tram with nearby car parks;
- Encourage the users of long-term car parks to use public transport, car par complexes or

P+R carparks.

For this purpose the number of short-stay “pay and display” car parks has been increased. This allows a faster rotation of parked vehicles and facilitates useful parking providing access to shopping areas, services and offices. Residents who do not have a garage may opt for a daily or monthly subscriptions at a cheaper rate, which are valid only in their area.

The eight P+R car parks, located along the tramlines offer 4230 parking bays. For a fixed parking fee, car drivers can park their vehicles for the entire day. The fee also includes a return tram ticket to the city centre for each occupant of the vehicle. 95% of those taking advantage of this offer are new public transport users who formerly used to park their cars in the city.. They represent, on weekdays, 5% and on Saturdays, 15 % of the tram passengers.

11.4. Management and Organisation of Employees’ Commuting

Commuter mobility represents the major reason of mobility and it is also the cause of the “peak hours” effect with its well-known impacts: bottlenecks, car accidents, pollution, delays claims of the employees.

In order to encourage alternative attitudes to home/work commuting, which looked beyond the only solution of car usage, the CUS has launched an innovative project, first of its kind in France, called GEODES (GEstion et Organisation des DEplacements des Salariés, Management and Organisation of Employees’ Commuting). The CUS has also set up an electric car rental service and actively supports the initiatives taken by *Auto’trement* (“Autotherwise”), an association working for the development of car sharing.

The main purpose of the GEODES project was to encourage commuters to resort to solutions other than the private car, to promote these solutions with companies and local authorities, within the Strasbourg Administration, and to facilitate the development of new solutions. Furthermore, the project’s aim was to set up equipment and services or advantages useful in bringing about a change in behavioural patterns, which tended to rely only on car usage for their home-to-work commuting trips.

The project was launched in 1998 for a test-period of 3 years by the CUS Transport Directorate and implemented with the employees of the Community administration. Working from the results of a survey conducted in 1998 on 6,000 employees, a plan of action was drawn up and developed in order to encourage changes in behaviour.

Besides the CUS other partners of the projects were:

- The *Compagnie des Transports Strasbourgeois* (the Strasbourg Transport Company, a contractor managing the bus and tram network over the entire Conurbation)
- *Réseau 67* (the company managing the suburban bus network)
- *Parcus* (the company managing all the car parks controlled by the Administration)
- *Vélocation*, directly under the Administration managing bicycle rent and care taking.
- the *SNCF* (French Railway Company) acting as a partner for all matters in the field of regional transport.

The main lines of work of the programme are grounded in the results and projects developed as part of the Urban Mobility Plan. They include the development of the use of bicycles by providing new services at the places of work; the promotion of public transport and car-sharing; the development of an information service to support the use of public transport.

Besides conducting a Personnel Mobility Plan (PMP) on an experimental basis within the Community administration, GEODES’ aims was to assist other public and private bodies in drawing up their own PMPs by taking on contractor-ship. For this purpose, the team’s role was two-fold

- As mobility advisors: That is, capable of informing and individually advising persons seeking information about their work-to-home journeys.
- As mobility consultants: That is, capable of improving awareness and then assisting companies in setting up their own PMPs.

11.4.1. Electric Car Rental

About 200 exhaust-free electric cars are presently being used in the city. “Voiturélec” Rental offers both professionals and individuals a wide range of cars specially adapted for city driving. Available seven days a week and at various locations throughout the city, these cars have an autonomous driving capacity of about a hundred kilometres and can be re-loaded in a few hours on a simple 16A wall socket.

11.4.2. Car sharing

“Car sharing” was implemented in Strasbourg at the end of the year 2000. The association *Auto’trement* has recently purchased a small fleet of cars to put at the disposal of its 40 members. In exchange of a yearly fee and a supplementary payment proportional to the kilometres travelled, each member can make use of any one of these 4 cars. Well established in Switzerland and in Germany, this initiative presents an effective and low-cost solution to the one-person-on-car phenomena and most particularly to the second car dilemma. While maintaining the use of public transportation for their everyday moving about, the members have nevertheless a chance to get their shopping done, organise an outing, get away for the week-end, or even plan a skiing holiday or a trip to the beach. The association is presently looking into creating several car-sharing sites at different P+R locations in an effort to associate this initiative with the use of public transportation.

11.5. Financial support

The project was financially supported by the PREDIT (Programme National de Recherche et d’Innovation dans les Transports Terrestres, Inter-ministerial Land Transport Research and Innovation Programme) and has benefited from the know-how made available by different networks of European cities such as ACCESS (Eurocities for a New Mobility Culture) and from the experience developed in the city of Nottingham (UK) for the “Green Commuters Plan”.

11.6. Results

The most important measure developed by the GEODES programme regards the financial contribution provided by the CUS in its role as an employer to the purchase of subscriptions for the network of public transport. This measure was made possible thanks to the elected members of Strasbourg who, during the debating session at the national level on the law on Urban Solidarity and Renewal (voted on December 13, 2000), required that an amendment towards such contribution be included.

Other results can be summarised under three different headings:

- Development of a methodology for PMP
- Evolution in Commuting Habits

Perspectives in the field of mobility consulting

12. AMSTERDAM

12.1. The Amsterdam Metropolitan area

Amsterdam is the capital of the Netherlands and its central city has a population of (approximately) 731.289 inhabitants, living at an area of 165.64 km2. The total region is considerably larger en contains around 1,5 million inhabitants.

After a failed attempt to set up an urban-regional province for the metropolitan area of Amsterdam, a regional council was established, the ROA (Regionaal Overleg Amsterdam, Amsterdam Regional Consultation). About 1,2 million live in the ROA area, which includes the airport and the satellite town of Purmerend. The Province of Noord-Holland uses a larger unit for regional planning purposes, with 1,9 million inhabitants. It stops at the provincial border, but the economic urban region includes a small part of Utrecht province, and also the new city of Almere in Flevoland province. The total for this “Amsterdam economic urban region” is about 2,1 million.

Amsterdam is a part of the ‘Randstad’, the urban region in western Holland in which the four largest cities are situated (Amsterdam, Rotterdam, The Hague and Utrecht) and which contains approximately 6 million inhabitants. The phase of mass immigration of the 1960's and 1970's is clearly finished. However, economic growth (until 2001) started a new immigration phase. Since the mid 1980’s the amount of labour and the number of inhabitants increased putting high pressure on the land market in Amsterdam increased strongly the last ten years.

The amount of available space is limited. Amsterdam is surrounded by areas that do not allow further expansion of the city. The Amsterdam Airport Schiphol, which is rapidly growing, and the harbour of Amsterdam restrict Amsterdam to grow westwards. Existing natural areas limit Amsterdam to grow northwards or southwards. Amsterdam is characterised by a structure of urbanised “fingers” in which urban development around public transport lines took place in the course of history and of green zones between these urban fingers.

The number of jobs in the city of Amsterdam totals 389792 (2000). In the central municipality, the number of jobs exceeds labour force by 22%. This is a relatively low figure when compared with many other European cities. However in the last 15 years, jobs grew 90 percent points faster in the peripheral area of the urban region than in the central municipality. This lead to an increase in the number of trips with both origin and destination in the peripheral areas, a worsening competitiveness of public transport and a bigger pressure on the network of main roads.

The network of motorways in the Randstad, and also in Amsterdam, is highly occupied. Congestion is rapidly increasing every year. The main road network inside the urban area consists of mainly radial links. These radials are connected by means of two tangential rings. The radial structure of links is also characteristic of the public transport network. The larger part of Amsterdam’s public transport consists of tramways. Caused by the city’s continuous expansion, the low speed of the trams causes more and more problems. Therefore, a lot of effort is currently put in an extension of the networks of both light rail and metro.

12.2. Institutional framework and planning system

12.2.1. Institutional framework

The Netherlands comprises of 12 provinces and 560 municipalities, committed to respect and help implement the decision of the state in terms of spatial planning. The reason for the strong influence of the national government in spatial planning decisions is that the Netherlands are so densely populated that the available space needs to be used with caution, and the national government has tried actively tried to control spatial development by careful physical planning. Another reason is the strong role of the Dutch welfare system,

which is keen on providing equal opportunities for its inhabitants. In the 1980 an institutional reform process started which ended in the establishment of seven metropolitan regions. The reform of the Law of Community regulations in 1985 enabled the institutionalisation of inter-institutional cooperation experiments among which the IAO (Informal Agglomeration Consultation) in the Amsterdam Metropolitan Area which became the ROA (Regionaal Overleg Amsterdam, Amsterdam Regional Consultation).

12.2.2. Spatial Planning

The Netherlands has a well-established planning system, based on a three-tier system: national, provincial and municipal planning. Decision-making institutions at each level are supported by official bodies that exist specifically for spatial planning, and they are vertically coordinated through formal and informal consultation. These governmental bodies use different kinds of policy instruments. An overview of these institutions and their policy instruments is presented in table 1.

Level	Body	Plans & policy documents	Preservation instruments
National	Ministry of Housing, Spatial Planning and the Environment	▪ national spatial planning policy document (*nota ruimtelijke ordening*) ▪ preliminary plan for specific policy sector (*structuurschema*)	▪ directives (*aanwijzigingen*) ▪ exemption provisions (*uitzonderings-bepalingen*)
Provincial	Provincial Spatial Planning Office	▪ regional spatial plan (*streekplan*)	▪ regulations ▪ directives ▪ approval of local land use plans (*goedkeuring bestemmingsplannen*)
Local	Municipal Spatial Planning Office	▪ structure plan (*structuurplan*) ▪ local land use plan (*bestemmingsplan*)	▪ building and construction permits (*bouwvergunningen, aanlegvergunningen*) ▪ exemption provisions (*uitzonderings-bepalingen*)

Table 9: The Dutch planning system

The municipalities have great autonomy in spatial planning. Spatial planning law has the character of framework legislation saying little about the content of spatial planning but providing a *procedural* framework. National government , provinces and municipalities are thus given the power to specify the content of the law. Dutch planning instruments can be divided into two categories:

- Plans and policy documents – which enable all planning institutions to carry out spatial planning in a form that is both explicit and open to discussion. The *municipal local land use plan* (*bestemmingsplan*) is the only legally binding plan.
- Directives, regulations and permits – which allow spatial planning policies formulated at a particular administrative level to be implemented at that and others levels.

12.2.2.1. National level

At the national level the Ministry of Housing, Physical Planning and the Environment is responsible for the formulation of the national government policy on spatial planning. The most important policy instrument is the National Report on Physical Planning, issued every 10 years since 1960. The report leads towards the so-called “physical planning key decision”, which sets the framework for provincial and municipal plans and for national policy. This documents define all the spatial aspects of sectoral policies (housing, transport, economy). The current report is the *Vierde Nota Extra, (Fourth Report on Physical Planning Extra, VINEX)* published in 1990, which is a specification of the *Fourth National Spatial Planning Policy Document* published in 1988. The Fifth Policy Document was launched in 2001. The

Ministry is also responsible for Housing Policies, which are in the Netherlands strongly integrated with spatial planning.

The ministry of Transport, Public Works and Water Management is responsible for the traffic and transport policies and for infrastructure investments. The policies are laid out in the Second Transport Structure Plan (*Structuurschema Verkeer en Vervoer II, SVV-II*). The SVV-II Plan translates the national environmental and physical planning goals into transport and traffic policy. The main objective of the policy is today to control mobility and the growth of car usage in urban regions, improve accessibility and raise the standards of living. Within the SVV-II, infrastructure projects, such as the high-speed rail network in the Randstad are directly oriented to the accessibility of the major cities.

12.2.2.2. Province level

The Provincial Spatial Plan (*Provinciaal Streekplan*) is the most important instrument available to the provincial authority for presenting its spatial planning policy. This plan outlines the main aspects of future spatial development for the whole province or part of it. A regional plan is in principle indicative rather than binding. But the final regional spatial plan will form the basis for approving municipal local land use plans.

12.2.2.3. Municipal level

The Municipal Council determines local spatial planning policy by drawing up local plans and adopting various policy documents relevant to spatial planning. The Structure Plan (*structuurplan*) designates a broad outline of the future development of the entire municipality, or a part of it. Although the plan is not compulsory, it has some legal consequences for certain actions of the municipality such as the selection areas for urban renewal.

The Local Land Use Plan (*bestemmingsplan*) is the only plan referred to in the Spatial Planning Act that is directly binding with regard to citizens and governmental bodies. Almost every spatial planning decision at the municipal level is linked to the local land use plan. Once the Local Land Use Plan has been adopted by the Municipal Council, higher authorities can only influence it by means of disapproval. They may compel the municipality to grant exemption to the local land use plan and to grant the necessary permits. This power is intended to speed up the provision of ‘problems sites’, such as waste disposal sites, centres for asylum seekers, etc.

12.3. National planning strategy

The foundation for the present spatial policy was laid in the 1980s during a period of economic growth after a recession period. The 1988 *Fourth National Spatial Planning Policy Document* reiterated previous national spatial policy on urban concentration in the Randstad and conservation of the Green Heart. However the Document changed its focus from managing growth through population and jobs decentralisation in secondary urban centres towards a revitalisation of the major urban centres, which had suffered significantly from the economic recession of the previous 20 years. Top priority of this new “concentration policy” or “compact city” policy was given to building in and near the major cities. The Document also introduced some new elements as part of the national spatial strategy, emphasizing the need for economic growth, the role of the market sector, the protection of the environment, and the control of (the negative effects of) the increasing car mobility.

In 1994 the *Fourth Spatial Planning Document Extra* (VINEX) was approved which placed further restrictions on growth location. Together with the National Environmental Policy Plan and the Second Transport Structure Plan, which both increased the restrictions on fuel emission and adopted a policy of environmental taxes on emissions, the VINEX goals for car usage reduction and environmental protection were to be achieved. In practice the Document Extra emphasises the intention to keep commuting distances as short as possible and to encourage the use of public transport through a better co-ordination between the planning of transport facilities and land-use. The national government controls the development pattern of urban (and rural) regions quite strongly. By the help of regulatory instruments and by

offering financial subsidies for infrastructure and housing development in return for inter-institutional coordination among local authorities, it can impose policy concepts such as the compact city, ABC location policy or VINEX dwellings policy. The VINEX policy was in fact accompanied by a process of decentralisation of administrative powers, concentrated on the main seven urban regions. These regional and metropolitan authorities, therefore and not cities were the main target of the housing and ABC location policies.

12.3.1. VINEX dwelling locations

As far as the VINEX-housing location policy is concerned, the Netherlands distinguishes itself from several other member states by the government's strong influence on housing supply. Under the new policy, decisions about the kind of dwellings to be built, and where, are as far as possible weighed off against policy decisions about work locations, services and public transport on the level of urban regions to stimulate a shift in the modal split from the car to public transport. Therefore administrative co-operation and functional integration are two important goals. Standards and orientation criteria should make abstract spatial structure concepts operational.

In the Fourth and in the VINEX documents very concrete locations are designated in and near the cities for large-scale house building and the development of sites for businesses. These VINEX locations are in many cases not situated on the territory of the central city, but do call for the commitment of these cities. The development of these VINEX locations is sketched by the Ministry of Housing primarily as a regional task, preferably in close connection with private bodies. For this task the government makes available per region a precisely determined amount of subsidy, which is used in part for the construction of certain infrastructure works, chiefly for improving public transport. The regions are obliged to build at least 70% of the dwellings in the market sector and a maximum of 30% in the social sector.

12.3.2. The ABC policy

Another promising and innovative land-use strategy, which exploits the differences between companies as to the mobility they generate, is the ABC-Policy. The main objective of the ABC-location planning instrument is to stimulate a shift in the modal split from the car to public transport by means of a land-use and location policy. The effectiveness of the instrument depends heavily on margins in the use of these modes between different company types and location types. Moreover the policy aims at promoting administrative coordination between all levels of government and between municipalities through adopting a regional implementation level. This is to avoid as much as possible the competition between municipalities of the same region to attract businesses.

The implementation of the ABC-location policy in urban regions is based on two classifications; one of their locations with respect to their accessibility characteristics (the accessibility profile) and another of companies according to their mobility characteristics (the mobility profile). A mobility profile describes the mobility generated by a company. The characteristics of commuting travel, visitors travel and freight transport are taken into account. The accessibility profile describes the accessibility of the location for personnel and visitors and goods with different travel modes. In order to establish optimal locations for each type of company, several types of locations are distinguished (table 2).

- A-locations: locations, which are highly accessible by Public Transport. Examples are major public transport nodes such as central stations in the larger urban areas.
- B-locations: are reasonable accessibility by both Private Transport and car.
- C-locations: are defined as typical auto-oriented locations. Examples can be found near motorway exits in fringe areas having poor public transport access.
- Al (a-local) locations: are defined as locations reasonably accessible by public trans-port and poorly accessible by car.
- R-locations: locations, which are considered to be poorly accessible both by public transport and by car.

	Accessibility by public transport		
Accessibility by car	Well	Reasonable	Poor
Well	A-type	B-type	C-type
Poor	A-type	A1-type	R-type

Table 10: Typology of locations by their accessibility profile

12.4. Causes of sprawl

Despite the Netherlands government continuous attention on the definition of growth management and spatial planning policies, there is certainly suburban sprawl in the Netherlands, visible especially in the historically more populated regions such as the Randstad. In fact, urban dispersal is a typical phenomenon around Dutch cities. The origins are not only to be found in accelerated demographic and employment growth but also in the side effects of the growth management policies and in the difficulties arising from the contradictions between housing policy and spatial planning.

12.5. The Amsterdam Structure Plans

Amsterdam is a good example of co-ordination and integration of land-use and transport planning with respect to the planning and implementation process. By matching the regional transport plan with the structure plan, co-ordination of transport and land-use has been achieved. During the last ten years, following national policy guidance, the municipal authorities and the ROA (regional metropolitan authority) have attempted to cooperate, particularly in the housing and transport sectors. This cooperation is also expressed in the 1993 document “Amsterdam Towards 2005” which illustrates the interactions between Amsterdam’s structure planning and the metropolitan-region’s planning. It also presents Amsterdam’s contribution to the implementation of the VINEX policy objectives. The document also shows several development priorities of the Amsterdam planning policy, which have a regional and metropolitan extent: housing expansion areas and critical infrastructure projects. It is important to underline that in the Netherlands transport planning is the domain of a special purpose district, which often doesn’t match the municipal or regional areas. The risks of planning mismatch have been overcome in the Amsterdam region by assigning the competence for transport planning to the ROA.

The municipality of Amsterdam is currently realising a new structure plan. There are two important changes in the land use and transport policy of Amsterdam that will be outlined in the new structure plan 2001/2002. The first is the change of perspective on the integration of land use and transport that is made in the Netherlands nowadays. The second is the change of desired urban form. Amsterdam has for years adopted a monocentric and compact city philosophy. New residential areas were to be realised only through infilling and expansion locations. The city case has today brought the compact city policy to its limits. Fifteen years of intensification and expansion has worn out the availability of developable land inside the city. Besides, the successful economic recovery of the central city did result in growing commuter volumes and congestion.

The new approach to spatial development makes a shift from the compact monocentric agglomeration with one real multifaceted urban centre to a polycentric region with a varied set of multifunctional urban centres. The change from a compact city based on proximity towards a polycentric network city based on accessibility and the change of goals and instruments this shift has brought must be considered as innovative in the Dutch context. No longer the central city and the city centre are sacred but an active policy to regulate the decentralisation trend is the challenge. The main goal is to develop a limited number of good accessible, urban centres characterised by multifunctional land uses and high density.

The main objectives of the plan are

- *Developing sub-centres within the municipality into multifunctional urban centres (mixed-use).*

  Firstly, the already developing sub-centres within the municipality have to be transformed into multifunctional urban centres with not only businesses but also residential buildings, shopping and recreational facilities.

  Secondly, to achieve some level in urban quality in the suburbs it is needed to cluster the suburban development as much as possible in one growth pole. This concentration will also enable high quality public transport towards the agglomeration of Amsterdam.
- *Clustering the suburban development as much as possible in one growth pole (Almere).*

  Clustering of the suburban growth is foreseen in Almere, firstly because Almere can and wants to grow and secondly because Almere has the opportunities to develop from a dormitory town towards a multifaceted urban centre. Nevertheless the concentration goal has large implications for Almere as well as for the rest of the region. It is therefore foreseen that in the end a more spatial balanced distribution will be realised.
- *Transforming the region.*

  It should became an urban network with complementary economic, residential and service functions, strengthening its international attractiveness for people and business to reside.

The new structure plan outlines a large number of policies and spatial principles. The following interrelated policies are seen as three of the most important for the realisation of new urban centres:

- *Intensifying existing urban areas:* a number of the new urban centres should be located inside the central city. Due to the scarcity of development land this requires imaginative solutions. The city has set out a range of measures to intensify the current built-up area and especially the current monofunctional sub-centres.
- *Developing mixed uses within existing and new centres*: the intensification of the existing sub-centres should include different functions. The local land use plans will allow residential, recreational and other functions within these new centres and the city will actively pursue the inclusion of these functions in the project plans made for the several sub-centres.
- *New location policy based on a selective development/hierarchy of centres*: The city has chosen to determine the size and function of the centres upon the basis of the position of the centre in public transport networks (international, national, interregional and regional). The profile of the centres will be described in terms of specialisation, characteristics, and level of ambition. The urban network should offer a metropolitan mix of functions, with differentiated centres (financial, leisure, tourism, etc).
- *Clustering of new sub-urban development in one place:* Clustering of the suburban growth is foreseen in Almere, firstly because Almere can and wants to grow and secondly because Almere has the opportunities to develop from a dormitory town towards a multifaceted urban centre.
  Nevertheless the concentration goal has large implications for Almere as well as for the rest of the region.
- *Increasing capacity of road and rail infrastructure between centres*: Cornerstone of the network city is the good accessibility (while the compact city was based on proximity). Therefore the investments in the infrastructure primarily aim to facilitate the multiple centres with good accessibility. Within the city this asks for smart solutions like the downgrading of the beltway into a high capacity city boulevard. In the region, and than especially towards the new growth area Almere, this asks for new infrastructure.

	AMSTERDAM							
Space	Issues	Main Principle of Sustainability	Broad Policy Goals	Policies				
				Fiscal	Land Use Planning Instruments	Housing and Design in the Private Sector	Transport	Other Projects/Actions in the Public Sector
	Environmental Quality	ECOLOGICAL: Reduce use of natural resources;		Tax on new transport infrastructures for protection of natural ressources (taxe sur les espaces sensibles)	greenbelts	infill development; brownfield development; concentrated development	energy efficient travel; increased public transport	greening the city
All	Loss of environmental quality to region							
All	Increased land pollution							
All	Increased air pollution							
Suburbs/ Hinterland	***Consumption***	ECONOMIC AND ECOLOGICAL: Reduce use of natural resources	limit outward movement of growth, revitalize urban centres, improve environmental quality, public control on land and housing markets	development impact fees	decentralized concentration, new towns, greenbelts	compact building design(new urbanism, cluster development) *infill development*	*focus development near transport hubs*	transfer of development rights, land banking, *brown field redevelopment, subsidies to maintain agricultural zones around cities*
	High land consumption for housing development							
	Land consumption for infrastructure development							
	Higher local government costs							
	Higher housing and infrastructure development costs							
	Mobility	ECOLOGICAL: Management of demands; reduce use of natural resources	reduce number of car km travelled, increased access to jobs and services of low income residents	Versement Transport; location efficient mortgage, public transport tariff integration at metropolitan area level (with a single ticket, people can use buses, coaches and trains), high automobile teaxes; high taxes on motor fuel	focusing development near transport hubs	*reduced demand for suburban development; compact building design (new urbanism, cluster development, infill development);*	increase dependable high quality public transit, policies decreasing auto use, parking policies, HOV lanes,	
All	Increased trip numbers, trip lengths and travel times							
Regional Centres	Increased congestion of radial roads							
Core	Rings of traffic jams							
Suburbs	Inefficient use of public transit due to low density development							
Core	Reduced accessibility of low income residents to jobs and serices							
	Adaptability of Physical Infrastructure	SOCIO-CULTURAL, ECONOMIC: Equity	increase choice of housing location ; improved urban design; revitalize urban centre; improve environmental quality	decrease demand for suburban housing (tax on new building in the periphery, tax incentive for new home owners locating in urban centre); incentive property taxation, location efficient mortgage		increased demand for core area housing (neighbourhood traffic calming, infill development, families needs)		core area revitalization (brownfield redevelopment, mixed use development, destructions to decrease density)
Core	Loss of economic activities / jobs in certain sectors and in areas of disadvantaged groups (urban centre)							
Core	Degradation of built environment							
Core	Loss of local tax revenues from urban cetnre							
Suburbs, Regional Centres	Inequitable distribution of services among subregions							
	Segregationof Social Groups	SOCIOCULTURAL: Diversity; Equity	increase choice of housing for low income groups; revitalize urban centre	rent housing vouchers/subsidy; tax transfer between areas, socila housing subsidies, local tax in case of a lack of social housing in a municipality)		*increased demand for core area housing (infill development);*	*dependable high quality public transit*	social housing; *core area revitalization (brownfield redevelopment, mixed use development) Local Plan for housing at middle range (programme local de l'habitat)*
Suburbs	Concentration of disadvantaged groups in suburbs (lowest income groups, minorities, elderly) and loss of middle class groups to core (families, first time home buyers from centre)							
Core	Concentration of disadvantaged groups in urban centre and less atractive areas (lowest income groups, minorities, elderly) and loss of middle class groups (families, first time home buyers from centre)							
Suburbs	Shortage of affordable housing in suburbs							
	Main issues							
		STRATEGY						
		DETAIL ANALYSIS						

Table 11: Issues and policy areas of the Amsterdam planning strategy and case policy

12.6. Limits of the VINEX and ABC location policies

12.6.1. VINEX

The VINEX-policy appears to have received general support and is implemented in a large number of urbanisation and infrastructure plans for the coming ten years. Horizontal and vertical material co-ordination takes place through the concentrated funding of housing projects which correspond to national integrated strategies combining land-use and transport issues to reduce the need for travel, especially dense building structures, mixed land-use, concentration around nodes of the public transport infrastructure. Formal co-ordination between different administrative levels and between private and public actors is a substantial part of the policy.

