SUSTAINABLE URBAN STRUCTURE

Aija Staffans, Marketta Kyttä, Tiina Merikoski (eds.)

SUSTAINABLE DEVELOPMENT TIMELINE

"DEPLETION OF NATURAL RESOURCES"	"ECO-CATASTROPHE"	"GREENHOUSE EFFECT"	"POPULATION EXPLOSION"	"CLIMATE CHANGE"	"CLEAN WATER"
1960	**1970**	**1980**	**1990**	**2000**	**2010**
BEGINNINGS OF DEBATE ENVIRONMENTAL ORGANISATIONS EMERGE	1972: UNEP FOUNDING OF ENVIRONMENTAL STUDIES DEPARTMENTS	1985: HOLE DISCOVERED IN THE OZONE LAYER 1987: BURNDTLAND COMMISSION'S REPORT 1987: THE SINGLE EUROPEAN ACT INTO FORCE	1992: RIO DECLARATION + AGENDA 21 1994: CAIRO CONFERENCE ON POPULATION 1997: AMSTERDAM TREATY 1997: KYOTO PROTOCOL	2000: UN MILLENIUM DECLARATION + LISBON 2001: GOTHERBURG 2002: JOHANNESBURG 2006: PROGRAMME FOR THE SUSTAINABLE DEVELOPMENT OF THE EU 2007: BALI SUMMIT	
CONCERN FOR THE IMPACT OF ENVIRONMENTAL CHANGES ON THE CONDITIONS OF GROWTH	A CONFLICT BETWEEN THE RICH NORTH AND THE POOR SOUTH: WHO ARE THE WORST POLLUTERS?	AWAKENING TO THE GLOBAL SCOPE OF ENVIRONMENTAL ISSUES: FROM DICHOTOMIES TO CONCEPTUAL FRAMEWORKS BASED ON THE COMMON GOOD	THE GOALS OF SUSTAINABLE DEVELOPMENT INCORPORATE MORE ELEMENTS OF SOCIAL JUSTICE	ADDRESSING LIFESTYLE CHOICES AS A MEANS TO PROMOTE SUSTAINABLE DEVELOPMENT	ADOPTING A SUSTAINABLE LIFESTYLE: VOLUNTARY OR SANCTION DRIVEN?

The illustration above represents the history of political environmental awareness. Catchwords refer to the central topics in past decades, followed by some of the pivotal events which have taken place on the world scene. The timeline sums up the essential content of how sustainable development has been understood in each decade. Concern for the impact of environmental change on the development of humanity and economic growth was ushered into the arena of public debate in the 1950s and 60s by a few thought-provoking books. Many environmental organisations were founded, among them the Club of Rome, Friends of the Earth and Greenpeace. The key issue was concern for the depletion of natural resources.

In the 1970s the discussion around sustainable development was marked by a dichotomy between the poor south and the rich north. Interrelation between population and the state of the environment was recognised in 1972, when the UN organised the first international conference to discuss the environmental effects of human actions. The conference gave rise to the United Nations Environment Programme (UNEP). The following year the EEC drew up an environmental programme as well. Ecocatastrophes were commonly discussed in public forums.

The global nature of environmental problems was realised in the 1980s. In 1985 a hole was discovered in the ozone layer. The greenhouse effect became a talking point. The Brundtland Report outlined the first global solutions to environmental problems. The report also popularised the term "sustainable development". The same year the Single European Act turned environmental issues into a central theme for EU policy making. With the document, principles such as "polluter pays" became widely used.

Discussion in the 1990s continued to be based on the idea of cooperation and common good that evolved in the 80s. The Maastricht Treaty saw the powers in environmental matters passed to the EU, and it was agreed in Amsterdam that the principles of sustainable development should permeate all EU operations. Population growth, human rights and equality were widely discussed. Agenda 21 regulated exploitation and conservation of forests. Kyoto Protocol laid down emission reductions for the industrial countries, cementing climate change as the main theme in the 21st century.

Apart from climate change, since the turn of the millennium sustainable development has increasingly emphasised humanity and culture. The European Union's Lisbon strategy (2000) emphasises skills, competitiveness and human well-being as a precondition of the former. The UN Millennium Declaration (2000) proclaims shared responsibility and universal human rights. At the Gothenburg Summit (2001) agreement was reached on slowing down climate change, increasing the use of clean energy, preventing health risks, responsible use of natural resources and improving transportation systems and land use. These themes form the framework for the sustainable development programmes in the EU and consequently, in Finland (2006). In its Human Security Report (2006), the UN formulated safety much in the way socially sustainable development is defined.

Faced with a global threat, the problem centres on the individual whose desire and reason conflict. **It is thought that the key challenge for sustainable development at the moment is guiding individual choice in a more sustainable direction**, either by voluntary means or by imposing sanctions. In the latest UN reports (Human Development Report 2007/2008), the social impact of climate change and global equality are key issues. Well-being and safety gain an added significance in a world where uncertainty is growing. As natural conditions keep changing, satisfying basic human needs, such as a reliable water supply, may become the next main issue for sustainable development.

SEVEN DIMENSIONS
TOWARDS SUSTAINABLE URBAN STRUCTURE

URBAN PLANNING

ECOLOGICAL: CITIES AS PART OF NATURAL ENVIRONMENT

MOBILITY AND TRANSPORT

URBAN SPACE AND ARCHITECTURE

LOCAL GOVERNANCE AND LEADERSHIP

PARTICIPATION AND INTERACTION

SOCIAL: HEALTH AND WELL-BEING

In this study, **urban structure** has been interpreted and approached as a broad concept that comprises both built environments (buildings, infrastructure) as well as human activities and social structures. In terms of scale, the examination of the urban structure extends from the regional level to cover single blocks and yards.

In this presentation we use **sustainability** to refer to the ecological, social and economic sustainability of the urban structure.
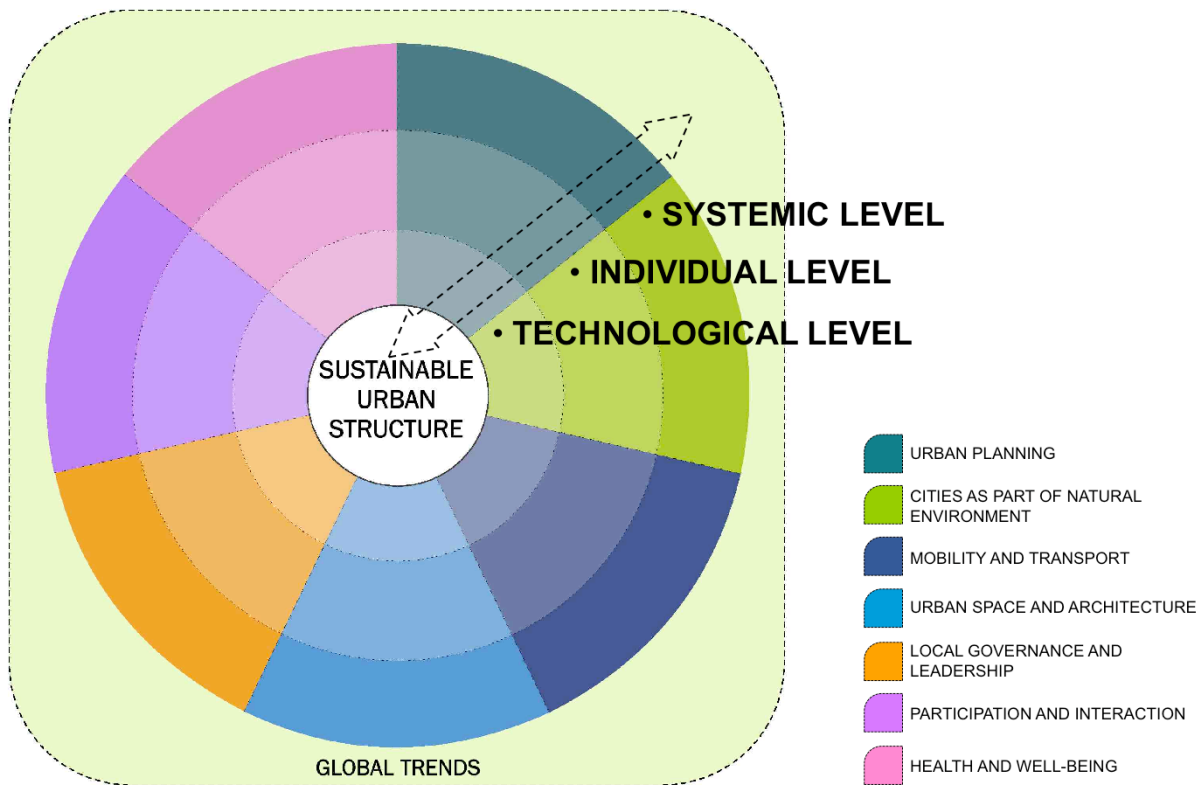
Regarding built environment, urban structure is controlled through *urban and regional planning* and other management systems for construction that are used in directing the development towards set targets. Land use management creates the core of urban planning with city planning - a lengthy process which establishes how areas are built. In addition to urban planning, the presentation brings forward the questions of *mobility and transport* as well. The theme has not been explored extensively, but its inclusion reminds of the close interaction between land use and mobility.

Based on ecological requirements, *adequacy of natural resources* (renewable energy, water, air, food) must be a key factor for sustainable urban structure. But what kind of urban structure is most efficient with respect to the utilisation of natural resources? As for social sustainability, the basic prerequisite is *human health and well-being*; a sustainable urban structure offers quality of life now and in the future. The scope of this study excludes the third requirement of sustainability, economic efficiency. This would have further complicated the work and added to the material under review.

The key actor singled out will be cities, which play an increasingly important role in the climate change mitigation as global urbanisation progresses. The political-administrative practices and structures of cities are vital for the aim of achieving sustainability. However, the cities cannot achieve results alone, and diverse partnerships with companies, NGOs, private citizens and the scientific community continue to increase in importance. For these reasons, the presentation includes sections on *local governance and leadership* as well as on *participation and interaction*.

The presentation has been compiled to serve **the Sustainable Communities programme by TEKES (Finnish Funding Agency for Technology and Innovation)**. The work was done as a collaboration between a multidisciplinary group of researchers, a process involving many long conversations and difficult choices.

SUSTAINABLE URBAN STRUCTURE

• SYSTEMIC LEVEL
• INDIVIDUAL LEVEL
• TECHNOLOGICAL LEVEL

SUSTAINABLE URBAN STRUCTURE

GLOBAL TRENDS

URBAN PLANNING

CITIES AS PART OF NATURAL ENVIRONMENT

MOBILITY AND TRANSPORT

URBAN SPACE AND ARCHITECTURE

LOCAL GOVERNANCE AND LEADERSHIP

PARTICIPATION AND INTERACTION

HEALTH AND WELL-BEING

ENVIRONMENT AND THE HUMAN BEING. This presentation explores urban structure as a space for interaction between societal regulation and steering. It also considers human experiences and behaviour as well as the choices made at an individual level. These two perspectives will emerge repeatedly in various parts of the presentation. Also megatrends, such as globalisation, urbanisation, advancement of technology and ageing population, steer development in particular directions.

The structure of this presentation follows the definition of sustainable urban structure as presented above - in other words, the "seven dimensions" that each have a bearing on developing urban structures towards sustainability. Each dimension has its own colour, which structures the material in the presentation and is integrated into the project logo (*illustration above*). The logo also calls to mind how multilayered the urban structure is: each dimension relates to sustainable urban structure at many different levels. Urban structure reflects the *megatrends* and the *structures and systems* prevailing in the society as well as the *choices made by people in their individual lives*. The core of productive innovation is distilled from these layers; in other words, it is *new technologies*, *planning solutions*, *organisational models* etc. that lead towards sustainable development.

The reporting method, "*power reporting*", is based on utilising the notes function of the common Power Point software. Therefore, the report can be used both as a slide show and as a written presentation supplemented with more detailed texts. The material presented is based on excerpts chosen from extensive international data sources by the group. The presentation includes references to scientific researches and policy programmes, as well as to concrete practices, plans, methods and products that we hope will inspire audiences to further develop the urban structure towards sustainability.

WHAT IS OUR VISION FOR FUTURE COMMUNITIES?

In this presentation urban planning refers to the comprehensive development of cities and regions. Its core questions include:

Where are the sustainable communities – how are they located and structured?

How big are the sustainable communities, how do they operate?
How are they built and what kind of technologies do they employ?

How is living and work organised in the sustainable communities – what is sustainable living?

How are sustainable communities planned?

How are ecology and economy combined – what is eco-efficiency?

Urban planning concentrates on land use and on planning of physical environment. It is increasingly tied to the conditions created by the restraints of natural environment and the demands of health and well-being of people. Future communities will optimise the use of the valuable natural resources, preserve the quality of life and hold the economy in balance. To achieve the challenging initiatives means multi-level integration of planning systems with other sectors and actors as well as development of new tools for the changing conditions.

Sustainable development refers to a process. Managing urban growth and regional development requires that we focus, apart from goals, on the means and processes that allow these goals to be achieved. This section looks at the urban structure and the future visions of it as well as the planning process and tools. Regarding density and quality of living environment as experienced, we will present some key results from research conducted in Finland .

WHAT KIND OF COMMUNITIES DO WE **WANT** ?

*"Carbon neutral **Newcastle** -- passionately protecting climate in the North East"*

*"**Ashton Hayes** going carbon neutral! Aiming to be England's first carbon neutral village.*

The University of Chester informs us that we have cut our emissions by 21% since we started (2006)! Well done everyone. "

*"The City of **Sydney** is committed to be carbon neutral by 2008. Our goals for the City:*

By 2008 the City will have zero net emissions, making us the first carbon neutral council in Australia.

The City is committed to reducing its emissions through energy efficiency by 20 per cent by 2012 and to use

100 per cent GreenPower."

*"**Stirling** is aiming to become the UK's first carbon neutral city"*

*"2015 er **København** med rette kendt som den af verdens hovedstæder, der har det bedste storbymiljø": Verdens bedste cykelby - Centrum for verdens klimapolitik - En grøn og blå hovedstad - En ren og sund storby"*

*"**Portland**: A Diggable City, Making Urban Agriculture a Planning Priority!"*

WHAT KIND OF CITIES DO WE HAVE IN FINLAND IN 2010? AND IN 2020? A review of the local planning objectives set by Finnish towns reveals, for instance, that concrete goals for energy efficiency and emissions are missing in planning projects. The goals are scattered under various programmes without being clearly connected to land use planning and management. The few environmental goals found in planning projects are vague.

Attitudes in regional development in Finland reflect the historical divide between urban and rural policies. In Finland terms such as organic, local and food production are associated with rural areas, although they are internationally recognised as part of urban and metropolitan policies. These attitudes slow down the attempt to establish some of the key principles of sustainable development in Finland. It is a paradoxical situation considering that by European standards the urbanisation of the country took place late, over a short period of time and many Finns are still very familiar with the agrarian traditions. The phenomenon of summer cottages becoming second homes may be a silent message from the nation to urban planners.

FUTURE CITY

★ **ADOPTING CITY**

★ **DENSELY BUILT CITY**

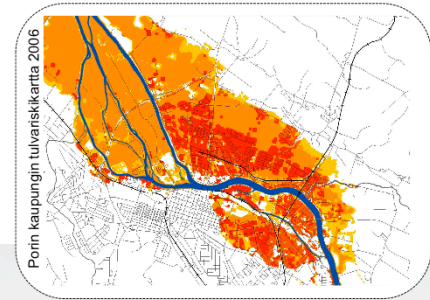★ **GREEN CITY**

★ **SERVICE CITY**

★ **CRADLE-TO-CRADLE COMMUNITY**

Porin kaupungin tulvaniskikartta 2006

Image: Masdar Development / Foster + Partners

Image: http://www.worldchanging.com/archives/008347.html

ADOPTING CITY. The central themes are preparedness for changes and protection from adverse effects, e.g. flood risk assessments. Protection programmes do not generally imply radical environmental changes; rather, they provide a checklist for the issues that must or should be taken into consideration in urban planning. The greatest natural or technological threats in Finland are posed by oil spills, nuclear disasters, blizzards, extreme temperatures, droughts, forest fires, floods, landslides and avalanches. (*Staffans, 2008*)

DENSELY BUILT CITY. The densification / defragmentation of the urban structure serves two objectives that often otherwise conflict: it slows down the process of urban spread claiming new natural areas (*environmental objective*) and increases the value of land within the existing structure (*economical objective*). This "parallelism" may explain why densification is currently the hottest topic in research on urban structures. Density increases the profitability of public transport as well. Densification can, however, also entail a fall in the quality of the living environment. A growing number of people are forced to live in noisy areas where the outdoor environment lacks important elements for well-being such as parks. The sticking point for densification is: how dense? (*Staffans, 2008*)

SERVICE CITY. With a service city it is acknowledged that consumption is natural for cities, but it must be channelled in ways that are sustainable. Instead of material goods, consumption needs to be directed at services that create experiences and well-being. A noticeable trend emerging in western cities is that amassing goods is being replaced by the acquisition of experiences. Regulating, decreasing or re-channelling consumption is a key issue although not effective enough by itself for reducing green house gases. (*Staffans, 2008*)

GREEN CITY. The urban structure in Finland is sparse and riddled with holes, which presents unique opportunities for developing a network of green cities connected by a railway infrastructure. Instead of building ever expanding centralised systems, other alternatives include solutions that employ renewable sources of energy and local treatment systems. The green city would hold a lot of cultural value for Finns. (*Staffans, 2008*)
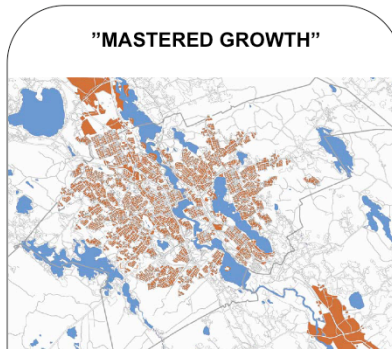
CRADLE-TO-CRADLE lifecycle development principle (*McDonough & Braungart, 2002*) is based on the idea of continuous recycling of goods (from consumer goods to buildings and communities), where the goods are given a new function as the old becomes obsolete, or the materials and parts are 100% recoverable. The principle offers an ambitious perspective to building and urban planning. Is it possible to view the existing structure as 100% renewable, and what sort of innovations does the principle require from planning and construction? (*Kuronen, 2005*)
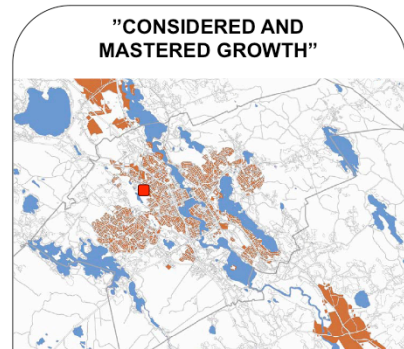
INFILLING AND DENSIFYING THE CITY
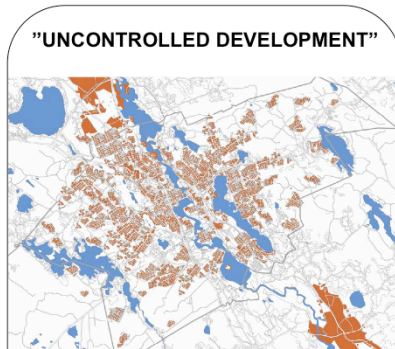
"UNCONTROLLED DEVELOPMENT"	"MASTERED GROWTH"	"CONSIDERED AND MASTERED GROWTH"
BUILT SURFACE AREA OF THE CITY DOUBLES IN 25 YEARS	CITY HAS CLEAR QUANTITATIVE AND QUALITATIVE OBJECTIVES	AMBITIOUS OBJECTIVES
PLANNING DRIVEN BY THE MARKET	PROJECTION-BASED GROWTH	VISION: "AMONG THE MOST LIVABLE CITIES"
GOVERNMENT CONTROL VERY LIMITED	SPREADING OF THE CITY IS CONTROLLED AND LAND USE PLANNING FOCUSED AT THE FRINGES	AS WELL AS CONTROL, CHOICES, RESTRICTIONS AND PROHIBITIONS
EMPHASIS ON NEW BUILDINGS AND DETACHED HOUSES; THE URBAN STRUCTURE DISINTEGRATES – AN "OIL SPILL"	MAJORITY OF NEW BUILDINGS ARE DETACHED HOUSES	EMPHASISES SERVICES AS WELL AS THE QUALITY OF HOUSING
CITY CENTRE AND SUBCENTRES WITHER	URBAN STRUCTURE THINS OUT	PROJECTS HAVE A CLEAR ORDER OF IMPORTANCE
TRANSPORT IN PASSENGER CARS	GOOD LIVING ENVIRONMENT	CHOOSING A ROBUST CITY CENTRE, RESTRICTIONS ON MALLS AND SHOPPING CENTRES
	CENTRE GROWS LESS LIVELY	STRUCTURAL GROWTH INWARDS

THE TARGET IS TO ATTAIN FUNCTIONALLY DIVERSE AND

STRUCTURALLY SOUND COMMUNITIES AND A GOOD LIVING ENVIRONMENT

(Finland's national strategy for sustainable development 2006)

Considered densification of urban structure refers to a comprehensive development of communities that relies to a large extent on the already existing structures and resources. The definition implies to infilling the urban space while aiming to improve the quality of the living environment as well (*Riipinen et al., 2003*). However, these goals are not necessarily consistent with each other.

It has traditionally been thought that more densely built urban structures are more ecological than sprawling structures. However, the sustainability of a community cannot be assessed merely based on the urban structure. The question of density has become one the key topics in the current discourse in planning (e.g. *Innovate & Green Conference and Seminars, London*).

Development strategies (*illustration*) prepared by the City of Hämeenlinna between 2003 and 2005 sums up well the current debate on the structural development of communities. A Finnish-Dutch architect was consulted for the project, and the Central European planning tradition is clearly reflected in the material. Hämeenlinna chose the strategy of "considered and mastered growth" for its future development. The challenge of this strategy is the growing area of hypermarkets on the outskirts of the structural model (*red dot in the picture*) that absorbs commercial potential from other areas, especially from the old city centre.

The latest master plan process outlined by the city of Vantaa is another example representing a strategy where growth is directed inwards. The preparatory material for the master plan of 2007 includes district specific "patchworks" that show how the entire city has been covered block by block to assess what kind of land use / building potential each area has. The structural plan includes analyses of the existing property stock, infill potential in the centre of town and in residential areas, and the expansion potential of the existing residential areas.

Infill models need to take into consideration the change in living and working preferences as well as the development of new financing mechanisms and laws. Successful infilling can significantly improve the identity of an area and positively influence its economic development.

A SERVICE CITY – A SERVICE NETWORK?