The combination of restrictive planning policy and precise designation of building locations, which are moreover subject to infrastructure and environmental difficulties, has brought about a shortage of building land. This has delayed the implementation of the policy for several years resulting in a general increase in land and housing prices.

Even though the designation of housing locations near the city edges is meant to increase the urban characters of the areas, the densities and typologies used in most of the VINEX location are the minimum required by the legislation. This is due to the progressive reduction of national subsidies to local authorities, which now amounts to only one third of the development costs. This has forced local administrations to refer to the private market for the achievement of housing needs. The private market is however more sensitive to individual needs of high income residents, which in the Netherlands are similar to those in the rest of Europe: low densities and single-family houses in a suburban environment.

Finally given the location and housing typologies of the VINEX developments, they have given rise to a selective process of migration and to the creation of “urban income districts” characterised by social and income segregation.

12.6.2. ABC

The fundamental drawback of the ABC-model is the fact that several starting points of the policy have proven not to be realistic:

The first starting point consisted of the assumption that the location of activities has a significant influence on the use of public transport to or from that activity. Empirical studies have concluded that this theory of ABC-location policy was wrong. The studies concluded that the main way of influencing the amount of mobility is focussing on the amount and the quality of available public transport services.

The second starting point is that companies will choose from the locations presented to them by government bodies as being suitable for those companies. Instead, municipalities compete to acquire companies in their area and neglect the location policy rules of the government in doing so.

Finally the policy does not take into account several autonomous developments, for instance the growth of the possibilities to travel in general, leading to less orientation of people and businesses on the central city of an urban region (which is part of the central thought of the ABC-model).

Today both the policies are under revision and the *Fifth National Spatial Planning Policy Document* has been ratified in 2000. Changes in the approach are already visible as stated in the words of the Council for Housing, Spatial Planning and the Environment:

> "Modifying the spatial structure is a rather ineffective way of curbing national mobility. Spatial planning and land use policy, in particular choices made in regard to infrastructure, have much more influence on where traffic flows occur and on the mode of transport than on the total volume of traffic in terms of numbers of journeys and kilometres driven. Spatial planning policy has a much greater impact on matters related to quality of the more local environment noise and other nuisance, hazard and the protection of scenic, ecological and cultural-historical features."

12.7. Qualitative evaluation

The literature and existing documents do not provide for enough information on the current results of the Amsterdam's structure plan. The Amsterdam case has rather raised attention for its innovative approach to planning which tries to encompass problems and solution at the metropolitan scale.

In this sense, despite the limits of the national policies for the location of housing and activities and for the related reduction of mobility the Amsterdam's planning experience is noteworthy for the effort pursued in the integration of local and regional planning and in intergovernmental coordination even in the absence of an institutionalised metropolitan governance.

13. PORTLAND

13.1. The Portland Metropolitan Region

Metropolitan Portland is the Oregon's largest metropolitan area. It is composed of parts of three counties and 24 cities. Metropolitan Portland cover 3026 square miles and is home to 1.1 million residents. The area's overall population density is about 364 persons per square mile. By the year 2000, the metropolitan area's population is forecasted to exceed 1.3 million.

The area's industrial base is a highly diversified mixture of manufacturing, business and personal services, and trade. The manufacturing sector produces a wide range of products including computers, instruments, transportation equipment, paper, and electrical and non- electrical equipment. Metropolitan Portland exports medical, financial and business services to national markets and throughout the Pacific Rim. The metropolitan area has had an annual employment growth rate of over 4% since 1985 and annual population growth of 1.3%. The suburban Washington and Clackamas counties are growing most rapidly.

In Portland urban growth has followed the same path of other US metropolitan areas. During the post war years, in order to avoid the possibility of an economic recession the local and federal government Portland implemented a vast programme of public infrastructure works, which included an inner belt throughway enclosing the CBD and additional high level bridges across the Willamette and Columbia rivers. At the same time in order to support the economic welfare of middle classes the use of mortgage loans was encouraged. Banks offering mortgages however would do so only in the condition that it was for a new house, which most of the times was only possible and less expensive outside the city. As a result during the post war years, economic prosperity, coupled with changing settlements patterns and growing consumerism, rapidly increased and facilitated sub-urbanisation and sprawl, automobile ownership and dependency, road congestion and environment degradation. Middle class households left the city for the suburbs while the poorest population groups and immigrant minorities remained in the downtown areas, which became increasingly degraded from a social as well as an urban point of view. During the mid 1960s, the retail industries in the city centre started to decline due to this out-migration of middle classes and shopping centres and shopping mall opened in the suburban areas.

Starting from the early 1970s and throughout the 1980s and 1990s however, the city enjoyed substantial revitalisation. The local government launched programmes to preserve and recycle old inner-city neighbourhoods, began a light rail transport system and contained new suburban development within the limit of an Urban Growth Boundary, established by the city government in 1979, as required by state planning legislation adopted in 1973. Crucial for the city's revitalisation was the Downtown Plan of 1972, adopted by City Council (and updated in 1980) to address the typical problems of "urban crisis": downtown decline, inadequate parking facilities and public transport, loss of retail activities threatened by regional shopping malls, loss of services and office jobs. The key goals of the plan were to increase accessibility to and the vitality of the city centre via a combination of measures including public transport improvement and provision of parking area, investment on retail activities, creation of attractive public spaces, a mix of densities, activities, and land uses (especially retail and housing) in the city centre.

The Downtown Plan can be seen as the watershed of planning in Portland. Its success is due to a strong citizens' lobby alliance, which included downtown business interests and retailers, property owners, neighbourhood groups and civic organisation and officials. The lobby established a planning practice based on integrated solutions and recognition of the mutual benefits deriving from job concentration and public transport. By applying this integrated approach, Portland community leaders have been able to stop several suburban freeway projects and to divert federal highway funds to the construction of public transport facilities and services. Portland and key suburban cities have agreed in the late 1980s to share the benefits of the integrated strategy and to support the development of a suburban light railway.

13.2. Oregon's Growth Management Policy

Urban growth management in the USA is applied sporadically. Unlike European countries, which apply urban growth management and planning policies and land use regulations throughout national territories, such policies and regulations are applied only in a few states. Oregon is one of the US states, which has the longest continuing history of statewide growth management and land preservation. It is a recognised leader of urban growth management in the USA and many states are now implementing features of Oregon's planning.

In 1973 a lobby guided by democratic governor Tom McCall and including mainly representatives from farmers, urban developers and civil society representatives worried for the loss of natural and agricultural resources, pressed through the Oregon legislature the Oregon Land Conservation and Development Act. Since 1973, Oregon has maintained a strong statewide program for land use planning. The legislature also created a new citizens' board, the Land Conservation and Development Commission (LCDC), which, through a participatory process identified and issued 19 statewide planning goals. The goals express the state's policies on land use and on related topics, such as citizen involvement, housing, natural resources preservation, protection of agricultural land, transport and urbanisation.

Oregon uses urban growth management to:

- direct the regional demand for urban development into areas contained by urban growth boundaries (UGBs) and away from resource lands;
- restrict exurban (beyond UGB) development so that it is compatible with resource activities; and
- restrict resource lands to resource activities.

Oregon's statewide goals are achieved through local comprehensive planning. State law requires each city and county to adopt a comprehensive plan and the zoning and land-division ordinances needed to put the plan into effect. The local comprehensive plans must be consistent with the statewide planning goals. Plans are reviewed for such consistency by the LCDC. When LCDC officially approves a local government's plan, the plan is said to be "acknowledged." It then becomes the controlling document for land use in the area covered by that plan.

Oregon's planning laws apply not only to local governments but also to special districts and state agencies. The laws strongly emphasize coordination - keeping plans and programs consistent with each other, with the goals, and with acknowledged local plans.

13.2.1. Integrated land use and transport planning

In order to accommodate the demands of a growing population and mitigate the potential negative impacts of growth to the state's quality of life, the Oregon Department of Transportation (ODOT) and the Department of Land Conservation and Development (DLCD) joined forces in 1992 to integrate transportation planning with the state-wide land use planning program to achieve benchmarks for mobility, air quality and community design. The result was the Transportation and Growth Management (TGM) Program, approved by the 1993 Oregon Legislature. The program is supported by state general funds and federal funds under the Federal Transportation Equity Act for the 21st Century (TEA-21). The program aims is to enhance Oregon's liveability, foster integrated land use and transportation planning and encourage development that results in compact, pedestrian-, bicycle-, and public transport-friendly communities.

The TGM program offers planning grants to local governments to help them plan for streets and land use in a way that creates liveable, transportation-efficient communities and makes the best use of state highway infrastructure.

Since 1993 the TGM program has distributed $21.6 million in planning grants to local governments to accomplish transportation-efficient planning. In the 2001-03 biennium, grants of approximately $4.9 million have been awarded to local jurisdictions for projects in two categories:

Category 1, Transportation System Planning: grants to help local governments develop transportation system plans and ordinances to implement the Transportation Planning Rule (TPR).

Category 2, Integrated Land Use and Transportation Planning: grants to help local governments develop integrated land use and transportation system plans that promote compact, mixed-use,

pedestrian-friendly development, reduce reliance on car usage by increasing opportunities for public transport, walking, and cycling, reduce reliance on the state highway for local travel needs.

Another important step in the integration of land use and transport management is the Transportation Planning Rule adopted by the LCDC in 1991. The TPR supports measures to reduce reliance on private car usage and local actions encouraging the development and use of transport alternatives such as public transport and car sharing. The TPR aims at supporting “a pattern of travel and land use in urban areas which will avoid the air pollution, traffic and liveability problems faced by other areas in the country” (Tri-County Metropolitan Transit District – TriMet, Planning and Design for Transport). To achieve this goals the rules requires:

- Local Transportation System Plans (TSP). Local authorities must adopt a TSP, which effectively reduces the vehicle-miles-travelled (VMT) by car per capita and integrates land use and transport objectives;
- Local governments must consider a revision of their local comprehensive plans to increase residential densities along transport corridors, floor-area ratio in new office and retail developments and to design land-uses to achieve a better balance between jobs and housing;
- TSPs must include measures to reduce per capita VMT and increase car occupancy rates in peak hours. Metropolitan planning organisations (MPO) must adopt plans which aims at reducing by 5 to 10% both the number of parking spaces and VMT per capita within 20 years;
- TSPs must examine alternative land-use scenarios to address transport demand. Local governments must adopt land-use regulations to promote the use of public transport (mixed use developments around public transport stops or stations);
- City administrations should take into account alternative land-use designations, densities and design standards instead of road improvements in metropolitan regions.

Finally it is important to underline the role played by the 1000 Friends of Oregon association and their LUTRAQ (Making the Land Use, Transportation and Air Quality connection) project in increasing the sensitivity of the state government towards the issue of integrated land-use and transport planning. The LUTRAQ project was launched in 1988 as an opposition to a proposed suburban freeway (the Western Bypass) and evolved into an innovative research program and demonstration activity for the promotion of land-se and transport alternatives. Up until today LUTRAQ has produced several technical reports on topic including integrated land-use and transport modelling, urban design, and economic feasibility of public transport-oriented development.

13.2.2. Urban Growth Boundary

The state-wide planning goal n. 14 on urbanisation requires cities to estimate future growth and needs for land and to plan and zone enough land to meet those needs. It calls for each city to establish an "urban growth boundary" (UGB) to "identify and separate urbanisable land from rural land". An urban growth boundary is essentially a line drawn around a metropolitan area that delineates where urban development may take place (inside the UGB) and where it may not (outside the UGB). Urban planning goal 14 states, in part that: “To provide for an orderly and efficient transition from rural to urban land use …, Urban Growth Boundaries shall be established to identify and separate urbanisable land from rural land”. “By restricting urban development to a well-defined, contiguous area, it is thought growth can be accommodated without permitting urban sprawl”. The goal also specifies seven factors that must be taken into account when establishing or changing a UGB:

(1) Demonstrated need to accommodate long-range urban population growth requirements consistent with LCDC goals;

(2) Need for housing, employment opportunities, and liveability;

(3) Orderly and economic provision for public facilities and services;

(4) Maximum efficiency of land uses within and on the fringe of the existing urban area;

(5) Environmental, energy, economic and social impacts;

(6) Retention of agricultural land, state law defines the criteria that are used to determine the order in which lands are included within the UGB. In general, high priority lands (areas outside the current UGB that are designated as lands that could be brought into the urban growth

boundary in the) must be included before lower priority lands (farm or forest land) can be added.

(7) Compatibility of the proposed urban uses with nearby agricultural activities.

Land within the UGBs is made available over time for urban uses. The conversion to urban uses must be based on consideration of the following criteria:

(1) It must provide for public facilities and services in an economic and orderly way;

(2) Sufficient land for the various uses must be available to insure choices in the market place;

(3) LCDC goals or the acknowledged comprehensive plan should be taken into account;

(4) Development within urban areas should be preferred before converting urbanisable areas.

The establishment and the change of a UGB is a cooperative process between a city and the county or counties that surround it. Urban Growth Management Agreements (UGMAs) are used to establish procedures for coordination between counties and cities that have jurisdiction within a specific urban growth boundary. UGMAs establish procedures for planning and managing growth in the unincorporated area within an UGB and for changing the UGB. For larger urban areas that include more than one city within an UGB, there might be individual agreements between each city and the county or there might be one agreement among all of the jurisdictions. The most basic issue in an UGMA is defining a decision-making structure and roles and responsibilities for each of the jurisdictions.

Land outside UGBs is restricted to farming, forestry and other resource uses. However, land outside UGBs that is unsuitable for resource uses due to terrain and soils conditions or historical development patterns, are given an “exception” status and allowed low-density development. During the period 1975-86, local plans were reviewed by the DLCD, for technical consistency with these and other statewide planning requirements. Plans that met statewide requirements were officially ‘acknowledged’ by the LCDC.

Although simple in concept, the construction of UGBs proved difficult in practice. Part of the difficulty stems from the uncertainty concerning the rate of urban development. With the rate of urban development uncertain, determining exactly how much land to include inside a UGB can be a difficult problem. Too little urban land could cause land price inflation whereas too much would not prevent urban sprawl. However to enhance the possibility of successful growth management UGB have been accompanied, especially in Portland and other metropolitan areas, by a detailed and comprehensive growth management programme which details land-uses, density and transport development.

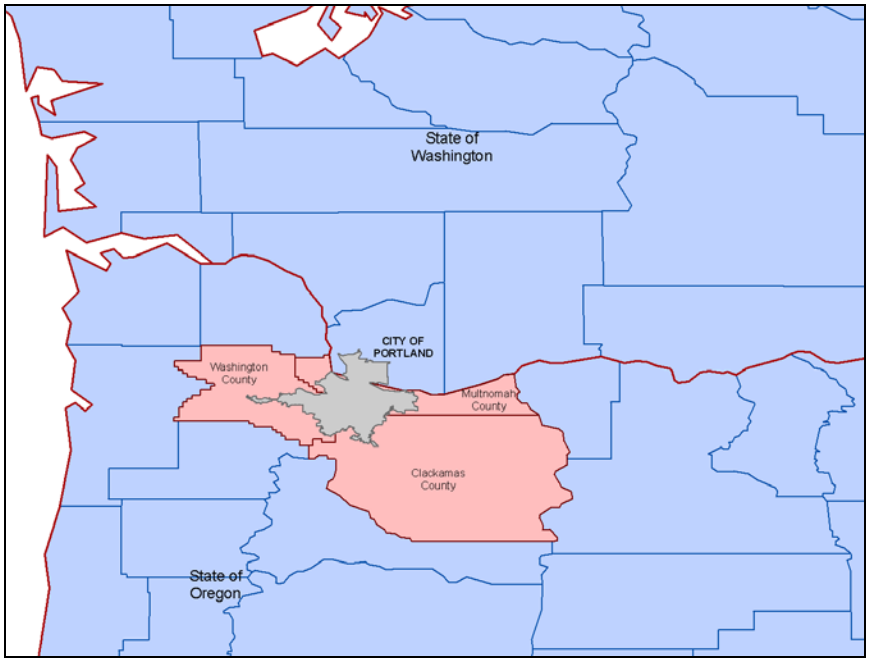


Figure 8: Map of the urban area of Portland (in grey) and of the three counties of Metro (in pink)

13.3. Portland planning system

The Portland region has the only elected multipurpose regional government in the US. Voters created Metro in 1978 by merging a regional planning agency and a weak metropolitan service district into a new unit of government with an elected executive and a council elected by districts. The vote gave Metro the responsibility for coordinating the land-use plans of the region's 27 jurisdictions (24 cities, including Portland and the three counties of Multnomah, Clackamas, and Washington counties, see fig. 8) as well as other issues of "regional significance". State land use laws required Metro to establish a regional urban growth boundary (UGB) and empowered Metro Council to make binding policy decisions regarding development within the boundary. Metro now operates under a rule charter (adopted 1992). The agency operates with a six-member council elected by districts and a council president elected at large.

Metro functions as a land use and transport planning agency. It is the official "metropolitan planning organization" required by federal law for the distribution of federal transportation funds. It has the authority to adopt regional land use plans and require local jurisdictions to mesh their own land use plans and regulations with its regional plans. Metro also provides several environmental services (garbage disposal, regional open spaces, Oregon Zoo). Other regional services are provided by separate agencies with boards appointed by the governor. the Tri-County Metropolitan Transit District (Tri-Met) operates bus and light rail service. The Port of Portland, also a three-county agency, operates airports, marine terminals, and industrial parks.

	PORTLAND							
Space	**Issues**	**Main Principle of Sustainability**	**Broad Policy Goals**	**Policies**				
				Fiscal	**Land Use Planning Instruments**	**Housing and Design in the Private Sector**	**Transport**	**Other Projects/Actions in the Public Sector**
	Environmental Quality	ECOLOGICAL: Reduce use of natural resources;			greenbelts	infill development; brownfield development; concentrated development	energy efficient travel; increased public transport	greening the city
All	Loss of environmental quality to region							
All	Increased land pollution							
All	Increased air pollution							
Suburbs/Hinterland	***Consumption***	ECONOMIC AND ECOLOGICAL: Reduce use of natural resources	limit outward movement of growth, revitalize urban centres, improve environmental quality	development impact fees	decentralized concentration, new towns, greenbelts	compact building design(new urbanism, cluster development) *infill development*	*focus development near transport hubs*	transfer of development rights, land banking, *brown field redevelopment*
	High land consumption for housing development							
	Land consumption for infrastructure development							
	Higher local government costs							
	Higher housing and infrastructure development costs							
	Mobility	ECOLOGICAL: Management of demands; reduce use of natural resources	reduce number of car km travelled, increased access to jobs and services of low income residents	Versement Transport; location efficient mortgage, public transport tariff integration at metropolitan area level, high automobile taxes	focusing development near transport hubs	*reduced demand for suburban development; compact building design (new urbanism, cluster development, infill development);*	increase dependable high quality public transit, policies decreasing auto use, parking policies, HOV lanes,	
All	Increased trip numbers, trip lengths and travel times							
Regional Centres	Increased congestion of radial roads							
Core	Rings of traffic jams							
Suburbs	Inefficient use of public transit due to low density development							
Core	Reduced accessibility of low income residents to jobs and services							
	Adaptability of Physical Infrastructure	SOCIO-CULTURAL, ECONOMIC: Equity	increase choice of housing location ; improved urban design; revitalize urban centre; improve environmental quality	decrease demand for suburban housing (tax on new buidling in the periphery, tax incentive for new home owners locating in urban centre); incentive property taxation		increased demand for core area housing (neighbourhood traffic calming, infill development)		core area revitalization (brownfield redevelopment, mixed use development)
Core	Loss of economic activities / jobs in certain sectors and in areas of disadvantaged groups (urban centre)							
Core	Degradation of built environment							
Core	Loss of local tax revenues from urban cetnre							
Suburbs, Regional Centres	Inequitable distribution of services among subregions							
	Segregationof Social Groups	SOCIOCULTURAL: Diversity; Equity	increase choice of housing for low income groups; revitalize urban centre	rent housing vouchers/subsidy; tax transfer between areas, social housing subsidies,		*increased demand for core area housing (infill development);*	*dependable high quality public transit*	social housing, *core area revitalization (brownfield redevelopment, mixed use development)*
Suburbs	Concentration of disadvantaged groups in suburbs (lowest income groups, minorities, elderly) and loss of middle class groups to core (families, first time home buyers from centre)							
Core	Concentration of disadvantaged groups in urban centre and less attractive areas (lowest income groups, minorities, elderly) and loss of middle class groups (families, first time home buyers from centre)							
Suburbs	Shortage of affordable housing in suburbs							
	Main issues							
		STRATEGY						
		DETAILED ANALYSIS						

Table 12: Issues and policy areas of the Portland planning strategy and case policy

13.4. Portland Regional Framework Plan

Adopted on December 11, 1997, the plan is the result of years of work with citizens and local governments, it provides specific guidelines that city and county governments will use to create and preserve liveable communities. The Metro Charter, approved by two-thirds of the voters in November 1992, establishes growth management as Metro's primary task and requires that a Regional Framework Plan be adopted by Dec. 31, 1997. The charter mandates that the plan address the following:

- management and amendment of the urban growth boundary
- protection of lands outside the urban growth boundary for natural resource use and conservation, future urban expansion or other uses
- urban design and settlement patterns
- housing densities
- transportation and mass transit systems
- parks, open spaces and recreational facilities
- water sources and storage
- coordination with Clark County, Washington
- planning responsibilities mandated by state law
- other issues of metropolitan concern.

The Regional Framework Plan brings together these elements and the contents of previous regional policies to create an integrated framework and to ensure a coordinated, consistent approach. While technically a new document, the Regional Framework Plan incorporates goals, objectives and policies established in existing documents, including the Regional Urban Growth Goals and Objectives (RUGGOs), the Greenspaces Master Plan, the 2040 Growth Concept and the Regional Transportation Plan.

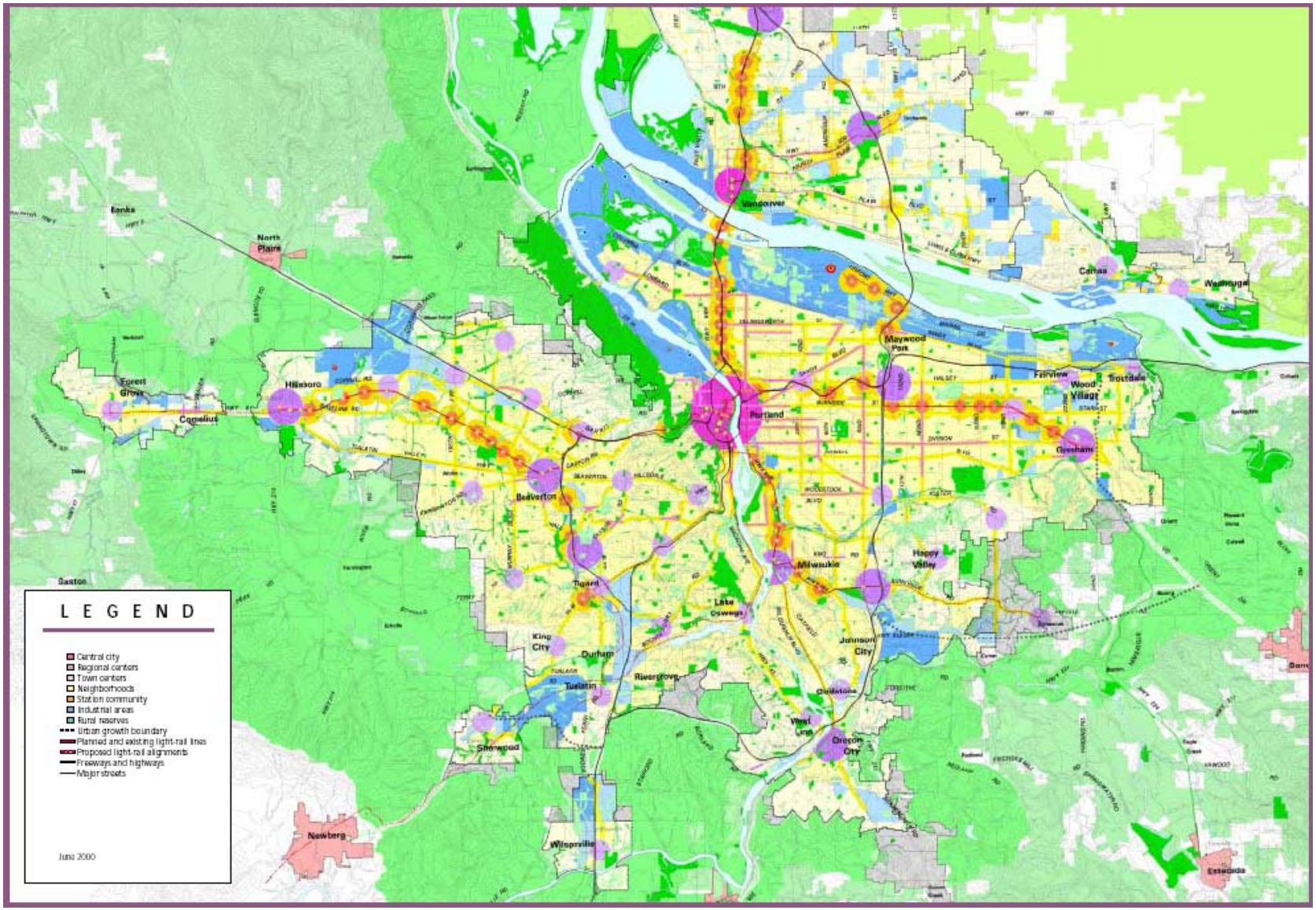


Figure 9: Portland Regional Framework Plan

13.5. The 2040 Growth Concept

The 2040 Growth Concept includes land-use and transportation policies that will allow the Portland metropolitan area cities and counties to manage growth, protect natural resources and make improvements to facilities and infrastructure while maintaining the region's quality of life.

Adopted by Metro in 1995 with the unanimous endorsement of local government partners, the Growth Concept is designed to accommodate approximately 720,000 additional residents and 350,000 additional jobs in this region. The total population served within this concept is approximately 1.8 million residents within the Metro boundary. The Concept implements state law requirements for every city and county in Oregon to have a long-range growth comprehensive plan. It also includes the definition of the UGB for the Portland region.

Between 1992 and 1994, Metro developed four alternatives: a 'base case' (what would happen if the region did nothing), Concept A, Concept B and Concept C. Table 1 presents the basic elements of each of these scenarios. Each option was analysed for effects on: land consumption, travel times and distances, open spaces and air quality and various urban landscapes. The four options, called "growth concepts," presented different philosophies about how the region should actively manage growth. Through a process of citizen participation, a Growth Concept was selected and approved which draws from different (and more consensual) of the four concepts. The general elements of the 2040 Growth Concept are described in the following paragraphs.

Mixed-Use Centres

Mixed-use urban centres inside the urban growth boundary are one key to the 2040 Growth Concept. These are higher density centres of employment and housing that are well served by public transport services to form compact areas of retail, cultural and recreational activities in a pedestrian-friendly environment.

Hierarchical and polycentric settlement structure

The central city of Portland is the largest market area, the region's employment and cultural hub. Regional centres serve large market areas outside the central city. There are nine potential regional centres, serving a total of four market areas outside of the central city market area. Many of these have developed as 'edge cities', and the Regional Framework Plan envisages more compact development, a light rail 'backbone' connecting all regional centres to the central city, and multi-modal street networks to hook up with mixed-use centres along the light railway.

Smaller town centres with local shopping and employment opportunities within a local market area connect to each regional centre by road and public transport. Planning for all of these centres is based on a balance between jobs, housing and urban amenities so that more commuter trips are likely to remain local and become more multi-modal.

Neighbour cities are centres outside the UGB with which Metro seeks a "cooperative policy" that emphasises four key goals: preserving rural land separating urban areas; keeping a jobs-housing balance within each neighbour city; possible development of a "green corridor transport facility" (e.g. the light railway) running through rural reserves and linking the metropolitan area with the neighbour cities.

Rural reserves

These are rural areas into which the UGB cannot be extended. Their main purpose id to keep urban areas separated.

Open Spaces

Recognition and protection of open spaces, both inside and outside the urban growth boundary, are reflected in the Growth Concept. Green areas inside the UGB may be designated as regional open space. This removes these lands from the inventory of urban land available for development. Rural reserves, which is land already designated for farms,

forestry, natural areas or rural-residential use, would remain and be further protected from development pressures.

13.5.1. Implementation of the Growth Concept

The basic principles of the Growth Concept directly apply Metro's Growth Management Goals and Objectives. Separation of urbanisable land from rural land is accomplished by means of the urban growth boundary for the region's 20-year projected need for urban land. Rural reserves are intended to assure that Metro and neighbouring cities remain separate. The result is a compact urban form for the region coordinated with nearby cities to retain the region's sense of place.

Flexibility

The mixed land use and density targets included in the Growth Concept are estimates based on modelling analysis of the possible configurations of the Growth Concept. Implementation actions may vary from these estimates and indicate a need to balance other parts of the Growth Concept to retain a compact urban. Land-use definitions and density targets are intended as estimates to allow jurisdictions the flexibility to adopt a mix of characteristics consistent with each locality and the overall Growth Concept.

13.6. Portland UGB revision

The UGB was originally proposed in 1978 and included 25% more land than expected to be developed by the year 2000. The LCDC approved the metropolitan Portland UGB in 1981, after insisting that its size be reduced to include 15.8% more land than expected to be developed by the year 2000. The expansion of the developable area became an issue in the 1990s as increasingly rapid growth began to push the supply within the initial limits and Metro engaged in systematic planning to gauge needed expansions.

Metro is currently revising the Portland's UGB. The current boundary contains about 236,000 acres of land and expansion is suggested for further 14,000 acres that can be selected from a "pool" of 80,000acres in 94 study areas. The need to expand the UGB is not only based on estimates of further population and employment growth but also on the impossibility, after the approval of a new policy measures, to increase densities within existing neighbourhood inside the UGB.

13.7. Qualitative evaluation

One assessment criterion is the relationship between UGB and housing costs. This topic is highly debated and open to different interpretations. Metro and the 1000 Friends of Oregon association have strongly denied the role of the UGB in the growth of housing and land prices that occurred in Portland during the 1990s. Referring to academic studies on the subject they have argued that home and land prices are affected by several different factors. The case for Portland house price increase is quoted as mainly one of economic recession during the 1980s followed by a rapid economic boom in the following decade, which could not be accounted for in the existing growth management plan. However the Metropolitan Home Builders Association and market advocates argue that a tight Urban Growth Boundary artificially constricts land supply and drives up the price of undeveloped land, with serious consequences for home prices. They argue that Metro has been much too slow and cautious in expanding the UGB and this has generated the current housing affordability crisis. Data confirms that at the end of 1999, the average rent for a one-bedroom apartment in the Portland market was 87% of the US average.

Other studies have evaluated the performance of the Portland UGB and growth management policies according to a range of key dimensions such as density increase, farmland preservation, car-usage reduction, promotion of public transport, reduction of energy consumption and decrease in public expenditure for infrastructure provision. According to Nelson (1999), who has compared Portland with Atlanta, indicators show the success of the Oregon and Portland growth policies in achieving all the target mentioned above.

14. HELSINKI

14.1. Helsinki Metropolitan Area

Helsinki, the capital city of Finland, forms a metropolitan area with the three other neighbouring cities, Espoo, Kauniainen and Vantaa. The influence of the metropolitan area is expanding as an employment centre to serve the surrounding region.

The metropolitan area covers 764 km2 of which 743 km2 is land and 21 km2 water (excluding sea area).

The city has, in general, expanded in concentric rings as the population and economy has grown. However, the important transport corridors have attracted growth further away from the centre than otherwise would be expected.

By the 1960s, the radial road network was largely in place and the currently visible "Maple Leaf' form of the urban sprawl began to form supported by the second industrialisation and the resulting migration from the countryside to the cities. Helsinki has experienced continuing spatial concentration of activities. There has been in the same time an out-migration of the rural population towards the urban areas and a scattered growth pattern. The most important reasons behind this urban growth pattern are internal migration from rural areas towards urban areas, improved transport services and changes in residential density.

The completion of the two ring roads and the current plans to build more private and public transport facilities in a circular fashion in the metropolitan area are likely to lessen the outward trend of land use away from the city centre.

The metropolitan area has the largest concentration of people in Finland. The total number of inhabitants in the metropolitan area study area is 1 million people (out of 5.2 million in the whole country). The growth has been significant especially after the Second World War and then levelling down in the seventies and eighties. In the 1990's the region was growing faster once again. The rapid growth of population is estimated to continue, with the rate slowly decreasing, to the year 2020. It is expected that in 2020 there will live 1,1 million people in the metropolitan area. This rapid population growth increases the pressure to urban sprawl as well as the use of the natural areas within the existing structure. It is expected that Helsinki can only accommodate less than one-fourth of the forecast growth, the rest being directed to the other cities of the metropolitan area.

14.1.1. Economic indicators

Helsinki region comprises about one third of the national GDP of Finland. It is one of the fastest growing cities in Europe. In addition to its administrative status as the capital city and home for industry headquarters, the economy of the region is based on retail, wholesale and private services. The region, therefore, has a surplus in its trade with the rest of the country. While the traditional manufacturing industries have been declining, the share of high-technology industries and services has been growing. The large and concentrated traditional industries such as metal and paper are not typically located in the region. Consequently, the foreign exports are not so dominant as for the rest of the country. As a big concentration of population, the level of imports is high.

14.1.2. Traffic and Transport

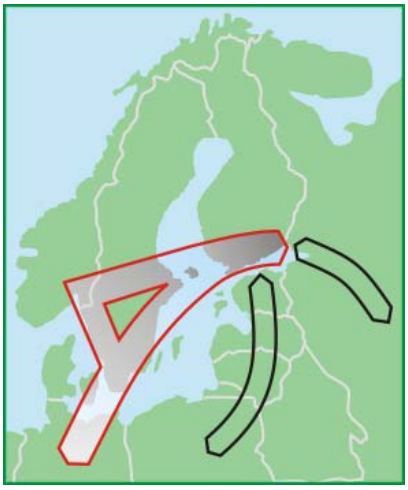
The supply of transport provides good coverage in the area and there are, in general, no major problems. There are radial motorways originating from Helsinki to all directions as well as two main ring roads. The network of other roads is dense.

In the metropolitan area, the public transport level of service is better than in the rest of the region. There is a dense bus network, a metro line, commuter train lines and tramlines in the metropolitan area. For the rest of the area, the network consists of trains and buses.

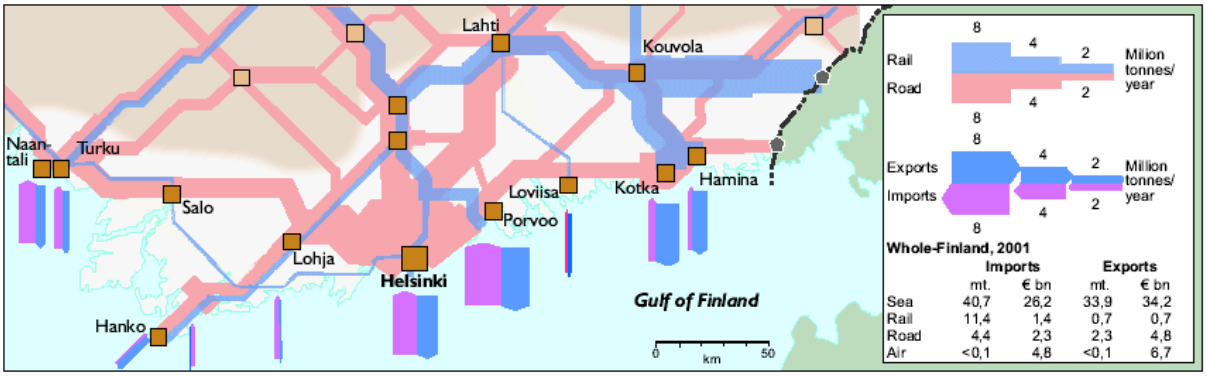
During the last decades, the sprawl has been fought against by, for example, metro and rail investments and with an efficient bus system. As a result the decline of public transport share

has stopped. But urban sprawl is still a problem. In parallel with the population growth predicted by 2020, it is predicted that mobility will increase more than the population. 1% growth in population causes 2% growth in car mileage resulting in environmental, congestion and other problems. One reason for this is the decentralising land use, but also the number of trips is expected to grow. If policies favouring public transport will be pursued, the share of collective transport should start slightly rise again.

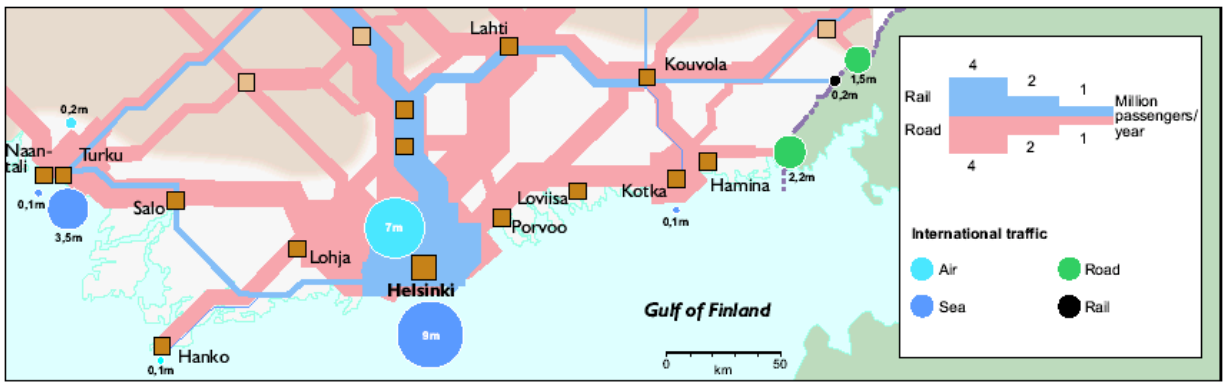
One of the most important international transport hubs is the Nordic Triangle. The transport system of the Nordic Triangle with its roads, railways, ports and airports is a central part of the transport system that serves the whole country, southern Finland and many cities. Its international importance is high as it serves the bulk of Finland's exports, imports and international passenger transport. The Nordic Triangle is the most significant connection between the EU and Russia and an EU-prioritised scheme in the Trans-European Transport Networks (TEN).



In Finland, the Nordic Triangle covers the road and rail connections from Turku to the eastern border via the capital region. The most important ports, airports and sea routes are also part of the transport system. The Nordic Triangle is a central part of the transport system that serves the whole country.



Freight flows in the transport system of the Nordic Triangle



Volumes of passenger traffic in the transport system of the Nordic Triangle

14.2. Brief description of the institutional framework and planning system in the region

The Finnish land use planning system has changed recently. In 1999, Parliament approved the new Land Use and Building Act, which came into force at the beginning of the year 2000.

The Act gives local authorities more extensive powers to make independent decisions in land use planning matters. Central government control was reduced. It was no longer required for

land use plans approved by local authorities to be submitted to the Ministry of the Environment or the Regional Environmental Centres for confirmation. The local authorities are now adopting a more open and interactive approach to planning.

The aim of land use planning is to promote the following, on a basis of interactive planning and adequate impact assessment:

1. Creation of a safe, healthy, pleasant and socially well-functioning living and working environment that meets the needs of various population groups, such as children, old people and the disabled
2. Economic community structures and land use
3. Beautiful built environment and the fostering of cultural values
4. Preservation of biodiversity and other natural values
5. Environmental conservation and the prevention of environmental hazards
6. Economic use of natural resources
7. Well-functioning communities and good construction
8. Economy in infrastructure building
9. Proper preconditions for business and industry
10. Accessible services
11. Practical traffic arrangements, specifically with good preconditions for public transport and non-vehicular traffic.

The Finnish land use planning system comprises national land use guidelines, in addition to the regional land use plan, the local master plan and the local detailed plan.

14.2.1. National land use goals

The Government defines national land use goals, which are supervised by a central government or regional environmental authority when implemented in land use planning. The Council of State sets national land use goals. The guidelines indicate which issues should be taken into account all over the country in land use. These goals comprise, e.g. main infrastructure networks or natural and built-up areas of national importance. The national land use guidelines have been grouped according to subject as follows: 1) a well-functioning regional structure, 2) a more coherent community structure and a quality of the living environment, 3) the cultural and natural heritage, recreation uses and natural resources, 4) well-functioning communication networks and energy supply, 5) special issues of the Helsinki region and 6) areal entities of outstanding interest as natural and cultural sites.

The national land use goals guide the transport policies set by the Ministry of Transport and Communication. The investments to major transport corridors should be consistent with the national land use goals.

14.2.2. Regional land use plan

The regional land use plan transfers national and regional land use goals to land use planning at the local authority level. These are the only plans to be submitted for approval. Preparation and approval of regional plans are the obligation of 19 regional councils, which are alliances of municipalities. When the plan is being drawn up, special attention should be given to ensure that there is an appropriate regional and community structure, to preserving landscape values and ecological sustainability, and to provide the proper operating conditions for business and industry. A regional council compiles the plan and the Ministry of the Environment confirms it. The regional land use plans and transport plans are relatively loosely connected. The impact assessment of combined regional land use and transport scenarios are seldom carried out.

14.2.3. Local master plan

Within a local authority, the local master plan is an instrument for guiding and co-ordinating land use at a general level. It can be either a very general strategic plan or a more detailed one for direct regulation of building, depending on the need. Municipalities may also decide on joint master plans, regulating road planning, and the location of retail trade, workplaces, and residential areas. Such joint plans require the approval of the Ministry of the

Environment. The local master plan is used to resolve questions concerning the functionality and economics of the community structure, the accessibility of services, the preservation of natural and cultural values, the quality of the living environment and the reduction of environmental hazards. When the plan is being drawn up, consultations have to be held with the Regional Environmental Centre to ensure that national goals are taken into account in local plans. The transport system plans are connected with the local master plans. Thus the development of the regional transport system and land use structure depends on the co-operation of municipalities. Since its foundation in 1970 the Helsinki Metropolitan Area Council has enhanced regional co-operation with the objective of regionally co-ordinating master plan level land use objectives and promoting various measures to secure balanced development in the region.

14.2.4. Local detailed plans

Local detailed plans are used for regulating building and the formation of the physical townscape. The emphasis is on taking local conditions into account and special attention has to be given to ensuring that there are enough parks and local recreation areas and promoting the use of the existing building stock. Detailed plans must not reduce the quality of anyone's living environment without a very good reason. Every local authority has its own building ordinance, the content of which is defined according to local needs. The dimensioning of streets, roads and rail lines goes parallel with local detailed plans.

Local decision-making is enhanced. Municipal plans are no longer be approved by higher authorities. Thus local authorities are expected to possess better resources and expertise. The government administration safeguards the achievement of national goals and provides assistance to local authorities. Appeals against local land use decisions are directed to administrative courts.

Public participation is strengthened at the local level. To ensure opportunities for inhabitants to participate, procedures for participation and assessment are required in every planning project. The law calls for a special participation and assessment scheme to be drawn up when land use planning begins. Participation is organised separately plan-by-plan in consultation with all interested parties. That means both landowners and those whose living and working conditions and other circumstances the plan is likely to affect. Interested parties also include all authorities and organisations whose area of operations is touched by the plan.

It is now also possible to assess how topical the existing detailed plans are: each plan shall be reviewed after 13 years to confirm if it is up to date, and plan implementation will be more flexible. The act has stipulations on particular development areas and on local planning needs.

The new act also has regulations on national urban parks to be sited on land owned by the state or the local authorities or a similar body. The aim is to create and maintain extensive, parks, recreation areas, and green belts in urban conglomerations so as to provide a good living environment and protect the natural and cultural heritage.

New commercial premises greater than 2 000 square metres will receive a building permit only when the site is specially designated for that purpose in the town plan.

14.3. Overall description of the planning strategy[1]

14.3.1. The Helsinki Metropolitan Area Vision 2020

Since its foundation in 1970 Helsinki Metropolitan Area (HMA) Council has enhanced regional co-operation with the objective of regionally co-ordinating master plan level land use objectives and promoting various measures to secure balanced development in the region. For this purpose HMA Council has prepared so-called co-operation plans approximately every five years. The Helsinki Metropolitan Area Vision 2020 (PKS 2020), is a continuation of

[1] Helsinki Metropolitan Area Council, 13.9.2002

this work, though putting more emphasis on the application of future studies, participatory planning and co-operation with transportation planning.

Vision work helps to advance co-operation in the field of general land use planning at the regional level. It also produces material describing the development of the region for the planners, civil servants and decision-makers of the member municipalities to be used in decision-making concerning the cities. Vision work also provides information for business life, citizens and media. It is also needed in other long-range planning work carried out by HMA Council –as the land use part in the Metropolitan Area Transport Plan – to clarify future prospects and policies of land use. A Vision is a description of an ideal state of affairs, but it must also be realizable. The purpose of a vision is to encourage finding strategies and creating solutions, which will lead to the accomplishment of objectives through utilizing opportunities that arise in the future.

The Metropolitan Area Vision 2020 pursues an ecologically, socially and economically sustainable urban region. The efficiency of functions would secure the competitiveness of the Area in comparison to other European city regions. The industrial structure would be highlighted by development work and production based on top knowledge and high technology, and supported by good services and accessibility by all modes of traffic. Among the central goals are also equality and social responsibility and, moreover, a high standard of environment and biodiversity. It was estimated that by 2020 the annual population increase in the Uusimaa County would be about 12,000 people, of which 8,000 would settle in the Metropolitan Area. The living conditions of both current and future inhabitants were expected to improve. The standard of living space was estimated to rise by eight square meters over the present level. Modes of housing were expected to diversify in the future and hence better respond to people's needs and wishes.

The main principle is that new construction is located in the vicinity of the main lines of public transport, especially of rail traffic. As the work progressed, the land use assessment was specified into the following estimates of population and job development by municipality:

POPULATION BY MUNICIPALITY (end of year)

	1997	2020	increase total	1998-2020 %
Helsinki	539 400	580 000	40 600	+ 8
Espoo	200 800	280 000	79 200	+ 39
Vantaa	171 300	230 000	58 700	+ 34
Kauniainen	8 500	10 000	1 500	+ 18
Metropolitan Area (total)	920 000	1 100 000	180 000	+ 20

JOBS BY MUNICIPALITY (end of year)

	1997	2020	increase total	1998-2020 %
Helsinki	307 500	348 200	40 700	+ 13
Espoo	81 200	126 200	45 000	+ 55
Vantaa	70 700	105 000	34 300	+ 49
Kauniainen	2 200	2 800	600	+ 27
Metropolitan Area (total)	461 600	582 200	120 600	+ 26

14.3.2. Objectives of the transport system plan

The objective of the Helsinki metropolitan area's transport system development programme is to improve the well being of the area's inhabitants as well as the operational conditions for business and commerce and the activities of the capital city.

The development objectives for the transport system were first approved in 1994, after which they were reviewed in 1998. During the duration of the present work, the objectives have been regrouped on the basis of the aims of the Ministry of Transport and Communications. In general, the aims of the transport system can be summarised as follows.

Aims of the transport system

LEVEL OF SERVICE AND COSTS WITHIN THE TRANSPORT SYSTEM
Society's economy
Operational functionality of transportation
Business and commercial conditions
Funding

HEALTH AND SAFETY

SOSIAL SUSTAINABILITY

URBAN DEVELOPMENT
Urban structure
Environment

IMPACTS ON NATURE

The general aims include the following set of objectives. These objectives have also been used in assessing the impacts of the plan.

A. LEVEL OF SERVICE AND COSTS OF THE TRANSPORT SYSTEM
Overall economic impact on society

- The transport system will be as efficient as possible from the point of view of its overall effect on the community
- The need for travelling about will be reduced and the growth in car travel will be controlled.

Transportation functionality
Public transport: functionality and competitiveness

- The level of service offered by public transport will be raised in terms of both quality and quantity
- The competitiveness of public transport will be improved in comparison to the use of private cars as measured, for example, by door-to-door travel time
- The modal share of public transport into the Helsinki city peninsula during the morning rush hour will be raised, and will remain at least at its present level in the area as a whole.

Functionality of motor vehicle traffic

- The smooth flow of car traffic will not be compromised during rush-hours and in surrounding areas

Walking and cycling

- These forms of mobility will be encouraged by taking them actively into account as the primary means of basic travel and by vigorously developing the conditions and connections for travel on foot and by bicycle.

Interconnectivity between various modes of transport

- The combined use of public transport and other modes of transport will be fostered.

Preconditions for business and commerce

Goods traffic

- Goods transportation as a whole will work efficiently
- The predictability of transit times for national and regional goods traffic will remain at least as good as at present
- The conditions for deliveries and other in-city goods transportation in the metropolitan area will improve
- Import and export activities that require heavy goods vehicles will in general be situated outside the central city area.

Working-place accessibility

- Public transport access to existing workplace areas will be improved

Funding

- A greater proportion of funding than previously will be directed towards measures involving public transport, walking and cycling.
- The introduction into use of new means of funding transport investments will be actively pursued
- An equitable share of national funding will be earmarked for the Helsinki metropolitan area consistent with its traffic amount and with the transport-specific dues and taxes collected in the area.

B. HEALTH AND SAFETY

Traffic safety

- The number of deaths and occurrences of accidents causing serious injury will significantly decrease.

Health

- Concentrations of air pollutants due to traffic will be below permitted guideline and warning levels
- The total area of noisy environment will not increase
- The number of those living in noisy areas will decrease.

C. SOCIAL SUSTAINABILITY

- Accessibility will improve
- The conditions for public transport, walking and cycling will improve
- The accessibility of basic services will improve
- The dependence of communities on the private car will decrease.

D. URBAN DEVELOPMENT

Community structure

- The use of public transport will be supported, particularly by the construction of housing developments that are dependent on rail transport
- Housing developments will be promoted that increase opportunities for walking and cycling
- Support will be given to the formation of districts that have innate vitality and provide a good level of services
- Preventative measures will be taken against the dispersion of housing and communities.

Living environment

- Conditions will be created favouring a living environment that is practical, many-sided, safe, healthy and pleasant
- The obstacles to access represented by arterial roads will be minimised as far as possible
- The city milieu or cultural value of the landscape will be preserved
- The unity of the green belt network will not be compromised

E. IMPACTS ON NATURE

- Emissions of carbon dioxide by traffic will be reduced
- The energy consumption per inhabitant due to traffic will be reduced
- The biodiversity of the natural surroundings will not be threatened
- The nature values of protected areas will not be endangered
- As little use as possible will be made of land area and natural resources
- The development of modes of travel that preserve the environment will be promoted.

14.4. The Helsinki Metropolitan Area Transport Plan and its outputs

The action plan includes measures, policies and projects that are regarded as most efficient in respect to the general objectives and functionality of the transport system. The assessment of these measures is based on in-depth impact analysis based on the objectives mentioned above.

1	Public transport
2	Motor vehicle traffic
3	Logistics of goods transportation
4	Pedestrian and bicycle traffic
5	Park-and-ride facilities
6	Traffic safety
7	Implementation of noise abatement programmes
8	Land use and transport system interaction
9	Traffic and mobility management
10	Development of the transport network - Starting-up, in-progress and continuous projects - Phase 1 projects (before 2010) - Phase 2 projects (2010-2019) - Phase 3 projects (2020-2029) - projects in the phase after 2030 - Land use reservation and projects to be examined
11	Funding

14.4.1. Development of public transport

Observing a transport policy that specifically favours this mode of transport will raise the competitiveness of public transport. This will be applied not only to public transport within the metropolitan area itself, but also to that between the metropolitan area and nearby municipalities. Investment will be made in the railway system, in particular, and through this the ground will be prepared for an enlargement of the public-transport-based city.

As well as during rush-hour periods, the supply of public transport services will be improved during other times of the day. An important field of development is cross-town public transport, for the improvement of which a separate development plan will be drawn up. Improving the connections between transfer points, and particularly between district centres and other terminuses will simplify the network of transport lines. Public transport's price and tariff policy will be developed to improve the competitiveness of this mode of transport.

Making use of publicity and marketing will increase public transport's attractiveness. Improvements will also be made to the conditions for cycling and walking to park-and-ride terminals, and to such movement free of unnecessary obstacles. Public transport vehicles and rolling stock will be improved, as will also the working conditions of staff.