A SERVICE CITY. Considering sustainable urban structures includes the range, location and accessibility of services available in the community, as well as the size of service units. As the urban structure continues to scatter, service-oriented functions that were formerly located in city centres have been relocated to intersections of major highways. At the same time services are concentrated into larger units. How grocery stores are located or built is not determined by a hierarchical service centre paradigm, but is based on vehicle access and the store's logistical requirements. Large shopping malls disintegrate the urban structure further and therefore increase carbon emissions from traffic. Meanwhile, smaller shop units such as the smaller shopping centres in residential areas have withered.
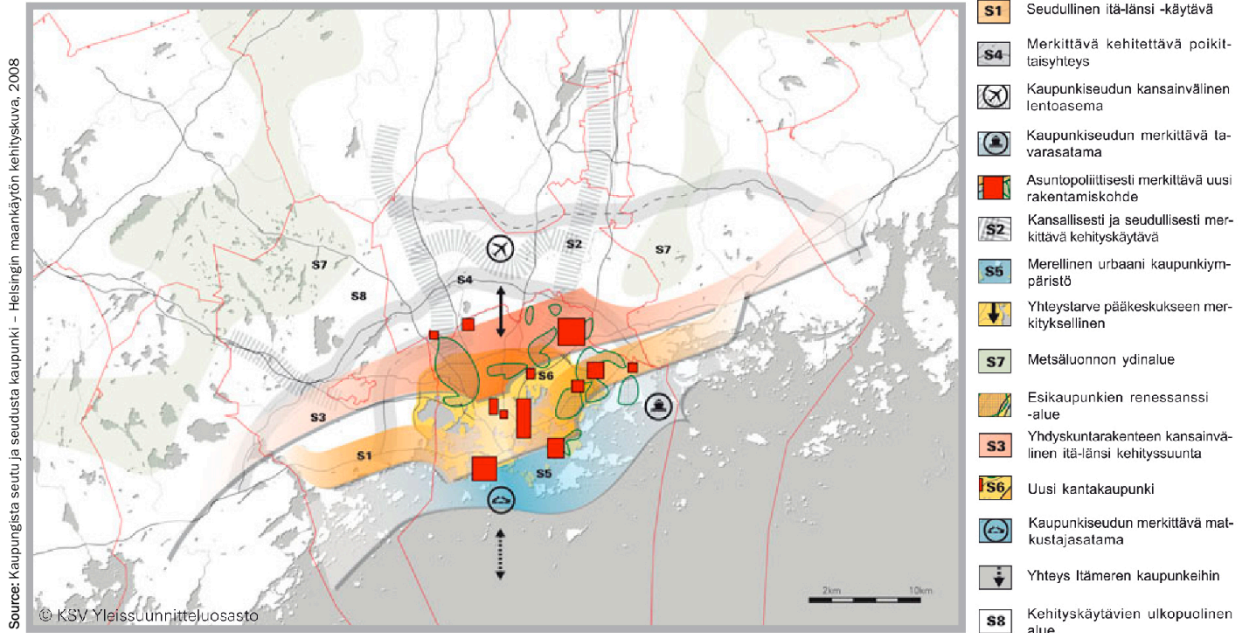
This trend is problematic both from the ecological and social perspectives. The falling number of local services means longer distances, which is time consuming, costs more and increases energy consumption. This trend has resulted in unequal shopping opportunities for different customers: as the service network scatters the number of consumers who cannot manage shopping independently rises. This becomes even a greater challenge with the ageing population. Physically handicapped or low-income consumers are particularly disadvantaged, as are consumers without cars. In the long run, the prevailing trend may not benefit actors in the trade sector either. The depopulation of shopping centres has been identified as a social problem in the United States (*New York Times 1.1.2000*).

In the service city improving local service structure is among the core issues, and the new service and distribution channels provided by the internet may offer solutions. The development of old shopping centres is one element in the continuum of urban change, and it must be approached from a variety of perspectives including business, public services, areal profile, ecology and networks. Large shopping malls have been criticised for lacking identity, and their size makes creating a profile difficult. As smaller units and as clusters of different uses, shopping centres hold a better position in becoming marketplaces for the neighbourhood, and at the same serve wider areas.

HELSINKI REGION
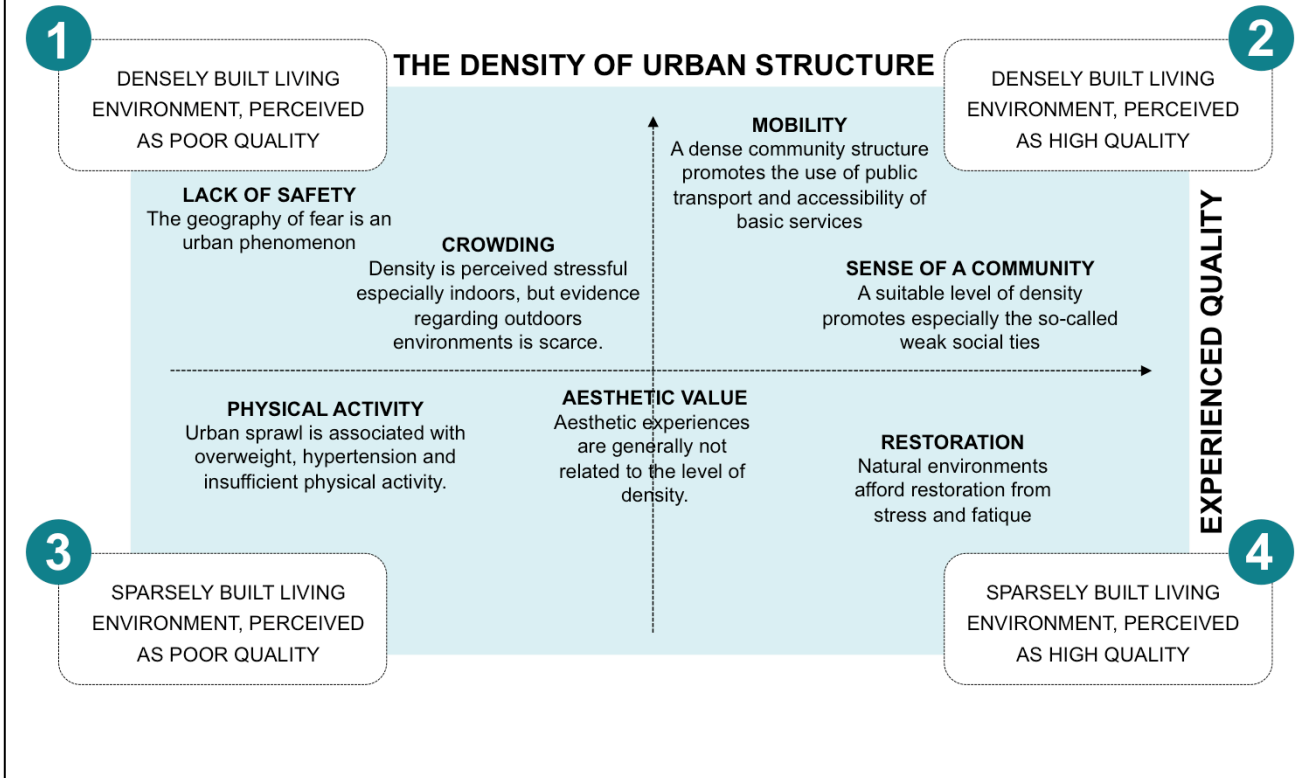
AN INTEGRATED METROPOLIS?

Metropolista yhtenäinen

Source: Kaupungista seutu ja seudusta kaupunki – Helsingin maankäytön kehityskuva, 2008

© KSV Yleissuunnitteluosasto

S1	Seudullinen itä-länsi -käytävä
S4	Merkittävä kehitettävä poikittaisyhteys
⊗	Kaupunkiseudun kansainvälinen lentoasema
⚓	Kaupunkiseudun merkittävä tavarasatama
■	Asuntopoliittisesti merkittävä uusi rakentamiskohde
S2	Kansallisesti ja seudullisesti merkittävä kehityskäytävä
S5	Merellinen urbaani kaupunkiympäristö
↓	Yhteystarve pääkeskukseen merkityksellinen
S7	Metsäluonnon ydinalue
	Esikaupunkien renessanssi -alue
S3	Yhdyskuntarakenteen kansainvälinen itä-länsi kehityssuunta
S6	Uusi kantakaupunki
⟳	Kaupunkiseudun merkittävä matkustajasatama
↕	Yhteys Itämeren kaupunkeihin
S8	Kehityskäytävien ulkopuolinen alue

GREEN HOUSE EMISSIONS AS PART OF EVALUATION FOR ALTERNATIVES IN LAND USE PLANNING AND CONSTRUCTION.
The metropolitan area produces about 10% of the country's green house emissions. Emissions per capita are extremely high by Scandinavian standards (7.1 tCO_2/person); twice as high as in Stockholm, three times as high as in Oslo and 40% higher than in Copenhagen. In 2007, the Helsinki Metropolitan Area Council (YTV) accepted a climate strategy for the metropolitan area that extends to year 2030. According to the strategy, the assessment of green house emissions should be included as a criterion in evaluating various alternatives in large-scale land use and building projects. However, there is no sign that the strategy would have put into practice in the metropolitan area so far. (*YTV, 2007*)

The planning review (*Kaavoituskatsaus*) for 2008, published by the City Planning Department in Helsinki, lists *developing areas with different identities* and *revitalising the historical centre* as two of the goals for planning in the metropolitan area. The planning review emphasises the role of an open public debate, the importance of well-being and the continued vitality of the city, but the objectives of sustainable development have not been similarly identified in the vision of the future Helsinki. Hence, how are the initiatives on sustainability included in the development of the capital? During transitional social periods, when some of the hallmarks and impacts of a sustainable community are not yet known, setting clear goals is crucial for developing strategies. How else can sustainable development be integrated as an element that permeates all levels of urban planning and building? How else can the solutions supporting sustainable communities be implemented in practice?

By European standards Helsinki is an unusually green city. Eero Nikinmaa, a professor in silviculture, is currently conducting a study on the significance of the carbon binding in trees for the greenhouse and nutrient emissions of the city. Nikinmaa's research reveals just how complex a question the sustainability and density of the urban structure is. Discussion around the densification of urban structure is currently far too vague and it lacks concrete emission and energy goals and follow-up procedures in regional planning.

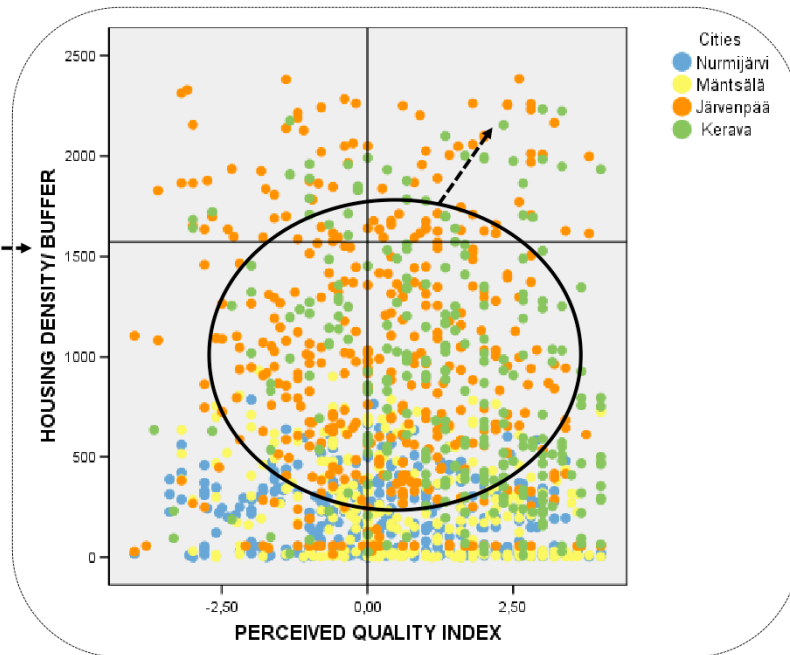# PERCEIVED QUALITY AND URBAN DENSITY

1 DENSELY BUILT LIVING ENVIRONMENT, PERCEIVED AS POOR QUALITY

2 DENSELY BUILT LIVING ENVIRONMENT, PERCEIVED AS HIGH QUALITY

THE DENSITY OF URBAN STRUCTURE

MOBILITY
A dense community structure promotes the use of public transport and accessibility of basic services

LACK OF SAFETY
The geography of fear is an urban phenomenon

CROWDING
Density is perceived stressful especially indoors, but evidence regarding outdoors environments is scarce.

SENSE OF A COMMUNITY
A suitable level of density promotes especially the so-called weak social ties

PHYSICAL ACTIVITY
Urban sprawl is associated with overweight, hypertension and insufficient physical activity.

AESTHETIC VALUE
Aesthetic experiences are generally not related to the level of density.

RESTORATION
Natural environments afford restoration from stress and fatique

EXPERIENCED QUALITY

3 SPARSELY BUILT LIVING ENVIRONMENT, PERCEIVED AS POOR QUALITY

4 SPARSELY BUILT LIVING ENVIRONMENT, PERCEIVED AS HIGH QUALITY

DEFRAGMENTING COMMUNITY VS. ENVIRONMENTAL QUALITY AS EXPERIENCED BY THE INHABITANTS. Studying the relation between densification policies and the experienced quality of the living environment is central to defragmentation policy issues. The question can be represented as a graph (*illustration*), the four fields of which stand for the four possible types of relations that can, in principle, exist between the level of density and the experienced quality of the environment. The structure of the community can be dense while the inhabitants experience the environmental quality to be poor (scenario 1). This could be the case in an inhospitable housing development with apartment blocks. In the second scenario, density and experienced quality meet (scenario 2), as, for instance, in a successfully built housing development with apartment blocks, which fulfils the quality requirements of the residents. Correspondingly, a sparsely built community can be experienced as either poor quality (scenario 3) or as meeting the requirements (scenario 4). The latter situation may prevail in many detached-house areas, most typically in traditional American suburbs consisting of detached houses, that fulfil the residents' desires of spacious houses and plots, but that as communities are often very sprawling, rely purely on car transport and are ecologically unsustainable. Naturally, in reality, the relation between building density and the experienced quality of the environment is very complex. For instance, to compensate for density in one place, space may be sought elsewhere. Compensating may also be evident in the lifestyles of the inhabitants who may actively look for an alternative to the overly dense environment, for instance during holidays.

Although dense building is mainly considered a stress factor in the research literature, the relationship between the level of community density and the experienced quality of the living environment is by no means straightforward (*Kyttä & Kahila, 2006*). The density of the urban structure relates simultaneously to many of the key quality factors in the living environment, as well as to the positive and negative effects these have for the experienced quality of the living environment. There is fairly compelling evidence to show that a dense urban structure reduces car traffic and promotes walking. A moderate level of density is related to an increased sense of community. Dense building is, however, also related to the reduced perceptions of safety and experiences of crowding. On the other hand, a sparsely built, scattered urban structure seems to have negative effects on physical health, if combined with low amounts of daily physical exercise. At the same time, the proximity to nature associated with sparse building may promote mental health as a setting for stress restoration. The aesthetic experiences of the inhabitants partly coincide with experiences of restoration, but for the most part, aesthetic experiences are not related to the level of density in the urban structure: both densely and more sparsely built environments can be experienced as aesthetic. Thus, a review of the literature reveals that the question of the relation existing between the quality of the living environment as experienced by the inhabitants and the level of density in the urban structure comes most likely down to the content of the quality factors emphasised by the inhabitants: the different quality factors stressed by each inhabitant are achieved to varying extents in various types of communities.

PERCEIVED QUALITY AND URBAN DENSITY

NURMIJÄRVI, KERAVA, MÄNTSÄLÄ AND JÄRVENPÄÄ

THE LIMIT VALUE, 20 HOMES/HA, IS THE US RECOMMENDATION FOR SUFFICIENT URBAN DENSITY FOR ORGANISING PUBLIC TRANSPORT

THE EMPIRICAL TESTING OF THE FOUR-FOLD MODEL BETWEEN PERCEIVED QUALITY AND THE LEVEL OF URBAN DENSITY. Empirical studies performed using the softGIS method in the cities of Järvenpää (*Kyttä & Kahila, 2006*), Kerava, Mäntsälä and Nurmijärvi (*Kyttä et al. 2009*) show that the relationship between the experienced quality of the living environment and the density of the community is concentrated on the lower right-hand square, i.e. on experiencing a sparsely built environment as good quality. Simultaneously, many inhabitants experience sparsely built environments as being of poor quality (lower left-hand square). The sparseness of building generally predicted that the quality of the living environment in these places was experienced as being high. Similar results have also been obtained in Spain (*Gómez-Jacinto & Hombrados-Mendieta, 2002*) and in England (*Bramley, 2007*). An exception among Finnish towns was Kerava, where there was a positive association between the density of building and the experienced quality of the environment. An analysis of the quality factors of the living environment as defined by the inhabitants reveals that the inhabitants of Kerava differ in this respect from the inhabitants of the other municipalities included in the study. Although all of the municipalities share an appreciation for peaceful homes and child-friendly environments, the residents of Kerava also stress the affordability of housing, as well as having the choice of using public transport, cycling or walking to get around. For the inhabitants of the other municipalities, the key quality factors are the sparseness of building and the peace and quiet of nature. Thus it would seem that Kerava has been successful in developing city planning in a more resident-friendly direction. One explanation is parks: the number of parks located nearby residents' homes is a strong indicator for the experienced quality of the living environment in Kerava.

Because the municipalities studied here are relatively sparsely built, we do not know what the conditions are that would allow a more densely built environment to be experienced as high quality. And is it possible use infill building to improve the experienced quality of a sparsely built environment that is currently experienced as being poor? In other words, the question is whether evidence can be found to support shifting the focus more towards the upper right-hand square in the four-field model. These are key questions for sustainable planning and development of urban communities that would also be attractive to inhabitants.

URBAN STRUCTURE – RAILWAY NETWORK!

Image: The regional plan of Häme, 2006
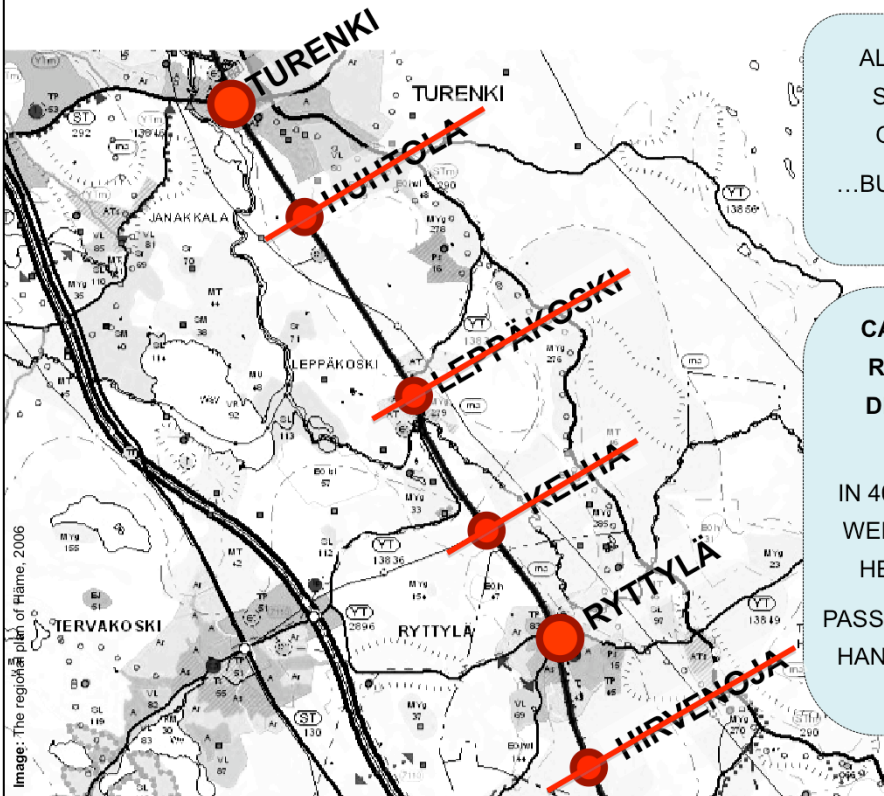
ALL AGREE THAT COMMUNITY STRUCTURE SHOULD REST ON A RAILWAY NETWORK…

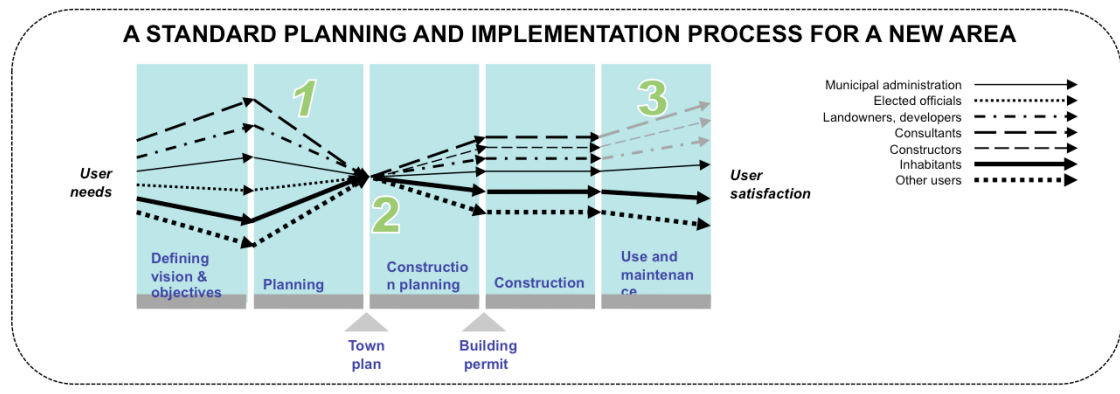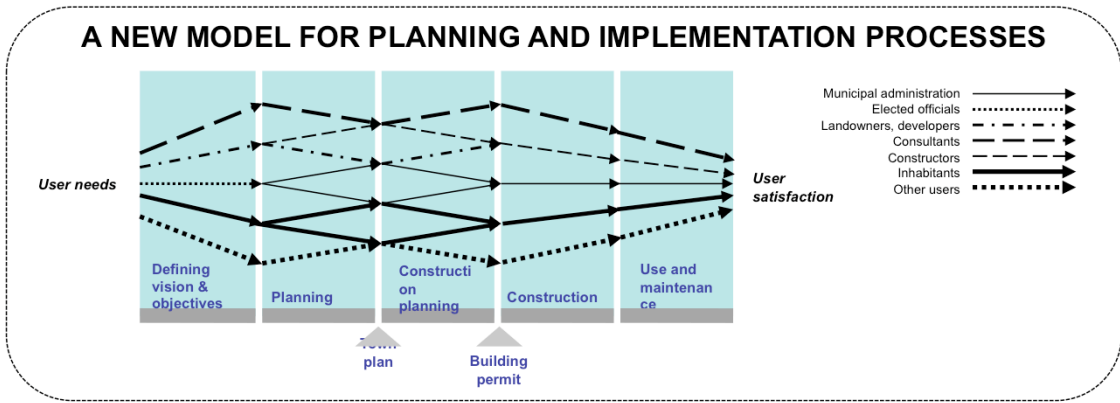…BUT DISAGREE ON JUST ABOUT EVERYTHING ELSE.

CAN WE AFFORD TO LET THE RAILWAY INFRASTRUCTURE DETERIORATE AND THE OLD STATION AREAS TO DIE?

IN 40 YEARS, 17 STATIONS/STOPS WERE CLOSED DOWN BETWEEN HELSINKI AND HÄMEENLINNA.

PASSANGER TRANSPORT BETWEEN HANKO AND HYVINKÄÄ HAS BEEN TERMINATED.

What kind of urban structure is best in terms of sustainable development? In different periods the question has been answered in many ways, such as garden cities, suburbs located in forests, and compact cities. The current key words are the defragmentation and density of the urban structure, but the opinions on how dense the structure can or must be are riddled with contradictions that go beyond national borders. Everybody agrees, however, on one thing: **LAND USE SHOULD UTILISE RAIL TRANSPORT TO MAXIMUM BENEFIT.**

Given the advantages of rail transport it is strange that the existing railway network in Finland has been allowed to fall into disrepair and the country is dotted with stations that have been closed down. The current estimation of the renovation debt for the entire existing transport infrastructure sets the amount at 1,500 million euros, with the railway network deficit accounting for about 500 million euros of the total. The number of stations and halts peaked at the beginning of 1960s (*Suomen turisti, 1964*). At the time, there were 42 stations or stops on the railway line between Helsinki and Hämeenlinna alone. Of these, 17 have been closed down. When J. V. Snellman presented his vision of the Finnish railway network in 1853, it was among the most progressive in Europe (*Finnish Railway Museum Archive*) – where is the vision for today?

The debate around dense vs. dispersed structures needs to be opened up in a way that would better accommodate the existing structures as well as special geographic and cultural characteristics. The premises in Finland are unique in many ways; we have always understood the importance of building connections between distant areas. A comprehensive railway network is a valuable inheritance from the preceding generations, and can serve as a solid foundation for building a sustainable urban structure for the future.