When making decisions on land use, the needs of public transport will be better taken into account than previously. In order to further this aim, a study will be produced highlighting those land-use planning principles that are beneficial from the point of view of public transport in that area. The rapidity and convenience of public transport will be facilitated by ensuring quick connections on its trunk network and by removing congestion points on other networks. The rail-based network will be enlarged and improved. Co-operation between the various transportation modes will be furthered by, amongst other things, improved park-and-ride facilities. A regional strategic plan will be drawn up for the upgrading of terminuses, stations and stops.

Travelling by public transport will be made easier by developing information systems. Basic structures will be improved, and extended use will be made of the possibilities offered by new techniques. Information systems will be expanded and the data they contain will be improved. Traffic signal priorities for public transport will be improved and enlarged. The control of traffic jams and abnormalities will be improved, and the areal coverage of this control will be extended. Ticketing system techniques will be developed.

Co-operation in the fields of public transport planning and maintenance will be enhanced towards the objective of a common regional public transport-handling organisation.

14.4.2. Development of motor vehicle traffic

The growth of vehicular traffic jams will be alleviated and traffic will be assured a reasonable continuity of flow. The utility of the present traffic network will be augmented with the aid of telematics and other measures.

The standard of services for cross-town vehicular traffic will be enhanced by improving the present ring roads and by building new ring connections and extensions to existing ring roads. These highway improvements and construction projects will be implemented in such a way that the ease of movement of public transport on ring-road routes will also be good. In the longer term, the aim is to renovate the ring roads as a whole to become dual-carriageway main city thoroughfares with flyover intersections.

Concerning the radial thoroughfares, both short-term repair projects as well as qualitative improvement measures will be undertaken, focussing on intersection arrangements, the improvement of conditions for public transport, cycling and walking, and noise abatement.

14.4.3. Logistics of goods transportation

The competitiveness of the metropolitan area and of the whole country in the field of global logistics will be improved in co-operation with industry and commerce, and other interested parties. Research and statistics in the field of logistics will be developed, and efforts will be made to ensure the recruiting of well-qualified staff for logistical tasks.

The unobstructed working of the ports will be ensured with the realisation of Vuosaari harbour and the measures connected with it. The conditions for goods traffic in the central area of the city will be improved. Telematics developments and highway investments will improve the freedom of flow of goods traffic. The requirements of heavy traffic will be better taken into consideration in the planning and implementation of road junctions. The infrastructure and control for the transportation of oversized loads and dangerous substances will be improved. Environmentally hazardous situations will be lessened by the development of the requisite technologies, working methods and conditions. Developments will be made in facilitating deliveries to households, and to the logistics of waste disposal and recycling.

In the planning and implementation of land use, logistical requirements will be taken into account. The infrastructure and services available in the airport area will be improved. The needs of goods traffic will be kept in mind at all levels of planning, and the essential requirements for the transportation of railway goods will be improved.

14.4.4. Development of pedestrian and bicycle traffic

The needs of walkers and cyclists will be taken into account, and the conditions for this type of traffic will be improved as a part of all infrastructure investments. The main cycling-road network in the metropolitan area will be improved to have common standards, and to be clear, easy-to-use and safe. As well as through increased investment, the safety and level of service offered to pedestrian and bicycle traffic will be improved by the development of road maintenance, arrangements linked to working times, cycle parking, cycle journey links (?), services, marketing and education specifically connected with these forms of traffic, as well as of planning and research related to pedestrians and cyclists.

14.4.5. Development of park-and-ride

Building parking places according to the park-and-ride strategy will increase park-and-ride activities. The financing and implementation of such parking places will be linked to investments in rail-based transportation. The sign posting, security monitoring and marketing of park-and-ride facilities will be improved.

14.4.6. Improvements in traffic safety

Traffic safety will be improved as part of all infrastructure investments and by carrying out the measures in the traffic safety strategy. An important method of increasing traffic safety is the employment of camera monitoring.

14.4.7. Accomplishing noise abatement

The adverse effects of traffic noise will be reduced by implementing noise abatement measures laid out in the corresponding programmes for the capital city's main thoroughfares and railways and for city streets.

14.4.8. The land use and the transport system

The transport system will be developed in such a way that it supports the region's housing policy and other land-use development.

Through improvements in co-operation and models for taking action, the objective is pursued of a housing area structure that is supported by efficient public transport, and within which the need for moving back and forth is small. By situating new land use in places that are traffic-wise well suited and economical, the transport system's capacity problems, as well as the need for the construction of new infrastructure, can be alleviated.

14.4.9. Traffic and mobility management

Mobility is to be guided in the direction of methods permitting sustainable development. This will be done with the help of information and attitude education methods, as well as by furthering the use of walking, cycling and public transport. This programme will be carried through as a joint co-operative effort involving municipalities, businesses and other parties.

Preparations will be made for controlling the increase in personal car traffic; these preparations include the study of concepts for effective and precisely selective actions to limit the demand for such traffic, as well as investigations into the applicability and impacts of such concepts in the metropolitan area.

Using traffic broadcasts and other telematics methods, the adverse effects of traffic jams and other disturbances, as well as the consequent costs to the community, will be minimised. At the same time, more efficient utilisation of the transport system's capacity will be obtained by, e.g., promoting the combined use of various forms of transport.

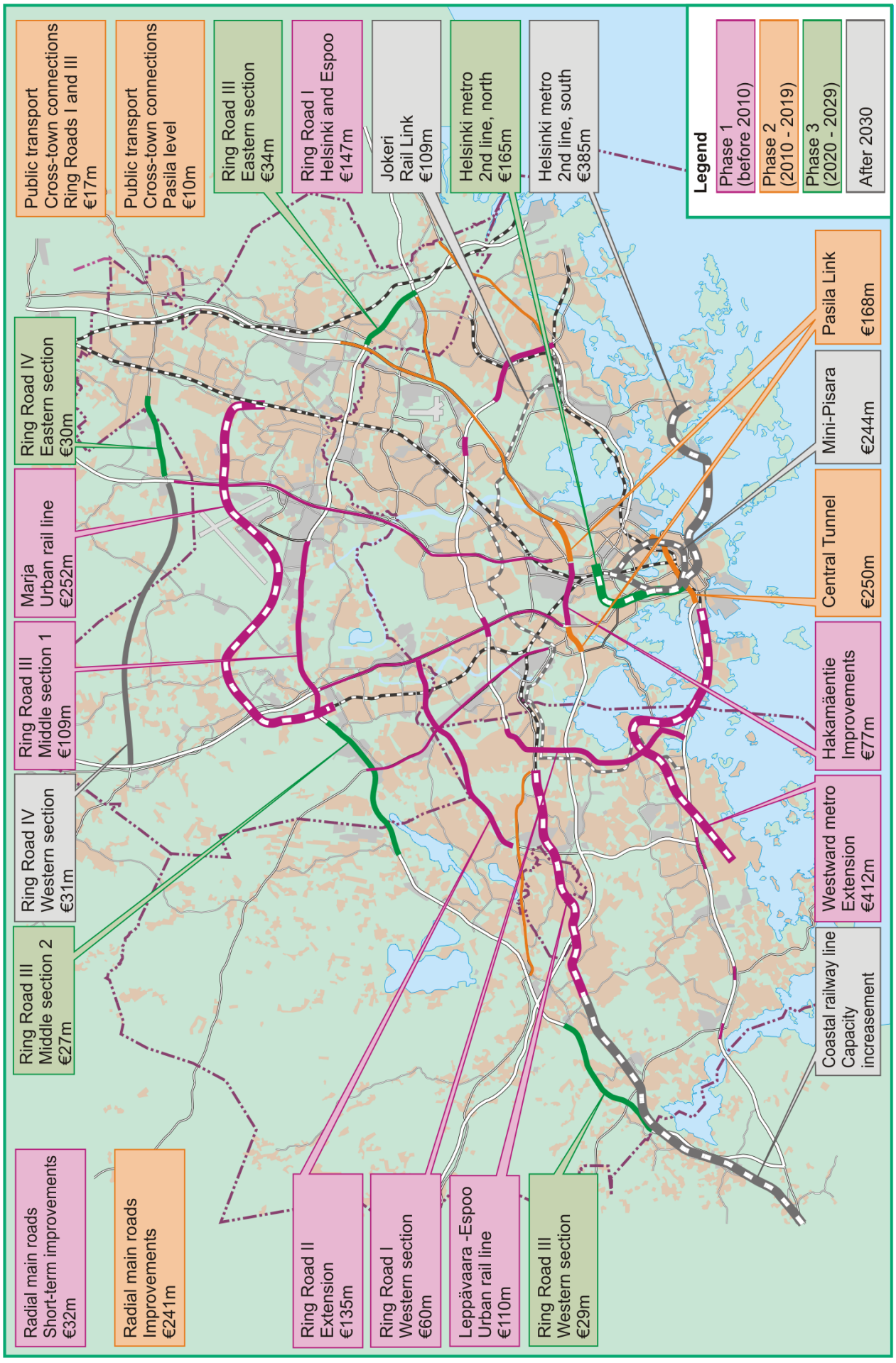
14.4.10. Development of the transport network

The target network for the Helsinki metropolitan area for the year 2030 is shown on next page. The transport infrastructure investments are prioritised into three phases, the most urgent projects to be implemented fist.

The government finances the main roads, but financing of streets and public transport comes from municipalities. Helsinki Metropolitan Area Council, which represents municipalities, can suggest investment projects, but it is the municipalities that make the decision. The

government financing is only available if municipalities can have a consensus over the infrastructure investments.

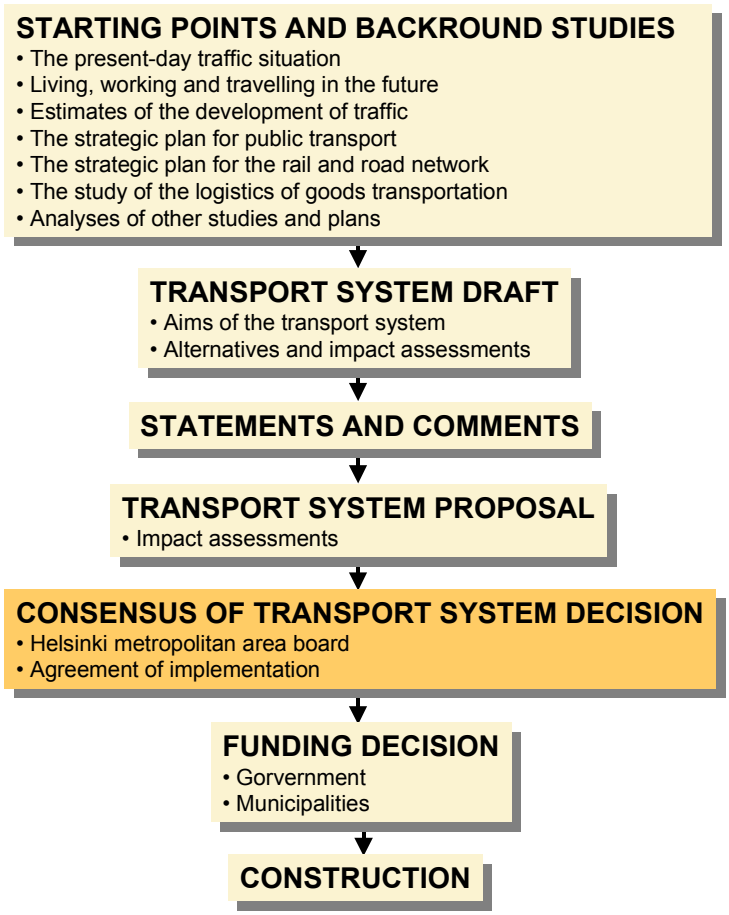
The funding needed to construct the transport system and to maintain it, as well as that for the running costs of public transport is guaranteed by municipal and government allocations.


Legend
Phase 1 (before 2010)
Phase 2 (2010 - 2019)
Phase 3 (2020 - 2029)
After 2030
Public transport Cross-town connections Ring Roads I and III €17m
Public transport Cross-town connections Pasila level €10m
Ring Road III Eastern section €34m
Ring Road I Helsinki and Espoo €147m
Jokeri Rail Link €109m
Helsinki metro 2nd line, north €165m
Helsinki metro 2nd line, south €385m
Ring Road IV Eastern section €30m
Marja Urban rail line €252m
Ring Road III Middle section 1 €109m
Ring Road IV Western section €31m
Ring Road III Middle section 2 €27m
Radial main roads Short-term improvements €32m
Radial main roads Improvements €241m
Ring Road II Extension €135m
Ring Road I Western section €60m
Leppävaara -Espoo Urban rail line €110m
Ring Road III Western section €29m
Coastal railway line Capacity increasement
Westward metro Extension €412m
Hakamäentie Improvements €77m
Central Tunnel €250m
Mini-Pisara €244m
Pasila Link €168m

Studies will be made of the possibilities of making use of other forms of funding and of using transportation expense levels as a tool for guiding and controlling traffic and also as a means of funding the transport system.

14.5. Design and implementation process

The Helsinki Metropolitan Area Transport Plan is a strategic plan that covers the whole transport system in Helsinki Metropolitan Area. It defines the common development objectives for the transport system and directs the regional transport and traffic policies. The main phases of the transport system plan and implementation of it are described bellow.



14.6. Qualitative evaluation

The Helsinki Metropolitan Area Transport System Plan includes a comprehensive set of transport measures and policies to support the development of Helsinki Metropolitan Area towards ecologically, socially and economically sustainable urban region. One of the limitations of this plan is that it only includes cities within the Helsinki Metropolitan Area. However, the whole commuting area has expanded outstandingly. In these surrounding municipalities transport is not organised by a regional body. This has led to the absence of a co-ordinated network, and a sub-optimal level of use of public transport. This also applies to suburban transport between Helsinki and the suburbs just outside the metropolitan area. The solution could be the enlargement of HMA Council or a wider co-operation agreement between HMA Council and other municipalities.

Another shortcoming is the competition between municipalities. For example, it is widely agreed that the westward extension of the metro line would be one of the investments that would give a most effective impetus to HMA to become ecologically, socially and

economically sustainable urban region. However the municipalities have not been able to get a consensus over this construction project.

At the moment, the process in HMA transport system plan focuses on infrastructure investments. Thus, it could be argued whether the process should be extended to include regulation and pricing policies.

15. MILAN

15.1. Description of the Milan area

During the last decades, Milan municipality has experienced a radical process of de-industrialisation and a constant loss of population. The transition characteristics of the entire area can be seen in the current asset (and in the changes it had in the last decades) of the economical and productive structures. These aspects can be seen in the major municipality, in the metropolitan area and, in general, in the whole Lombardia region.

Changes in the socio-economic structure of the whole area led (but it is still an on-going process) to changes in the mobility patterns within, and sometimes outside, the metropolitan area: from a centripetal pattern (with focus on Milan) to a centrifugal one (with focus on the metropolitan area). Such changes were not supported by an efficient transport supply, except for the road network (with the building of the external ring roads), and public transport is still designed according to the "historical" radial patterns within the metropolitan area.

15.1.1. Population

As in most important cities of industrialised countries, the phenomenon of the loss of population is statistically relevant. Inhabitants of the Milan Municipality decreased from 1971 to 1986 of about 240.000 people (about 14%), and from 1986 to 2001 of about 310.000 people (about 21%). On the other hand, some municipalities in the hinterland have experienced an opposite tendency. In fact nearly all the minor municipality in the study area show an increment of resident population, most of all the historically rural ones in the south and in the west of Milan .

15.1.2. Economic activities

With more than 402,000 economic activities on its territory, the province of Milan occupies the first place at national level. The importance of industrial sectors, traditionally very high, is now (Istat, 2001) comparable with national data: 26% (employees 34%) in the Province against 25% (employees 32%) of Italy.

In fact the "strict" industrial sectors have experienced a radical process of de-industrialisation (partially still going on) that induced in Milan a decrease of employees from 1971 to 1991 of nearly 50%. In the metropolitan area this process is still relevant, but have a different temporal dimension. Statistical data show that the de-industrialisation in the outer urban ring began later than in the city of Milan: in the seventies the loss of industrial employees was of about 27% in Milan and "only" 7% in the metropolitan area. In the following decade, the process affected the two areas in a similar way (Municipality -30%, outer urban ring -27%). The location of industrial activities seems to move more and more in the external areas and have now reached municipalities, which are outside the metropolitan area and the Province.

15.2. The sprawl phenomenon in the Milan area

The Milan area has experienced, and is still now experiencing the sprawl phenomenon at a higher and higher scale. The first “historical” waves of urban growth were mainly located along transport infrastructure (railways and underground) and affected Milan and its immediate surroundings. More recent waves have a wider extension, which in many cases is detectable even over the Province border, and a far higher penetration force. The phenomenon is now characterised by an infill processes of areas not necessarily connected to the infrastructure system. On the other hand we can state that the changes in the socio-economic structure of the whole area led to a radical process of de-industrialization, that mainly affects the “historical” heavy-industrial sectors located in the Milan peripheral areas and in the municipalities immediately surrounding the main municipality, that cause the loss of thousands of jobs and the redundancy of million of square metres of former industrial sites.

To manage this new type of city at this wider, regional or even interregional spatial/functional scale, where Milan can be seen as one node in a polycentric system and as part of a compact conurbation extending to the north and to the east, the needed set of actions to be implemented are partially different from the one adopted in the past.

15.2.1. Origins and main causes of urban sprawl

Many factors have influenced more or less directly the location choices of population and economic production sectors. As we know, most of them, especially the ones related to the production sectors, are not strictly dependent on the local Milan environment, but are an effect of the socio-economic changes that have lead to a radical process of de-industrialisation that can be stated in almost all the modern industrialized country. In the Milan area such effect are more visible than in other Italian areas because of the "historical" heavy-industrial productive vocation of Milan and his hinterland.

Moreover there are some "general" social factors that have influenced it, such as:

- The location preferences of the finest (more profitable and with higher availability to pay) urban functions that tends to locate in the city core, causing a sensible change in the core land use destination (from residential to services), a lack of residential floorspace and the consequent increasing in city core land values.
- Households' life cycle and cultural factors. The search for residential areas is driven by the attempt to meet lifestyle requirements (living space, general and service accessibility), which on one side change with the households' lifecycle and on the other are influenced by ideological and cultural trends such as those of the garden city. The factors influencing the spread in the location choices can be summarised as follows:
    - High standards of housing in suburban areas are preferred to a "perceived" lack of efficiency of the city.
    - High dimensional standards are preferred. Housing prices allow to buy more square meters in peripheral areas than in central ones.
    - The real estate market is driven by this growing demand towards the production of mainly residential areas, with a low urban "value".
    - The planning system and the decisional arenas reinforce these trends favouring the spread of residential areas.
- Location freedom, granted by the use of private means of transport, mainly cars.
- Non-internalisation within households' budgets of the negative externalities generated by the use of car. The costs of negative externalities such as traffic, congestion, pollution and land and infrastructure consumption are only met by public local authorities; households therefore suffer less living expenses and are therefore driven to chose location whose accessibility is only supported by private transport.

From a "local" point of view, in the Milan area we can moreover consider:

- Planning regulations and policies: urban sprawl grows mainly from mid '70 to mid '90 also as a consequence of the urban policies implemented in the whole area. More recently (in the last 10 years) regeneration policies have been undertaken by local authorities governing the municipalities surrounding the city of Milan as an attempt to compensate the growing deterioration of peripheral areas of both Milan and the secondary cities of metropolitan region, due to this earlier phase of migration.
- Economic factors: increasing land values in central areas are a significant cause of population emigration. Less wealthy households, unable to meet the increasing costs of housing move out of the city towards poor and deprived peripheries, which are still within economically affordable distances from the central area and its employment basin. More wealthy, bourgeois households instead can afford to move to a farther distance from the centre where higher housing and environmental standards are to be found.

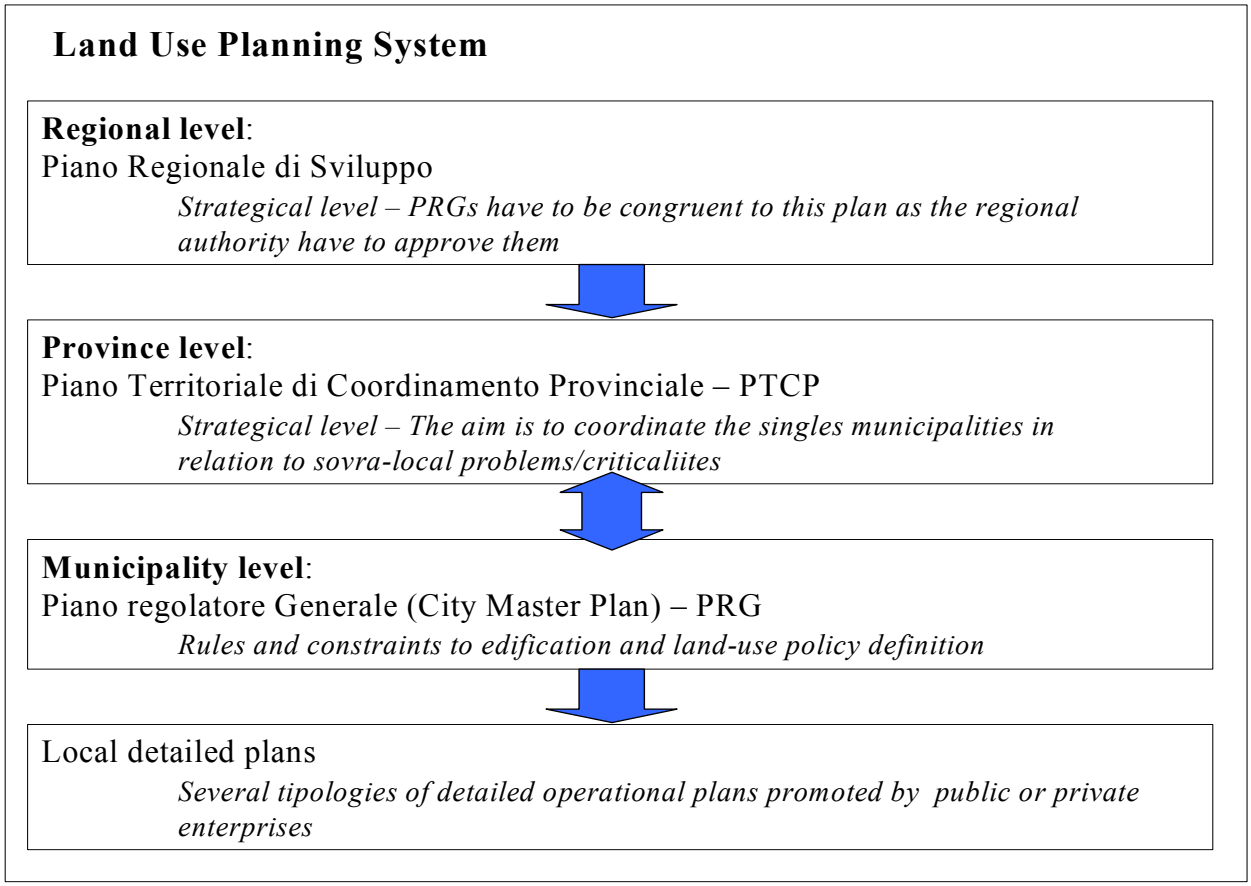
- Progressing decrease in the quality of life in the city of Milan: increasing pollution, reduced access to services, lack of open and green spaces. Milan becomes, in facts and in its residents perception, a hard place for families to live in. On a different note the city core has been able to increase those factors able to attract types of population like the “city users” whose definition of quality of life rests on the satisfaction of different requirements: high level employment centres, cultural and leisure facilities.

15.3. The institutional framework and planning system in Italy and in the Milan region

According to In the Italian ongoing de-centralization process, the national authority has now a marginal role in the definition of the general development strategies, as such a role is demanded to the Regions. This process began in the 1976 (DL 616/76) with the delegation to the Regional Authorities of some institutional powers and was more recently (DL/59/97, known as “legge Bassanini”) completed. National authority still has a strategic role only in the definition of sector plans regarding, for example, transport (national interest network), etc. In a similar way the Regions have to delegate to lower institutional level some of the acquired powers.

Figure below illustrates the Italian Planning system from the regional to the local level (Regione Lombardia in the Milan case study). The first step is the implementation of the “Piano Regionale di Sviluppo” (regional development plan) whose aim is to design the strategic development of the whole area.

At a lower level the Provinces produce the “Piano Territoriale di Coordinamento Provinciale” (province coordination plan) with the main aim to collaborate with and to coordinate the single municipalities, with particular attention to the implementation of critical aspects of the single City Master Plans. These aspects are generally those that invest an area wider then the one of the single municipality, and so a common and shared definition of the strategy to act in relation to such problem.



The planning tool that gives, in practice, most part of the rules and the constraint to land-use is the “Piano Regolatore Generale” (city master plan) implemented by the Municipality. This plan defines also the mayor land-use policy at the local level and it has to be coherent with the regional plan, as it has to be approved by the Regional Authority. In addition to the PRG there are several typologies of local detailed implementation plans that are used for regulating the construction sector and the formation of the physical townscape and that can be promoted by both public and private enterprises and have to be approved by the municipality Government.

A further planning level was instituted to manage at a wider scale some metropolitan areas in 1990. In fact one of the issue of the law 142 was the institution of a new level of governance to be acted in the main Italian conurbations (Milan, Turin, Genova…) called “Area Metropolitana”. But the new planning level was, in its original proposal, partially in contrast with the former planning institutions that would have loosed some political autonomy (mainly with the Provinces, that should transfer some critical task to the new planning level, and the capital municipalities, that will loose part of their local hegemony) and was never put into practice. Such Metropolitan Areas are now considered mainly in relation with the environmental critical issues (traffic bans) and is in several institutional researches on transport and environment. The political debate on such theme is at the moment still on going and the reform of the law 142 will probably propose some innovations on it.

The goal of coordinating the single municipalities, with particular attention to the implementation of critical aspects (generally those that invest an area wider then the one of the single municipality, and so a common and shared definition of the strategy to act in relation to such problem) of the single City Master Plans is actually covered by the Province with the “Piano Territoriale di Coordinamento Provinciale” (province coordination plan). Such plans do not have the strength to impose to local institution some strategic planning

strategies (PTCP, when tried to impose a sort a supra-municipality Master Plan, was rarely successful or was only partially implemented because of the resistance of the single municipalities) but can be a powerful tool when acknowledging some planning design developed at a local level, following a sort of bottom-up approach to the design and implementation of supra-local urban policies

15.4. Overall description of the planning strategy

For almost a century the north Milan areas were one of the major industries centres in Lombardy and Italy. The serious industrial slump which affected traditional production sectors such as electromechanical and metal-working industries and their consequent upgrading led to the closure of large companies (Falck, Marelli, Breda, etc.), causing the loss of thousands of jobs and the redundancy of about three million square metres of former industrial sites.

In such situation private enterprises demonstrated to be, if alone, unable to regenerate the economic and social structure of the area

The Strategic Plan identifies resources and problems in the area related to local development, and supplies a series of economic, local, social and institutional scenarios, principles and guidelines for possible feasible actions in the 2000-2010 time span.

The main objectives of the approach adopted pinpoint policies for sustainable local development, formulated jointly with local government, public and private bodies and services, strengthening the management capacity of the transformation processes. A new profile of the North Milan area will thus be defined, highlighting the critical nature of the area and giving guidelines on the priority of intervention for a concerted guided action oriented to the forms of production and work around: innovation (technology, production, and administration) and urban and environmental quality.

The **North Milan Development Agency** (ASNM) is a joint-stock company established in 1996 on the initiative of the Municipality Council of Sesto San Giovanni in partnership with the Municipality Councils of Bresso, Cinisello Balsamo and Cologno Monzese. The tool chosen to build up a shared vision and reference framework for inter-council policies is the North Milan Strategic Plan

15.5. The North Milan Strategic Plan

Strategic plans are "light" planning tools aimed at outlining a shared reference framework and different strategies based on actions and projects fielded by public and private bodies.

In the case of North Milan, the Strategic Plan takes on the nature of a local political manifesto and for local government planning tool, in order to meet a definite need expressed by the Municipalities of Bresso, Cinisello Balsamo, Cologno Monzese and Sesto San Giovanni, and is coordinated by the North Milan Development Agency (ASNM). The promotion of the projects and actions is on behalf of or in partnership with the main agents involved in the process of local development, from local government (Municipality Councils, Province and Region) to private operators. For this reasons the ASMN can directly supply the actions of the North Milan Strategic Plan only with technical resources (expertise, …). A direct founding of the plan is carried out by the political institutions that have proper financial resources and by the private enterprises involved in the various project.

Issues	Main Principle of Sustainability	Broad Policy Goals	Policies				
			Fiscal	Land Use Planning Instruments	Housing and Design in the Private Sector	Transport	Other Projects/Actions in the Public Sector
Environmental Quality	ECOLOGICAL: Reduce use of natural resources;			greenbelts	infill development; brownfield development; concentrated development	energy efficient travel; increased public transport	greening the city
Loss of environmental quality to region							
Increased land pollution							
Increased air pollution							
Consumption	ECONOMIC AND ECOLOGICAL: Reduce use of natural resources	limit outward movement of growth, revitalize urban centres, improve environmental quality	development impact fees	decentralized concentration, new towns, greenbelts	compact building design(new urbanism, cluster development) *infill development*	*focus development near transport hubs*	transfer of development rights, land banking, *brown field redevelopment*
High land consumption for housing development							
Land consumption for infrastructure development							
Higher local government costs							
Higher housing and infrastructure development							
Mobility	ECOLOGICAL: Management of demands; reduce use of natural resources	reduce number of car km travelled, increased access to jobs and services of low income residents	Versement Transport; location efficient mortgage	focusing development near transport hubs	*reduced demand for suburban development; compact building design (new urbanism, cluster development, infill development);*	increase dependable high quality public transit, policies decreasing auto use, parking policies, HOV lanes,	
Increased trip numbers, trip lengths and travel times							
Increased congestion of radial roads							
Rings of traffic jams							
Inefficient use of public transit due to low density development							
Reduced accessibility of low income residents to jobs and serices							
Adaptability of Physical Infrastructure	SOCIO-CULTURAL, ECONOMIC: Equity	increase choice of housing location ; improved urban design; revitalize urban centre; improve environmental quality	decrease demand for suburban housing (tax on new buidling in the periphery, tax incentive for new home owners locating in urban centre); incentive property taxation		increased demand for core area housing (neighbourhood traffic calming, infill development)		core area revitalization (brownfield redevelopment, mixed use development)
Loss of economic activities / jobs in certain sectors and in areas of disadvantaged groups (urban centre)							
Degradation of built environment							
Loss of local tax revenues from urban cetnre							
Inequitable distribution of services among subregions							
Segregationof Social Groups	SOCIOCULTURAL: Diversity; Equity	increase choice of housing for low income groups; revitalize urban centre	rent housing vouchers/subsidy; tax transfer between areas		*increased demand for core area housing (infill development);*	*dependable high quality public transit*	social housing; *core area revitalization (brownfield redevelopment, mixed use development)*
Concentration of disadvantaged groups in suburbs (lowest income groups, minorities, elderly) and loss of middle class groups to core (families, first time home buyers from centre)							
Concentration of disadvantaged groups in urban centre and less atrractive areas (lowest income groups, minorities, elderly) and loss of middle class groups (families, first time home buyers from centre)							
Shortage of affordable housing in suburbs							
Main isuues							
	STRATEGY						
	DETAILED ANALYSIS						

Table 13: Issues and policy areas of the Portland planning strategy and case policy

15.5.1. Main objectives of the North Milan Strategic Plan

The Strategic Plan identifies resources and problems in the area related to local development and supplies a series of economic, local, social and institutional scenarios, principles and guidelines for possible feasible actions in the 2000-2010 time span.

The main objectives of the approach adopted pinpoint policies for sustainable local development, formulated jointly with local government, public and private bodies and services, strengthening the management capacity of the transformation processes. A new profile of the North Milan area will thus be defined, highlighting the critical nature of the area and giving guidelines on the priority of intervention for a concerted guided action oriented to the forms of production and work around: innovation (technology, production, and administration) and urban and environmental quality.

Five working areas have been set up to reach these goals, on the following themes:

- Infrastructures and transport: trough the identification of the main criticalities for actions and infrastructure plans relating to networks, the road system and public transport in the North Milan area;
- Innovation: to coordinates ASNM actions and those of other actors on the theme of the relationship between innovation, territory, and socio-economic development;
- Strategic areas: to identify the areas in ongoing transformation and the focal points in the North Milan area which are planned to take on an inter-council and metropolitan role;
- Environment, landscape and Agenda 21: to focus on the main themes for defining local policies related to the protection of the urban landscape and parks, and also to the activities of the North Milan Agenda 21;

- Work and training: The North Milan Forum has been chosen as the best tool for starting up system and pilot actions related to the integration of employment and training policies. An agreement has already been reached to upgrade the training system to meet present and future needs in the area and the business system.

15.6. Design and implementation of the selected policies/actions

All the projects proposed by the plan lie behind of the Forum for North Milan Development, a consultancy organ in which the main socio-economic agents in the area discuss strategic plans and approaches for development of the area.

In fact cooperation and negotiation between the agents involved are perceived as the main tool to create the political, social and economical agreement that is needed to put into practice the proposed actions.

Anyway there is not a fix step-by-step process or mechanisms that led the policy or action to stage to the implementation. ASNM has no founding capacity, but the actors involved in the Piano undertake the responsibility to carry out the singles project. Each actor has indeed his proper implementation tools.

In the following tables the main actions proposed by the North Milan Strategic Plan

Strategies	Objectives	Policies/actions
Environmental: Defined trough the common "Agenda 21 del Nord Milano"	Upgrade the environmental quality	Develop a deliverable on the state of the environment in the whole North Milan setting up an efficient set of "environmental sustainable indicators"
	Guarantee the eco-efficiency in the production processes and in the urban developments	Prepare an Environmental Action Plan
		Pilot projects on environmental quality
	The north Milan green belt: enforce the green parks system and connect the "green net"	Enlargement of "Parco Nord"
	The "artificial landscape": increase quality and availability of public open space	Activate the coordinate program for the institution and the completion of the "Media Valle del Lambro", "Grugnotorto" and "Cave" parks
		Enforce and connect the urban green areas
		Create an "Integrated Support Service" to help the municipalities in urban upgrading policies
		Promote neighbourhood participated planning
Territorial:	Enforce east-west connections	Upgrade SS 36 main road
	Promote multidimensional projects	Upgrade Fulvio Testi urban road
	Re-planned existing infrastructures	Build the Sesto San Giovanni ring road
		Fill in a part of the East ring road
		Build the Milano - Cinisello tram line
		Build the North tram line
		Upgrade and complete the underground net
		Upgrade the rail public services
		Upgrade the administrative aspects of public transport services
		Promote a Mobility Program for the North Milan

	Upgrade the urban texture	Built the "new gates" of the North Milan
	Promote new territorial centralities	Promote temporary re-use and re-definition of public space
	Promote a new regional role and develop local complementarities	Make the changing process visible
Human resources development	Built an efficient monitoring tool to check the needs of the territory, of the enterprises, of the citizens and of the formative offer	Build a net for monitoring the professional formative needs among public and private services operating in the north Milan territory
	Promote structural actions to integrate policies on work, instruction, professional formation and vocational guidance	Develop actions to promote new job opportunities
	Develop experimental initiatives based on local partnership, in connection with local productive system	Plan instruction vocational guidance services to assist specific weak social groups
		Promote durable professional training in collaboration with local enterprises, especially in new technologies sector
		Activate collaboration process among University, school and professional training
		Promote durable professional training for public administration sector
Innovation and development	Favour the small enterprises development	Stimulate the innovation process in small-medium enterprises transferring technologies
	Support the grow up of small new technology enterprises	Promote activities and services to favour the small enterprises development
	Enrich the territory with integrated project to locate innovative enterprises	Promote integrated settlement
	Enrich the territory with innovative infrastructures	Actuate a diffuse hard-wiring in the area
Institutional cooperation	Interpret and answer to the requirements and the questions of citizens and productive system	Make the multi-services enterprises an effective strategic tool for the implementation of economical policies in the area
	Promote a new "style" in the management of supra-municipality issues	Realize standardized purchases in the involved administrations
	Promote the quality in the democratic and participative process	Activate permanent consultancy and cooperation synergy among the technical offices of the involved administrations, starting from a common Territorial Informative System
		Constitute a common agency for monitoring the development of the proposed actions, and for implementing, if needed, support measures to them

Table 14: Main actions proposed by the North Milan Strategic Plan

15.7. The future of the North Milan Strategic Plan

The North Milan Strategic Plan is only one stage in a longer process of constructing shared strategies for the development of the area through:

- The formulation of a local agreement for development as the basic goal in strategic planning activities
- A Strategic Plan which does not only include North Milan
- A Strategic Plan which dialogues with other tools
- The definition of planning tools negotiated on a local scale.

15.8. Qualitative evaluation

At this stage of the project it is possible only a preliminary evaluation because of the time threshold of the plan (2000 – 2010) do not permit to know if all (or which of) the proposed actions will have a physical implementation and which will be in practice the physical, long term impact of such actions/policies in the living environment. Anyway the successful cooperation led to a dynamic environment: in the first two years few projects was completed, but many are in progress.

The common “Agenda 21 del Nord Milano” was born in 2000 and at present strategies, targets, field of action and priority actions are identified, and some demonstrative pilot projects are in progress. In detail:

- Voluntary agreement for an innovative energetically and environmentally urban development
- Integrated energetic system for neighbourhood cogeneration system and high energy efficiency
- Sustainable mobility: dial and ride services, mobility managing, car sharing
- Campaign for more efficient household appliances

Some territorial strategies are to be physically implemented in the area: in the transport infrastructure side some major projects are in progress:

- Upgrade of some main and urban roads (SP5, connection between SS36 and the highway net, viale Fulvio Testi)
- Fill in a part of the East ring road
- Light underground connecting Milano and Cinisello
- Extension to Monza of the Metro line 1
- Light underground “Metrotramvia nord”

In the land-use side several projects aiming to re-use some existing brownfields are in progress.

In the human resources development sector many professional training project was activated in collaboration with the University, political institutions and private enterprises.

The innovation and development sector is one of the most active at this stage of the “Piano”. Several enterprises were born to support the new innovative enterprises, or to support the existing small-medium size enterprises by transferring (innovative) technologies. The main are:

- Proxima. To promote teleworking and support enterprises involved in internet services,
- OMC (Officina Multimediale Concordia). To support small size enterprises with direct services supply and financial facilities
- BIC - La Fucina. That gives global assistance to new high innovative enterprises in the starting-up phase.
- CRIS. To support third sector enterprises

Those actions are not explicitly designed to tackle with urban sprawl, anyway most of the effect of those actions will have a visible influence on the phenomenon.

Some expected results, at this stage only partially reached, are the limitation of the existing political and socio-economic conflicts in such a sensible areas, the enforcement of the polycentric and plural functioning of the urban systems, which can counterbalance the growth of urban sprawl. Such policies can indeed promote a more structured and therefore more manageable local and supra-local mobility

16. RENNES

16.1. Introduction

The case city Rennes is located in the northwest of France. Rennes is the administrative capital of Brittany region.

16.1.1. Population.

Since two decades, Rennes is with Toulouse and Montpellier among the more dynamic of the great French urban areas in terms of growth of population and jobs.
The whole urban area has known a yearly growth of population of 1.6% per year between 1962 and 1999 On a long trend, one can see that Rennes has known a population growth that concerns all the parts of the urban area, but more the suburbs than the core since 1982. This year can be considered like the starting point of the scattered development.

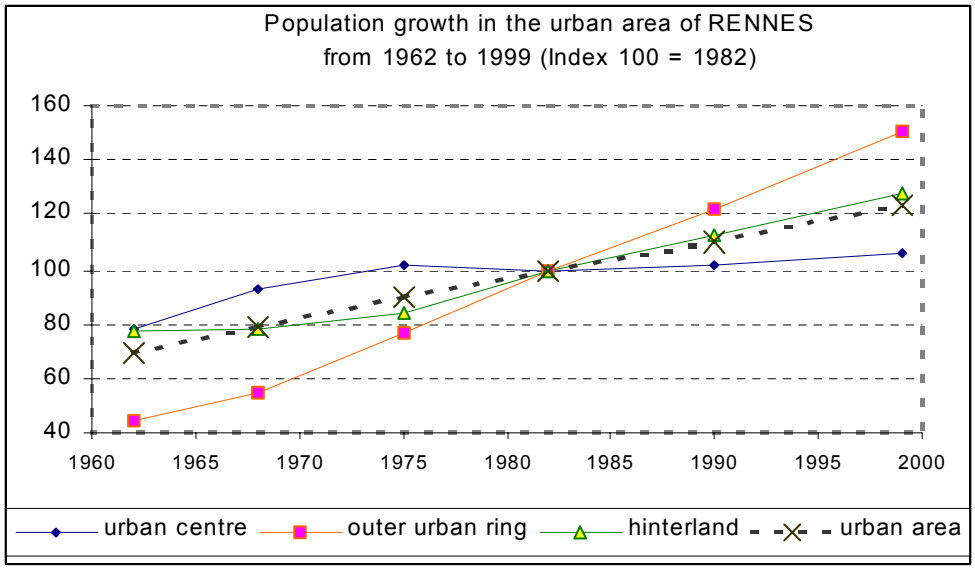


Figure 10: Population growth in the urban area of Rennes between 1962 and 1999 (Index : 1982 = 100). source : census, INSEE

To sum up **spatial demographic evolution** of the case city Rennes and its evolution in the recent period, four characteristics can be underlined.

- The city core is still concentrating most of the population, dwellings and jobs (figure 3). Except the central city, densely populated (206,000 habitants), the biggest communes of Rennes area have only 10,000 inhabitants. The urban centre represents around 40% of the population of Rennes urban area. The urban centre and the outer urban ring represent 70%. The number of inhabitants in the central area has still known an increase all along this period.
- The recent period is still a context of strong growth for the urban area of Rennes (1.3% per year for population between 1990 and 1999, Table 1). In this context, studying the scattered evolutions become of a great interest. Furthermore, one could underline that the number of inhabitants in the central City of Rennes is still increasing all along this period, even if the scattered urban developments are stronger. And that is a big difference with the other cases study, for example Stuttgart or Brussels.

Area	Main figures						average annual growth from 1990 to 1999		
	population		dwellings		jobs				
	1990	1999	1990	1999	1990	1999	population	dwellings	jobs
Studied area of RENNES (urban area defined by INSEE in 1999)	463,366	521,188	190,052	231,978	202,477	228,445	1.3%	2.2%	1.3%
city of Rennes	197,536	206,229	91,478	108,053	103,915	110,351	0.5%	1.9%	0.7%
Rennes métropole except RENNES	129,075	158,423	43,763	60,616	64,590	78,555	2.3%	3.7%	2.2%
hinterland (urban area except Rennes Metropole)	137,055	156,536	54,811	63,309	33,972	39,539	1.5%	1.6%	1.7%

Table 15: Evolution of population, jobs and housings (1990/1999). Source: census, INSEE

16.1.2. Land use.

A good analysis of the figures requires a knowledge of some morphological elements. Firstly, it is important to keep in mind the fact that there is a very important difference in the level of density between the central city and its suburbs (Figure 4).

Most of the built-up area is located in the central city of Rennes. So, one can says that the commune of Rennes includes most of its inner suburbs ; it means that possibilities for urban sprawling are high even in the inner suburbs but also that the political decisions in term of planning are very important for the sprawling issue even in the core of the urban area.

Urban growth has concerned all the «communes» of the Rennes urban area. But preservation of natural zones has always been a priority leading to an absence of a dense inner suburbs. In particular, the city centre is separated of its neighbouring «communes» by a green belt. Land allocation plans aims at fighting against the development of a contiguous suburban growth.

	Population in 1999	Surface of the area (km2)	**Density (inhabitants/km^2)**
- Urban centre	206,229	50	**4,125**
Outer urban ring	158,423	559	**283**
Hinterland	156,536	1,933	**81**
Urban area of Rennes	521,188	2,542	**205**

Table 16: Density in inhabitants in the urban area of Rennes in 1999. Source : census, INSEE

16.1.3. Economic indicators.

Employment is mainly located in the city centre and some of its neighbouring «communes» (figure 3). Five local authorities of the central area (that includes 36 communes) represent 80% of the jobs. Whereas residential function is scattered, there's a spatial polarisation of jobs. Hypermarkets are also located around the city centre.

Industrial manufacturing has been existing in the Rennes area only since the sixties with the implantation of CITROEN. That's why industrial manufacturing was located immediately in industrial zones around the city core and along the main roads. The fact that Rennes isn't an old manufacturing city has consequences on urban sprawl. Indeed, it's difficult for the local government to find old industrial zones in the city centre in the aim to build new housings.

Research and development are well-represented activities in the Rennes area (communication, data processing). Important centres of research and engineer schools are located in the Rennes area. University is one of the most important in French west region.

The number of workplaces in administrations and public sector is also important. It can explain why **local economic activities isn't really affected by economic cycles. It depends a lot of public subsidies.**

About local tax, it's important to note that a single tax rate exists between the 36 communes of Rennes Métropole about location of firms since 1994. It has permitted to limit the concurrence for the location of new economic activities and then to rationalize industrial and business zones planning.

16.2. Institutional framework and planning system in Rennes region

In metropolitan area of Rennes, it hasn't existed until nowadays a whole planning system integrated. Level of planning system is different between the central part covered by a **political institution called *Rennes Métropole*** (36 municipalities with the city centre) and the peripheral core where municipalities keep developing their own urban politics without coordination. In the next years, situation could change. Political leaders of Rennes Métropole managed to convince mayors of peripheral core to take part in the new master plan process of elaboration. This document called *schéma de cohérence territoriale du Pays de Rennes* will concern the most part of municipalities under urban influence of Rennes. Its elaboration has just started in 2002 by the definition of the boundaries of territory concerned by the plan.

16.2.1. Planning strategy on Rennes Métropole: public control as a priority.

At *Rennes Métropole* level, several orientation documents exist to precise orientations, objectives for the development of the politic community concerning business activities, transport system, natural zones, and new buildings. The most general document is called urban area project (projet d'agglomération), it can be considered as a formalisation of the political project for *Rennes Métropole.* Concerning spatial dimension of this schemes, a land allocation plan has been continuously updated (1974, 1983, 1994, 2003). It has a regulation force. Other plans have a regulation force concerning public transport (plan des déplacements urbains), new buildings (programme local de l'habitat).

Rennes Métropole has financial resources, which allow the implementation of concrete actions about urban and transport planning. Public transport is managed by Rennes Metropole inside its boundaries. Municipalities can be helped by subsidies to build social housing or to buy land in order to organize urban development.

Concerning the municipalities of *Rennes Métropole*, each one has its own allocation plan, which must respect coercive measures inscribed in the regional land allocation plan and other plans with a regulation value. Also, local authorities have in charge the issuance of building permits.

An advice structure called AUDIAR (agence d'urbanisme et de développement de la région rennaise) has in charge the elaboration of the most of orientation and allocation plans at regional level.

16.2.2. A lack of planning strategy in municipalities composing peripheral core

Concerning areas comprised in the peripheral ring around *Rennes Métropole,* orientation or allocation plans don't exist at a regional level. Each local authorities (communes) has its own

allocation plan and has in charge the issuance of building permits, leading to a lack of coherence in the implementation of measures against urban sprawl.

AUDIAR is just starting advising municipalities of the peripheral core by producing data, spatial representations in order to sensitise elected people at the functional relations between this territory and the central core.

PLANNING POLICIES AND TOOLS			
	Orientation documents	Documents with a regulation value	Concrete actions
Rennes métropole level	Political project for urban area **(Projet d'agglomération)** Business development plan **(Plan de développement économique)** Shops development plan **(Charte d'urbanisme commercial)**	Land use plan **(Schéma directeur)** Transportation development plan **(Plans des déplacements urbains)** Housing development plan **(Programme local de l'habitat)**	Land action (Programme d'action foncière) Social Housing (Subsidies) Managing of transport network
Municipalities level		Land use plan **(Plan local d'urbanisme)**	**Land action** **Permits**

Table 17: Synthesis of the Rennes Métropole planning tools.

16.3. Causes of sprawl

Each year around 250/300 hectares of undeveloped zones are urbanized on the city core (Rennes Métropole). Evolution of land use on peripheral ring isn't known.

The main causes of sprawl identified by local actors and confirmed by experts are:

- Housing markets (housing prices lower in the periphery than in the core city, Rennes is the third highest level of price for housing in provincial French cities)
- Appeal of a rural ambiance and low density settlements
- Decrease of travel times due to the extension of the highway network, Improvement of sub-urban road infrastructure
- Increase of the total population of the city in a context of lack of spaces for new urbanisations in the city centre

16.4. Overall description of the planning strategy

The land-use and spatial development strategy for the Rennes Métropole is set by the schéma directeur designed in 1984 and than revised in 1994 by the district de l'agglomération rennaise. The revision of the strategy in 1994 was made necessary by the multiplication of modifications asked by municipalities in order to create business parks.

In order to pursue the principle of sustainable development the Rennes Métropole has set the following strategies:

- balancing the overall spatial structure through decentralised concentration following a model composed of development centres; Land use plans try to organize urban development by locating new developed sites (for residential or economics aims) in several peripheral municipalities. They organize also urban growth surrounding urbanised areas.
- enforcement and maintenance of environmental, social and economic vibrancy of the urban centre; architectural patrimony preservation started in the seventies and has

permitted to offer nowadays a good quality of life in the historical centre. Environmental and social problems have appeared in neighbourhoods built in the sixties (Zones d'Urbanisation Prioritaire). New projects try to integrate green spaces and a compromise between densification and appeal of low-density settlements.

- protection of green belt around the city centre and around main peripheral municipalities,
- enforcement of social diversity in all the sectors by proposing social housing in peripheral municipalities; a plan elaborated by *Rennes Métropole* determines level of new housings by year for different geographical sectors (plan local de l'habitat). AUDIAR has in charge the verification that municipalities housing new projects permit to produce number of dwellings decided by the plan. By working with elected people, AUDIAR technicians obtain also a respect of social diversity.

16.5. Conferences about urban density: a new tool to tackle urban sprawl in Rennes region?

16.5.1. Context

In the last master plan of Rennes metropolitan area (1994), an objective about location of new buildings was adopted. According to it, 2/3 of new buildings should be located in the inner and outer suburbs and 1/3 in the city of Rennes in 2000. This objective means a deep change with the current situation. Indeed, at the middle of nineties, 2/3 of new buildings were located in the core area. Any more, this objective could create a risk to increase urban sprawl. In the outer suburbs, most of new dwellings were individual houses.

	Individual Housings (1999)	Collective Housings (1999)
Rennes	14,90%	**85,10%**
Rennes Métropole (except city centre)	**73,50%**	26,50%

Table 18: Source: FILOCOM, 1999

To concentrate new residential developments in suburbs could accentuate urban sprawl. Technicians and some political leaders have taken into account this issue and decided to implement a symbolic measure which aims is to manage to increase density for the new buildings located in the outer suburbs.
In 2001, a new law, "Solidarité et Renouvellement Urbains"[2] aims at planning. To wrestle with urban sprawl and to develop urban regeneration became fundamental priorities for the government.

16.5.2. Description of the measure

In 2001, Jean-Yves Chapuis political leader in charge of urban design in Rennes Metropole decided to organize a cycle of conferences and visits about urban density. The public of this meetings was constituted by technicians, mayors of municipalities. Architects, urban geographers or sociologists, urban planning professionals were invited to debate about urban sprawl and measure to tackle it. Three or four conferences have been organized in Rennes and in peripheral municipalities. At a first level, these conferences created a common knowledge between technicians and elected people about urban sprawl : its different form, its intensity, and its historical development in the case of Rennes. At a second level, several examples of architectural projects were presented to show how an increase of

[2] Loi du 13 décembre 2000, dite SRU, "Solidarité et renouvellement urbain"

density could be harmonized with the permanence of qualities, which make attractive individual houses.

In the same time, visits of neighbourhoods with very different levels of density were organised in the Rennes area. Elected people were for example very surprised by the fact that in social housing built in the 60's or the 70's, density was less important than in traditional areas of the city-centre. They also assessed diversity of densities concerning houses. For example, they visited the city garden of Le Rheu and a new neighbourhood in Rennes (Beauregard) built according to sustainable development principles.

Figure 11: Beauregard, a new high quality environmental neighbourhood in Rennes city centre

Conferences and visits were organised by Rennes Metropole and AUDIAR, which is the regional urban planning agency. The number of participants was voluntarily limited in order to favour debate and to prevent from a logic of representation that could drive elected people.