THE PLANNING PROCESS

A NEW MODEL FOR PLANNING AND IMPLEMENTATION PROCESSES

## A STANDARD PLANNING AND IMPLEMENTATION PROCESS FOR A NEW AREA

Source: Väyrynen, E. (2007) Suunnittelusta toteutukseen - prosessinäkökulma

Urban planning is generally represented as a hierarchical system which becomes more defined as the process moves forward. The hierarchy is built into the planning system, which defines the contents of land use in stages to direct future implementation. In practice, progress is not this rational and higher-level plans are reassessed if, for instance, the implementation of the plan looks unlikely or the focus of regional development, economic conditions etc. change.

The long process and the temporal distance between the beginning and the implementation of a plan is a problem that has been addressed in many research and development projects in recent years. Projects such as Beyond Vuores, Decomb and OPUS have addressed this issue, each from a slightly different perspective. The Vuores and OPUS projects focused on how a vision and goals were carried over from plans to implementation, whereas Decomb developed the process starting from the standpoint of a particular venture, i.e. from implementation. The illustration represents an analysis of the local planning and implementation process, based on the empirical data collected by Erja Väyrynen. The picture shows that 1) implementation is not guided by a vision, 2) there are breaks in the transmission of information and 3) the process does not extend to the operational stage.

The sustainable community will become a reality only if the entire chain (vision, goals, planning, implementation, operation and maintenance, follow-up) can be aligned. Both Suurpelto and Vuores planning projects have looked for tools that would make this alignment possible. In OPUS, this kind of a planning process is called "learning" urban planning, and there the aim has been to develop a corresponding methodology that would include everything from the vision to the follow-up on the development of the areas. In Vuores, the emphasis has been on improving cooperation between planners and the organisations carrying out the implementation.
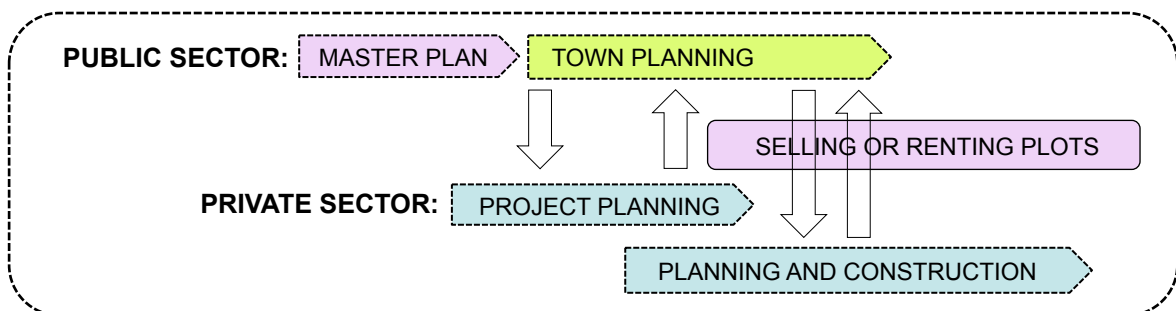
Source: Diagram is based on a modified version of a presentation by Pertti Tamminen PUUSTA, on 21.11.2006 / Vuores project

A FLEXIBLE TOWN PLAN?

Source: Melama, 2007.

HOW SPACE FOR INNOVATION AND FLEXIBILITY IS INTEGRATED INTO PLANNING? The most legally binding document of planning is the town plan. It is a commonly held view among planners that the quality of the area under planning is ensured exactly by the regulations included in the town plan. This has led to highly detailed entries and regulations. However, as the implementation becomes current, an amendment to the town plan is often needed, because the detailed regulations are no longer up to date. Overly specific town plans may present problems from the standpoint of the inhabitants as well: when the plan is being drawn up, the future users are not generally known.

FLEXIBLE TOWN PLAN. Town plans may be left open-ended in some respects, but in that case other documents must be attached to them to ensure the final outcome. The permitted building volume can be implemented gradually, for instance by using a separate block plan, which specifies a systematic way to infill the block structure of the area in accordance with the changing conditions. The status of a block plan can be reinforced by making reference to it in the regulations included in the town plan (*Melama, 2007*). The solution echoes the advise given by Pekka Vikkula, a project manager of the Suurpelto project in Espoo:

"Avoid creating a whole; make one half and leave room for the new and the changing alike."

This paradigm does not, however, gain much support in terms of planning, financing, taxation or decision making policies; a generally accepted starting point is that an area is developed "as a whole".

SELF-ORGANISING CITY. Another example of flexible planning is the notion of town planning that would be self-organising within a certain regulatory framework. Instead of the end result, a set of rules is defined to regulate development. The rules can specify, for instance, how much the utilisation rate of a plot can change, or what kind of functions the plot may be used for, given the possibilities provided by the neighbourhood. Different computer simulations have been used to model this kind of "emergent dynamic city". The purpose of the simulations has been to explore the necessary conditions of desired development and to define factors that could be left undetermined, in order to ensure the continued potential for transformation and self-organisation. The simulations can also function in concrete planning work as means of communication between parties. The planning method is being developed at EDGE, the urban research laboratory of the Tampere University of Technology.

"THE VANCOUVER MODEL". One way to enhance flexibility, especially in residential areas, is to mix high and low buildings in the same area. The paradigm has been systematically developed in Vancouver, Canada. The most typical model for a city block is a rectangular area limited by streets on all sides, in the middle of which there are two approx. 30-storey "condominium" high-rises surrounded by townhouses, which encircle the block in a chain. The low buildings create a pleasant and safe street milieu while the high-rises ensure efficiency. The outcome is a densely built urban environment that offers housing for different needs.

NEW TOOLS FOR PLANNING

HOW CAN WE BEGIN TO ENVISION THE FUTURE COMMUNITY?
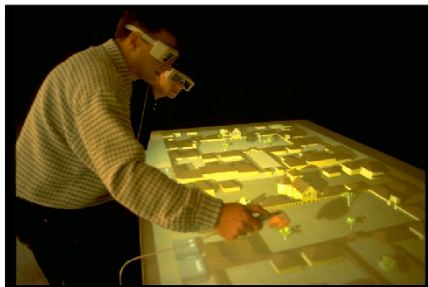
Source: Resposive workbench http://graphics.stanford.edu

STRUCTURAL MODELLING

Source: www.mobilityvip.com
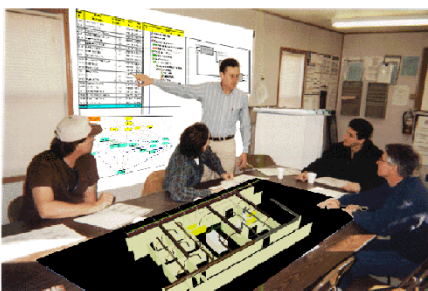
SIMULATION ENVIRONMENTS FOR PROCESSES AND AREAS

Image: Interactive workspace /Stanford
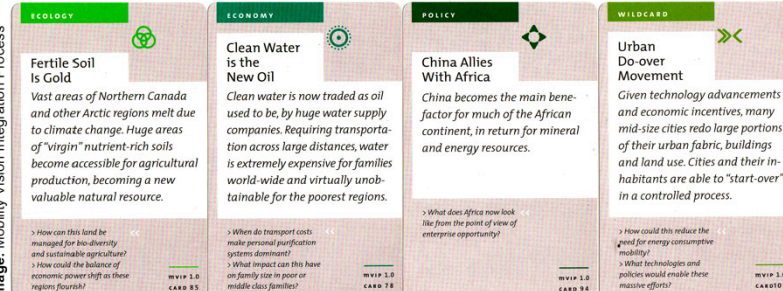
INTERACTIVE ENVIRONMENTS

Image: Mobility Vision Integration Process

ROLE AND INTEREST GAMES/ ENVISIONING THE FUTURE

HOW TO PLAN ENVIRONMENT IN A CONSTANT CHANGE? A central challenge to environmental and urban planning is how the future community and its operational environment are described (envisioned). Thus, planning tools and methods become essential for the planning process. Ideally, they enable planners to imagine and visualise new situations, and let them focus on the core questions of their work. Furthermore, the tools are increasingly required to function in cross-sector interfacing between actors, and to have the capacity to recognise and discern the divergent interests of various communities and actors. Therefore, how do we plan environments that adapt to changing conditions, and recognise the diversity of interests? What kind of tools do we use to pursue the future community we hope to build? The previous turning point for planning tools was experienced when computer-aided planning and planning programmes were introduced. Now, we are taking the next step towards tools that employ virtual models and simulation environments. The salient features of these tools are being able to recognise change and the demand for change. They also need to help us envision the future societies and the operational environments that bring together heterogeneous actors allowing them to participate.

INTEGRATION OF VISIONS INTO PLANNING PROCESSES. Traditionally planning begins with documentation and analysis of a development process within a certain timeframe, which is used as a basis for estimating the direction where the process is headed. But is this the future we are envisioning? To what extent can unforeseeable situations be integrated into this vision? An American university, the Art Center College of Design, has called for an early-phase integration of visions into planning. Creating and visualising different future scenarios can be employed as tools throughout the planning process. New innovations can also be tested in different future spaces and feedback obtained from various actors. Methods of this type have become standard procedures in sectors like industrial design, but the idea can be adopted for strategic development of communities and for urban planning as well. Based on this paradigm, the Art Center College of Design has created the Mobility Vision Integration Process (MVIP) cards as a tool for creating innovative transport solutions. The cards are used to present the planners with a randomly chosen future scenario, a planning context and a challenge that needs to be solved. The purpose of the process is to encourage planners to produce innovations rapidly and pursue continuous feedback from experts, users and other actors.

INTEGRATION OF PLANS. From the point of view of sustainable development, it is also important to be able to integrate plans from different fields and to assess their joint effects. The mash-up of different computational data or modelling emerges again and presents challenges to new planning environments.

THE CITY AS A LIVING LABORATORY

"CITIES AND URBAN NATURE CAN BE SEEN AS
LABORATORIES FOR ASSESSING THE EFFECTS OF CLIMATE CHANGE,
REACTING TO CHANGING CONDITIONS, IMPROVING
THE METHODS OF DATA COLLECTION AND FINALLY,
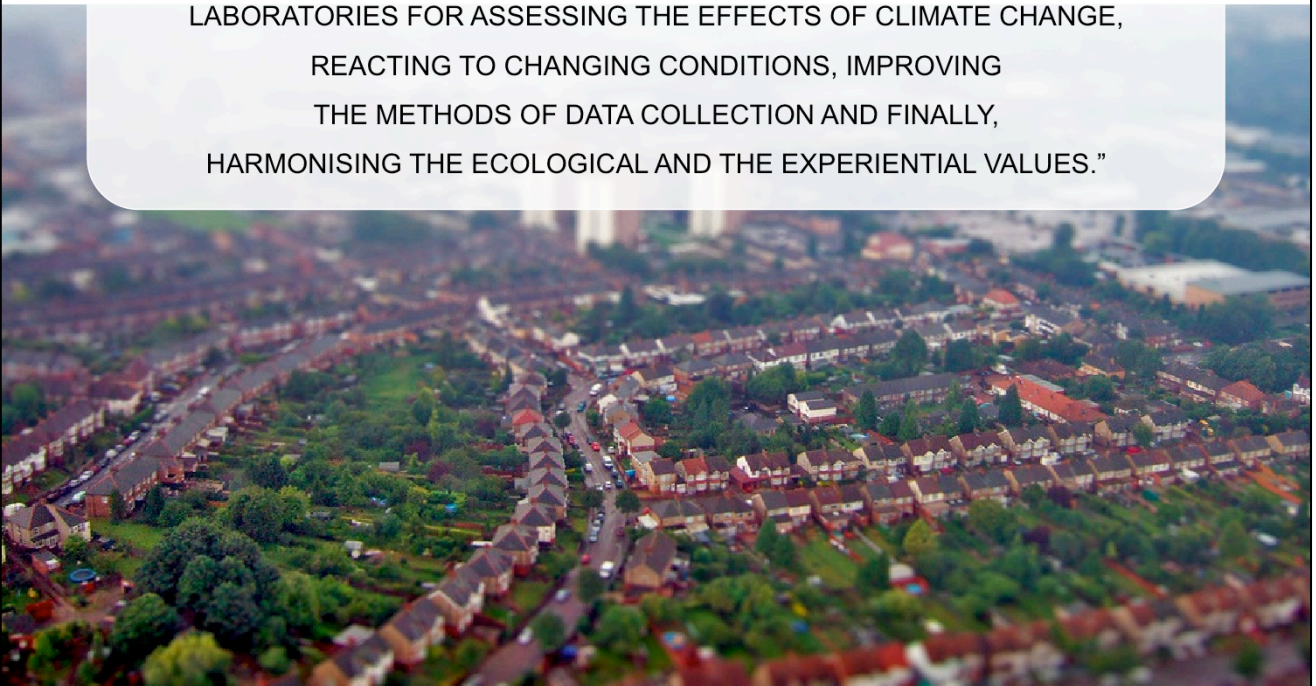HARMONISING THE ECOLOGICAL AND THE EXPERIENTIAL VALUES."

Image: http://www.flickr.com/people/71428150@N00/
Quote: Sipilä et al., 2008 (translation: AAC Noodi Oy)

WHY LIVING LABORATORIES ARE IMPORTANT? Experimental housing projects enable us to test new models and innovations in practice. At their best they also function as reference sites on the global market, thus boosting local competitiveness. Since the turn of the millennium, the readiness to design and realise new experimental areas has declined in Finland.

Finland needs demonstration projects testing sustainable solutions for housing and living environment in order to successfully compete in the international arena. It also needs to be ensured that good results become established in the planning and implementation. The previously realised demonstration projects have remained individual cases.

WHERE DO THE LIVING LABORATORIES LOCATE? Considering the structure of the Helsinki region, Eco-Viikki – an ecological housing project - is located relatively far from public transport connections and the existing, dense urban structure. Eco-Viikki is based almost entirely on new construction. Transforming existing property and infrastructure is even more challenging than creating sustainable environments from scratch. Therefore solutions that are based on modifying or complementing the existing structures are specifically needed. Where do we establish the new demonstration areas in relation to the existing structure? How do they connect to the existing transport networks? One interesting, if challenging opportunity for demonstration projects can be found in the existing railway network. What kind of eco villages could we integrate into the surroundings of existing stations?

WHAT IS THE SCALE OF A LIVING LABORATORY? Could we have demonstration projects in a context of a wider urban structure? Demonstration models are often criticised for being peripheral and offering only marginal solutions. Many of them work in small scale eco villages but are difficult to modify for the needs of growing centres, where the demand for these innovations is higher and the operational environment more challenging.

OFF-GRID. Off-grid (or non-grid) communities are based on local cycles in waste management, energy systems and water management. With self-sufficiency off-grid communities aim at low emissions, reduced waste and minimised environmental impacts. The existing urban structure in Finland is scattered. Could a regional network of small off-grid communities based on local and self-sufficient systems be tested in Finland?

ECO-VIIKKI

PLANNING PRINCIPLES & PROCESS ✚ ECOLOGICAL ARCHITECTURE & CONSTRUCTION

Source: City of Helsinki, Ministry of the Environment/ Eco-Viikki – Aims, Implementation and Results

ECO-VIIKKI, HELSINKI. "Eco-Viikki" is the first urban ecological housing project in Finland located in the Viikki district of Helsinki, and it is built for the most part between 2000 and 2003. Ecology has been interpreted in a broad sense in the project. It means that ecological aims have been applied both to building technologies and to how the site relates to the natural environment. The planning process of Viikki incorporated new features that proved effective for achieving the goals:

- in addition to planners and designers the teams participating in the architecture competition for the area were required to include organisations responsible for implementing the plan
- planning was subordinated to a set of ecological criteria, based on a point system
- lot allocation conditions were pegged to the criteria, and the organisations involved in implementation committed to follow-up
- implementation of the criteria was monitored by a specific team appointed for Viikki site

In the Viikki master plan built environment and "green fingers" alternate and all buildings in the area demonstrate sustainable principles. One solution tested in Eco-Viikki is a local solar heating system that includes 380 homes. Solar power is used to produce approx. 15% of the energy needed to heat up water and approx. 6 % of the annual heating required by the buildings. It was hoped that energy consumption in the area would be reduced to 50% compared to standard building solutions. Follow-up revealed that although in many terms Viikki turned out as a successful process, many of the user and maintenance organisations did not quite achieve all the ecological goals (*Väyrynen, 2007*).

Living in Viikki has normalised, and the area offers a unique opportunity to study how ecological housing works in practice. Some of the most interesting questions include:

Who lives in Viikki and why?

To what extent does the area require its inhabitants to change their everyday habits?

What are the lessons to be learnt? What kind of follow-up is needed?

How should the area be developed further?

How can the knowledge and the experience gained be applied in new projects?

Why have there been no other ecological demonstration projects of the same scale?

RIONE RINASCIMENTO, ROME

GEOTHERMAL ENERGY ✛ MICROCLIMATE ✛ LOCAL COMMUNITY ✛ BIODIVERSITY

Rione Rinascimento
Parco Talenti a Roma

RIONE
RINASCIMENTO
Parco Talenti
Roma

I trasporti

DI SANT'ACHILLE

Source: http://www.cnbceb.com/Articles/2007/March/13/empire-rebuilding.aspx and http://www.mezzaroma.it/

RIONE RINASCIMENTO, ROME. Rione Rinasciment (Rome, Italy) is an urban development project that covers 600 000m³ in all. The area will comprise 1 100 new homes, public services, commercial enterprises and several parks that are all located in a large area north-east of Rome, in an area called Talenti Park. Total area to be built is approx. 65 hectares. The new area will function as a buffer zone or a filter between the surrounding urban structure and the popular Talenti Park (ca 40 hectares).

Several internationally well-known architects have been involved in the planning such as Ricardo Bofill, Mario Botta, Arata Isozaki, Manfredo Nicoletti, Paolo Portoghesi, Franco Zagari and Giuseppe Anighini.

In 2002, a major architecture competition was organised for the area, with the aim of encouraging young architects to present new ideas. The first phase in the area has been completed, and the next stages are currently being planned. Various subprojects show the process of creating a flexible body ("*urban body*"), that subtly accommodates the diverse environmental, biological-physical, climate-related and anthropological elements.

Analyses and evaluation of wind direction and strength, radiation of the sun, temperature, relative humidity, biophysical elements (such as vegetation), geological topography and geothermal characteristics of the earth were given emphasis in planning the site. A power station with sustainable solutions can eliminate about 87% of its carbon emissions compared to a power station using standard operation processes. Rione Rinascimento is one of the first sites to employ renewable energy from the hot springs found around Rome.

One of the goals has been enhancing local identity and integration with cultural tradition. The building material is brick, which is traditional in Rome. The area contains large open spaces that allow people to enjoy the pleasant climate. The heart of the area is Talenti Park. It has been planned in terms of biodiversity by carefully choosing species and by paying attention to the existing infrastructure like paths, fences and lighting. The residents who already live in the area have been invited to participate in the planning. The end result provides a living environment for humans as well as the local flora and fauna.

HAMMARBY SJÖSTADT

TECHNOLOGY-BASED SOLUTIONS FOR SUSTAINABLE COMMUNITY STRUCTURE

Source: The Hammarby model, http://www.hammarbysjostad.se/
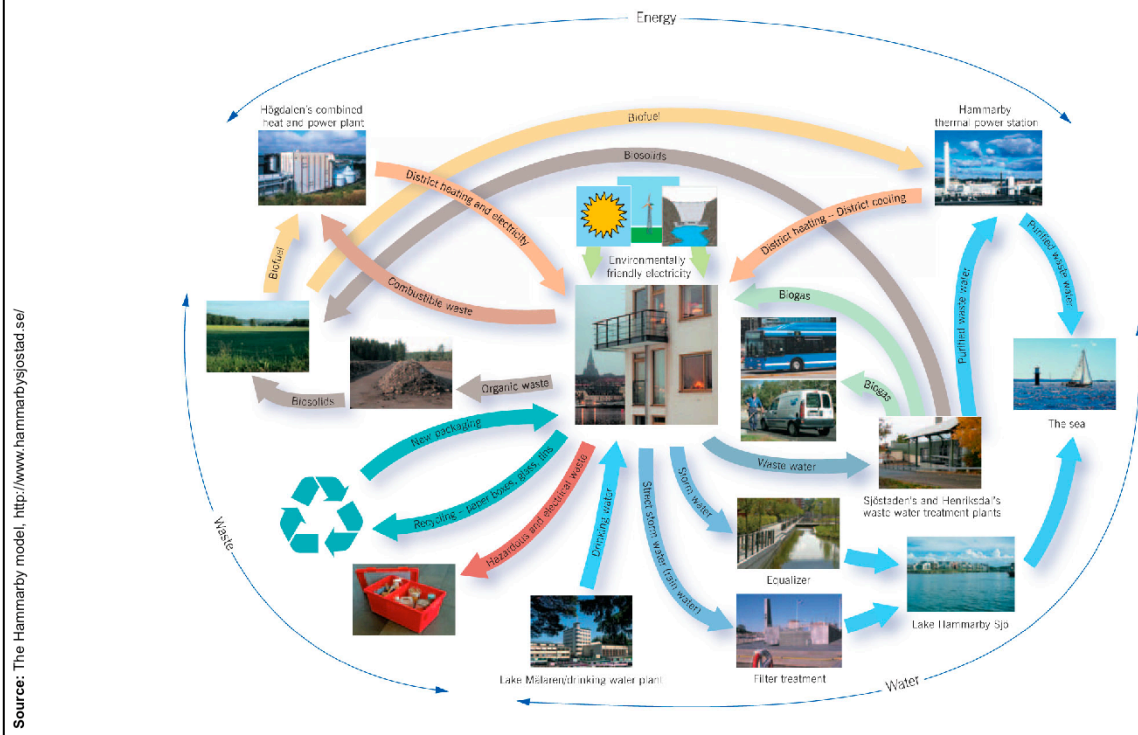
HAMMARBY SJÖSTADT, STOCKHOLM. Hammarby Sjöstad is a housing project of 25 000 inhabitants (by 2015), currently under construction outside Stockholm, Sweden. The planning and construction of the area is based on sustainable goals and technological innovations that support ecological living. Hammarby Sjöstad is also a model for land use planning that promotes healthy living environment: the district has been built on an old industrial park, which has been redeveloped into a housing environment. Setting goals and putting them into practice has required close collaboration between the public and private sectors. The City of Stockholm has set strict environmental regulations and requirements from the beginning of the planning and building processes. The area aims to achieve 50% reduction in environmental impacts compared to other new housing projects of similar size. The water and energy companies and the waste management department of the city (*Stockholm Vatten*, *Fortum*, *Stockholms Stad*) have jointly developed a so-called Hammarby model (*illustration*), which is used to ensure that the material cycles and technological solutions are organised as efficiently as possible. Instead of being independent operational units, the model unites these cycles into an interconnected entity. The Hammarby area and the model have been viewed with great interest in the global field of urban planning.
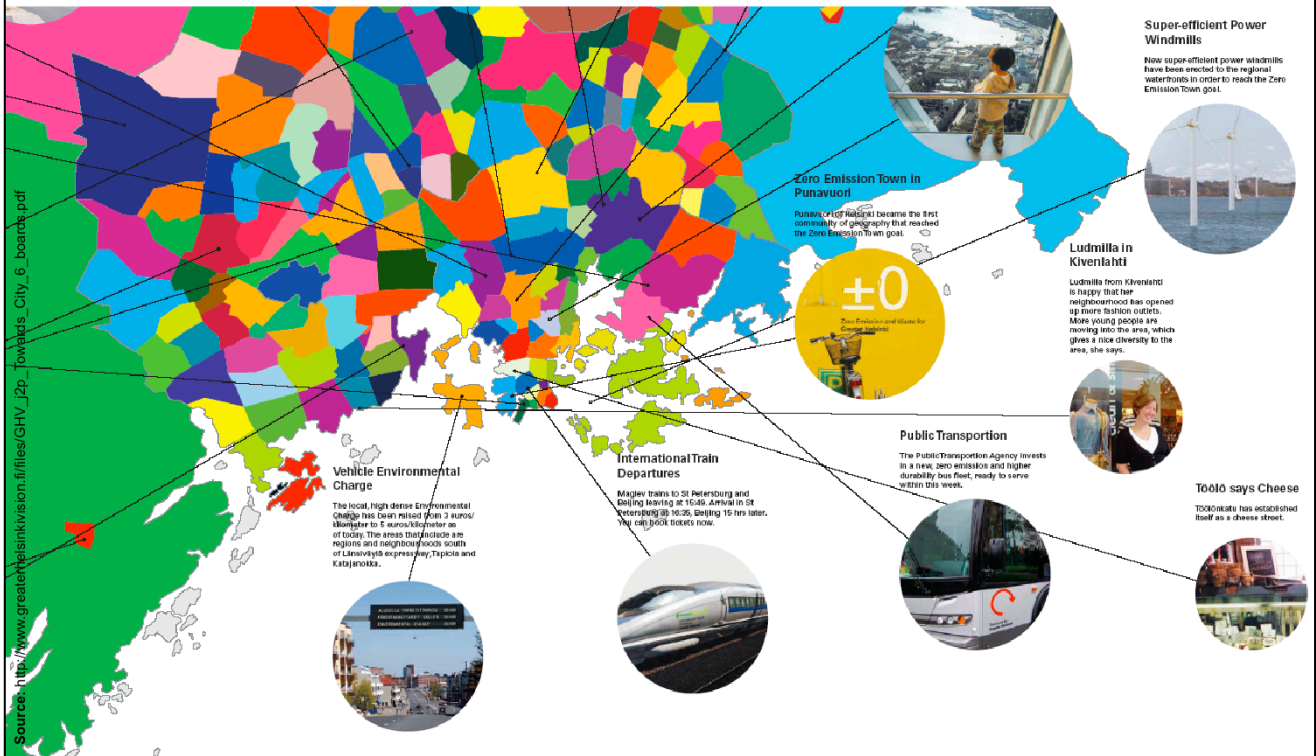
Examples of energy solutions in the area: One aim in Hammarby Sjöstad is to test different energy production and source solutions in practice. These solutions include two buildings with solar cells that collect energy for collective spaces. One residential building uses energy from the solar panels to heat water (50% of the annual total). Of the energy needed for heating in the area, 34% is derived from sewage, 47% from combustible household waste and 16% from biofuels (in 2002).