16.5.3. Expected effects and analysis

For Jean-Yves CHAPUIS, the political leader at the initiative of this measure, the main expected effect is to build a urban culture between all the mayors of Rennes Metropole. Several municipalities between the 36 of Rennes Metropole, are still agricultural. Their elected people don't have a knowledge about urban issues. In their negotiation with developer properties, they were often constrained to accept their projects. They didn't manage to propose an alternative way in order to prevent their municipality from an urbanisation with large low-density houses. Also, they did not have concerns about the financial cost of urban sprawl and its effects on the budget of the municipality. Common representation was also shared about densification. According to them, to increase density was synonym of building large collective buildings and to support less favoured people.

Interviewed people in this work and who have participated at conferences and visits underlined the serious attitude of participants. Mentalities could have changed even if we didn't have enough distance to evaluate its real effects. Shall we see in the future a sensible evolution in urban design of new buildings located in outer suburbs ? Debates, which will rhythm new master plan elaboration during 2003, will give an indication about success or failure of this measure. However, we can notice that it is in rupture with classical measures implemented to tackle urban sprawl. Organizing conferences and visits about density can be considered as a cognitive, a symbolic measure. It differs with rules, fiscal or land use/transport integrated measures. Qualification of symbolic must be explained. Target of this measure is an evolution of representations, moral values, principles shared by elected people about the meaning of low/high density, about what are the attempts in term of housing of new householders leaving the city centre to the outer suburbs.

We must underline that technicians, elected people are sensitise about urban planning culture in the case of Rennes. This is a specificity of this urban area by comparison with other situations in France. This socialisation on urban issues can be explained by a tradition of land use planning on long term since 1970. Each newly elected political leader learns how institutions in charge of urban planning work by taking part in commission where plans are presented by technicians and discussed. A collective learning about urban issues and tools has thus been building between technicians and political leaders. That can explain why local stakeholders participated at conferences, visits.

17. BRUSSELS

17.1. Description of the city

Brussels is the administrative capital of Europe and the federal capital of Belgium. This international function, which started to really develop in the nineties contributed to give a new impulsion to the economy of the urban region. The urban economy undergoes a mutation leading to a strong decline of industry and heavy tertiary functions and a strong growth of a variety of administrative functions, other high tertiary functions and services to firms. The considered territory includes the urban region, its near hinterland and an outer ring of medium-size cities. The observed urban sprawl generated by the income growth (increase of car ownership, access to cottages in the countryside,…) and the opening of the city to the car created a strong decline of population in the centre of the city (loss of about 125.000 inhabitants in 30 years). This urban sprawl has been largely increased by institutional barriers, which delayed the creation of a mass transit system between the suburbs and the city.

17.2. Description of the institutional framework

After the creation of the "Region of Brussels-Capital" in 1989, one of the first symbols of independence was to realize for the first time an integrated regional development plan of the Region of Brussels (PRD), concerning all its competences, i.e. mainly land use planning, transport planning (all transport modes except railway) and public housing. This plan covers only the central part of the urban area (=the Region of Brussels) while the rest of the urban area is managed by the development plans of the two other Belgian Regions, quite different by their philosophy and means. This institutional situation makes the management of urban sprawl particularly difficult because it relies on the existence of a dialog between the 3 Regions. At the moment, this dialog does not exist, except in the field of transport, between the Flemish Region and the Region of Brussels.

17.3. Overall description of the planning strategy

The major goal of the development plan of Brussels is to attract middle class and upper class households in the Region, in order to increase its financial resources. In the present institutional situation, the strategy of the Region can only be a strategy of seduction : embellishment of the city, improvement of the quality of life by all means and decrease of traffic congestion.

The creation of an efficient mass transit system, with a high quality of service, requires a better management of the location of economic functions on the territory of the Region. This is why the plan proposed to introduce a new logic in the principles of business location aiming at avoiding dispersion of big office buildings in the urban area : the ABC theory or "the right business in the right place".

17.4. Detailed description of one policy or measure

The way this ABC theory is applied in the Region of Brussels is interesting.

Because of the small size of the concerned territory and its central location in the city, the plan has considered only the location of private or public administrative activities usually locating in high-rise buildings.

17.5. Definition of the areas where high-rise buildings can locate

In 1994, the approval of the PRD ("*Plan Régional de Développement" of the Brussels-Capital Region*) made mandatory the location of high-rise office buildings in specific areas, defined according to the following criteria :

- An accessibility map (see below) showing the zones having a very good accessibility by long distance public transport modes (in dark blue) : mainly important central railway stations and their hinterland limited by the isochronal curve of 10 minutes distance walking or travelling by public transport. High-rise office buildings can only locate in these zones ;
- The evaluation of the capacity (in built sq. meters) still available for office buildings in the dark blue zones, very near the stations (essentially in the 2 Central business districts – *Quartier Léopold* and *Quartier Nord* – and near the South Station) ;
- The socio-economic nature of the neighbourhoods covered by the dark blue zones; some of these are residential areas declared “zones of high housing protection” with no possibilities at all for offices.

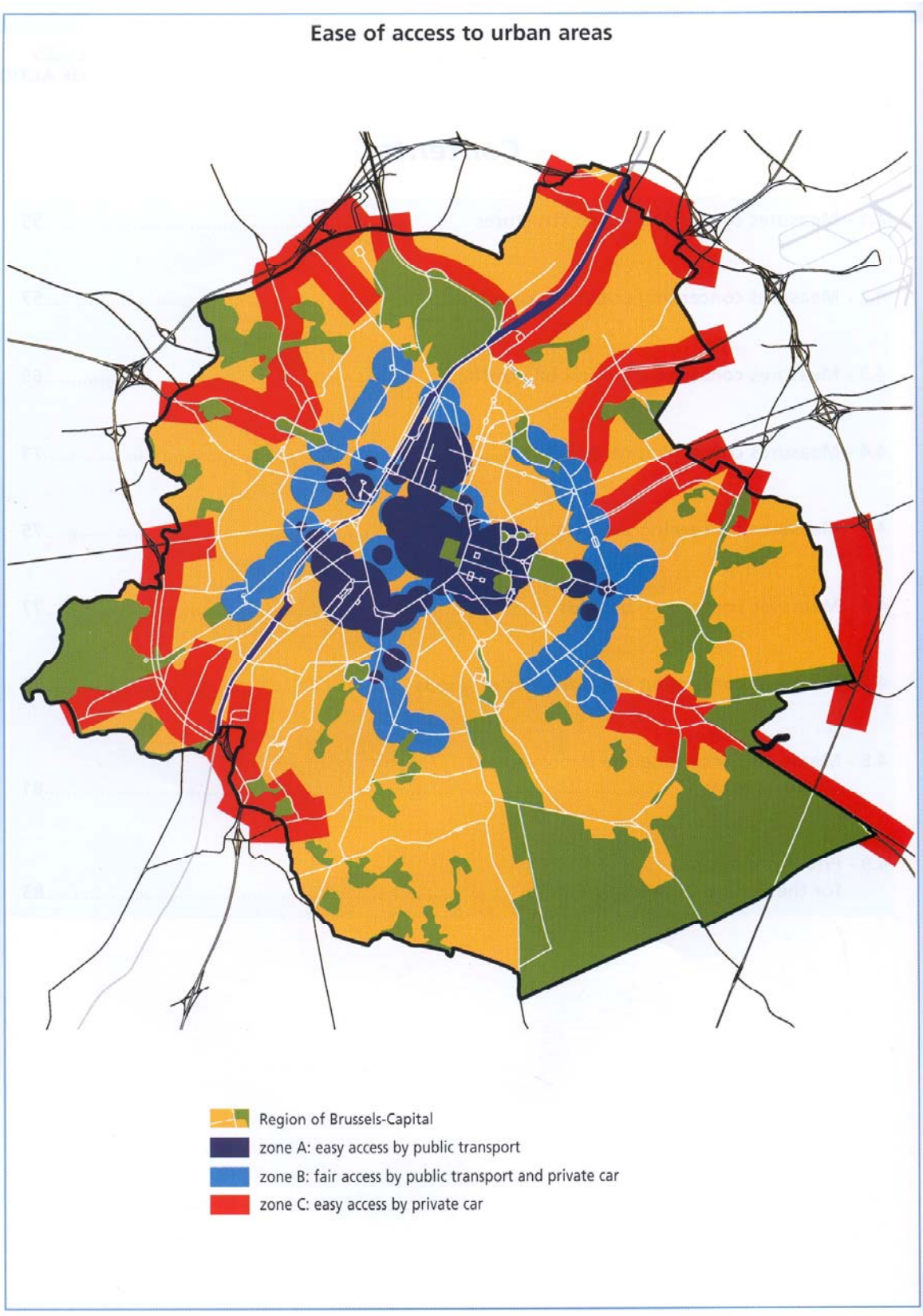
Finally the approval of the PRAS (*“Plan Régional d’Affectation du Sol”* of the Brussels-Capital Region - land use plan) in 2001 fixed in detail for each block of the Region, the capacity still available for offices of all sizes, according to some rules depending on the nature of the zone: mixed, residential or high housing protection.

Since then, the possibility of creating an office building by renovation or new construction depends on the allocation by the Region of a building permit and an environment permit, referring to the regional plans.

17.6. The urban charges: a complementary policy

Since these specific zones have the considerable advantage of having a good accessibility by public transport modes thanks to very important infrastructure investments paid by the entire urban community, and generating high real-estate earnings to the private sector, the idea was to return these earnings to the urban community by the mean of an “urban charge” (*“charge d’urbanisme”*) imposed to the property developers. It is also an application of the polluter-pays principal since high-rise buildings generate much traffic congestion. This urban charge consists of either building for free a surface area of low rent apartments proportional to the office surface area, or investing the same amount of money in the improvement of the surrounding public space quality. The nature of these charges is negotiated with the local authorities.

The table below summarizes the overall strategy of the Brussels-Capital Region (cells in dark grey) and the particular policy measures, which were analysed above (cells in light grey).


Ease of access to urban areas
Region of Brussels-Capital
zone A: easy access by public transport
zone B: fair access by public transport and private car
zone C: easy access by private car

	THE REGION OF BRUSSELS-CAPITAL							
Space	Issues	Main Principle of Sustainability	Broad Policy Goals	Policies				
				Fiscal	Land Use Planning Instruments	Housing and Design in the Private Sector	Transport	Other Projects/Actions in the Public Sector
	Environmental Quality	ECOLOGICAL: Reduce use of natural resources;			greenbelts, green corridors	infill development; brownfield development; concentrated development	energy efficient travel; increased public transport	greening the city
All	Loss of environmental quality to region							
All	Increased land pollution							
All	Increased air pollution							
Suburbs/ Hinterland	***Consumption***	ECONOMIC AND ECOLOGICAL: Reduce use of natural resources	limit outward movement of growth, revitalize urban centres, improve environmental quality	development impact fees, subsidies for economic and housing development in selected areas	decentralized concentration, new towns, greenbelts	compact building design(new urbanism, cluster development) infill development	focus development near transport hubs	transfer of development rights, land banking, brown field redevelopment
	High land consumption for housing development							
	Land consumption for infrastructure development							
	Higher local government costs							
	Higher housing and infrastructure development costs							
	Mobility	ECOLOGICAL: Management of demands; r	reduce number of car km travelled, increased access to jobs and services of low income residents	Versement Transport; location efficient mortgage	focusing development near transport hubs	reduced demand for suburban development; compact building design (new urbanism, cluster development, infill development);	increase dependable high quality public transit, policies decreasing auto use, parking policies, HOV lanes,	car free neighbourhoods
All	Increased trip numbers, trip lengths and travel times							
Regional Centres	Increased congestion of radial roads							
Core	Rings of traffic jams							
Suburbs	Inefficient use of public transit due to low density development							
Core	Reduced accessibility of low income residents to jobs and serices							
	Adaptability of Physical Infrastructure	SOCIO-CULTURAL, ECONOMIC: Equity		decrease demand for suburban housing (tax on new building in the periphery, tax incentive for new home owners locating in urban centre); incentive property taxation		increased demand for core area housing (neighbourhood traffic calming, infill development)		core area revitalization (brownfield redevelopment, mixed use development)
Core	Loss of economic activities / jobs in certain sectors and in areas of disadvantaged groups (urban centre)							
Core	Degradation of built environment							
Core	Loss of local tax revenues from urban centre							
Suburbs, Regional Centres	Inequitable distribution of services among subregions							
	Segregation of Social Groups	SOCIOCULTURAL: Diversity; Equity	increase choice of housing for low income groups; revitalize urban centre	rent housing vouchers/subsidy; tax transfer between areas		increased demand for core area housing (infill development);	dependable high quality public transit	social housing; core area revitalization (brownfield redevelopment, mixed use development)
Suburbs	Concentration of disadvantaged groups in suburbs (lowest income groups, minorities, elderly) and loss of middle class groups to core (families, first time home buyers from centre)							
Core	Concentration of disadvantaged groups in urban centre and less attractive areas (lowest income groups, minorities, elderly) and loss of middle class groups (families, first time home buyers from centre)							
Suburbs	Shortage of affordable housing in suburbs							
	Main issues							
		STRATEGY						
		DETAIL ANALYSIS						

Table 19: Issues and policy areas of the Brussels planning strategy and case policy

17.7. Outputs of the policy

This ABC policy, coupled with the urban charges, has the advantage to accelerate the renovation of old industrial areas located in the centre of the city (*Quartier Nord*), to attract population again in these areas and to increase the employment density in the right places. This increases the flows of people reaching these areas at the peak hour and leads to the possibility of offering higher frequencies of public transport and, as a whole, a better quality of public transport service, capable of convincing more people to leave their car at home.

By chance the European function of Brussels expanded quickly during the late nineties. A high number of office-type jobs were created in the private and public sector – in the “right places” of the city. The induced effects of these tend to concentrate around the European area more and more specialized in international activities, while a second Central business district (*Quartier Nord*) is being built very quickly and devoted to Belgian administrations. So there is a movement of re-concentration of jobs in the central areas.

On the other hand, it can be observed that a high percentage of high income foreigners tend to live alone or with their families not very far from their jobs, in nicely renovated residential areas of the Region.

The cumulative effect of these 2 mechanisms contributes to decrease urban sprawl towards the periphery, as seen in the statistical analysis. Finally it is surprising to observe that the best policy against urban sprawl has been the coming of the European institutions in Brussels !

17.8. Qualitative evaluation

Nevertheless, this ABC theory, as applied in Brussels, is incomplete (only A zones) and reduced to a small territory (the Region of Brussels). Outside the Region of Brussels, office buildings can be built everywhere in the South (Wallonie) and in the East (near the airport), in areas where the quality of public transport services is low. This means that the modal split is very favourable to the use of cars and that traffic congestion and air pollution are high.

Furthermore, almost nothing is done currently to increase the population density in the periphery or to favour park & ride around the railway stations where commuters could take the train. Some policies proposed in the regional plans are still to be implemented.

Last but not least the ABC theory implemented in Brussels is progressively disappearing from the plans : neither the PRAS nor the new PRD talk about it. If the concept or even the logic is disappearing, the land use design still implements it just because some central areas are still devoted to high-rise office buildings. For how long ?

18. THE STUTTGART REGION

18.1. Population and urbanisation

The Stuttgart Region is situated in the south-west of Germany and covers five state districts (Kreise) called Boeblingen, Esslingen, Goeppingen, Ludwigsburg and Rems-Murr, and the City of Stuttgart with a total of 179 (Gemeinden) communities (Figure 12). The overall population of the Stuttgart Region is about 2.6 million inhabitants. The region represents the economic and cultural centre of the state of Baden-Wuerttemberg. With an area of 3,700 km^2 this region is one of the most densely populated regions of Germany.

The Region of Stuttgart has only a few geomorphologic constraints (horseshoe-like hills in the south of the centre). Therefore, the urban development is almost uniformly spread over the whole area. This is reflected in the location of many medium size and big municipalities (sub-centres) organised almost uniformly around the City of Stuttgart (see the Figure 13).

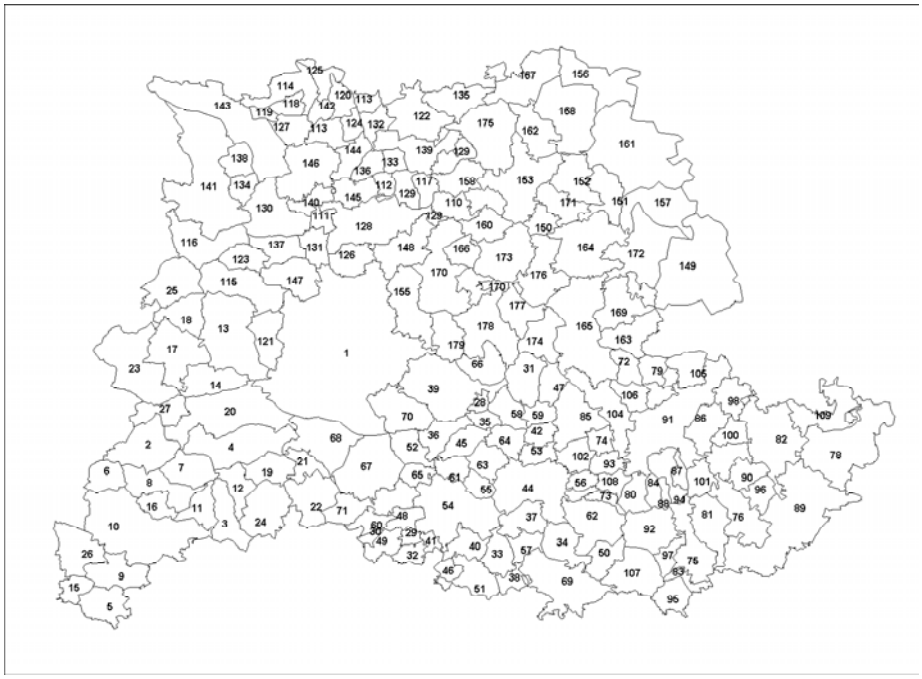


Figure 12: The 179 communities of the Stuttgart Region (list of communities in appendix II)

There are about 570,000 inhabitants concentrated in the City of Stuttgart. This corresponds to 22% of the total population of the Stuttgart Region. Taking into account the adjacent communities (Sindelfingen, Boeblingen, Esslingen, Leonberg, Leinfelden-Echterdingen, Ludwigsburg, Schorndorf) within a small circle (15 Km) around the centre of the City of Stuttgart about 38% of the total population can be found. Not only is the City of Stuttgart densely populated so too are those neighbouring communities.

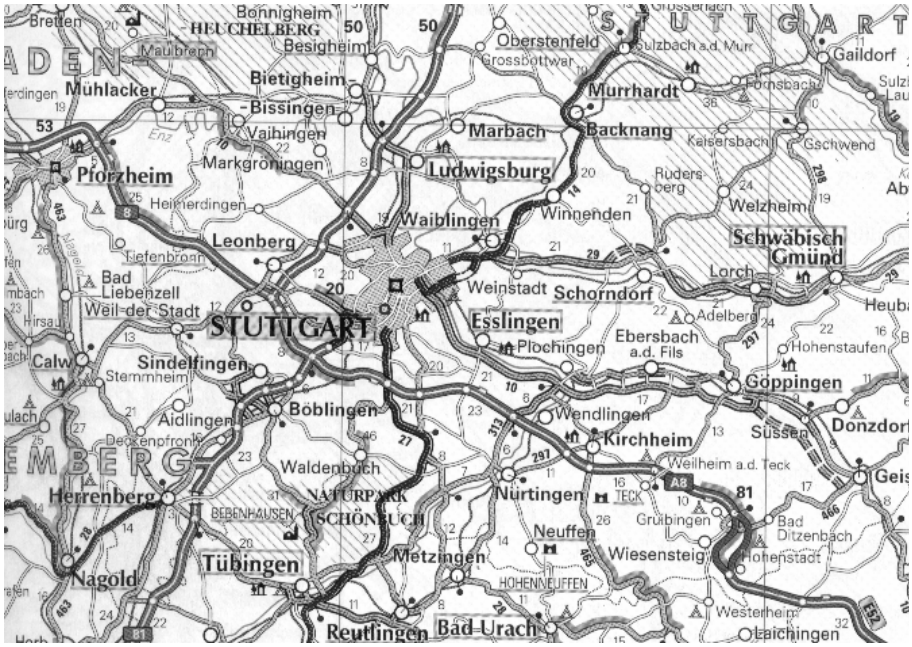


Figure 13: Street map (mainly) of the Stuttgart Region

A very strong networking can be found for the City of Stuttgart with the surrounding districts ("Kreise") of the Region of Stuttgart over the entire investigation period 1989 to 1995. The districts Ludwigsburg, Esslingen, Rems-Murr and Boeblingen exhibit a strong networking (affinity) with the City of Stuttgart also, contrary, to other districts where the corresponding values are considerably smaller. This underlines that the Stuttgart Region should be seen as an agglomerative unit, or in other words as one metropolitan area.

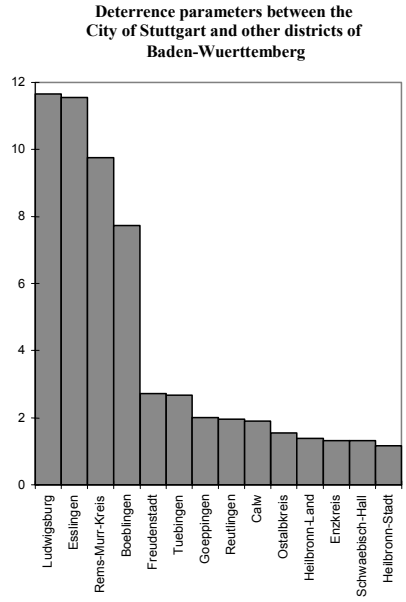


Figure 14: Deterrence parameters between the City of Stuttgart and other districts of Baden-Wuerttemberg

But, how are we to understand the partly massive out-migrations from the City of Stuttgart into the peripheral districts Ludwigsburg, Esslingen, Rems-Murr-Kreis and Boeblingen?

First of all, certainly economic considerations of individuals in the sense of cost-benefit optimisation may play an important role in the spatial restructuring of the population

distribution. In such a way the peripheral districts offer considerable advantages (Birg, Filip, H[3]ilge 1983) :

- Lower rent and land prices.
- A very good local accessibility of services covering daily needs which are often covered better by the peripheral districts than by the City of Stuttgart (e.g., bakers, butchers, other foods, but also leisure time facilities, etc.), especially, since the travel times (in the cost-benefit consideration) have to be considered.
- A good accessibility of Stuttgart's city centre from the peripheral districts via a good traffic infrastructure. For example, the motorway A81 offers the possibility to be able to take use also of the advantages of the city in addition to the comforts of living "on the country-side", without having larger disadvantages in travel-time.

In the production sector an out-migration of enterprises during the last decades can be found from Stuttgart mainly into the adjacent districts of the city (90% of all firms which fully changed their location, 100% of companies which opened an additional production place), with corresponding shifts of the places of work. The chosen city-near shifts of firms indicate that not only the centre of Stuttgart did not lose its economical importance as a whole but also that firms are interested to be located close to the heart of the Stuttgart Region.

In Figure 15 the development of the population numbers of the five districts and of the total population of the Stuttgart Region between 1992 and 2003 are depicted[4]. The total population of this metropolitan area has grown by about 3% since 1992, beside the enormous decrease in the scaled population of the City of Stuttgart of about 4.5% (599,415 inhabitants in 1992, and estimated 571.910 inhabitants in 2003). Especially the neighbouring districts Boeblingen (7.1%) , the Rems-Murr-Kreis (5.5%), and Ludwigsburg (5.0%) are gaining inhabitants, Esslingen (2.4%) and Goeppingen (2.9%) seem to follow the general trend.

In addition, an enormous growth in industrial and business zones took place in the peripheral zones, which, besides its traffic-generating impact on commuting and passenger transport in general, surely affects freight transport as well and has lead to an increase of urban sprawl.

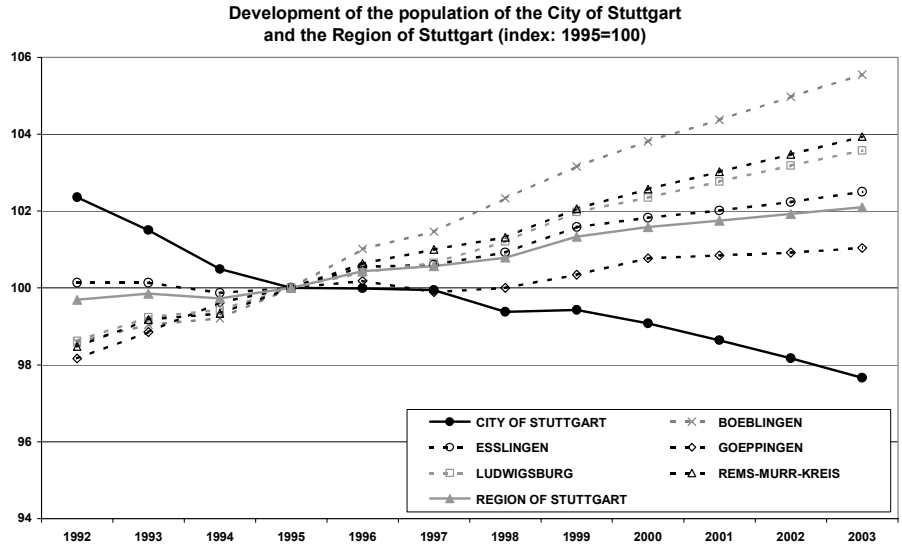


Figure 15: Development of the scaled population shares of the Stuttgart Region (Index: 1995=100)

[3] Birg, H., Filip, D., Hilge, K. 1983: *Verflechtungsanalyse der Bevoelkerungsmobilitaet zwischen den Bundeslaendern von 1950-1980,* IBS-Materialien, 8, Universitaet Bielefeld

[4] Between 1992 and 1999 empirical data are presented, after 1999 forecasted population numbers are shown.

Increasing demand for available floor space led to a disproportionate enlargement of the settlement area and its corresponding land use not only during the last 10 years as shown in Fig.16. Forty years ago the available floor space per person was merely 26 m^2. In addition the required areas for production and services expanded dramatically.