About 900 homes in Hammarby Sjöstad use biogas for cooking. The gas is produced from the residents' waste water. Replacing the traditional electrical cookers with appliances that use biogas has reduced energy consumption by 20% in these premises.

Apart from energy solutions, clear goals have been set for the models and technologies used in water management systems, as well as for waste management, organisation of transport and choice of building materials.

CITY 2.0

LOCALLY CONSTRUCTED BOTTOM-UP CITY

Super-efficient Power Windmills

New super-efficient power windmills have been erected to the regional waterfronts in order to reach the Zero Emission Town goal.

Zero Emission Town in Punavuori

Punavuori of Helsinki became the first community of geography that reached the Zero Emission Town goal.

Ludmilla in Kivenlahti

Ludmilla from Kivenlahti is happy that her neighbourhood has opened up more fashion outlets. More young people are moving into the area, which gives a nice diversity to the area, she says.

Public Transportion

The Public Transportion Agency invests in a new, zero emission and higher durability bus fleet, ready to serve within this week.

Töölö says Cheese

Töölönkatu has established itself as a cheese street.

Vehicle Environmental Charge

The local, high dense Environmental Charge has been raised from 3 euros/kilometer to 5 euros/kilometer as of today. The areas that include are regions and neighbourhoods south of Länsiväylä expressway, Tapiola and Katajanokka.

International Train Departures

Maglev trains to St Petersburg and Beijing leaving at 16:49. Arrival in St Petersburg at 16:35, Beijing 15 hrs later. You can book tickets now.

Source: http://www.greaterhelsinkivision.fi/files/GHV_J2p_Towards_City_6_boards.pdf

HOW INNOVATIVE CITIES ARE BUILT? One of the most captivating proposals presented in the Greater Helsinki Vision 2050 Competition (held in 2006-2007) was a concept called Towards City 2.0 by the Demos Helsinki collective. The proposal begins with the enormous changes that the social and cultural structures will undergo by 2050. The main changes identified are the ageing population, the pressure to change attitudes and habits due to climate change, the changes in global mobility, and the growth of self-built cities and slums [1]. Furthermore, the proposal envisions the emergence of a new kind of individualism and a diversification of the traditional bipolar form of life established between home and work. The key premise in City 2.0 is the growing need of individuals to contribute and participate much more actively in the decision making and shaping of communities. The proposal recognises this need and gives the inhabitants an opportunity to directly participate in the processes of planning and development.

City 2.0 is a model for a community where people build and modify their living environment themselves. The model is inspired by open source software development, and applications such as wikipedia which allows anyone to participate in writing and producing the content of an encyclopaedia. These self-built cities can therefore be referred to as "wikicities". (*Mokka, 2008*).

The proposal lists innovation and Nordic welfare as the strengths of the Helsinki Metropolitan Area. Although self-built communities are usually associated with poor and disenfranchised metropolitan slums, for Demos Helsinki the idea of self-building represents the greatest opportunity for the future of urban communities.

City 2.0

Me
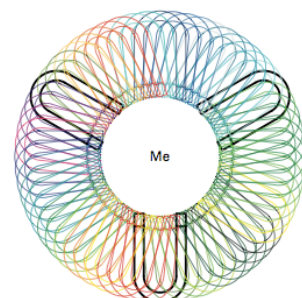
1] The UN has estimated that by 2050 the number of people living in slums will grow threefold (up to 3 000 million). http://www.unhabitat.org/content.asp?typeid=19&catid=10&cid=928

ECO CITIES

EXPORTING SUSTAINABLE COMMUNITIES?

Image: http://www.vtt.fi/proj/ecocitychina/index.jsp
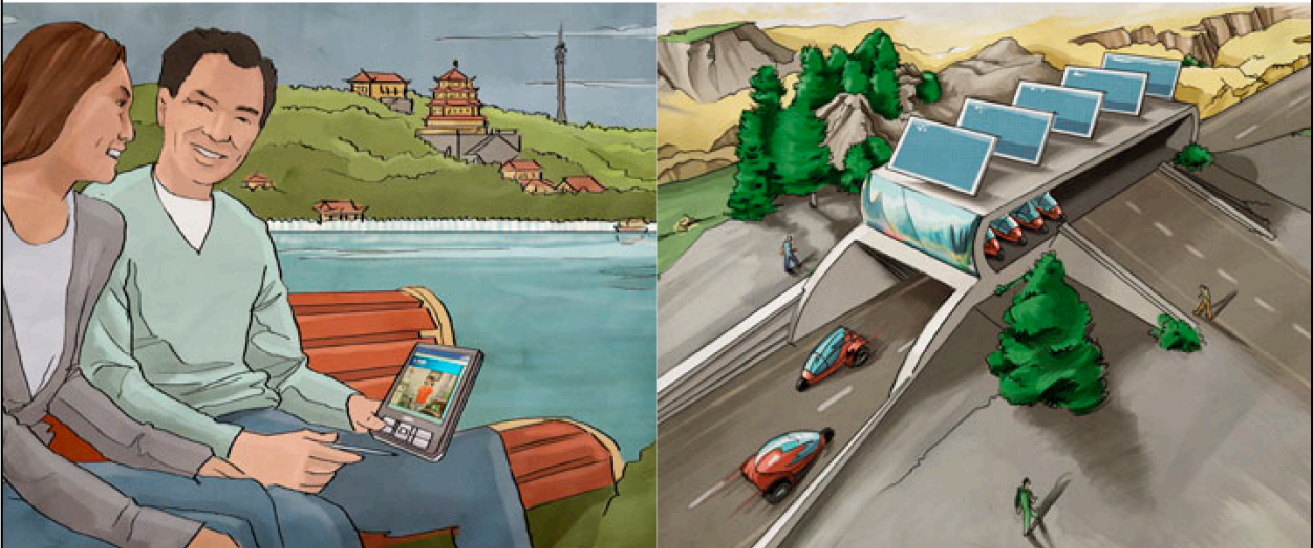
EXPORT PROJECTS OF SUSTAINABLE COMMUNITY MODELS COMBINE
EXPERTISE IN ENVIRONMENTAL TECHNOLOGY, URBAN PLANNING
AND CROSS-SECTOR COLLABORATION BETWEEN COMPANIES

Finland has extensive know-how and a long tradition as an exporter of technology. Can we apply that experience with sustainable urban concepts? Could Finland be known in the future as the exporter of sustainable urban models? Some examples already exist, such as the ecocity projects in China based on the ideas of Professor Eero Paloheimo.

Paloheimo's book, *The Way Towards a New Europe*, was translated into Chinese in 2005. In response, his ideas about eco-efficient cities were found inspiring, and VTT Technical Research Centre of Finland organised a seminar called *Live in a Future Home Today – Finnish High-Tech EcoCity* in Tianjin in the spring of 2007. The seminar doubled as a preparatory seminar for the ecocity project in Tianjin. The Tianjin project is part of a larger VTT project called *Finnish Ecocity for Future in China*. The latter is a three-phase pilot project, the first phase of which is due to be completed within three years.

The Tianjin pilot has given rise to several similar projects around China (e.g. in the Mentougou district of Beijing). The key principles of these ecocity projects are zero pollution and minimised exploitation of natural resources. The means to pursue these principles include self-sufficient systems for energy, food production and water management. Waste management and material recycle are linked with other urban functions. Another strong principle concerns traffic: instead of conventional car traffic, mobility in the cities is organised using electrical means of transport (*Kinnunen, 2008*).

"The demand for an energy-efficient and environmentally-friendly form of society is continuously increasing in China. In rapidly growing areas, such as in cities in China, there is a great demand for various solutions of sustainable development. These solutions play a significant role in construction, traffic, data communication, water resources management and decentralised energy production."

VTT, Finnish Ecocity for the Future in China

HOW TO GET MORE OUT OF LESS?

HOW DO WE FULFIL THE NEEDS OF

THE EVER URBANISING WORLD, AND ENSURE THE WELL-BEING OF A GROWING POPULATION WITH AS LITTLE ENVIRONMENTAL IMPACT AS POSSIBLE?

How do we plan and develop cities and communities in ways that maintain our impact on the environment balanced with its resources, although our needs continue to grow? How can we reduce the growing demands of consumption in our society? On the other hand, how the communities living in extreme poverty can be provided with a sufficient level of social welfare? These questions relate both to our material-physical and socio-cultural structures: how do we understand the relationship between communities and natural environment, and how do we see our personal relation with the environments that frame our daily lives? It is yet to be seen what kind of practical solutions and physical structures these relationships result in terms of sustainability.

Communities are environments in a constant change. Communities are interconnected with the also dynamic natural environment. Cultural landscapes and urban nature reflect the ongoing encounter between diverse values, goals, decisions, activities and the growth potential of nature.

What does the environment offer: to whom, where, when and how? Looking at the challenges and opportunities presented by an environment, it is crucial to understand that the perspectives of a *planner* and a *user* may vary. Is it possible to include the user perspective into planning, or to harness the user experience into a planning process? Can subjective experiences become a starting point in planning? How do we incorporate both the ecological and the experiential meanings into urban and regional planning?

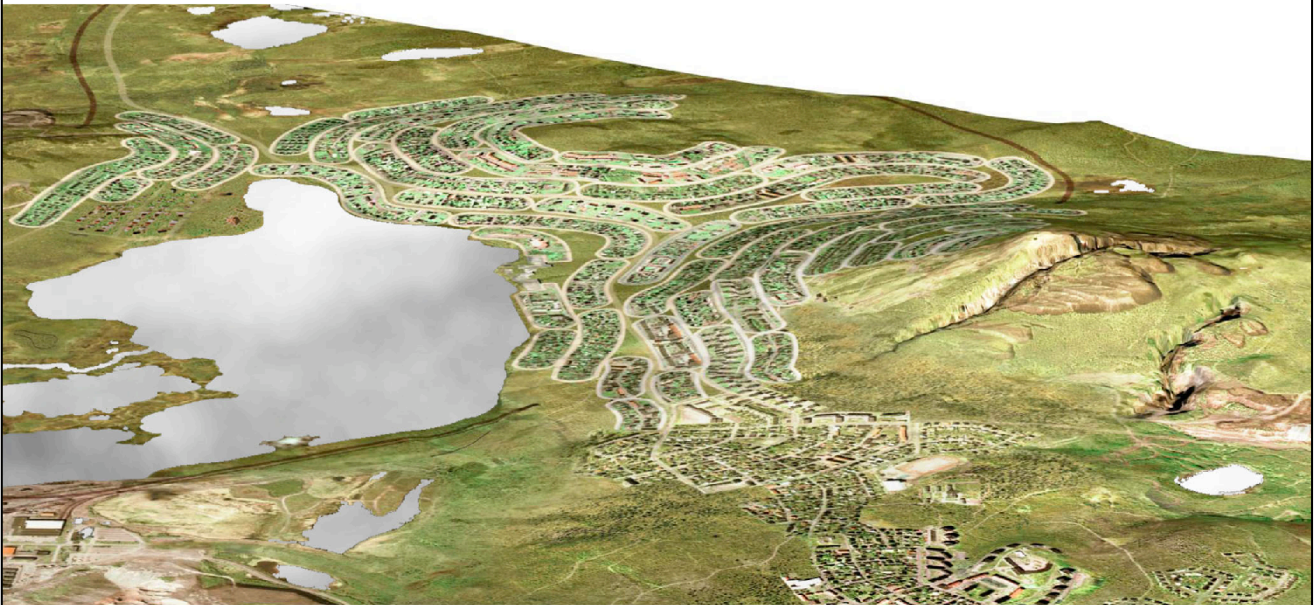# ”IN TODAY'S WORLD THE ECOLOGICAL SIGNIFICANCE OF CITIES IS LARGER THAN EVER”

Image: Wilhelmson Arkitekter – New Kiruna / Peter Thuvander, Björn Andersson
Quote: Yrjö Haila, 2008 (translation: AAC Noodi Oy)

WHAT IS THE RELATIONSHIP BETWEEN NATURAL RESOURCES AND PLANNING? Communities are part of the natural environment. Environment is in a constant change, both due to us and to reasons independent of us. With planning we shape the size and the location of natural environment in relation to the built environment. Land use planning affects also how natural resources are utilised and what kinds of activities are encouraged. Therefore, how do we divide the responsibilities on decisions concerning environment between the various actors – decision-makers, planners, service providers and businesses, inhabitants and other users? Our relationship with the environment changes and evolves continuously. We have a certain life cycle as individuals and as communities. But we also have changing hopes and needs that have an effect on how we relate to the environment. In addition to the direct benefits from natural resources and the operative aspects, the relationship with the environment is characterised by ecological, experiential and aesthetic meanings.

Urbanisation and increasing traffic are global drivers of change. They create the changing conditions to which the human kind must adapt their social and physical living environment. Finding a sustainable solution to these problems will simultaneously provide a key to slowing climate change. What makes climate change particularly problematic is its rapid progress, combined with the fact that changes in the natural environment have a direct impact on the basic human needs, such as the availability of water. Indirectly, climate change has universal effects on the global economy and demographic development.

Many services and businesses depend on natural resources or other products the nature has to offer. These include bio-energy production, domestic travel, activities related to conservation and management of the natural environment. Many of the service and business sectors that are dependent on the ecosystem are seen to offer opportunities for rural areas where the forms of livelihood are changing. According to the Finnish National Strategy on Sustainable Development, economic incentives are targeted at developing new, nature-related sources of livelihood, such as nature tourism, enterprises that process natural products as well as nature and landscape management businesses.

POTENTIAL IN FOREST MANAGEMENT. Finland has a long tradition in forest management and forest industry. Finland is among the first countries where the long term effects of unsustainable exploitation of forests was understood. Due to this realisation methods to ensure sustainable forest management and economy were developed. The economics of global forestry is manifold; the forests function as carbon sinks, have effects on ecological biodiversity, energy, food production and economy, and offer recreational opportunities of people. Forest industry is definitely one of Finland's strengths in the global markets. But what are the changes that will reshape the industry, and the knowledge, technology and methods within, to reflect the new conditions required by sustainability?

ENERGY-EFFICIENT COMMUNITIES

"WE MUST NOT BE SATISFIED WITH JUST SCRAPING THROUGH.

WE MUST GET READY FOR AN **ENERGY REVOLUTION**

THAT WILL CREATE AT LEAST AS MUCH GLOBAL TURMOIL

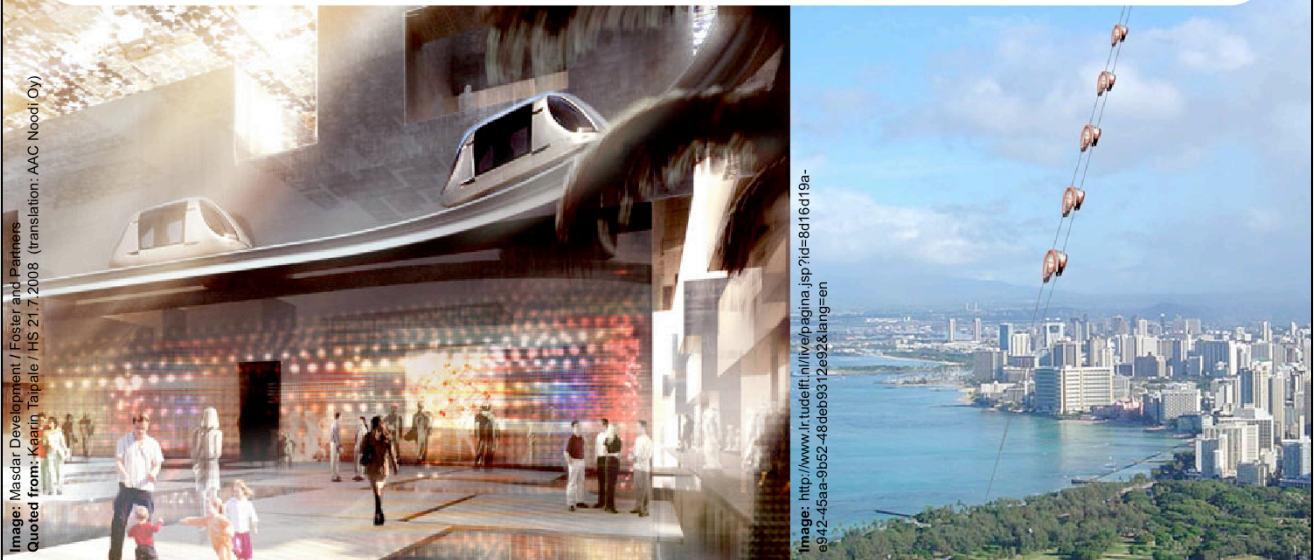AS THE INDUSTRIAL AND INFORMATION REVOLUTIONS."

Image: Masdar Development / Foster and Partners.
Quoted from: Kaarin Taipale / HS 21.7.2008 (translation: AAC Noodi Oy)

Image: http://www.lr.tudelft.nl/live/pagina.jsp?id=8d16d19a-e942-45aa-9b52-48deb9312e92&lang=en

DO WE HAVE AMBITOUS ENOUGH GOALS FOR ENERGY CONSUMPTION, PRODUCTION AND DISTRIBUTION IN FINLAND?
Why are we not aiming at 100% zero energy solutions for new buildings? The questions concerning energy sources, production and distribution interrelate with all levels of urban planning, urban structure and land use. Finally, consumer choices and behaviour have a significant role to play in the energy revolution. It has become evident that we will need both new and renewable sources of energy, as well as innovative models of production and distribution. In recent research, locally built and light systems are emerging as alternatives to heavy, centralised energy production and distribution systems. The decentralised community structure in Finland offers ideal conditions for testing these systems.

Innovations in the energy sector require testing environments. Criticism against biofuels claims that the total negative effects are so significant that they nullify the gains obtained from reduced emission levels. On the other hand, utilising waste and sewage in the production of bio-based fuels and energy has not been researched, developed or implemented to the same extent, although it is believed to offer many opportunities and interesting indirect effects. The reuse and recovery of waste such as landfill, waste water and waste from farm animals are all challenges that energy production can provide answers for.

DELFT UNIVERSITY OF TECHNOLOGY - kite energy for an entire city. The Delft University researchers have studied new opportunities for wind power. Laddermill is an innovation comprising several kites that combine elements from a conventional kite and a plane ("*kiteplanes*"), and that can move both upwards and downwards. The kites are propelled in a circular motion that can reach a height of nine kilometres (30,000 ft). This circular motion can be converted into energy (100 MW). The goal is to be able to control the kites with an automation system similar to that used in planes.

AN OIL STATE BUILDS A CARBON FREE CITY. Masdar, a new city of 50,000 people, is under construction in Abu Dhabi in the United Arab Emirates. The city is fully based on renewable energy sources, such as solar power, as well as the principles of zero carbon and zero waste. The project was started in 2007 and is scheduled to continue until 2023. The city is planned by Foster + Partners, a London-based architectural practice.

2006:
69.2 MILLION TONNES
OF WASTE IN FINLAND

40%
RECOVERED

AS MATERIAL OR ENERGY

Image: http://www.flickr.com/people/unclebumpy
Source: Waste Statistics 2006, Statistics Finland

IS "*ZERO WASTE*" POSSIBLE? Waste creates some of the greatest challenges to climate change alleviation, developing sustainable communities and encouraging new lifestyles. The global aim for "zero waste" refers not only to production processes, material innovations and a more efficient product and material recovery than we see today, but also to a revolution in attitudes and consumption, as well as to a change in the way planners, businesses and political decision-makers think. Waste must be understood broadly, and all factors contributing to the accumulation of waste must be recognised. Furthermore, we must look at the waste cycle as a whole (from collection to transport and final storage / recovery) and study all means to recycle waste before "zero waste" can be discussed and innovation can begin.

The process towards "zero waste" begins with preventing and reducing waste production. For the time being, we produce enormous amounts of waste. Current means of waste treatment include material recycling, waste modification or reprocessing, energy recovery, and a proper end treatment as the final stage.
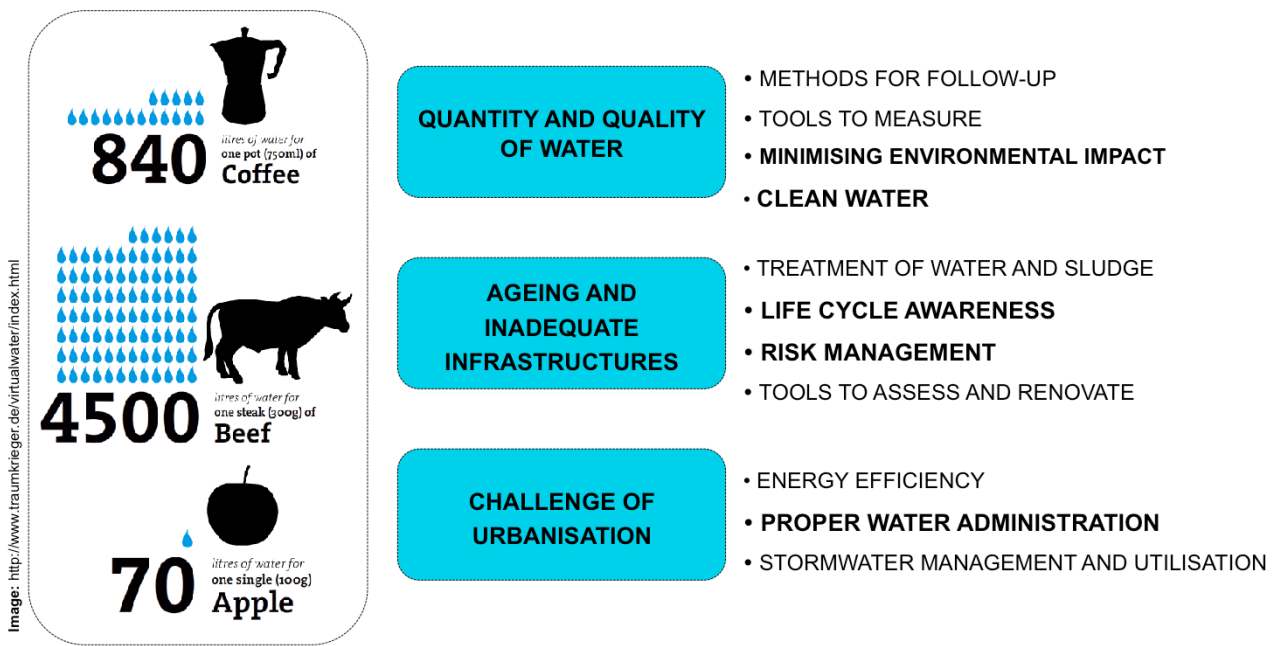
Sustainable community includes, apart from the responsibility for one's living environment and home community, an understanding of the wider context: waste does not disappear by handing the responsibility for waste treatment over to someone else. The issues facing waste and environmental management differ greatly in various parts of the world, but the environmental problems they cause extend across borders. The responsibility is global.