Both effects were, and are still much stronger than population growth in this particular region. The result is a corresponding decrease of contiguous areas and a related increase of scattered areas (urban sprawl).

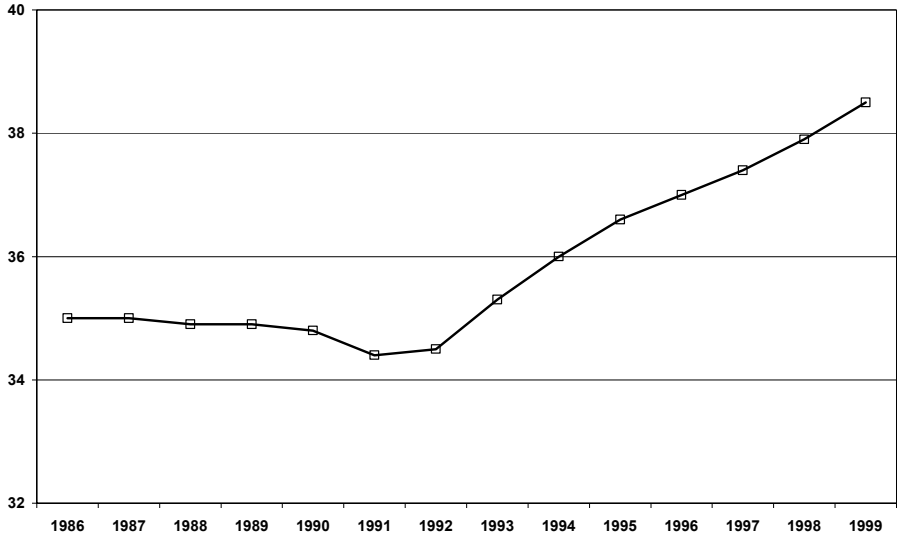


Figure 16: Floor space per m^2 between 1989 and 1999 in the City of Stuttgart

In Tab. 19 a selection of stock data of the City of Stuttgart is presented. It should be mentioned, that without a decrease in the number of inhabitants of the City of Stuttgart during the last three decades, in combination with the general increase of required floor space per m^2, has caused a dramatic increase in new housing units. Consequently this would result in having to identify new settlement areas, and/or a higher concentration of rooms and production areas in the City of Stuttgart had to be realised. Due to the rather limited ground area of Stuttgart this had led to an increase in transport problems and related negative externalities as well as to additional problems in the social function of the city[5]. In so far the population tension within the City of Stuttgart has been decreased.

year	population	german	foreigner	buildings	apartments	rooms	area 1000m²	floor space/m²
1986	551819	453720	98099	66185	263217	1044033	19335,1	35
1987	555807	453196	102611	66488	264740	1049174	19443,8	35
1988	559523	453291	106232	66771	265769	1053218	19528,8	34,9
1989	562167	454121	108046	67094	266866	1058092	19634,8	34,9
1990	568870	455423	113447	67424	268629	1064770	19769,8	34,8
1991	578407	452760	125647	67718	270037	1070059	19878,7	34,4
1992	582094	446962	135132	68066	272786	1079348	20070,3	34,5
1993	575277	439595	135682	68448	275955	1090921	20302	35,3
1994	568000	432989	135011	68783	278111	1098343	20457,1	36
1995	562213	428324	133889	69021	280100	1105091	20591,9	36,6
1996	560925	425712	135213	69274	282137	1112453	20738,9	37

Table 20: Current stock data of the City of Stuttgart

[5] Remark of R. Ensslin (Director of the Stuttgart Region) during an extensive discussion with the Stuttgart Region

There are 49.7% of the city area used as settlement and traffic areas (see Table 20, Statistisches[6] Jahrbuch Stuttgart, 2000).

City	ground area	settlement and traffic area	building area	traffic area	area for agriculture	forest area
Berlin	89067	59726	34903	13518	5963	15661
Hamburg	75533	42954	26717	8857	21183	3405
München	31046	23832	13680	5077	5349	1404
Köln	40515	24269	13069	6311	8362	5535
Frankfurt	24836	13555	7742	4316	6686	3900
Essen	21036	11083	8150	2933	4030	2561
Dortmund	28028	16784	11320	4121	8557	2766
Düsseldorf	21700	11105	7631	3474	4987	2378
Stuttgart	**20734**	**10313**	**6038**	**3000**	**5064**	**4949**
Bremen	32664	18364	11372	3893	10884	457
Duisburg	23282	13582	8316	3432	4831	1926
Hannover	20407	13673	7360	3183	3309	2293
Nürnberg	18638	10410	6363	3174	4665	3123
Leipzig	29044	13069	7497	3121	13151	1661
Dresden	23742	10929	7224	2545	5438	6058

Table 21: Indicators of settlement structure of German Cities (all areas are measured in ha)

The particular topographic-climatic situation of the City of Stuttgart (the City of Stuttgart is surrounded by hills of about 200 – 250 m above the centre of the City in a horse-shoe like shape with its opening towards the north) in summer often a high concentration of ozone and nitrogen oxides can be found. In this respect the investigation of the relationship between commuting and spatial organisation of the region becomes very important.

18.2. Economic situation of the Stuttgart Region

In 1995 the number of workplaces in the Stuttgart Region was about 1.34 million. In this year 513 workplaces were available to 1,000 inhabitants. It is worthwhile to emphasise that about 30% of the economic power of Baden-Wuerttemberg is concentrated in the region.

A long tradition of industrial manufacturing exists in the Stuttgart Region. The emphasis is given to export oriented branches like the car industry (yearly turn-over in 1994: DM 4.7 billion), electrical equipment industry (yearly turn-over in 1994: DM 14.2 billion) and mechanical engineering (yearly turn-over 1994: DM 2.8 billion) with a total of about 73,000 workplaces.

Modern manufacturers like DaimlerChrysler AG and Porsche in the car sector and firms like Siemens Nixdorf, IBM, Hewlett Packard and Kodak are concentrated in the City of Stuttgart as well as 100 different credit institutes and 133 publishing houses. Therefore, the Stuttgart Region belongs to one of the strongest economic regions in Europe. The dependence of the industry of the region on export activities is very strong. About 35% of the GRP (gross regional product) depends directly on export.

Research and development are important location factors of the Stuttgart Region. The City of Stuttgart houses two universities (University of Stuttgart with about 25,000 students, University of Hohenheim with about 15,000 students) as well as six academies and colleges and several non-university research centres like the German Aerospace Centre DLR, the Fraunhofer- and two Max-Planck-Institutes.

[6] Statistisches Jahrbuch Stuttgart 2000, Statistisches Amt der Landeshauptstadt Stuttgart

18.3. The transport network within the Stuttgart Region

The City of Stuttgart represents an important traffic node within the Trans-European Network (TEN). As to the traffic infrastructure, network elements on all spatial levels are represented: in private vehicle traffic they range from city streets to motorways, and in public transport from city buses, rail rapid transit (S-Bahn) and U-Bahn to high-speed trains (ICE). All modes are present: pedestrian, bicycle, bus, light rail transport, suburban rail, car, as well as intermodal transport opportunities like P&R (park-and-ride).

An important east-west link in the international traffic, namely the motorway A8, between Austria and France via Salzburg, Munich, Stuttgart and Karlsruhe exists. The motorway A81 is an important element in the Northern-Europe- Germany-Switzerland- Italy chain. The railway lines run in parallel to these links and connect the capital to the wider regions mainly by radial elements.

Due to urban and regional traffic, the motorway network around the City of Stuttgart is highly overcharged. The consequences are overloading (congestion) leading to serious obstructions in long-distance traffic, as well as high environmental pollution in the adjacent areas of the motorways.

The causes of the heavy[7] regional traffic are[8] suspected to be related to the interactions within the traffic system as well as with the settlement structure (SACTRA 1994, Batty 1970). There are a bundle of well constructed secondary roads connecting the City of Stuttgart with the sub-centres of the other five state districts of the Stuttgart Region. The interactions within the traffic system include traffic diversions from the secondary road network, as well as extensive diversions from parallel major roads. In addition, there are also possible diversions in public transport at the time of the installation of the rail rapid transit.

The Stuttgart Region is served by an international airport located in the south of the City of Stuttgart. This airport is well connected to the region by the S-Bahn (rapid rail transit line S2, S3) and a junction to the motorway A8.

Currently 7 rapid rail transit lines serve mainly the radial axes of commuting traffic directed towards the centre of Stuttgart. In addition those lines are connect the ICE-link Mannheim - Munich, as well as to the Stuttgart Airport through the city's central railway station. The existing rapid rail transit lines are extremely overburdened in the peak hours - just like the parallel street network - although it still seems to have potential capacity reserves.

In the region of Stuttgart there are about 1.6 million listed cars, leading to a car density in the total area in 1999 of 596 private cars per 1,000 inhabitants. The road network of the Region of Stuttgart consists of approx. 150 Km motorways and about 3,400 Km of secondary roads.

18.4. The institutional framework and planning system in the Stuttgart region

18.4.1. The planning system of the Stuttgart Region

The organisational networks Kreistag, Landtag, Verband Region Stuttgart play an important role in the decision-making process of the Stuttgart region with respect to land-use and transportation. The VVS (Verkehrsverbund Stuttgart) is responsible for the common tariff system in the Stuttgart Region.

The following description of the structural organisation and the aims of the Verband Region Stuttgart are directly obtained via the web-side www.region-stuttgart.org.

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[7] SACTRA 1994: *The Standing Advisory Committee on Trunk Road Assessment:* Trunk Roads and the Generation of Traffic, Department of Traffic, London 1994

[8] Batty, M. 1970: *Models and Projections of the Space Economy: A Subregional Study in Northwest England*, Town Planning Review, 41, 121-148

The Verband (= "Association") Region Stuttgart was founded in 1994 to give the Region a political organisation with its own directly elected representatives of the population: the Regional Assembly. This democratically legitimated decision-taking body covers the central planning policies - regional, infrastructure, landscape, and traffic and transport - as well as business promotion, local public transport, waste management, trade fairs and exhibitions and tourist marketing and can present an objectively uniform picture of the Region inwardly and to the outside world.

On 24th October 1999, the population of Greater Stuttgart decided for the second time on the composition of their Regional Assembly, and elected 90 representatives for a 5-years term.

The central aim of the Verband is to marshal the forces of the 179 independent municipalities (towns and city districts) within the Stuttgart conglomeration in order to enable the Region to compete effectively at the European and the world level.

18.4.1.1. The tasks of the Verband Region Stuttgart

According to Baden-Württemberg state law, the Verband Stuttgart has the following responsibilities:

- Regional planning
- Landscape planning
- Traffic and transport planning
- Business promotion and tourism marketing
- Local public transport
- Waste disposal

The Verband can take on other tasks voluntarily:

- organising new trade fairs and exhibitions of regional importance
- organising cultural and sports events and congresses.

The Baden-Württemberg *Landtag* - the state assembly - passed an amendment Act in October 1999 granting the Verband additional rights

18.4.1.2. Regional planning

The Verband Region Stuttgart draws up and finalises a Regional Plan, with a time-horizon of some 10 to 15 years. It formulates the goals, basic principles, and suggestions from which the planners at municipal level have to take their line. For instance, it contains the area's first in line for new housing or commercial and industrial development, routes and locations for infrastructure, and also the green belts and zones that are to be kept free of development.

The preparation of the Regional Plan is based on a long-term view of the Greater Stuttgart Region characterised inwardly by clearly defined residential and commercial areas and outwardly as a metropolitan region of European dimensions. The existing innovation potential of the Region in business and science is to be strengthened in particular in the field of mobility services and products.

The common factor running like a thread through all aspects of planning is the aim of developing the Region on a sustainable basis and to ensure it has a secure future.

18.4.1.3. Landscape planning

Landscape planning is an important component part of regional planning. This is where the landscape and ecological specifications of the Regional Plan are prepared in technical terms. Regional green belts and wedges form the necessary counterweight to the inevitable spread of commercial and residential areas.

It also defines which areas deserve special ecological protection, such as biotopes or water catchment areas.

The Verband has drawn up an all-embracing concept called the "Greater Stuttgart Landscape Park", showing where open areas are to be improved, redesigned, and linked up together. The basic idea of the landscape park is enable people to enjoy the landscape and thus to protect it at the same time.

The combined commitment of the Region, the municipalities, and all the various authorities is necessary for implementing these plans. The Verband has not so far been able invest directly in landscape projects.

18.4.1.4. Traffic and transport planning

The traffic and transport infrastructure is the nervous system of a conurbation like Greater Stuttgart. For the first time, the Region now has an integrated traffic and transport concept, which is at the same time co-ordinated with regional, and landscape plans.

The regional traffic and transport plan contains long-term strategies for roads, railways, and cycle paths, and a list of priorities for future investments. It is expected to be finalised and approved in 2000. This traffic programme will represent a blueprint for county and municipal planning, and will ensure that the Verband is able to influence the investment programmes of the State of Baden-Württemberg and the German Federal Government.

18.4.1.5. Business promotion and tourism marketing

Business promotion is absolutely essential for a location like Greater Stuttgart. Programmes have to be aligned inwards as well as outwards, so that local business are given the prospect of development as well as the location being made known and attractive to inward investment. The Verband has established a company called *Wirtschaftsförderung Region Stuttgart GmbH* to co-ordinate all the activities from a database full of information on business locations and advice to municipalities, investors, and business start-ups to a regional employment agency that comes to the aid of companies and their employees in times of crisis.

In the field of tourism, the Verband Region Stuttgart fulfils its obligations by participating in a company called *Regio Stuttgart Marketing und Tourismus GmbH*, the aims of which are to promote tourism, particularly in the geographical outskirts of the region as a specific part of business promotion, and the local recreational facilities as a contribution to reducing traffic volumes.

18.4.1.6. Local public transport

The Verband Region Stuttgart is the organising body behind the local suburban electric railway system and, since October 1999, for all regionally important rail traffic. This means that the Regional Assembly decides on extensions to the regional rail network, vehicles, special offers, and so on. The Verband "buys in" the transport services from the transport companies such as suburban electric services from Deutsche Bahn AG (German Railways). The recent amendment Act also enables the Verband to uses buses instead of rail transport.

In this function, for example, the Verband is working on the extension of the suburban electric railway network, has decided on improvements to the timetable, and will be introducing a regional night-bus service at week-ends in the spring of 2000. As a partner of the transport companies, it has committed itself to ensuring the local public transport should continue to operate in such a way that both passengers and the public sector can afford it.

18.4.1.7. Waste disposal

The Verband Region Stuttgart is responsible for part of the waste-disposal business, which also includes the disposal of contaminated soil. Regulations have been drawn up, in collaboration with the counties, which for the first time cover the whole Region on a uniform basis. The introduction of competitive elements has led to substantial price advantages for suppliers.

The Verband also takes the view that the Region should in general be regarded as a single area for waste-disposal purposes, in order to prevent over-capacity situations from arising, exploit market opportunities, and create transparent strategies for business and private households.

18.5. Design and implementation process of the selected policy in the Stuttgart Region

To support the positive effects and impacts and to reduce urban sprawl different policies and measures have been proposed:

- Better coordination of the different planning systems and a better inclusion of the population.
- The municipalities of the Region of Stuttgart should develop a common area development concept (Flächennutzungsplan) so that a better settlement control can occur against urban sprawl.
- This also requires a system of supporting measures, for instance for those municipalities refusing to extend new land-use developments and which are compensated by the other municipalities for it. The tariff system should become more flexible and more easy to use.
- Introduction of a telecommunication system for the busses and the trains in order to obtain better information about the schedule and to minimize possible delays.

The urban planning has shifted in two main directions. On the one hand the development towards the southern part of the Stuttgart region: the new fair complex in the Filder area, the ICE station and the expansion of the airport have acted as attraction centre of further residential and industrial developments. In addition, a cluster of leisure and service activities close to the motorway in the southern periphery of Stuttgart has developed. On the other hand, the Stuttgart 21 Plan aims at rebuilding the Stuttgart – Ulm – Augsburg rapid rail line, comprising improvements in regional and long-distance transportation; excellent connections to the Filder Plain and the airport; development of new urban neighborhoods in the city centre; enlargement of park areas and creation of new jobs at the centre of the Stuttgart region. This aim will be achieved by rerouting a part of the tracks through underground tunnels and lowering the station, it is possible to significantly reduce the inner-city area required for tracks. This opens up urban development opportunities and space for new development (about 1 km^2) right in the heart of the city.

19. BRISTOL

19.1. The Bristol Urban Region

Bristol is the largest urban area in southwest England, covering an area of a little under 110km2. The city was formerly the administrative centre of the County of Avon, however, following local government reorganisation in 1996 the county was divided into four unitary authorities (Bristol, Bath & North East Somerset, North Somerset, and South Gloucestershire. See fig. 17). The total area of this subregion is 1346.41 km2 and the total population is 983860 inhabitants in 2001 (see tab. 22). Bristol, covering an area of a little under 110km2, is the principal urban settlement of the region, bordered by semi-rural authorities and the Severn Estuary.

Figure 17: Bristol and the former County of Avon

	Total population	% of the population
Avon area	983860	100%
Bath and NE Somerset	169045	17%
Bristol City	380615	38%
North Somerset	188556	20%
South Gloucestershire	245644	25%

Table 22: Population percentages among districts 2001 (Source: Population Census, ONS)

Inside the boundaries of Bristol, the area is almost entirely urbanised. The city is surrounded by a greenbelt with the exception of the northern section across the boundary with South Gloucestershire, which was dismissed in the late 60s to allocate the new office and industrial developments. New motorways and rail connections to the southeast of the country were also realised in the same period. The area surrounded by the two motorways and the north

boundaries of the current Bristol City District was allocated for productive sites and residential development, in order to counterbalance the negative effects of the economic crisis in manufacturing industries in the region. The economic crisis of manufacturing industries in the 70s and 80s affected the entire ex-Avon region but it is in the northern area (known as the North Fringe) and in the Bristol City Centre that new economic development was mainly located. Industries from the southeast of England, strangled by the harshening congestion problems of that region, have relocated here since the late 1970s attracted by lower costs and higher accessibility levels. Since the 70s and particularly during the 80s the North Fringe has become the preferred location for suburban housing developments characterised by typical urban sprawl features such as low density, single family detached housing, lack of public services and transport. One of the biggest shopping centre of the southwest is also located here. In contrast to this landscape the rest of the region has remain fairly rural and is today in some cases suffering from lack of development and high unemployment rates.

Since the 1980s the centre of City of Bristol has experienced a boom in office development dominated by the financial and business sector and supported by a significant scheme of former industrial land redevelopment within the city centre. Today the city is one of the most popular cities in Britain for business relocation, to the extent that a potential shortage of office space has been predicted. Some 130,500 m2 of office space was taken up in 2000, leaving only 39,000m2 (less than 3% of the total) office stock available in the whole city. Several parts of the city centre are also undergoing extensive renovation for commercial, and in particular office, developments. Other regeneration sites are also being promoted for mixed-use developments, combining office space with homes, and leisure activities in order to create safer public spaces. The city centre has undergone a significant change in recent years with the quality of life increasing as more public space has been introduced, traffic has been redesigned out, and residential and leisure development has been undertaken.

Much of the traffic found in Bristol originates from its catchment area of more that 1 million population, hence the city should always be considered, with regards to transport planning, within its regional setting. The attraction of Bristol for employment, leisure, education and other activities results in over 400,000 vehicles driving into the city everyday. The predominant mode of transport is the private car, and the level of car ownership in Bristol (0.37car/inhab) is the highest for any city of comparable size in the UK and is compounded by an even higher and increasing car ownership (0.43 car/inhab) in the surrounding catchment area.

The development of the city and the related growth in traffic levels, has put a great pressure on the urban and regional road network, with higher congestion and longer journeys. Bristol's major roads are essentially radial, with little opportunity for inter-city mobility and are therefore more sensitive to congestion. Rising car ownership has encouraged lower density development and a dispersal of activity from Bristol towards the North Fringe and locations with less congestion and higher accessibility. Mobility patterns have become increasingly complex, with less use being made of public transport and low-energy mode of travel. Finally, increases in road freight have occurred with the improvements to the national road network.

These trends in road traffic growth are perceived by the local governments and residents as a threat to quality of life and sustainability objectives such as the reduction of greenhouse gases and air pollution, the protection of landscape, the economic performance of the cities in the ex Avon area.

19.2. Institutional and planning framework

19.2.1. Institutional context

Local government in the UK has various functions and responsibilities, e.g. social services, education, environmental health, transport and land use planning. Until April 1996, local government services were organised via a two-tier system of local authorities: district and county councils (outside of the major conurbations). Following the reorganisation of local

government, unitary councils are now providing the entire range of local government services with some authorities having joint arrangements for particular functions. The study area for the SCATTER project has been identified on the base of the pre-review Avon County. Table 23 shows the current institutional structure of the area.

COUNTY (number of districts pre-review and date for implementation of any change)	**NEW STRUCTURE** (district councils on which unitary authorities are based)	**CEREMONIAL ARRANGEMENTS**
Avon (6) (April 1996)	4 unitary authorities: a) Bristol b) North Somerset (formerly Woodspring) c) Bath and North East Somerset (formerly Wansdyke + Bath) d) South Gloucestershire (formerly Northavon + Kingswood)	Avon abolished. A separate Lieutenancy created for Bristol. N Somerset and Bath & NE Somerset deemed part of Somerset. S Gloucestershire deemed part of Gloucestershire.

Table 23. Structure of the institutional reform

19.2.2. The planning system

The framework of planning policy in Britain is structured according to a clear hierarchy of guidance from national, regional and local planning bodies. There is no specific policy or plan for the whole country but national guidance takes the form of Planning Policy Guidance Notes first prepared in 1988. PPGs are not legally binding but local authorities must show that their development plans take account of and conform to national policies.

19.2.2.1. Regional Government

At the regional level Regional Planning Guidance (RPGs), prepared jointly by the regional planning conference and the relevant government office, set out broad strategic policies for land use and development. In the South West, the appropriate bodies are the South West Regional Planning Conference (SWRPC) and the Government Office for the South West (GOSW). RPG10, the regional guidance for the South West region:

- provides a regional spatial and transport strategy within which local authority prepare development plans and Local Transport Plans (LTPs)
- sets out a broad development strategy for the period to 2016 and beyond
- provides the spatial framework for other strategies and programmes.

Regional Government Office are responsible for reading all draft plans on behalf of the Secretary of State, provide feedback to local planning authorities and, if necessary make 'formal objections' where plans appear not to have taken proper regard of national or regional planning guidance.

19.2.2.2. Local authorities

Each local planning authority - usually the local council - must produce a development plan for its area. This sets out the council's policies and proposals for how land is used and developed within its area over a period of up to 10 years. Decisions on planning applications and appeals must be made in line with the development plan, unless there are very good reasons to do otherwise. Councils must have plans in place for whole of their area. Plans should be reviewed every five years and changed when necessary to keep them up to date.

The Development Plan comprises several documents:

- **Structure Plans** - prepared by the Structure Planning Authorities (where existing, see table 24; otherwise prepared by local authorities) setting out key, strategic policies for the area(s) as a framework for local planning;
- **Local plans** - prepared by local planning authorities setting out more detailed policies to guide development in their areas, including proposals for specific sites;

- Minerals and Waste Local Plans setting out the land use policies for managing minerals and waste in their areas.

In the Avon area the county of Avon Structure Plan was originally approved in 1985, before institutional reform. Alterations to the Plan changed some of the policies and rolled the Plan forward, so that the Third Alteration, approved in 1994, covered the period to 2001.

With the abolition of Avon County Council in 1996, the four new unitary local authorities became responsible for structure plan preparation. In line with Government advice they agreed to work together to prepare a new plan for the area. A Joint Committee for Strategic Planning and Transportation was set up, comprising members of the four authorities, and supported by a Joint Unit (JSPTU). The Unit and Committee are responsible for the drawing up and adoption of the Joint Replacement Structure Plan that will provide policy guidance for land use and transport planning decisions from 2001 to 2011. All local plans within this area are at present under revision in order to conform to provisions in the Joint Replacement Structure Plan for the Avon Area.

Local Authorities are also in charge of designing the Local Transport Plans, which have replaced the Transport Policies and Programme (TPP) system. LTPs are strategy documents and do not require comprehensive coverage of individual schemes. They cover all forms of transport, including those that are provided by the public and private sectors and by communities. Its central theme is one of partnership and making best use of existing and future resources in a sustainable way.

Local Transport Plans also contain a bid for Government funds through which transport projects can be financed. Local authorities are required to provide a LTP to the national government's Department for Transport. The plan's documents detail the projects that the authority wishes to undertake during the following five years, as well as acting as a bid to government for funding. LTPs are updated annually with a progress and monitoring report. The effectiveness of the strategy is dependent to some extent upon the success of this bid. Government funds, together with funds from the Councils and other partners, enable the transport improvements outlined in the Local Transport Plans to be taken forward and implemented

PLANNING POLICIES AND TOOLS			
	Guidance	Documents with strategic value	Documents with regulative value
National level	Planning Policy Guidance		
Regional Level (Government Office for the South West)	Regional Planning Guidance (RPG10)		
County level (Formerly Avon county. Currently represented by the Joint Committee for Strategic Planning and Transportation		Structure Plan (Joint Replacement Structure Plan)	
District level (4 unitary authorities)			Local Plans Local Transport Plans

Table 24: Synthesis of the Bristol Area statutory planning tools

19.3. Bristol Region's Integrated Transport Strategy

In Bristol congestion is recognised as a major problem both for the economic vitality of the city and the quality of life for those living, working and visiting. Bristol's Integrated Transport Strategy aims to improve the transport system to improve social inclusion and accessibility.

The strategy is part of the Joint Replacement Structure Plan and sets out an integrated approach to development and transport. The 1995 Environment Act on air quality, and the 1997 Road Traffic Reduction Act, indicated a new agenda for transport policy, confirmed in the 1998 White Paper “A New Deal for Transport” and the 2000 Ten Year Plan for Transport. The Structure Plan and its transport strategy seek to take this policy agenda forward, making use of promised new tools, including local authority powers for road user charging which could radically increase the resources available for improved transport.

The specific transport policies included in the plan are integrated with a land use strategy which seeks to reduce the overall need to travel. According to the integration of the land use and transport strategies, development should in general be of a form that discourages car use. Developments that are able to generate many trips should be located where there is good access to public transport and to cycle and pedestrian routes.