HOW DO WE INTEGRATE INNOVATIONS IN WASTE MANAGEMENT INTO OUR LIVING ENVIRONMENT? What kind of structures, products or solutions would help to reshape consumer behaviour and attitudes? Can waste management systems help us to better understand and perceive waste related challenges? Western consumers have learnt to pass waste over to service providers who take care of waste treatment. This makes the environmental effects of waste treatment and the challenges it presents difficult to grasp. What sort of innovations in the living environment would work as practical indicators of the positive and negative environmental effects of the waste we generate?

At what point does waste become a resource?

How does a future community look like where "waste" has become obsolete?

WILL THE WATER SUPPLIES LAST ?

Image: http://www.traumkrieger.de/virtualwater/index.html

840 litres of water for one pot (750ml) of **Coffee**

4500 litres of water for one steak (300g) of **Beef**

70 litres of water for one single (100g) **Apple**

QUANTITY AND QUALITY OF WATER

• METHODS FOR FOLLOW-UP
• TOOLS TO MEASURE
• **MINIMISING ENVIRONMENTAL IMPACT**
• **CLEAN WATER**

AGEING AND INADEQUATE INFRASTRUCTURES

• TREATMENT OF WATER AND SLUDGE
• **LIFE CYCLE AWARENESS**
• **RISK MANAGEMENT**
• TOOLS TO ASSESS AND RENOVATE

CHALLENGE OF URBANISATION

• ENERGY EFFICIENCY
• **PROPER WATER ADMINISTRATION**
• STORMWATER MANAGEMENT AND UTILISATION

WATER CONDITIONS ARE DETERMINED BY LOCAL ENVIRONMENT. Finland is known for its clean water. Still the global challenges connected with the quality and quantity of water affect the local debate.. Growing attention is being paid to the issues of improving water quality as well as to the minimising and evaluation of environmental effects. With the climate change local characteristics of natural environments are changing more rapidly than what societies have previously been prepared for. Through research we can envision the changing conditions and their effects. However, it is the local environment that finally determines the greatest questions and opportunities in water related issues.

WATER MANAGEMENT SYSTEM AS A PART OF SUSTAINABLE INFRASTRUCTURE. The existing water infrastructure is ageing. It means challenges considering the system capacity, the costs of renovation and the future of the system. What kind of life cycle does the infrastructure have? What kind of opportunities do alternative or decentralised systems offer in new areas? The questions and opportunities related to water management systems depend on whether we are looking at an existing area or a new building site.

URBANISATION TRANSFORMS HYDROLOGY. With the urbanisation built environments and impermeable surfaces expand, and as a result the amounts of surface runoff increase. This development can lead to sudden discharges of large quantities of water. Among extreme climate phenomena, alterations in rain intensity create challenges. Floods are considered the most significant risk factor threatening built environments in Finland. How can we adapt to the changing water conditions and be prepared for the expected floods, heavy rain and storms in terms of land use planning? Can we accommodate or even benefit from the local hydrological conditions?

WATER ENGINEERING AS A FINNISH STRENGTH. The Finnish national water programme lists success in international comparative studies, advanced water expertise and research infrastructure as some of Finland's strengths in the water sector. The programme estimates that Finland can become a leader in water engineering and a promoter for clean environments. Potential is seen also in water related business innovations (*Vahala & Klöve, 2008*). Experts interviewed for this presentation identified natural storm water management and the development of storm water strategies as opportunities for visionary planning solutions and operational models. The commercialisation of these solutions and models form a link between research, development and business.

HYDROLOGY, WATER MANAGEMENT AND URBAN STRUCTURE

Images: Herbert Dreiseitl, http://www.dreiseitl.de/ (Topos: Water: Design and Management 59/2007)
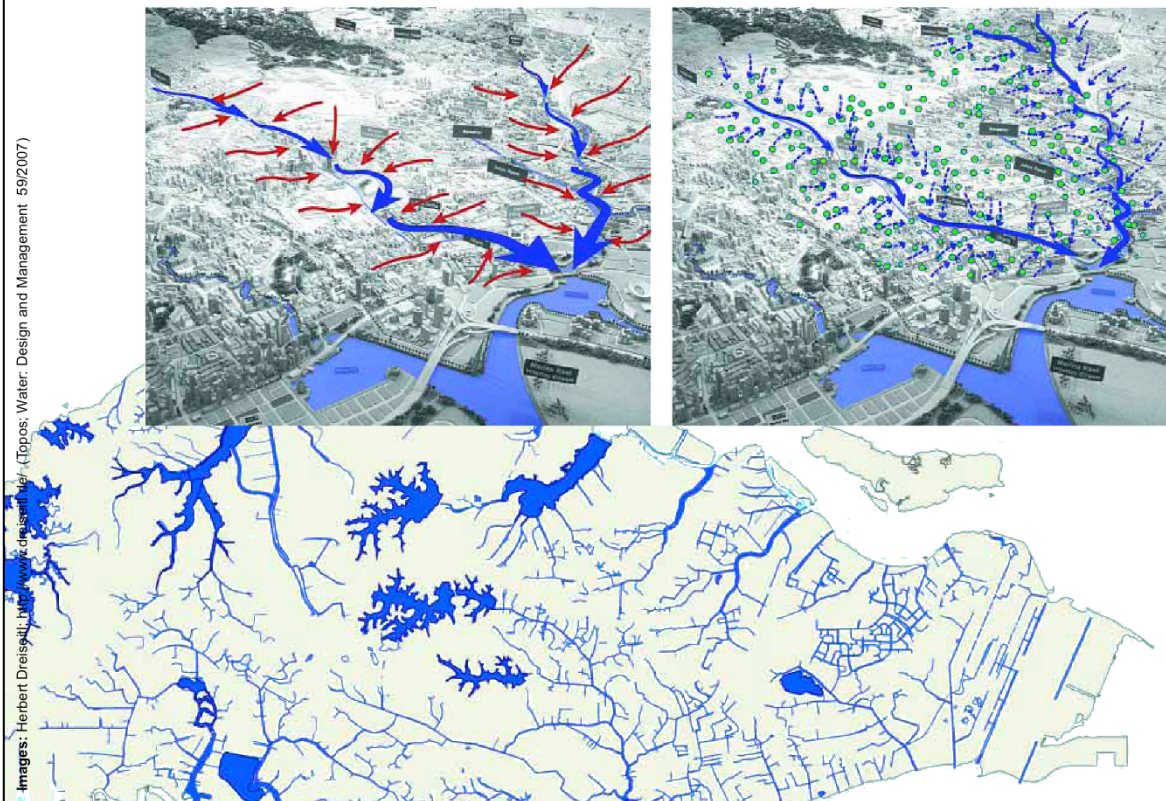
WHAT DOES HYDROLOGY MEAN FOR THE URBAN STRUCTURE? Conventional planning and the environmental permit policy in Finland encourage to paved surfaces with a sewer system for storm water collection. As a result we are facing difficult challenges with dense urban areas and industrial sites in terms of hydrology. Consequently, the amount of impermeable surface has become a key indicator for storm water management. Water management in built environment requires innovations in planning, and building regulations and policies have to be developed considering the hydrological conditions. A decentralised and sparsely built urban or regional structure allows more flexibility in storm water management and to organise it through natural means, that is to preserve the natural hydrological conditions as far as possible.

Sustainable models to use water in planning and architecture has been recognised internationally as means of improving the image of an area or a project. (*Jormola, 2008*) International demonstration projects have compared the potential of local rainwater systems and decentralised models with centralised systems. For example, studies of green and brown roof systems for rainfall retention have given encouraging results (e.g. Hammarby Sjöstad and the SWITCH pilots). In Germany, a concept for *replacing (Ersatzbiotop)* has been introduced into environmental policies, and biotopes destroyed as an effect of land use must be replaced with similar biotopes or other suitable biotopes that are introduced artificially (SYKE Finnish Environment Institute). However, while looking at the international models we need to be aware of the local water-economic and climatic conditions, and any paradigms, solutions or innovations must be contextualised. Planning is always framed by the local hydrology (*Jormola, 2008*).

Internationally competitive planning requires more extensive understanding of issues related to water in urban and regional planning: solutions must incorporate watershed with its natural water circulation. Planning based on hydrological conditions, and analysing challenges and opportunities in water management, are means to connect the water sector more closely to the processes of urban planning.
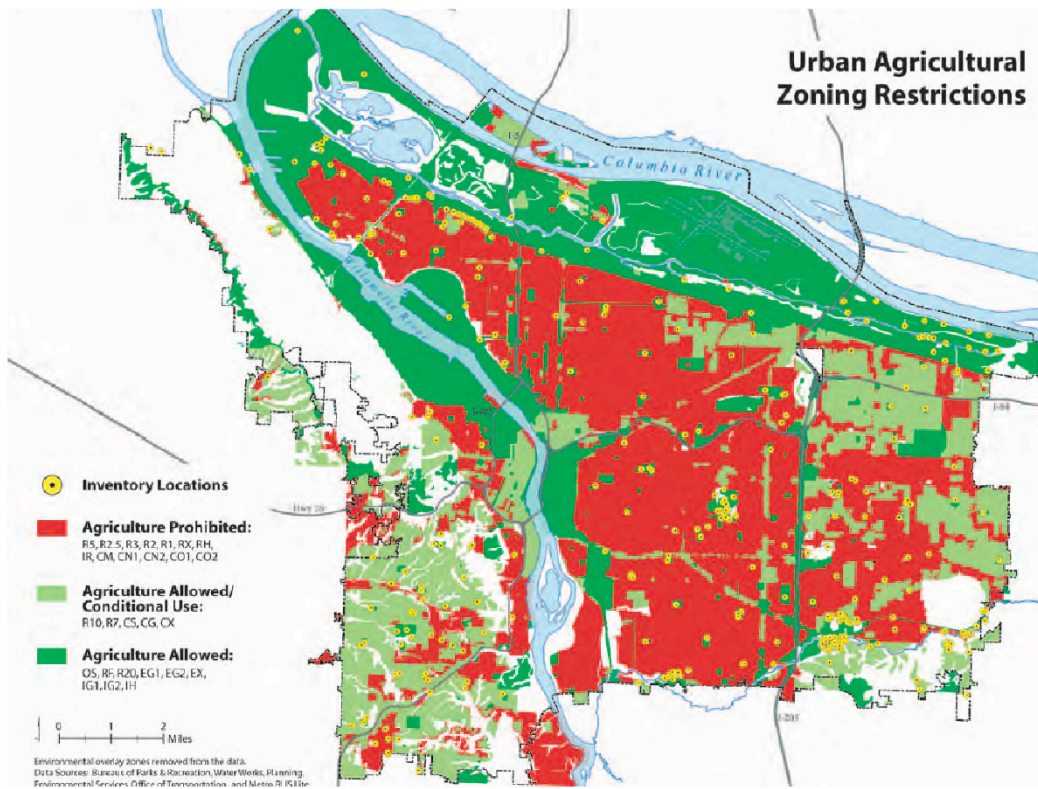
LAND USE AND FOOD PRODUCTION

Image: http://www.portlandonline.com/shared/cfm/image.cfm?id=122590

FOOD PRODUCTION WITHIN URBAN STRUCTURE. Food production is traditionally connected with rural land use. As the needs of urban communities continue to grow, and environmental awareness (regarding food production) increases, many urban communities have begun looking into the potential for urban agriculture: food production, within the urban structure, that goes beyond small-scale farming. Apart from food production, urban agriculture comprises other functions and goals. Cultivated areas belong to the park and recreational structure of the cities and can be used for environmental education. Cultivation can also be a temporary form of land use.

Portland gives one example on how the suitability of areas for agriculture and for food production in particular (*illustration*) can be studied and mapped. In the inventory, the areas were divided into three categories:

1. Areas where agriculture is allowed,

2. Areas where agriculture is conditionally allowed, and

3. Areas where agriculture is prohibited.

Based on this study the possibilities of food production within the urban structure can be calculated and evaluated.

At the Columbia University (NYC) Thompson (*2008*) studied how urban agriculture can be integrated into land use planning in the New York region. The research addressed also the effects of urban agriculture and local food production on public health and on the local economy (*Thompson, 2008*).

How is food production connected with land use planning?

What kind of land use regulations enable permanent or temporary agricultural activities?

SHELBY FARMS PARK

A PARK PROMOTING WELLBEING AND SUSTAINABILITY. Shelby Farms is a park of 18.2 km^2 located in Memphis, Tennessee, United States. For a park that was already in active recreational use, a plan and a development strategy was found through a planning competition. A proposal by the New York-based practice Field Operations won the competition. The proposal is based on the users' vision for the future of the area, ecologically sustainable planning solutions and a carefully planned and phased implementation. The extensive park offers a range of recreational and sporting opportunities including running, cycling, swimming, horse riding, camping, fishing and bird watching. The plan is based on a theme of 12 "landscape rooms" that each have a different identity, atmosphere and characteristics. The plan also recognises the cultural and historical heritage of the area and incorporates areas for agriculture and food production.
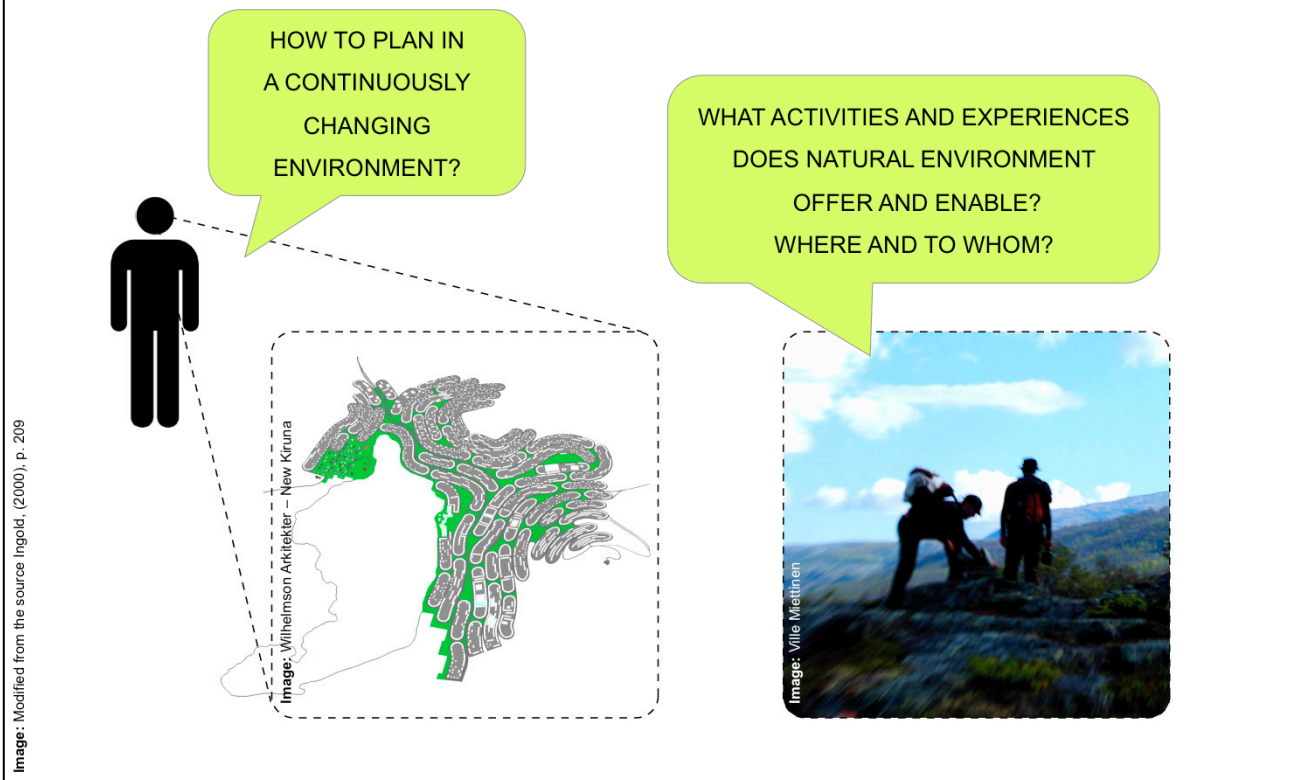
The vision for Shelby Farms is ambitious: a metropolitan park for the 21st century is a site for creativity and activity, and it brings together natural environment, sustainable values and the needs of the community. Shelby Farms is envisioned as an urban forest, a playground for the community and a model that promotes health, wellbeing and sustainability. The park can be seen as a prototype and become an internationally recognised example.

COLLECTIVE DECISION MAKING. Shelby Farms Park Conservatory SFCP is an organisation of volunteers, founded to further develop the park with a wide range of recreational opportunities and nature experiences in the middle of an urban structure. Instead of the traditional planning and decision making process, the organisation promotes more flexible and community-minded decision making processes.

FINLANDIA PARK, HELSINKI. The new Finlandia Park, currently under construction in Töölönlahti, forms together with the Central Park a green belt of about 10km² that extends from the very centre of Helsinki as far as the Nuuksio National Park. By including sustainable innovations and planning solutions in its realisation, this urban park complex could become a new flagship for ecological values of Helsinki.

URBAN PLANNING AND THE EXPERIENCE OF NATURE

HOW TO PLAN IN A CONTINUOUSLY CHANGING ENVIRONMENT?

WHAT ACTIVITIES AND EXPERIENCES DOES NATURAL ENVIRONMENT OFFER AND ENABLE? WHERE AND TO WHOM?

Image: Modified from the source Ingold, (2000), p. 209

Image: Wilhelmson Arkitekter – New Kiruna

Image: Ville Miettinen

URBAN STRUCTURE AND THE NATURAL ENVIRONMENT. From the perspectives of urban and regional planning the questions of natural environment relate to ensuring the diversity of the ecosystem, and the availability of the resources and services ecosystems offer. Through planning we determine the relationships between the built and the natural environment (networks of parks, recreational areas and other green areas, and the accessibility to these networks), and how urban nature connects to the living environment as an element of well-being.

In the Finnish legislation ecological values come through much stronger than the experiential values, although research on the possibility of merging of ecological and experiential knowledge exist (e.g. *Sipilä et al., 2008*; *Kyttä & Kahila, 2006*; *Tyrväinen et al., 2007*; *Pelkonen & Tyrväinen, 2005*). A successful land use process transmits the experiential knowledge of the inhabitants to planners and decision-makers and allows the values of experts, inhabitants and other stakeholders to converge.

NATURE TOURISM links the urban structure and the experience of nature. Growing environmental awareness and the appreciation of nature experiences – whether harmonious coexistence with nature, or bonding with nature through adventure or other sports – require urban planning and tourism industry to carefully consider how the operations will be organised without endangering the ecological and esthetical qualities of the area.

Valuable and fragile natural environments attract tourism, and under pressure from the growing tourism industry, the role of urban planning and its effects becomes more important, as does aligning planning processes with the development of tourism services. Linking the processes of urban planning to the development of tourism is one step in the effort to protect the future of the environment and the local communities. It is a mean to strengthen the development processes aiming towards sustainability in regions of tourism and leisure. A project for sustainable tourism between Finland and Estonia (*Kestävän matkailun yhteistyöhanke http://www.fintourist.net/*) defines the goal of sustainable tourism as *a new kind of attitude towards the sustainable development of tourism rather than isolated instances of improvement. According to the principles, the operations must be organised in such a way that the quality of the environment is preserved, ecological processes function normally, natural and cultural heritage is conserved, the local community benefits and the tourists enjoy the experience.*

PLANYC 2030

LAND ✤ WATER ✤ TRANSPORTATION ✤ ENERGY ✤ AIR ✤ CLIMATE CHANGE

Image: Felix Moller

Many cities, such as Stockholm, London and New York, have introduced goals to radically reduce emissions in the next decades. In Finland similarly ambitious and clear political decisions have yet to be made.

A VISIONARY DEVELOPMENT STRATEGY FOR SUSTAINABILITY: PLANYC 2030. PlaNYC 2030 is a strategy for sustainable development that is divided into six dimensions: *land*, *water*, *transportation*, *energy, air* and *climate change*. The goals of land use include transit-oriented development, reclaiming underutilised buildings and sites, ensuring affordable housing, extending park land and increasing options for active open spaces, and the remediation and recovery of brownfields.

One mechanism concerning the strategies of land use planning, is to provide state incentives to lower the costs of brownfield redevelopment. As other initiatives the plan *seeks to adapt new uses to outdated buildings* (e.g. schools, libraries, parking) and *explores opportunities to create new land areas by constructing decks over transportation infrastructure*.

Concerning water, the plan aims to upgrade the wastewater treatment infrastructure, and to repair and modernize the ageing in-city distribution. In addition the plan aims to explore natural solutions for water cleansing and management, and to reclaim the waterways as part of the *blue belt*.

As for transport, solutions are sought for congested routes and for improving the rail and bus services. The ambitious strategy aims to expand the commuter rail access to Manhattan and to improve the access to public transport.

In energy production, the goal is to introduce cleaner and more reliable forms of energy. As far as the efforts to improve air quality are concerned, the plan aims for the cleanest air in the country. The challenges of climate change are addressed with a strategy to decrease the emissions by 30% by the year 2030.

A NEW LANDSCAPE?

WHAT IN LANDSCAPE EXPRESSES SUSTAINABILITY?

WHICH ELEMENTS IN LANDSCAPE WILL BECOME SYMBOLS OF SUSTAINABLE COMMUNITY?

Image: Shihchun Yen / www.flickr.com/photos/yenba

LANDSCAPE OF THE SUSTAINABLE COMMUNITY. What does the future community look like? What kind of landscapes do they create? The Finnish landscape is commonly summarized in pastoral images of open fields and rustic villages. On the other hand, living in and from nature has imprinted the image of Finland as a land of forests and thousands of lakes. Culture and communities reflect on the landscape, and as society and sources of livelihood change, the landscape changes as well. But how do we experience the sometimes very rapid change in the environments and landscapes? Accepting changes in familiar landscape may be difficult, even if it is well understood that both natural and cultural environments are in a constant change.

Landscapes of cultural heritage may be preserved, or they can be conserved and maintained, but new cultural landscapes evolve in as a result of the activities and changing needs of society. The landscape analyses and reports compiled for land use purposes are mainly based on identifying and evaluating the landscape's natural, historical and cultural features. Direct effects or new imprints left by human beings are often interpreted as defects or disruptions. Disruptions are typically categorised as isolated factors that interfere with the visual landscape or rather, the flawless idealisation of it, such as power lines, cell phone towers, factories and production plants that are not included in the traditional definition of a nostalgic rural landscape.

How would the landscapes or environments that we appreciate and value include the values of a new society, over and above cultural heritage and nostalgia? How do we extend landscape analyses to recognise and evaluate the elements that characterise sustainable communities and life forms?

VALIDATING LANDSCAPES. In Europe, Landscape Character Assessment (LCA) is used as a method to categorise landscapes. LCA is a tool to separate the analysis of a landscape from a set of prior value judgements. The method is based on identifying the character and the identity of a landscape. The value of the site is set by its own features. (*Muhonen, 2007*). This way, landscape assessment and evaluation can be connected more closely with the prevailing values, local needs and the various stages and processes involved in land use planning. The method is specifically designed for landscape analysis, and is therefore independent from e.g. the assessment of ecological value. LCA has not been applied in Finland as such, but similar approaches have been employed in the regional and provincial level landscape assessments by the Finnish Environment Administration.
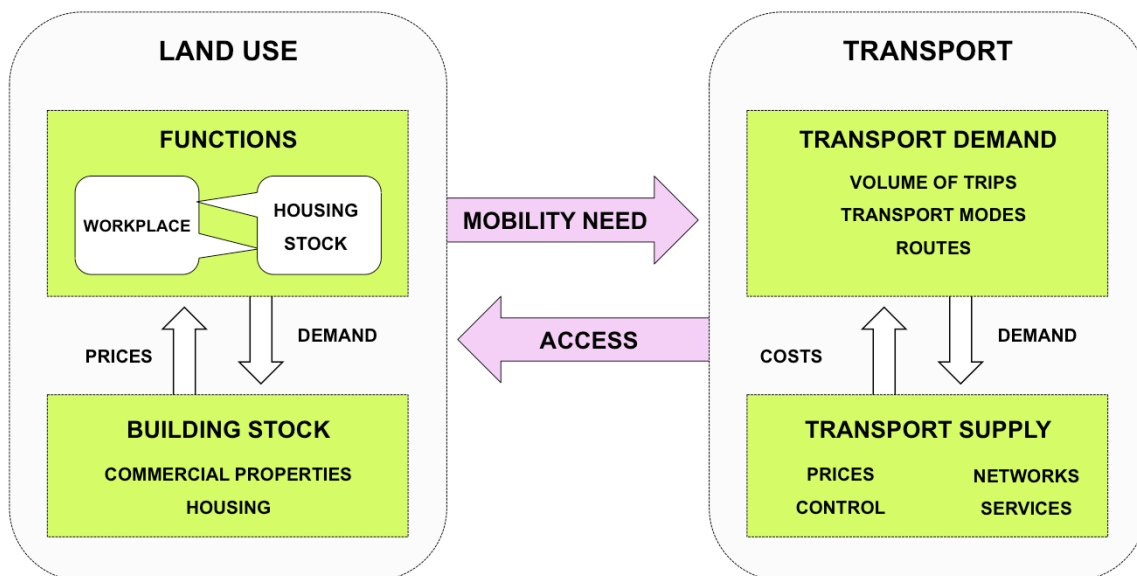
WHAT IS SUSTAINABLE MOBILITY?

MOBILITY OF PEOPLE AND GOODS is one of the key factors bearing on the sustainability of the urban structure. Communities are planned, also in Finland, to rely too much on car transport. The increase in the price of oil and the adverse environmental impacts of traffic are, however, guiding development both at the global and the individual levels towards a lesser dependence on passenger cars.

Land use and mobility are always connected to the local conditions, and cannot be isolated from social, cultural or institutional factors. Ecologically sustainable transport needs the support of social practices and has to be included in the processes of socially sustainable development.

We need innovations to minimise and to offset the negative effects of traffic, but also to change the entire culture of mobility. Reducing the need for transport is not the only challenge; it is equally important to develop ways and modes to guide our mobility, and lead it towards a more sustainable direction. A dense, network-based urban structure that relies on rail infrastructure reduces the negative environmental impacts of transportation.

Transport systems and traffic planning are often considered being separate from other fields of urban planning. It has become increasingly important to encourage closer collaboration and comprehensive thinking of actors ranging from users to decision-makers. In addition we will need planning, service and product innovations that are attractive to the end users, and understand the demands of mobility.

RECIPROCAL INTERACTION

LAND USE

FUNCTIONS

WORKPLACE — HOUSING STOCK

PRICES — DEMAND

BUILDING STOCK

COMMERCIAL PROPERTIES

HOUSING

MOBILITY NEED

ACCESS

TRANSPORT

TRANSPORT DEMAND

VOLUME OF TRIPS

TRANSPORT MODES

ROUTES

COSTS — DEMAND

TRANSPORT SUPPLY
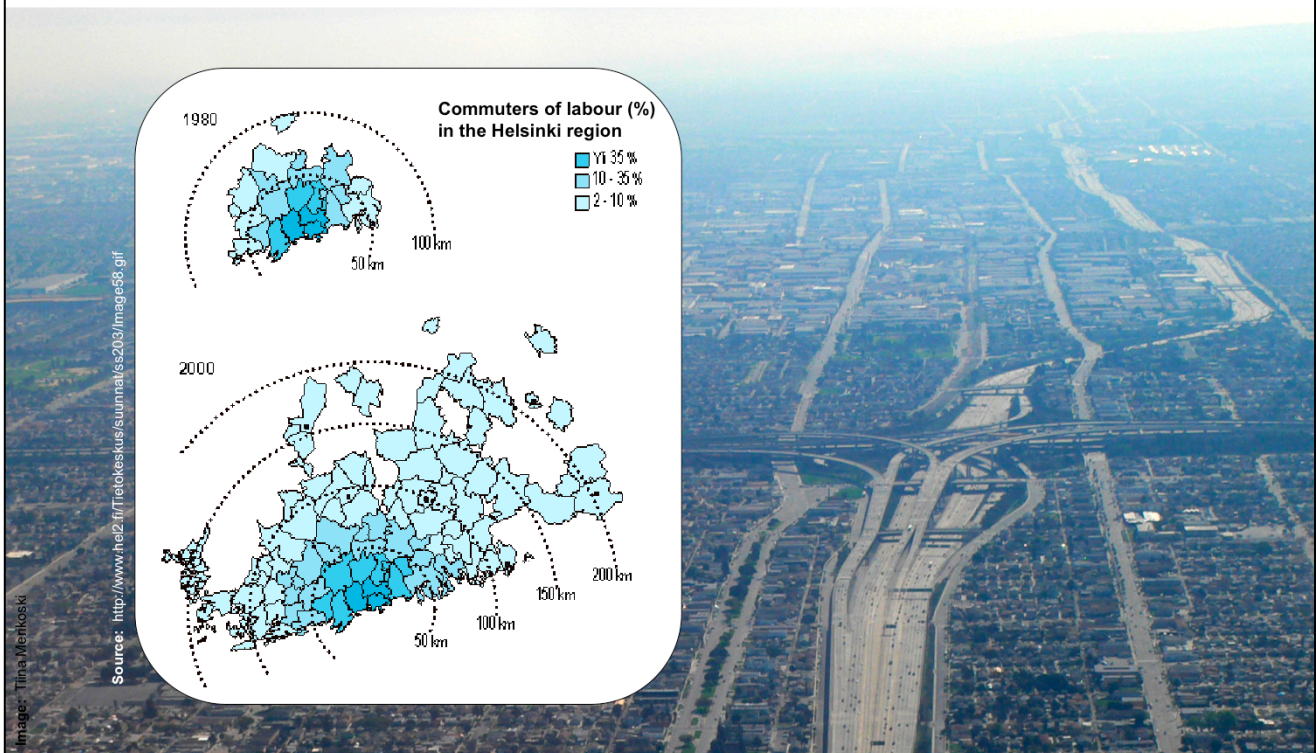
PRICES   NETWORKS

CONTROL   SERVICES

Source: Modified from Uudenmaanliitto 1997

KEY FACTORS IN THE INTERACTION BETWEEN TRANSPORT AND LAND USE ARE RELATIVE LOCATIONS OF FUNCTIONS AND THEIR ACCESSIBILITY BY SUSTAINABLE MODES OF TRANSPORTATION. Functions such as housing, work and services generate traffic, which necessitates the transport system. On the other hand, transport routes, terminals, stations, ports, airports and other transport facilities effect on the accessibility of different locations, which in turn attracts businesses and households. Investments in the transport system transform the accessibility. This is further reflected e.g. in the property market. The value of land and the congestion of transport routes have, therefore, impact on where functions become located, and how the flows of traffic become oriented. (*YTV, 2005*)

Sustainable urban structure integrates land use and traffic planning. Integrated development strategies for land use and transport combine individual projects. They are designed to obtain accumulative, mutually beneficial effects or, alternatively, to minimise the negative effects of separate courses of action. Separate actions may not be optimal with respect to overall targets; for instance, land use plan focused on transport and maximising its capacity may fall short of the targets set for enjoyable urban space, the integrity of green areas, or social and physical safety. For this reason, the various courses of action, which may have long-standing consequences, should be considered side by side, and the possibilities for maximising the benefits and minimising drawbacks should be identified. (*YTV, 2005*)

Transport is a consequence of human action and everyday practices. Individual mobility choices depend on what alternatives we have and how well-informed we are on the effects of the choices we make. It is not obvious that people will take advantage of the sustainable means of travel provided, even if these alternatives were promoted in planning. Often personal circumstances determine mobility habits to a greater extent than the living area and related urban structure. (*YTV, 2005*). The city structure and the physical environment are, however, essential factors that frame the mobility options. The decisions on mobility are formed, on the one hand, as a result of the desires and demands of individuals or families and, on the other, within the range of opportunities offered and supported by the living environment.

HOW TO CONTROL TRAFFIC?

Commuters of labour (%) in the Helsinki region

Yli 35 %
10 - 35 %
2 - 10 %

Source: http://www.hel2.fi/Tietokeskus/suunnat/ss203/Image58.gif
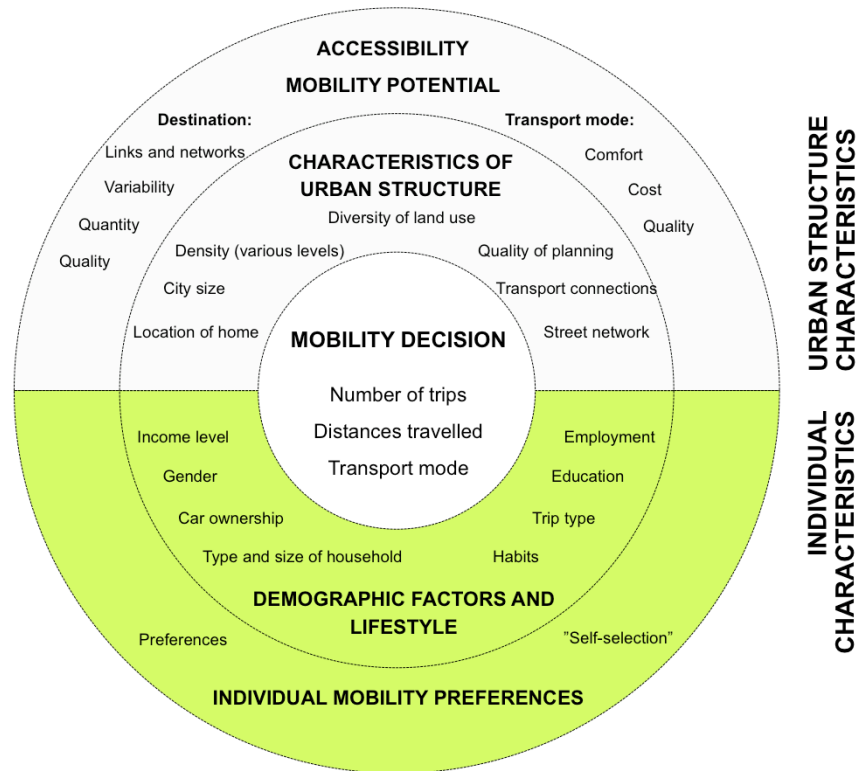
Image: Tiina Merikoski

TOOLS FOR COMMUNITIES IN CHANGE – MOBILITY MANAGEMENT. Mobility Management MM (also *Transport Demand Management TDM*) is used to facilitate planning and decision making. It aims at influencing attitudes and mobility practices (*MAX, 2007*) as well as addressing the demand and form of travel before the trip is undertaken (*European Conference on Mobility Management ECOMM 2007*). Traffic planning often seeks to respond to the existing needs and demands but with MM, planners begin with the mobility and transport that is envisioned for the future. MM emphasises soft indicators, which include information and access to information, communication and service operations, as well as various forms of coordination and management (of actors and stakeholders) (*MAX, 2007*). The soft indicators are used to support the transport infrastructure, and they are targeted at improving the performance and efficiency of transport systems.

Apart from attitudes and travel routines, MM stresses access and social structures, the maximum utilisation of the existing structures and networks, as well as alternative transport forms and their compatibility. Key goals include reducing the dependence on passenger cars and the number of motorised trips per capita. (*MAX, 2007*) Commuting distances in the Helsinki metropolitan area have increased dramatically during the past decades (*illustration*), and there is a great demand for alternative forms of transport to replace passenger cars.

A recent focus at the EPOMM (*European Platform on Mobility Management*) online forum and at the ECOMM (*European Conference on Mobility Management*) conferences (*ECOMM 2007 and 2008: Travel Demand Management - Tackling Climate Change*) has been climate change and its effects on mobility demand, management and transport planning. ECOMM 2007 also brought forth the effects of demographic changes on mobility: how the ageing and increasingly multicultural population transforms mobility demands. Other themes of ECOMM 2008, held in London in June, were transport management, health and well-being, and recreational mobility.

What is the future transport system that we want?

URBAN STRUCTURE AND EVERYDAY MOBILITY

ACCESSIBILITY

MOBILITY POTENTIAL

Destination: **Transport mode:**

Links and networks   Comfort

Variability   Cost

Quantity   Quality

Quality

CHARACTERISTICS OF URBAN STRUCTURE

Diversity of land use

Density (various levels)   Quality of planning

City size   Transport connections

Location of home   Street network

MOBILITY DECISION

Number of trips

Distances travelled

Transport mode

Income level   Employment

Gender   Education

Car ownership   Trip type

Type and size of household   Habits

DEMOGRAPHIC FACTORS AND LIFESTYLE

Preferences   "Self-selection"

INDIVIDUAL MOBILITY PREFERENCES

URBAN STRUCTURE CHARACTERISTICS

INDIVIDUAL CHARACTERISTICS

RESEARCH ON FACTORS CONTRIBUTING TO MOBILITY CHOICES. The extensive research literature on everyday mobility of the inhabitants reveals how and to what extent the structural characteristics of communities contribute to how people travel. Distinguishing factors related to urban structure from factors related to individuals and their lifestyles is difficult. The studies give a slightly contradictory view about whether or not the urban structure has an effect on mobility. It would seem that the effect is fairly small in comparison with the effects of different lifestyles and attitudes related to mobility. Several of the studies have not been able to overcome the problem of self selection, meaning that in comparing two different areas and the mobility habits of the inhabitants we cannot be sure whether people with different attitudes have chosen particular and different areas to start with. In this case, any differences found in mobility habits would ultimately be explained by different attitudes rather than urban- or neighbourhood structure. (*Kyttä & Kahila, 2006*)

One of the best studies in the field has focused extensively on this problem. Krizek (*2003*) studied the same individuals before and after they had moved from one type of area to another. The study also excluded those inhabitants who underwent a major change in their lives at the same time, such as the birth of a child. The inhabitants whose lives had not changed greatly during the observation period and whose attitudes were likely to remain the same, kept a mobility diary before and after they moved. The former and the new area were analysed, using geographic datasets, to determine the so-called neighbourhood accessibility of the residential area, comprised of variables measuring the density of the area, the diversity of land use and block size. The results of the study indicated that moving to an area with improved accessibility significantly reduced the kilometres travelled by car, volumes of travel and repetition. Instead, the total number of trips increased.

Certain characteristics that promote especially walking and cycling can be identified in the research literature. These include:

• the existence of nearby services (*McCormack et al., 2008*)

• good walkways and services within a 200 m radius (*Krizek & Johnson, 2006*)

• grid plan system (*Handy et al., 2006*)

• sidewalks and good public transport connections (*de Bourdeaudhuij et al., 2003*)

• aesthetic enjoyment, the existence of many different sites and low traffic volume (*Craig et al., 2002*)

TRAVELLING – HOW, WHY AND WHERE?

Domestic travels in Finland 42 km / person / day

public transport 6,1 km
other private 1,7 km
pedestrian and cycling 2,9 km
private car 32 km

other free time 11,8 km
summer house 2,6 km
visiting 8,7 km
commuting 7,4 km
studying 1,6 km
business 3,9 km
shopping etc 5,8 km

Sources: The National Passenger Transport Survey and Viljo Miranto / The Finnish Road Administration [1]

PASSENGER CAR TRANSPORT IS BY FAR THE MOST POPULAR FORM OF TRANSPORT IN FINLAND, and it is still growing (*Finnish Road Administration*). Approximately 70% of households own at least one car (*Statistics Finland*). Only about one in three trips are done by walking or cycling, and only 8% of all trips are done by public transport (*Mobility Management in Finland – State of the Art Report for ECOMM 2008*). Reducing dependence on passenger cars has been identified for a long time as one of the main challenges for traffic planning, mobility management and the provision of transport services (e.g. *Newman, 1996*; *Systems, Cities & Sustainable Mobility Summit 2008*). According to Statistics Finland, Finns are also aware of the environmental damage caused by passenger cars, and the surveys indicate that they are willing to make changes in their individual lives. However, only single person households include a significant proportion of those who believe they can manage without a car (*Statistics Finland*). Helsinki has invested in an efficient public transport system and especially in tram transport, but making public transport systems profitable has not succeeded elsewhere in Finland. Public transport requires a sufficient urban structure and an adequate user capacity. What kind of model could work and become profitable in small communities?

More than half of the motorised trips per capita relate to leisure trips, and the majority of motorised trips are done in passenger cars (*National Passenger Transport Survey 04-05*). Some studies have shown that the urban structure has a greater effect on the so-called "bound" than "flexible" trips (e.g. *Næss, 2006*). Directing leisure mobility by means of urban structures is challenging, because the needs and situations vary greatly between individuals and households. Research literature on mobility and accessibility focuses for the most part on mobility between home and basic social functions (work, school or place of study and commercial services). Future research needs to focus more closely on detailed analysis of individual mobility choices and look at the full range of mobility options.

[1] Viljo Miranto, Finnish Road Administration: Transport concentrates in the south. Of the motorised road trips per capita, 21% are done in Uusimaa Region. Finland's highest transport volumes are found in Uusimaa (the ring roads and main entrance roads in the Helsinki capital region / 50 000–100 000 vehicles/working day). It is estimated that until 2030, increase in traffic will be dramatic in the capital region. Traffic will increase in the Uusimaa Region by approx. 40% by the year 2030.

A NETWORK OF DIFFERENT OPTIONS

Images: Tiina Merikoski
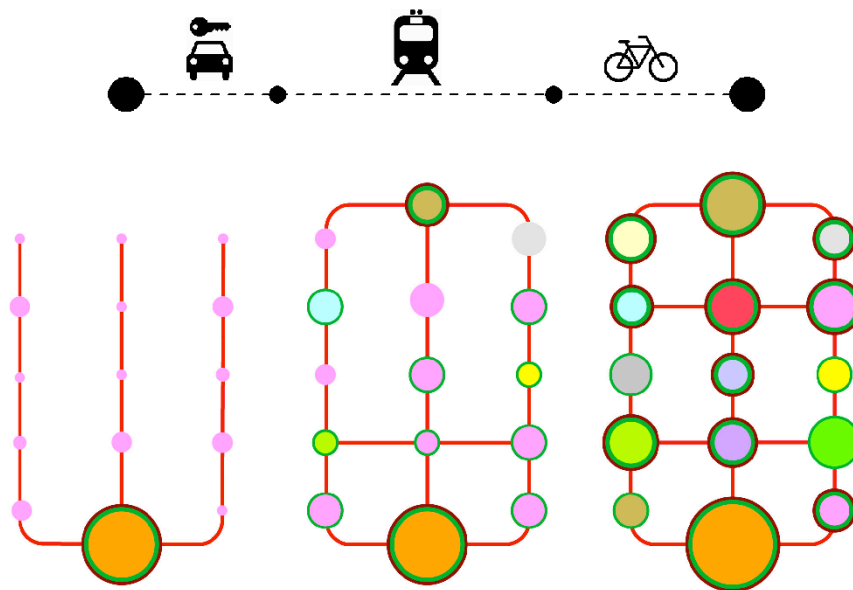
A MULTICENTRED AND NETWORK-BASED
URBAN STRUCTURE

ALTERNATIVE MOBILITY OPTIONS AND NETWORKS. A network of well-accessible transit systems offering alternative travel modes offers a mean to channel mobility away from private car. Nevertheless, studies on the effects of polycentrism (multiple centres in one area) on traffic volumes and modal split have given disputed results. The reason for this may be the growing complexity of systems, which makes mobility options, conditions and actualised mobility practices an increasingly difficult issue to grasp. A key element, however, is combining different solutions (*Bertolini et al., 2005*), and taking steps to develop both town centres and mobility environments in ways that successfully link the accessibility and the proximity of different functions.

Multiple centres and good transport connections between them also effect on the innovativeness and competitiveness of cities. An efficient transport system and easy access to centres support localised specialisation, and therefore, indirectly promote innovation activity (*Ruoppila et al., 2007*). Polycentrism enables growth centres to develop their regional competitiveness, while allowing smaller centres to become locally attractive. Local centres can opt to invest, for instance, in the development of housing and leisure facilities and in related services. This specialisation produces synergy benefits and enables, for its part, jobs and homes to coexist in the same area.

In the international debate, urban structure based solely on heavy transport infrastructure is considered an inflexible system that cannot respond to the continuously changing demands. Although the existing heavy structures, such as the railway network, set the frame for planning and development of communities, lighter transit systems offer the needed flexibility. Lighter systems supplement the available transport alternatives, and can be implemented with fewer resources. Also their integration into the existing system is flexible (*Systems, Cities & Sustainable Mobility Summit 2008*; *Newman, 1996*), and they improve the accessibility to the heavier transport network.

Image: http://www.flickr.com/photos/andrewcurran/2339840290/sizes/l/

SERVICE INNOVATIONS

TO SUPPORT SUSTAINABLE MOBILITY MODES AND STRUCTURAL FRAMEWORKS

GROWING DEMAND FOR SERVICES. Mobility, mobility management and the implemented transport solutions offer a wide range of opportunities for developing different services that promote sustainable travel. In addition to planning solutions, opportunities to develop services lie in the coordination and management of mobility, and in the communication related to mobility options. Sectors such as advertising, marketing, education and training are some key niche markets for public relations services and for services targeted at changing consumer attitudes and habits. The potential for service innovations is also evident in the collaboration between planners and decision makers, in the participation of stakeholders, in developing information flows and distribution, and in finding practical applications for the new information produced in research institutes. Also, planning is a mean to develop creative environments and therefore help these innovations become a reality. (*Ruoppila ym., 2007*).

SERVICE INNOVATIONS FOR MOBILITY. Planning solutions and technological innovations require the support of service innovations. Urban structure that supports sustainable forms of mobility is an integrated unity consisting of "hard" structural mechanisms and "soft" systems (*Ruoppila et al., 2007*; *Systems, Cities & Sustainable Mobility Summit 2008*). A well-designed transport system or a technological innovation may remain unused without the support of the "soft" socio-cultural infrastructure, such as a service that promotes or encourages its use. Services that aim to steer mobility practices often require supportive measures from local government as well. Most importantly innovations must be attractive, practical and convenient to the users themselves. The real challenge is to sort out how the consumers and end users can be involved in the processes of service development and innovation. (*Systems, Cities & Sustainable Mobility Summit 2008*). As Juha Kostiainen sums up the challenge: How do we harness the consumer power?