19.3.1. The spatial dimension of the transport strategy

The strategy identifies 22 areas and corridors (Fig. 18) important to strategic travel patterns and sets out priorities for transport improvements in each corridor. Policy guidance to local authorities for local plans and local transport programmes is provided for in the strategy. These areas and corridors reflect the need to provide for a growing number of orbital movements around areas as well as established radial trips.

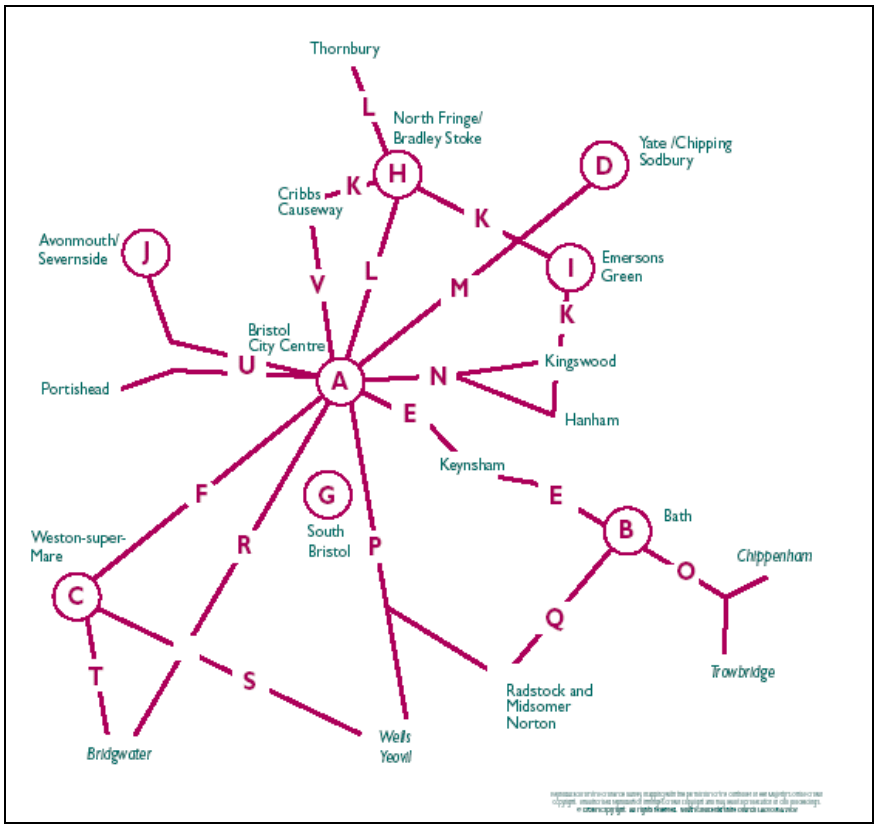

Figure 18: Key diagram of the strategic corridors and areas

At the same time policies are differentiated according to the special needs of each area and corridor. In the corridors approaching the Bristol area, a pattern of new interchanges with park and ride facilities is conceived in order to distribute trips by more sustainable modes to various destinations in north and central Bristol. In corridor K, following the completion of the Avon Ring Road, a multi-modal approach is to be followed to improve accessibility from the locations to the east of Bristol to the North Fringe along an orbital route. In corridor L priority will be given to the implementation of the Rapid Transit Line (a light railway system), between the centre of Bristol and the North Fringe. On the parallel road routes, traffic management scheme will be implemented to achieve increased space for bus corridors and

better facilities for walking and cycling, taking into account the growing residential settlements developing along the corridor.

The effective implementation of the transport strategy in the area also requires implementation of the spatial land use strategy. This is based on encouraging development in the existing large urban areas or, where necessary, at other locations where public transport can operate effectively. In particular peripheral and dispersed employment and shopping patterns are to be minimised. Besides this general recommendations, the strategy suggests differentiated policies for the identified areas and urban centres.

19.3.2. Key transport policy guidelines

The Joint Replacement Structure Plan seeks to encourage alternative modes of transport to the car, to discourage car use where appropriate alternatives are available, and to integrate transport with urban regeneration and planned development. The successful implementation of this strategy requires a four-way partnership between local authorities, the transport operators, developers and occupiers of property, and the general public. This comprehensive approach will include:

- a 'carrot and stick' approach to promotion of sustainable modes linked to parallel control of car traffic;
- infrastructures for a comprehensive and integrated pattern of rail and bus passenger services, incorporating better modal interchange;
- traffic management measures, user charges, and control of parking provision that restrict undesirable car use, give priority to non-car modes of travel and protect communities from the adverse effects of private motorised traffic;
- transport and land use measures to make walking and cycling more attractive.

The comprehensive strategy includes the following guidelines for local transport and development plan making:

- Priority must be given in transport and development plans, to *improving alternatives to the use of private cars*. To achieve this goal a partnership between local authorities, transport providers, commercial employers and the general public is necessary. A combination of measures is also required including provision of a wider choice of dependable public transport services, reallocation of road space to provide congestion-free priority bus and cycling routes, parking control and parking and road charging as financial measures to reduce car usage and increase the available resources for transport improvement. Local plans will have to follow the area/corridor approach set out by the transport strategy.
- Upgrade of *bus services* in coordinated packages along particular transport corridors, through quality partnerships between local authorities and operators. Crucial measures include the introduction of bus lanes and "bus gates" and traffic management to favour bus priority. Socially necessary bus services will have to publicly financed and attention needs to be given to corridors linking residential areas with high unemployment rates to employment locations, Priority should also be given to non radial services and rural bus services.
- Encouragement and support, sometimes financial, to the improvement of *rail passenger services and facilities*. In particular rapid light transit systems should be introduced as an alternative to car usage and to serve the Structure Plan's spatial strategy. Improvement to heavy rail can be promoted for medium and long distance travel.
- Opportunities for enhancing interchange facilities between public transport services, and between them and other modes, should be safeguarded and promoted. Such facilities will often be appropriate at rail stations, bus stations, groups of bus stops used by different routes, and at new park and ride sites. *Enhancing interchange facilities, including park and ride sites*, is considered essential to the comprehensive upgrading of the transport network. Each site should be accessible by walking, cycling and motorcycling, bus, taxi, and car.

- Cycling and walking. The local planning authorities shall promote walking and cycling to reduce energy use, pollution and traffic congestion and improve health. The priority given to walking will reflect its status as the basic element of movement in transport, and a positive strategy of developing walking routes pursued. Pedestrian priority schemes and other measures will be introduced to improve the pedestrian environment, and reduce community severance and the threat of traffic, particularly in shopping areas and other areas with high pedestrian activity and/or a high level of danger to pedestrians. Primary cycle networks, including the National Cycle Network will be defined, safeguarded, developed and enhanced, to include off-road sections and reallocated road space.
- Appropriate *strategic parking policies* are required to discourage car usage. Public and private parking provision should reflect the accessibility profile of the surrounding transport network, including public transport services and traffic congestion. In the centres of Bath, Bristol, Weston-super-Mare long-stay car parking provision should take account of maintaining commercial viability, but should not extend beyond operational requirements. Instead, public parking spaces should be aimed at short-stay, off-peak visitors required to support business, retail and leisure functions. Parking standards for new development will be set in cooperation between authorities, to avoid distortions of competition. In new residential development, the authorities will encourage developers to minimise parking and adopt “car free” areas. Harmonisation of pricing regimes should also be achieved.
- *Traffic management* measures should be implemented as priorities at locations with a high incidence of road accidents, and areas with recurring traffic congestion. *Traffic calming* should be extended to the majority of residential areas, and required in all new developments to secure road safety and environmental benefits.

19.4. Bristol’s Local Transport Plan

In line with national and regional policy guidance and with the Integrated Transport Strategy, the Bristol City County approved a Local Transport Plan in 2000. The plan follows from the Provisional Transport Plan adopted in 1999 after a public consultation involving residents, community groups, commercial bodies, transport providers and others. The consultation demonstrated that Bristol people saw improved public transport as a priority, and that they were prepared to consider new ways of raising revenue to achieve this goal.

19.4.1. Evolution of the Local Transport Plan Strategy

The long-term strategy set out in the Bristol Local Transport Plan, has evolved over many years. The strategy grew from the results of the Bristol Integrated Transport and Environmental Study (BRITES), carried out in 1990 which looked at the effects of various different transport strategies against a set of environmental, safety and accessibility related objectives. Through assessing forecast changes in accessibility across the study area, it was possible to also evaluate the effects of different strategies on issues of social exclusion. The most effective strategy has been the subject of exhaustive research in subsequent years, testing various other options, revising and updating the models used, and conducting further sensitivity tests on particular elements of the strategy. The strategic assessment work conducted is summarised in table 25. These studies provided a background of comprehensive research, through their ability to assess the forecast effects of both land use and transport changes, and how they impact on all modes of transport within the city.

BRITES Study	1990	To assess the effectiveness of different transport investment strategies.
BRITES GLT	1992	Further research into the relative effectiveness of a bus, guided bus (GLT), or rapid transit based strategy.
BRITES SRTM	1992	Tests conducted by DETR to assess scheme options for the motorway network around the Bristol area (SRTM – sub Regional Traffic Model).
TPP Package 1994-95	1993	Detailed revised tests on preferred strategy to support the TPP Package of measures.

TPP Package 1995/96	1995	Further revised tests in support of the Package strategy, incorporating revised land use scenarios, providing updated growth forecasts on both high and low economic growth assumptions, and detailed sensitivity tests on individual elements within the strategy.
Traffic Restraint Study (TRAM)	1997	Revised and updated model developed in partnership with the DETR to investigate traffic restraint, and possibilities for traffic reduction. (TRAM B Traffic Restraint Analysis Model).

Table 25: Analysis conducted in the development of the overall Local Transport Plan Strategy

The hierarchy of tests shown above has been supported by further work conducted on specific issues, including studies into the proposals for Bristol and South Gloucestershire Rapid Transit and Park & Ride provision. During the process of developing the plan, the models were revised with updated land use and growth assumptions, and these provide a robust analytical base for the preferred strategy set out in this plan. The technical analysis provides the foundation of the plan, however it is through extensive public consultations carried out in developing this Plan, that the final plan's strategy has been selected.

The most effective package measures, according to the evaluations conducted, combines the introduction of Rapid Transit to significantly enhance public transport, with road user charging in the central area to manage demand. These two elements are crucial to ensure that the plan meet its objective. Although these two elements are critical in widening choice to the travelling public and managing the transport network more effectively, the plan contains many elements under these two broad components, and through the integration of these many proposals provides a balanced programme of investment over the five years of the plan.

The measures included in the plan to significantly enhance the bus service, together with enhanced conditions for cycling and walking complement the necessary introduction of a new rapid transit system. In managing the network, these elements are also essential. Traffic restraint in the form of road user charging cannot be introduced before significant improvements to public transport and other alternatives to the car are in place. Together with Rapid Transit , evaluation of the strategy has shown that greatly improved bus services, including Park & Ride, better promotion and information and better facilities for walking and cycling will achieve these essential improvements to the transport infrastructure of the city.

19.4.2. Key Transport Policies

The long-term strategy is concerned with lessening the dependence on the car by developing and promoting alternatives, particularly through high quality public transport improvements, and complementary restraint measures. This will be achieved in partnership with other stakeholders to ensure that the economic vitality and sustainability of the city is enhanced. These issues involve widening travel opportunities, strategic network management and influencing land use and economic development.

In seeking to widen the transport choice, the Transport Plan attempts to foster and facilitate the use of the full range of methods of transport:

- Buses: priority bus lanes, low-floor buses, automatic timetable information systems and bus stop facilities are part of the council's Bus Quality Partnership with transport providers. Other measures involve the development of an experimental network of night buses, improvement of orbital bus routes and a better and cheaper ticketing system.
- Rail: The council has joined with the other former Avon local authorities to draw up a common sub-regional rail strategy and supports the concept of a train operator's management unit centred in Bristol
- Walking: Proposals within the Transport Plan include an audit of walk routes to local shopping centres and to public transport facilities, with the overall aim of increasing walking by 10% by 2012. The city road system review will enable the definition of some pedestrian and cyclist priority routes along selected roads to local centres, and into the city centre.

- Cycling: The Council's cycling policy aims to quadruple the level of cycling in the City by 2012. The policy emphasises the need to integrate cycling as part of a wider transport strategy, including traffic restraint and speed reduction and reducing the need to travel.
- Rapid transit (tram): This is the major public transport scheme in the Strategy. It is to be delivered jointly with South Gloucestershire Council and in partnership with the private sector. Line 1 will connect the rapidly expanding communities of Bradley Stoke, Filton and the large employment areas of the North Fringe, to the city centre via Bristol Parkway and Temple Meads stations. It has emerged as the top priority from consultation and several local polls. Rapid Transit is essential to enable targets for reducing travel demand by car, and the resulting congestion and pollution, to be met.
- Park and Ride: Park & Ride will be pursued for all major corridors, associated with bus, rapid transit (modern trams) or rail services. Most potential sites lie outside the city boundary and will rely on inter-authority co-operation.

In managing strategic networks, the plan proposes a system of transport user priorities and road-space reallocation, that puts the needs of pedestrians, cyclists, public transport users and disabled travellers at the top, and at the same time takes account of the needs of servicing access. Key measures are:

- Urban Traffic Management and Control (UTMC): Introduced to Bristol in 1992, the Urban Traffic Control (UTC) system co-ordinates the traffic signals in the city centre by computer. The plan will extend UTC to some of the main radial roads and upgrade to UTMC to embrace bus priority and air quality monitoring.
- Road User Charging: the Council is considering the introduction of road user charging that will allow a local authority to charge for particular roads, on the condition that the money is then spent on improving the city's transport. Proposed is an electronic cordon with 14 entry gates only charging vehicles on inbound journeys in the morning peak (see fig. x). Working in partnership with the key stakeholders, including the public, the road user charging scheme is supported provided alternatives are in place.
- Parking strategy: The Transport Plan parking strategy seeks to foster a pricing regime to enable good availability of short-stay parking, whilst discouraging commuter car journeys to the city centre.
- Community neighbourhoods: A number of existing and proposed council initiatives are helping local residents regain a fair share of their streets. These include the Safer Routes to School, the accident remedial programme, speed reduction initiatives including 20mph zones, parking control and Home Zones (residential areas or neighbourhood centres where pedestrians have greater priority on the roads).

The land use policies are derived from strategic plans agreed at regional, sub-regional (the authorities in the former Avon area) and city level. The Local Transport Plan seeks to further promote the local economy and encourage land use patterns, which work towards reducing car dependency.

- Regeneration initiatives: Some parts of the city have relatively low car-ownership and are not always well served by other transport options. Assistance for these areas is essential to meet the city council's objectives of social inclusion. associated forms of social exclusion. Particular problems are remoteness from new employment centres, and insufficient accessibility to attract new employment. The council recognises the need to improve the connections of south Bristol with the motorway network, and gives high priority to extending the rapid transit network. Orbital and express buses will also be examined, and the cycle network further developed. A local transport forum is being established.

Bristol City centre: An extensive programme of traffic reduction in the city centre has been developed. Its aim is to give the area a safer and more relaxed atmosphere in which pedestrians can move easily and business and tourism can thrive.

SECTION 3

INTERVIEW IN THE U.S.

20. INTERVIEWS IN THE UNITED STATES

20.1. Background to the interviews

Mike Batty (MB) began by setting the context, defining the SCATTER project and explaining how applied research financed by the EU under their Framework Programmes was usually conducted by a series of partners drawn from different member states. The notion of using research as a vehicle to integrate the community and to develop comparability in policy was something that needed explanation to an American audience. Moreover the different development patterns of European cities in contrast to those in North America was also noted at the onset of the seminar. The division of the SCATTER research programme into work packages and staged deliverables of with this interview part of work package WP4, was also presented.

20.2. Best Practice: Successful Instruments to Contain Urban Sprawl

We began by talking about best practice, that is successful examples of containing suburban sprawl and we naturally turned to the example of Portland, Oregon for which MB explained that we had already a case study based on interviews. Reid Ewing (RW) confirmed that he thought that Portland was a classic example of best practice in that less land per capita had been consumed there than any other US city of comparable size, as a result of density targets which had led to average densities some 40 percent less than the average US city. Moreover the downtown had not decanted its activity in the manner of other places and it was still a vital part of the city's infrastructure. But the downside of all this was that housing in Portland was no longer affordable, it is a city for the relatively well off, all as a result of control of land supply. In fact the urban growth boundary that had been put in place to ensure these controls was slowly but significantly being extended to provide more breathing space for the city. If the wider region is considered, then the picture changes in that sprawl begins a distance from Portland where the strict controls end and other municipalities and counties begin to exert their influence.

This introduction to the concept of the urban growth boundary is rather different from European experience where there is no such instrument per se and it is significant that it has become enshrined in US land use planning during the last 30 years. In some ways it is not very different from the edge of the 'green belt' in British planning although it is operated in a much more bottom up fashion for individual cities. Bob Burchell (BB) also introduced the example of Lexington, Kentucky which he argued is perhaps the most successful boundary and has been in existence for several decades. But he made the point that the boundary was drawn far too loosely and within Lexington, urban sprawl has taken place within the boundary. The kind of relativism which such boundaries presume is similar to the way green belts around cities are continually changed in response to emerging conditions. Reid Ewing also introduced the issue of infrastructure provision arguing that the great success of Portland was to avoid, indeed to abolish the idea of a beltway around the city and to develop a light rail system in its stead. The LUTRAC demonstration project he argued was perhaps the best example too of the development of models and techniques to assess infrastructure provision for managing urban growth and referred us to examine this project in more detail. But Bob Burchell argued that success in containing urban growth is never easy to evaluate. In Portland, he said: "… for every positive issue, there is an equality ripping negative issue".

20.3. Growth Management and Smart Growth

In a sense the success stories of containing sprawl – it was clear from our general discussion that these are relatively few – are being gradually added to the measures which constitute the idea of 'smart growth'. Smart growth is a recognition, says Burchell, that growth cannot be stopped but we need to take an intelligent approach to managing growth – Americans use

the word ‘smart’ to stress this (and we should note that the term ‘smart’ is widely used in American, not British/European English). Burchell defined smart growth as encompassing five types of issue which all have accompanying measure or policies often bundled into various types: these are:

- Control of outward development, assuming that growth is polarized in some manner around an historic core or region
- Refocusing of the centre
- Land conservation
- Reorientation of transportation and movement
- Ensuring a minimum quality of life, usually in environmental and access terms

Moreover the concept of smart growth is consistent with what Americans hold most dear – to own land free from government interference – which is enshrined in to the Constitution. Smart growth in fact is the evolution of ideas about growth management which have dominated US planning for the last 20 or more years but with much more focus on incentives to be smart about growth – to set aside areas for specific public and related uses and to preserve rural legacy areas in the context of sprawl. Moreover smart growth is loosely associated with more compact development although there is still ambiguity about this.

20.4. Scale, Growth and Sprawl

There is little doubt that as one aggregates the unit in which sprawl might be measured then the variations become less and the picture becomes more homogeneous. However Reid Ewing also argued that as metropolitan and municipal governments become more ‘fragmented’ then sprawl tends to increase inter alia. This is because there is less concerted and coordinated action and too much competition between jurisdictions. Bob Burchell essentially made the point that there is no longer any appetite in the US for regional government, thus instruments to control sprawl as this level have little teeth while the most uniform level of administration still in the US is the county. Furthermore, sprawl is being exacerbated as are issues of urban finance and taxation by the general decline in city-county annexation. Our experts referred to the Colorado in the Denver-Boulder region, Houston and Portland as three examples that we should study further with respect to the way municipal and country and city governments affect the issue of sprawl and how it can be dealt with. They referred to David Rusk’s work on annexation and sprawl in the mountain states and to Paul Lewis’s study on *Reshaping Suburbia*. Issues of leapfrogging in terms of growth and sprawl are central to the question of how fragmented administrative units are.

20.5. The Costs and Benefits of Sprawl

Bob Burchell was adamant that urban growth and involvement in the democratic process were closely related in that as administrative areas become more fragmented, there is more chance for local populations to exert their democratic rights and to become involved in the community. In fact in a way he went as far as to say that suburban and sprawl are part of the ‘American Dream’: he quoted the doyen of urban growth, Tony Downs of Brookings, as saying: “sprawl promotes democracy”. There are very clear benefits of sprawl for those who have a certain income, are single family households, probably youngish and mobile, and wish to live in low density communities where they can become involved in small governments and generally meet all their needs easily at a relatively low cost. Low taxes in remote municipalities, more school participation than average, lower services cost and provision in terms of central public services (not infrastructure), and more public safety due to lower densities and non-pressurized police services are all issues that characterize the benefits of sprawl. This as both Reid Ewing and Bob Burchell argued, implied living far from the center city. But the general cost of this is a degree of subsidization by those who do not live in sprawling suburbs. This is a tricky argument for as any one knows who has tried to track the impacts of direct and indirect costs and subsidies and benefits, the chain continues

indefinitely, becoming circular with no beginning and end unless terminated in space and time.

Counter arguments to sprawl were then discussed, with a focus on the right to own land, the freedom to choose, and the need for self-governance. The notion of sprawl being efficient in producing the most flexible form of urban development was also noted but there does not appear to be any general consensus or even good scientific work on this argument as yet although there should/could be. Bob Burchell raised the issue of sprawl being for the rich while the central city and inner suburbs were now for the poor but also indicated that the baby boomers had largely driven the path to sprawl and in an era when the population begins to age, then there is likely to be less favorable conditions for the intensification of sprawl. In fact what BB argued was that aging and demographics would probably result in a much more heterogeneous pattern of urban development during the next 20 years as demographics and immigration together would lead to some very different forms of urban pattern. Central city living is probably back on the cards in some sense purely due to large numbers of aging but relatively wealthy people who do not want to drive and this in turn could see some small increase in mass transit. Some evidence of this is already clear in places like Old Naples in Florida and in the key examples of the new urbanism and cluster housing at places like Seaside. What BB and RW were both agreed upon was that rising costs of gasoline would not change sprawl very much as there would be dramatic substitution of large for small vehicles and the quest for fuel efficiency in vehicles had barely yet started in technological terms.

20.6. Changing Life Styles and Sprawl

All were agreed that life style change is likely to have a much greater impact on what cities will look like in the future than any technological changes in that technological changes are always adapted in terms of life style change. For example the shift to smaller and more fuel efficient vehicles would be forced by the need to keep travel costs the same or even to lower these as a percentage of income and this would in turn be forced on manufacturers and technologists through the market place. RW identified several issues that are already being incorporated in emerging lifestyles which relate to housing location:

- The preference for smaller places in terms of residential living, both in terms of lot size as well as community size.
- The move towards fitter lifestyles where there is a recognition that walking is more important that it has been. This is partly a function of medical awareness but also related to aging.
- The need to building more robust communities, again due to aging but also due to a recognition that sprawl leads to a loss of community in some, not all instances.
- Greater opportunities and wealth amongst the young leading to a preference for urban living in denser areas.

However countervailing trends which tend to reinforce sprawl involve

- The need for enhanced security which appears to be easier to achieve in the suburbs and in low density areas.
- Better schools which tend to be the result of collecting children from low density suburbs over a wide area.
- The need for secure and livable environments in which to raise young children which seem inconsistent currently with most urban living.
- The long standing quest for residential homogeneity rather than ethnic mix.
- The need to minimize local taxes in terms of the space required.

It was also clear that in the history of urban development in the last century in the US, it was in the 1980s that sprawl really became significant, after the 1974 oil crisis, when vehicles

become larger, highway building continued in the suburbs and the baby boomers began to dominate the economy. In this era, home ownership was dramatically extended .

20.7. Fiscal Measures

RW argued that in many cases sprawl was exacerbated by public policies in that the evidence seemed to show that urban growth boundaries were of limited use in that development could easily fragment and leapfrog such boundaries. The notion of fiscal measures to contain sprawl was also discussed. In particular impact fees charged by a developer on development such as charging by the lane miles produced when land is developed were also seen as significant. However such fees were often passed on to the consumer of housing which out of 18000 or so jurisdictions with the power to charge such fees in the US, only 500 actually operated such instruments often with mixed results. What become very clear from our interview was that the SCATTER project requires a more detailed examination of these fiscal measures and their relative importance. All this interview managed to do was to identify their importance and their feasibility and ease or difficulties of implementation while at the same time, indicating that there was a wealth of literature in America which needs to be synthesized. There is a substantial amount of case law that is relevant to this area.

20.8. Current Policies: The Future

Both BB and RW agreed that there was a new sense of policy development in this area with particular emphasis on the idea of smart growth. Conservation was a key issue here and this is something that we have not spent much time on in SCATTER. The idea of conserving large areas of open land – agricultural yes, but also resources based such a forest and wetlands – these are key issues in the quest to limit urban sprawl in American. Moreover better coordination of land use and transportation as in the Portland case study is also a key issue which has been recognized.

One issue which is of great importance if the extend to which sprawl varies regionally and demographically in terms of different places and people. What is happening in the south and west of America is very different from the north and east while what is happening in cities of different sizes also changes the picture of sprawl. It is clear that sprawl is not a linear phenomena in terms of city size for small cities tend to be able to contain it and deal with it more appropriately than big cities. These are impressionistic conclusions which require a clearer basis in an analysis, and in conclusion, the US experts argued that what we need to do is get a better understanding of sprawl is to unpack the analysis to different cities and different social groups, thus concentrating on the diversity of sprawl relative to other forms of development.

What was clear from this interview and from other parts of work package 4 which deal with the US experience is that there is much more concern on the diversity of planning issues ranging from conservation to environmental quality, from aging and demographics to fiscal measures, and from organisation and administrative arrangements to case study law in the US approach to the study of sprawl than is featured in the SCATTER project. This is partly a function of the fact that we did not set out to find comparable work to SCATTER (which does exist within the US literature and case studies) but simply wished to reinforce, through this interview, our impressions of the current range of work in sprawl in America.

20.9. Literature

We have a substantial amount of literature which comes from this review and interview and we will document this as part of the overall work package in its final form. The main references which refer to the issues discussed in the interviews are:

Belzer, D. and Autler, G. 2002. *Transit oriented development: Moving from rhetoric to reality,* Brookings Institution Center on Urban and Metropolitan Policy, Washington, DC.

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