A CHALLENGE. Tourism is an example of a service industry that has strong implications for mobility demands and transport solutions. A great challenge for tourism is to develop sustainable service and structure models in conjunction with systems that promote sustainable mobility. Key tourist destinations have a common interest to develop the industry towards sustainability, and to protect the environment as our common property.

SERVICE INNOVATIONS SUPPORTING CYCLING

Image: BikePortland.org / Jonathan Maus

New service and business models have been developed for the demands of the cycling culture in particular. Cycle route networks that are well-connected to public transit networks are supplemented and supported by services and facilities such as safe storage and maintenance, underground bicycle parks, tunnel cycle paths, and bicycle stations that offer a wide range of services and are open around the clock.

CYCLING IN SWITZERLAND / Sveitsi / www.cycling-in-switzerland.ch

A national project, and a "product" based on service provision. The project developed and implemented a nationwide cycling network, as well as standardised and complied the information tools (e.g. maps, signposts and internet services), services and actors related to it.

Images: www.biceberg.es

BIKESTATION / The United States / www.bikestation.org

A network of stations offering cycling-related services (e.g. maintenance and rental services, route planning and information services, and at some stations, dressing room and shower facilities). The stations offer park-and-ride facilities and are always linked with the public transport network.

BICEBERG / Spain / www.biceberg.es

An automatic underground bicycle park system, that is easy to use and offers safe storage. One park stores up to 92 bicycles.

TECHNOLOGICAL INNOVATIONS

Image: Tiina Merikoski

NEW FORMS OF CAR TRANSPORT – FREEDOM OF MOBILITY WITH ELECTRICITY AND ALTERNATIVE FUELS. In recent years, the debate on the future cars has focused much on biofuels. The essential incentive for introducing biofuels is to reduce our dependency on fossil fuels. But so far biofuels can offer only a marginal solution: they replace only a fraction of petrol consumption. Also, producing raw material for biofuels competes with food production which has created complicated situations especially in the less developed countries. Waste may offer a solution but is still rarely used to produce biofuels. Alongside alternative fuels, solutions utilising other forms of energy are slowly being developed. Key initiatives include the recent advances made in electric car designs and the rise in the popularity of hybrid cars.

Emissions created by electric cars are far less than the emission caused by cars using combustion engines, but at the same time, they offer individuals almost the same freedom of mobility. Advances made in battery technology have extended the travel range of electric cars, and the price of the batteries has fallen. The current range with an electric car covers over 200 kilometres. A more common and very popular solution is the *hybrid* car, which is already available on the market. The hybrids make use of both a combustion and an electric engine. The combustion engine supplements the limited range of the electric engine, and provides added power at high speeds and during acceleration. Although hybrids consume significantly less fuel than cars with combustion engines, they are still partly dependent on oil.

Also, cars with hydrogen-powered fuel cells have been introduced. A challenge with hydrogen cars is that they require investments on a new fuel distribution network. For this reason, hydrogen cars are unlikely to become a widely adapted solution in the coming years. The larger car manufacturers are, however, actively involved in the development of hydrogen fuel cells. The most significant advantage of hydrogen engines is that the emissions consist only of water.

In Finland, technological innovations for passenger car traffic have been approached from an entirely new angle. The Electric Cars – Now! project aims to develop and construct a model to transform old combustion engine cars into electric cars by equipping them with an electric engine and other required technology. The project is based on collective "open-source" development and is moving along on an open Wiki site.

HOW DOES SUSTAINABILITY COME OUT IN THE LIVING ENVIRONMENT?

We have seen the green, mossy eco villages [1]. We have also seen sky scraper complexes that remind us of a science fiction film but are based on zero energy and self-sufficiency [2]. Nonetheless, can we really envision what architecture in the 21st century will look like? How sustainable solutions will reflect to our living environment? How do we recognise the innovations that will truly support sustainable development?

Sustainable urban structure includes - in addition to built environment and infrastructure - social, functional, and natural environments. Changing social structures and increasingly multicultural societies entail new landscapes for the living environment. Thus, rather than a question of style, the form and architecture of sustainable living environment consists of a much wider range of issues.

Everything we build is based on the existing environment and its structures. Therefore, we can no longer make compromises on ecological planning processes, zero energy targets and well-being of communities. The existing property stock and infrastructure must be carefully considered, and the new building stock must be integrated into it.

[1] For instance, http://www.dancingrabbit.org/, http://www.ecovillage.dk/, http://www.munksoegaard.dk/en/about.html

[2] For instance, Beach Road in Singapore, designed by Foster and Partners: http://www.fosterandpartners.com/Projects/1545/Default.aspx or the Honeycomb, designed by the architects of MAD: http://www.inhabitat.com/2008/08/06/mad-sinosteel-plaza/

"THE NEW ARCHITECTURE IS NOT A QUESTION OF STYLE"

HOW WILL SUSTAINABILITY

RESHAPE THE ARCHITECTURE OF OUR LIVING ENVIRONMENT?

BUILDING SOLUTIONS

ENERGY SOLUTIONS

HOUSING PREFERENCES AND WELL-BEING
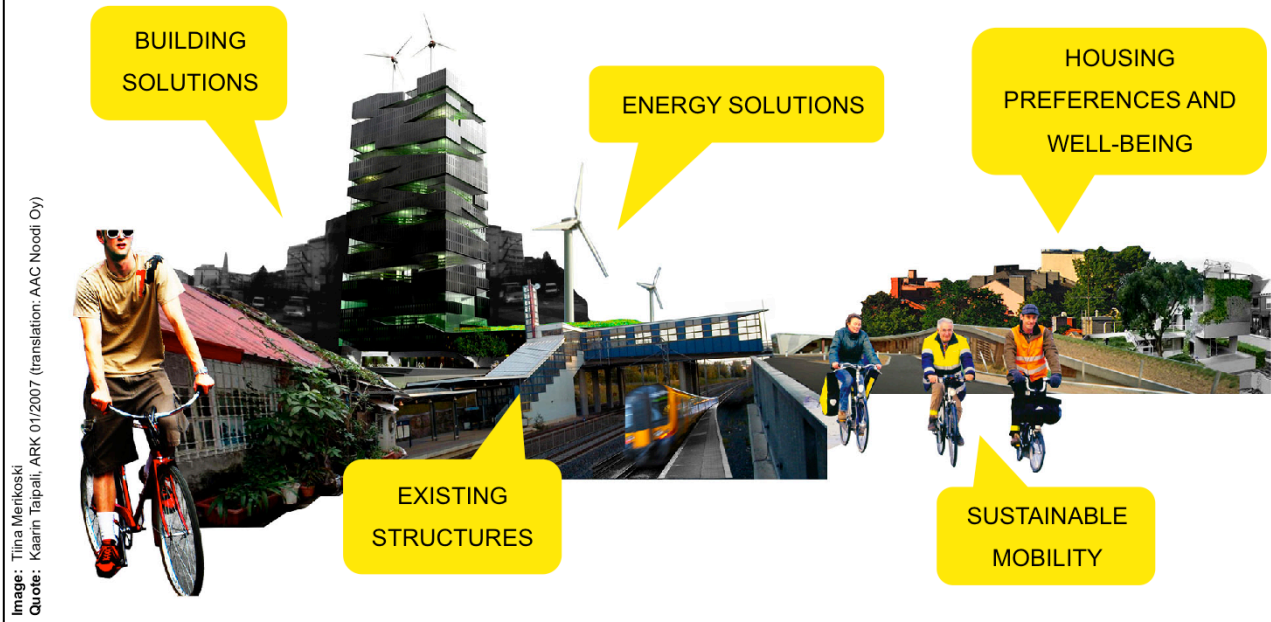
EXISTING STRUCTURES

SUSTAINABLE MOBILITY

Image: Tiina Merikoski
Quote: Kaarin Taipali, ARK 01/2007 (translation: AAC Noodi Oy)

IMAGE / SPACE / FORM OF SUSTAINABLE LIVING ENVIRONMENT. Kaarin Taipale has written (Finnish Architectural Review 01/2007) that socially significant changes often underlie new architecture and its form [1]. Global challenges include the unsustainable exploitation of natural resources, an unparalleled rate of urbanisation, climate change and the challenges presented by the global economy and market forces. As new technologies are introduced to find solutions to these problems, the architecture for the 21st century is defined at the same time. Do we want to have a say in how it will be shaped and what it will stand for?

INTERPRETING OUR LIVING ENVIRONMENT. Do we need indicators in our living environment to show us the ecological value or footprint of a particular building, structure or other environmental product? The eco certification systems (such as the North American LEED) designed to guide and evaluate buildings and construction, are tools and incentives for design and thus not visible in the everyday environment. But how can we, as citizens and users, recognise sustainable innovations in our living environment? What kinds of messages could the cityscape send to inhabitants, tourists and other users?

BRAND AND IMAGE. Attractive and competitive cities draw attention. What are the local strengths or features that attract new residents, businesses or tourists? What would it mean to brand a city and its image with sustainability? Ambitious strategies that aim towards sustainable communities, and that are reflected in the living environment, already contribute to the attractiveness of communities. The new ecological cities that are under construction, such and Dongtan and Masdar [2], are clear examples of brands built on sustainability. But how can an existing community create a strong image of sustainability? How could Helsinki, for instance, be internationally known as a pioneer in practical, sustainable solutions or principles?

[1] "The new architecture is not a question of style. It may be the result of an unexpected challenge: The history of sky scrapers derives from the grain silos of Chicago, the stock exchange, and fires, as well as the invention of lifts and fire protection for steel. Trains, the metro, and planes gave rise to building types never seen before." Taipale, ARK 01/2007, p.16 (translation: AAC Noodi Oy)

[2] Dongtan is an eco-city to be built near Shanghai, and Masdar is the first attempt to build a completely carbon free city. http://www.dongtan.biz/english/zhdt/, http://www.arup.com/eastasia/project.cfm?pageid=7047 and http://en.wikipedia.org/wiki/Masdar_City

TRANSFORMATION?

Image: Laurin Kofler http://www.flickr.com/photos/9760699@N08/

HOW DO WE GIVE THE EXISTING STRUCTURE A SUSTAINABLE FUTURE?

EXISTING PROPERTY STOCK AND INFRASTRUCTURE. The existing structures present a challenge all over the world: how can ageing, possibly inadequate or functionally outdated structures, buildings and areas be integrated into sustainable communities? How are unsustainable solutions and technologies made sustainable? Integration of new innovations into the existing infrastructure and property stock, and linking them with the processes of land use planning requires new kind of thinking and priority setting.

The desires and demands placed on the living environment change continuously. In addition to the challenge of transformation of the existing environments, these changing conditions present a challenge of how to adapt new structures to new situations and demands. Locally based systems that are lighter to implement, and require less investments and maintenance than centralised and heavy infrastructure systems, may open up innovation opportunities for more flexible and fast-adapting solutions. Energy self-sufficiency in construction is yet another challenge for traditional energy production and supply models.

DIGITAL INFRASTRUCTURE of a city is formed by the information and communications technologies together with the media and service environments supported by them. It enables more efficient and flexible coordination of functions and resources by improving information generation, transmission and exchange. Digital infrastructure already forms an integral part of the urban structure, bringing together separate actors in a city and enhancing communication between them.

The digital infrastructure is both visible and hidden. We see digital advertisements and other instruments of communication in the streetscape. Personal mobile technology connects individuals and groups with each other regardless of their whereabouts.

What do the new digital infrastructures mean for urban structures? Who owns, controls and operates the digital infrastructure? Who uses the infrastructure, and for what?

DIMENSIONS OF HOUSING PREFERENCES

TRADITIONAL	EXPERIMENTAL
COMFORT SEEKER	ACTIVE LIFESTYLE FAN
GREGARIOUS	MYSTERIOUS
PATRON OF NEARBY SERVICES	BUSYBODY
NATURE URBAN	**CENTRE URBAN**
ANYTHING GOES TYPE	HEALTH ENTHUSIAST
NESTMAKER	LIKES VARIETY
ACTIVE	SLEEPER
THRIFTY	LIKES TO INVEST
DO-IT-YOURSELF	BUYS READY-MADE
SEPARATES WORK AND HOME	**MIXES WORK AND HOME**
FAMILY-ORIENTED	SINGLE-ORIENTED
SAFETY-ORIENTED	**ADVENTURE SEEKER**
VALUES DIVERSITY	SEEKS CONFORMITY
FLAT DWELLER	**HOUSE DWELLER**

INHABITANT DEMAND FOR SUSTAINABLE LIVING ENVIRONMENTS. The extent to which there is genuine demand and interest among the inhabitants for living environments that are specifically based on sustainable solutions is a key question for the actualisation of the sustainable community. Research conducted on the housing preferences of inhabitants finds the diversification of preferences a crucial and topical housing policy phenomenon. The reasons stated for the growing diversification in housing preferences coincide with phenomena that have also been identified as key trends for post-industrial societies: accelerating individualisation, differentiation in lifestyles and even the proactive construction of individual life policies. Different types of inhabitants are thought to form "tribes" in different areas that are shaped on the basis of different lifestyles and unite, for instance, one type of consumers or individuals who have a common hobby. (*Beck, 2002*; *Knuuti, 2007*). In this debate, the challenges facing planning are specified as an ability to respond to the inhabitants' ever-changing desires and the ability to build a distinctive profile for each residential area; a brand to attract the right people. It is quite likely that ecology will feature as an essential characteristic in only some of these diversifying profiles.
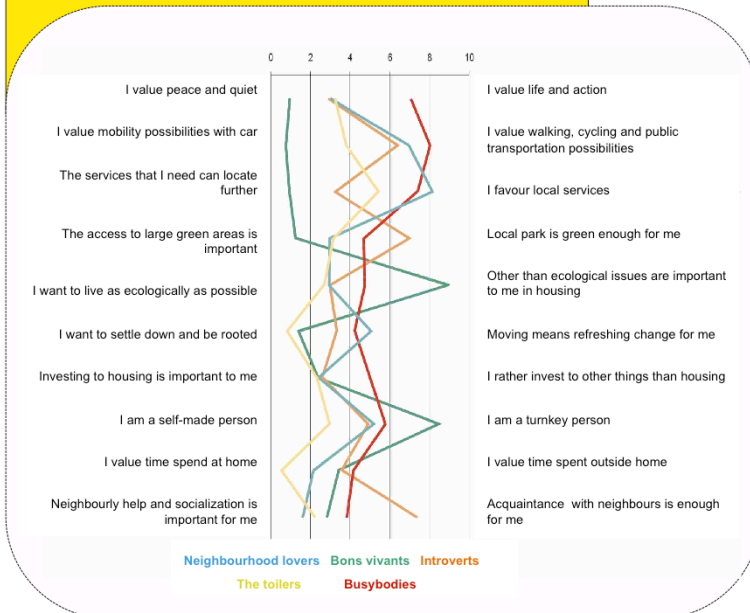
Unfortunately, the housing preferences of inhabitants have not been systematically followed in Finland. It is not unlikely for desires regarding housing to have varied greatly among the inhabitants in earlier decades as well. In Finland, demand in the real estate market has been so high that there has been no need to systematically diversify the supply to meet various kinds of desires. The illustration represents a variety of possible content dimensions related to housing preferences, as outlined by Kyttä et al. (*2009*). The concept holds that each inhabitant's desires regarding housing are constituted at a given time by a set of possible dimensions that may vary across time and space.

There is little actual empirical evidence for the diversification of housing preferences. Many studies have concluded that housing desires between different population groups are surprisingly uniform in Finland (*Kyttä & Kahila, 2006*; *Tuominen et al., 2005*). Instead, it has been possible to verify the demographic, regional and functional diversification of housing. There is ample empirical evidence to indicate the existence of an area-level segregation trend, increase in single person households and a trend of increasing inequality in housing.

From the perspective of inhabitants, the diversification of housing supply and increased customisation are highly welcome. However, it is worthwhile to consider whether there are risks involved in the extensive custom-tailoring of homes, especially from the standpoint of sustainable development, such as shorter housing life cycles. And should the building of indisputably non-ecological residential areas be prevented even if they were wanted?

DIFFERENT HOUSING PREFERENCE TYPES

FIVE HOUSING PREFERENCE TYPES: **FINLAND**

I value peace and quiet — I value life and action

I value mobility possibilities with car — I value walking, cycling and public transportation possibilities

The services that I need can locate further — I favour local services

The access to large green areas is important — Local park is green enough for me

I want to live as ecologically as possible — Other than ecological issues are important to me in housing

I want to settle down and be rooted — Moving means refreshing change for me

Investing to housing is important to me — I rather invest to other things than housing

I am a self-made person — I am a turnkey person

I value time spend at home — I value time spent outside home

Neighbourly help and socialization is important for me — Acquaintance with neighbours is enough for me

Neighbourhood lovers   Bons vivants   Introverts
The toilers   Busybodies

FIVE LIFE FORM TYPES: **DENMARK**

HOME AND LEISURE ORIENTED
- 40-50% OF THE INHABITANTS
- VALUE QUALITY IN DAILY LIFE
- QUALITY OF THE LIVING ENVIRONMENT IMPORTANT

CAREER ORIENTED
- 30% OF THE INHABITANTS
- WORK COMES FIRST
- ENTIRE CITY IMPORTANT

INDEPENDENT
- 5% OF THE INHABITANTS
- PROACTIVE AND IMPROVEMENT ORIENTED
- QUALITY OF URBAN SPACE IMPORTANT

CATALYSTS
- 5-10% OF THE INHABITANTS
- PROJECT ORIENTED INDIVIDUALS
- MOVE EASILY

SUPPORTED
- 15-15% OF INHABITANTS
- NEED PHYSICAL OR SOCIAL SUPPORT
- GOOD LIVING ENVIRONMENT, MEETING PLACES

EXAMPLES OF DIFFERENT HOUSING PREFERENCE TYPES. Although there is little empirical evidence for the differences in housing preferences so far, some studies do exist. A Finnish classic on the subject is a study by Mervi Ilmonen on the variations in housing preferences between the so-called knowledge workers and crafts workers.

Ilmonen discovered three different inhabitant groups: nature, centre and village-urban inhabitants. The categories combine many dimensions: family situation, relationship to nature, community, freedom of living and services – the question extends far beyond attitudes towards the natural environment. The centre-urban inhabitants value the extensive range of socio-cultural supply available in city centres. The nature-urban inhabitants are family-oriented individuals who value a spacious, free and independent housing style at the periphery of the urban area. The village-urban inhabitants represent an intermediate form between centre and nature urban individuals. They value both a rural-like lifestyle close to nature and a village-like community life. (*Ilmonen et al., 2000*).

More recently, many researchers have discovered similar types of preferences that vary from one inhabitant group to another. The right side of the picture represents the five life form types discovered in a qualitative study conducted as part of the drafting of a strategic municipal plan for Copenhagen in 2003 (*Koebenhavenerlivsformer, 2004*) The left side represents the five preference profile types discovered by Kyttä, Pahkasalo and Vaattovaara (*2008*) in a small-scale study conducted in the Muijala district of Lohja and Arabianranta in Helsinki. This study also employed qualitative methods. Of the identified inhabitant types, whose preference profiles differed from each other – the toilers, bons vivants, introverts, neighbourhood lovers and busybodies – there were some for whom ecological issues were not particularly important. One such inhabitant group were the bons vivants, who rated the natural environment very highly while having little interest in ecological issues.

Future research will certainly reveal many other housing preference types existing in Finland. Research will hopefully also explore the extent to which the inhabitants' desires are convergent, shared, permanent, even universally human and the extent to which they vary and change between different inhabitant groups. From the sustainable community standpoint, it is the information on the role of ecological values in housing preferences that matters most. In addition to relatively abstract studies on housing preferences, it would be paramount to obtain more research information about the relations between preferences and actualised housing choices, as well as the everyday habits that go with different forms of housing. What are the factors that ultimately determine the choice of housing? What does the reality of everyday life look like in different living environments? And are there characteristics that can be identified in the living environment which actively direct, attract and encourage inhabitants to pursue increasingly ecological lifestyles?

CHANGING SOCIAL AND CULTURAL STRUCTURES

HOW ARE THEY REFLECTED IN OUR LIVING ENVIRONMENT?

Image: http://flickr.com/people/ethnocentrics/

HOW DO CHANGES IN SOCIAL STRUCTURES AFFECT THE PLANNING OF OUR LIVING ENVIRONMENT? At least two essential changes will take place in the social structure of Finnish communities in near future: an exceptionally rapid and dramatic ageing of the population and an increase in the number of immigrants. These changes are closely related and will present a challenge to community planning solutions.

AGEING. A population projection published by Statistics Finland predicts that the proportion of the population aged over 65 will rise from the current 16% to 26% by the year 2030. The proportion those of under 15 years will decrease from 17% at present to 15.5% by the year 2040 respectively. In the same period the proportion of working population will fall from 66.5% at present to 57.7%, and the proportion of population over 85 years is predicted to rise from 1.8% to 6.1% by the year 2040. (*Population Projection, Statistics Finland*). Due to migration and variation in birth rates, regional differences in population structure are relatively high in Finland, but dwindling workforce threatens, not only areas traditionally hit by depopulation, but also areas with high birth rates and areas that gain from population migration. (*Romppanen, 2000*). In comparison with other EU countries, ageing is dramatic in Finland: Finland is, together with the Netherlands, one of the most rapidly ageing countries in Europe.

MULTICULTURALISM is already taking place faster than ever before during Finland's independence. In 2006 for instance, 22 700 people moved to Finland from other countries. The proportion of foreign citizens is highest in the capital region, Turku and Åland, where individuals with foreign backgrounds amount to ca. 5% of the population. The counties of Ostrobothnia, Savo and Satakunta have the least foreigners. The foreign population of Helsinki grew five-fold between 1990 and 2005 (*Peuranen & Ranto, 2005*). The Government Migration Policy Programme 2006 states that measures must be taken to significantly increase work-related immigration due, in particular, to the ageing of the population and the impending lack of workforce.

Ageing population and increasing immigration are likely to present both opportunities and challenges for the planning of our living environment. New planning solutions must promote health and well-being, and the independent, active living of the ageing population. At the same time service innovations create many opportunities for new business models. Identifying and developing those features in communities that are socially sustainable, adapt to the special needs of diverse population groups and foster social balance is a work in progress. Future research projects shall hopefully reveal new strengths in the Finnish living environment that can be turned into assets as cities compete in attracting skilled workforce (*Florida, 2004*). Although factors related to the living environment have not emerged as drivers that would attract migration to Finland yet (*Forsander et al., 2004*), they can be turned into future assets, at least if we are able to further refine the strengths of the Finnish living environment.

A PALETTE FOR ASSESSING THE QUALITY OF THE ENVIRONMENT:

A USER PERSPECTIVE

The smooth running of daily routines and how residents experience their environment are the touchstones of good planning. The living environment as the experienced, lived setting of everyday activities is the ultimate criterion of successful planning. The systematic collection of feedback data from inhabitants has been surprisingly rare in Finland. Especially empirical data relating to the physical features and specific planning solutions of an environment are nonexistent.

Elsewhere, assessment after occupancy (Post Occupancy Evaluation = POE) is a common practice, particularly as part of the real estate administration of public buildings. Feedback research on the experiences of inhabitants has been mostly performed at the level of individual buildings, and specific methodology packages have been developed for the purpose (*Preiser et al., 1988*). At area level, there have been fewer evaluations – but still relatively many – in the other Scandinavian countries, Sweden (*Ceccato,1998: de Laval, 1997*), Norway (*Guttu & Martens, 1998*) and Denmark (*Ambrose, 1996*). The few residential areas that have been evaluated in Finland include the Helsinki districts of Kivikko and Arabianranta, which were audited from many different angles, such as the residents' perspective, architectural value, the smooth progress of planning and the success of the transport system (*Kyttä et al. 2004; Kyttä & Tynnilä, 2006*).

Connecting the experiences of residents to the physical environment, and analysing them in relation to given planning solutions and structural characteristics of the community, requires methods that enable experiences to be connected with places. The illustration represents some of the methods employed at various levels of evaluation. Feedback data from residents is needed for the evaluation of homes, the living environment and the community alike. For instance, The Centre for Urban and Regional Studies at the Helsinki University of Technology has developed softGIS methods that enable the collection of experiential feedback data from the residents through easy online questionnaire applications that can be used to connect experiences with geographic information. The feedback method for home planning solutions, shown at the bottom of the illustration, was carried out in a house featured by Kastell at a housing fair, in collaboration with the University of Jyväskylä in 2008.

Sustainable community planning sorely needs feedback data on the daily life of the residents: how do the residents ultimately behave in their living environment, which planning solutions work and which do not? Only feedback information allows improved planning solutions to be developed. The toolkit used in the evaluation of living environments must naturally contain tools specifically designed for the assessment of the ecological sustainability of the environment. For the purposes of comparing results it would be important for these tools to be at least somewhat standardised. The transparency of evaluation is likewise important, in particular from the standpoint of participation processes. There may also be widespread international demand for tools that evaluate eco-social sustainability and utilise the new technologies in the process.

SUMMER COTTAGES –

AN ECOLOGICAL ALTERNATIVE?

Image: http://www.flickr.com/people/bluumwezi/
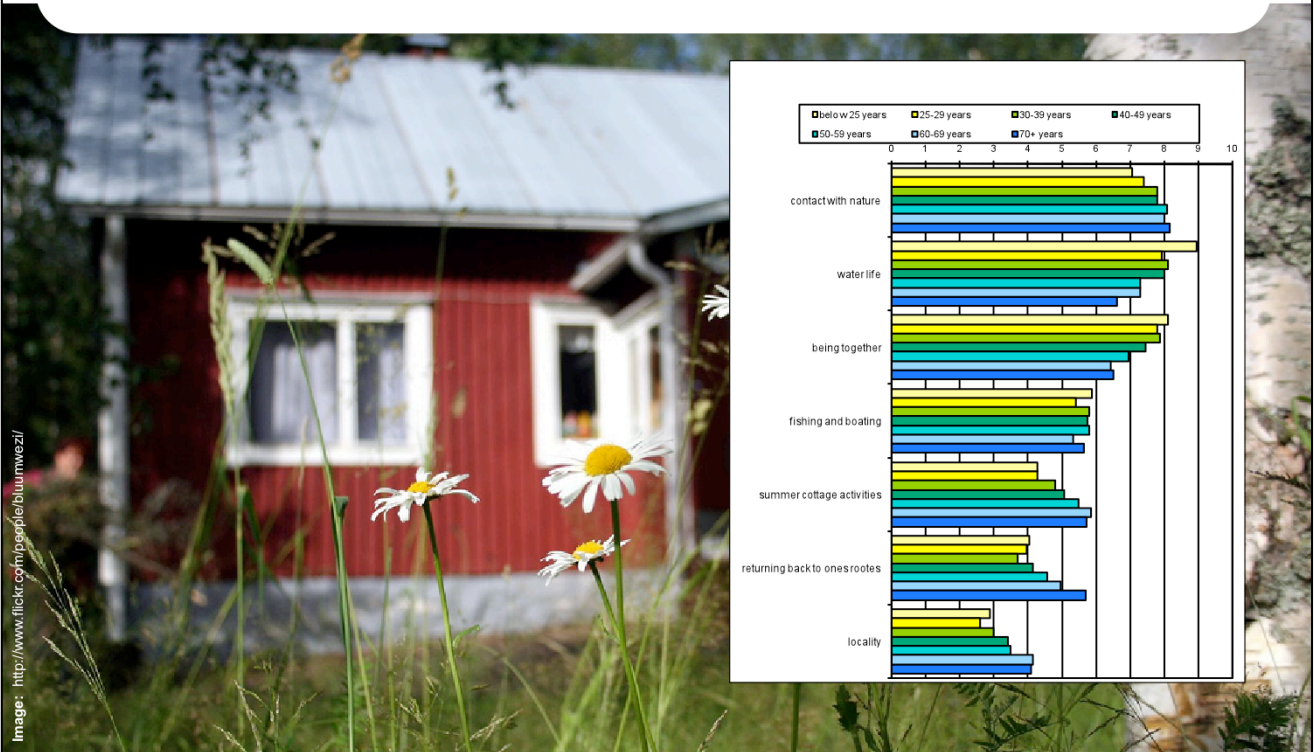
SUMMER COTTAGES – A RETURN TO NATURE OR AN ECOCATASTROPHE? Finland has almost half a million summer cottages, clustered largely along the coast, in the archipelago and the southern part of the Lake District. Spending time at summer cottages is a relatively recent phenomenon considering that in 1960, there were only about 90,000 cottages in the country.

Summer cottages have, however, already become established as an integral part of the mental landscape of Finns. Three out of four randomly selected Finns have spent time at one leisure home or more during the past year. For many, spending time at a cottage involves traditions, habits and customs that span several generations. For elder Finns cottages represent a return to rural landscapes, places that they or their families used to live in. However, most often cottages are experienced as places to revive contact with nature, to enjoy nature-related activities and to spend time with the near and dear. (*Hirvonen & Puustinen, 2008*).

With higher standards of living, the cottages' size and standard of equipment have risen, and the distances travelled may have increased as well. Few cottage dwellers ever think of the traffic and energy consumption generated by the cottage culture. Finns' trips to and from cottages consume about 1,070 gigawatt hours of energy annually and the average accumulated distance driven during weekend trips is 2,170 km per household annually. The energy consumption of cottages is approaching 1,000 gigawatt hours, which corresponds to about 10% of electric heating and household electricity combined. The proportion of cottages kept heated at a particular temperature all year round already accounts for 18% of all leisure homes. (*Kasanen et al., 2006*; *Melasniemi-Uutela, 2004*). The ecological impact of cottages is thus significant.

The eco-efficiency of cottages can and must be improved. The increasing demand to increase the comfort level of cottages may not be ecologically harmful if new solutions are developed. Potential targets for development and innovations include:

• a freeze-proof water management system tailored to the needs of part-time occupancy, in order to reduce unnecessary year-round heating (*Kasanen et al., 2006*)

• Co-ownership of cottages, cottage pooling, time shares and cottage rentals would enhance the eco-efficiency of leisure homes (*Kasanen et al., 2006*)

Another question to consider is whether the cottage might replace the primary home as a place where more time and longer uninterrupted periods are spent, in which case a small flat could suffice as the city home. In this scenario, part-time inhabitants help to revive local rural economies and the environmental load related to frequent travel decreases.

ZERO ENERGY HOUSING DEVELOPMENTS

BedZED (Sutton, UK), GEOS (USA)

ZERO ENERGY ZONES ARE BEING DEVELOPED IN DIFFERENT PARTS OF THE WORLD.

BEDZED, GREAT BRITAIN: Sutton, near London, is home to the largest zero energy housing project in the country: BedZED. The first homes in the area were completed in 2002 and the number has grown up to 82. The area brings together ecological, social and economic sustainability. It also combines various forms of management and different functions, and relies on renewable and locally produced energy.

BedZED combines modern design with a green setting: almost all homes have a roof-top or ground-level garden. Good basic services in the area (shops, day care centre, exhibition room) and environmental transport solutions (light traffic, bus, train, tram, bicycle storage, city car, charging station for electric cars) encourage ecological lifestyles. Solar energy, recycling of waste water, energy efficient devices and the possibility to follow energy consumption in each home facilitate the aims for zero energy. Building materials are mostly thermally-massive structures and recycled materials. The area has been developed by the Peabody Trust. It has won several awards and attracted great interest in Britain and abroad. There are regular tours organised in the area, for instance for school children. The tours also provide environmental education.

GEOS, USA: The largest zero energy housing development in the US is under construction in Arvada, Colorado. The construction of GEOS, an energy self-sufficient development of 250 homes, is scheduled to start during autumn 2008. GEOS is an advanced example of a housing project that represents the so-called *new urbanism*, which, although implementing sustainable values, has not previously presented a project with energy self-sufficiency. The energy system of GEOS is based on a combination of solar energy and geothermal heating. The homes are located on plots in a grid plan in a way that allows each house to absorb the maximum amount of solar energy. The parks of this mixed-use area are used to collect and recycle rain water. Food is produced in collective gardens. GEOS represents affordable housing production: property prices start at USD 200 000. The homes are detached or semi-detached houses, row houses, blocks of flats and collectives.

OLD BECOMES NEW

798 SPACE

Image: http://www.flickr.com/people/jin_aili/

RE-USE. Sustainable urban development should, as far as possible, be based on taking advantage of the existing infrastructure, and on the re-use of outdated sites and buildings. Successful re-use creates a new identity for the site, and has a positive influence on the local economy.

Many former industrial sites and traffic zones are experiencing a change: a large number of old industrial buildings and areas have been abandoned since the mid-20th century in Finland, Europe and elsewhere in the world. Re-use of these sites is always a challenge since the functions that can be adapted is limited, and the preservation codes may impede re-use. Successful re-use generally involves a mixed-use model, where one feature (music, art, etc.) clearly prevails and therefore creates a strong sense of identity for the place.

AN OLD FACTORY. SPACE 798 is an example from China (*image*). A former electronics factory located in Beijing has been transformed into a large cultural centre that functions as a meeting place for the growing art and culture community of the city. The centre aims to present different forms of socialist culture and work as a forum for bringing together the art forms of the "New China". The development started in 2002, when artists and art organisations began to rent and renovate the space. Step by step, the factory has turned into a busy cultural centre that is now a home to restaurants, a book shop, a cinema, fashion, dance and design and last but not least, modern art.
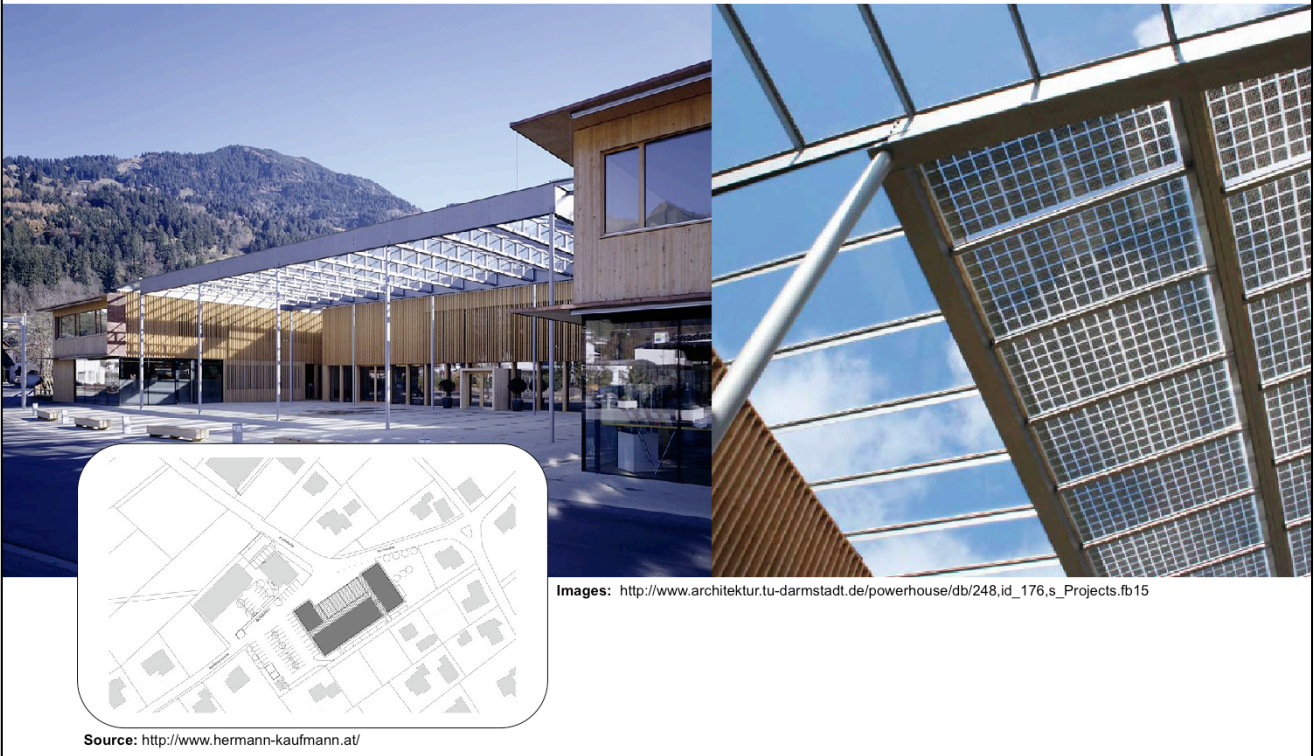
In Berlin, buildings formerly occupied by the film industry now house ufaFabrik, which offers a wide range of functions joined by the common theme of ecology. Huset, in Århus, is an art school that, apart from organising wide-ranging arts education, also participates in the operation of local schools and cultural centres. The common factor is that the education is for children. PS1 is a first-rate extension development by MoMA in New York, which takes modern art beyond its stronghold of Manhattan galleries to an old school building in Queens. In Finland, some well-known examples of the re-use of industrial properties include Verkatehdas in Hämeenlinna and Kaapelitehdas and the Suvilahti area in Helsinki.

Rehabilitation is an opportunity. Successful re-use models and processes at local level may become a ground for service and business concepts with potential in international market.

GEMEINDEZENTRUM LUDESCH

INFILLING ✚ ECOLOGICAL SOLUTIONS ✚ COMMUNITY

Images: http://www.architektur.tu-darmstadt.de/powerhouse/db/248,id_176,s_Projects.fb15

Source: http://www.hermann-kaufmann.at/

SUSTAINABLE SOLUTIONS TO INFILL EXISTING STRUCTURE. Gemeindezentrum Ludesch (Ludesch, Austria) is an example of incorporating new functions and buildings into an existing village structure. The plan of a new community centre aimed to create a meeting place for the village that could offer a wide range of activities, and to complement the structurally scattered village centre. The new community centre is located at the end of the main road like a traditional village square.

The community centre is a complex comprising three buildings. In addition to a community hall, the centre hosts the town hall and offices, library, the post office, a coffee shop and other commercial premises as well as facilities for other communal activities. The buildings frame the outdoor space on three sides, and the square functions as a new public meeting place and market. The square is covered with transparent solar cell elements.

The new community centre was built as a prototype for ecological building (as part of the Haus der Zukunft programme). The buildings comply with the principles of passive housing and minimum energy, and employ renewable energy sources, such as electricity collected by solar cell elements. Heating is based on locally produced bioenergy. The planning and construction processes of the centre have been heavily influenced by the sustainable use of resources, technological solutions, and the ecological value of building materials (wood) and methods. Gemeindezentrum Ludesch showed that ecologically sustainable building materials halved the energy needed to produce them but the costs increased by only 1.9%.

The building was completed in 2005 and has won several architecture awards. The architects of Hermann Kaufmann have also been awarded the Global Award for Sustainable Architecture in 2007.

RIKO HOUSE

HEALTHY ENVIRONMENT ✚ ECOLOGICAL MATERIALS ✚ MASS CUSTOMISATION

Image : http://www.riko-hise.si/

THE RIKO HOUSE CONCEPT. Riko House is a Slovenian company that has specialised in wooden structures since 1999. The company builds mass customised homes and housing developments based on planning solutions that emphasise healthy and comfortable living environments, clean and ecological materials, and details both inside and in the facades that meet the hopes and needs of the customer. Consideration for customers is also shown in fast delivery times; using element structures ensures that the house can be erected within months. Construction and erection can also be undertaken in all seasons.

The structures are made of solid, laminated and technically dried fir. The basic structure is a 10 cm thick wall element made of solid wood. A layer of wood fibre insulation is placed between the wall element and the façade. Natural materials are ecological to use, recyclable, and provide the houses with a cleaner and more allergy friendly air quality. Façades of the buildings are likewise wooden. The façade innovations are suitable for new buildings and renovation sites alike, and the façade elements can be mounted on any structure or material.

The Riko House concept was created in an area where the tradition in wood construction is strong. The concept offers a modern combination of ecological materials, low energy solutions, element construction, careful design and high production quality. Many internationally known architects have designed Riko Houses, and in addition to Slovenia, they have been implemented in countries such as England, Ireland, Croatia, Germany and France. Apart from private homes and housing projects, the company has designed and developed public buildings, as well as different ceiling and façade solutions. The concept has been awarded the low energy rating of B in Slovenia.

URBAN SPACE

GREEN AREAS ✚ URBAN FARMING

Images: http://myfarmsf.com/photos.html

CITY DWELLERS AND NATURE. In Finland, planning, maintenance and management of urban nature has traditionally been the responsibility of professionals such as landscape architects, land use planners, gardeners and forest experts. The views of the inhabitants and users have turned into concrete measures only indirectly, mediated by experts' interpretations and tools (*Jokinen & Asikainen, 2008*). "Caring for nature" is often associated, not with urban life but with the livelihoods based on natural resources, such as fishing, agriculture or forestry. According to Jokinen (*2004*) these concrete practices offer at least the possibility to create an individual relation with nature, to become aware of its state, and to care for the environment (in some cases own land) and its future. Why couldn't city dwellers act as caretakers for their urban nature. What forms could this concept take in urban environments?

What would an urban relationship with nature be like where dwellers take part in activities such as planning, decision-making and maintenance of the urban nature? Examples from other countries show that the "Urban Farming" movement has become increasingly popular. It holds the promise of uniting people, natural systems, and urban space. Urban farming is not only about recreation – local, ecological and self-sufficient food production is also at stake. In the global context, innovations for urban agriculture and local food production are sought after.

MY FARM. A San Francisco-based collective has offered city dwellers a model of decentralised urban farming. People are given the opportunity to lend a yard, or a section of it, as part of a collective vegetable garden scattered around the city. My Farm asks the residents what they wish to grow in their garden, then plans and implements it, and maintains the garden weekly. When the vegetables have grown, My Farm harvests the crop and leaves the fresh vegetables at the residents' door. Surplus vegetables are distributed to other residents belonging to the collective. My Farm aims to support the locally produced and organically grown food in the urban environment, and in doing so, to participate in the global debate on food production as well.
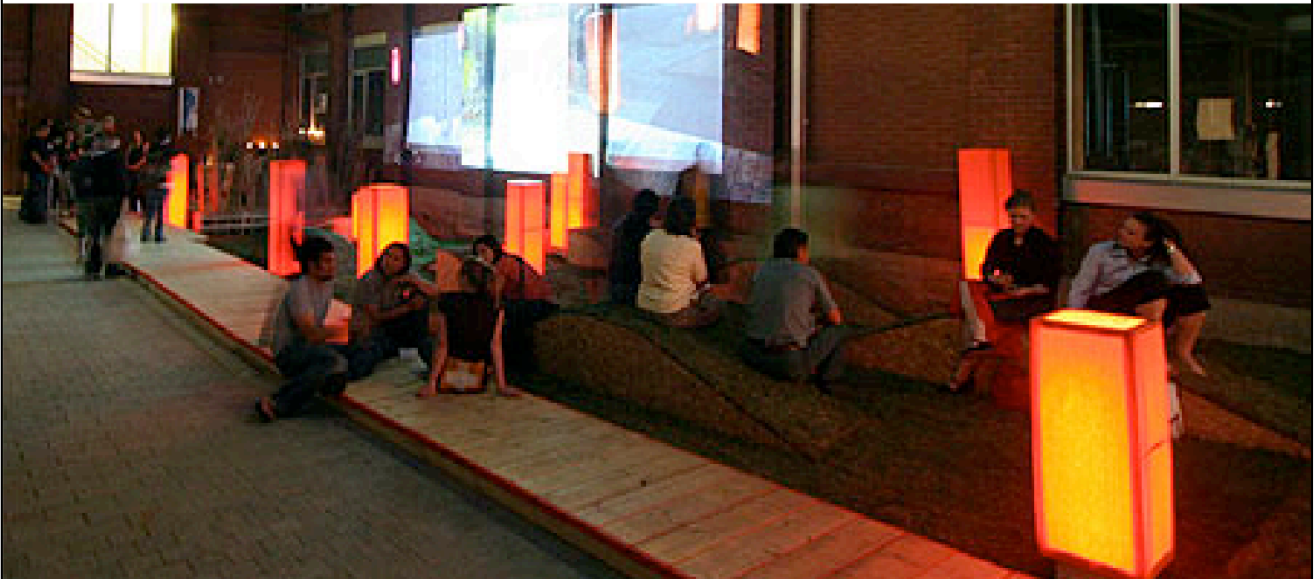
URBAN SPACE

STREET LIFE ✚ "THIRD PLACES"

Image: http://mocoloco.com/archives/002845.php

WHAT CAN SUSTAINABILITY MEAN IN URBAN SPACE OR IN THE STREETSCAPE? - SOME EXAMPLES

POCKET PARK. "The commissioned installation was unveiled at the 2006 Mayor's Celebration of the Arts and was situated in the West Courtyard of the School of Architecture. Originally meant to facilitate outdoor class lectures and impromptu events, the courtyard has remained an underused and neglected space by both the students and citizens of Cambridge. Its potential as a successful gathering space exists, but has fallen short, due in part to some of the other more conducive social spaces in and around the school." (http://www.flickr.com/photos/74686819@N00/sets/72157594174901565/)

HAPPIHUONE. Happihuone exhibition space, which operated in the Töölönlahti bay area of Helsinki until 2007, offered a Finnish example of a meeting place for citizens operating on a voluntary basis. The small building resembling a green house was built in 2000 when Helsinki was designated as one the European Capitals of Culture, after which the City of Helsinki sold the building to the O2 association. The Happihuone community was active: they grew flowers on the waste lands of the park at Töölönlahti bay, build a peat sauna, and organised events, such as art exhibitions, open-air dance evenings and poetry performances. The space brought together citizens from around the city and offered passers-by and joggers a place to rest in a green oasis in the middle of Helsinki. The space gave the city residents an opportunity to influence on the development of their immediate living environment in a concrete way, and to bring spontaneous cultural activities to the city. Happihuone was pulled down by the volunteers when the lease agreement for the site expired in the autumn of 2007. The site had to make way for the new Finlandia Park.

THE "DIY STREETS" PROJECT helps residents to re-design their streets inexpensively, and in a way that local people get actively involved in the development and in the implementation. Streets are made safer and more pleasant urban spaces – a part of a good living environment. The project was launched by "the Liveable Neighbourhoods" team of Sustrans (Britain's leading sustainable transport support organisation) and it operates in cooperation with local organisations, helping residents to improve their environment.

HOW TO GUIDE COMMUNITIES TOWARDS SUSTAINABILITY?

CITIES. Cities play a key role in the local and global pursuit of sustainable development. However, cities are politically and administratively fragmented and even conflicting organisations. Therefore their strategic capacity to achieve sustainability, for example, differs considerably from the strategic opportunities of companies. Managing cities and identifying the right steering mechanisms are therefore challenges for cities all over – is it even possible to manage and lead cities?

PARTNERSHIP AND COOPERATION. Cities alone cannot create sustainable communities. Regional structure is an exceptionally complex "output" of long processes and countless factors. The impact of individual projects is usually insignificant; the effectiveness is created from getting as many stakeholders as possible to work towards common goals. These processes involve strong leadership, but in a way that the direction of development is continuously discussed – which has created a major challenge to city governance, when aiming for sustainable development.

FINLAND. Municipal self-governance is strong in Finland; it becomes evident in land use planning since municipalities have a legal monopoly on planning. This position may also be misleading; achieving land use objectives depends also on a variety of other factors.

MONITORING DEVELOPMENT. In this chapter, municipal leadership and management are examined with a limited focus. Emphasis is put on how important monitoring the development and giving it visibility are to a successful local governance.

SIX CAPITALS OF CITIES (PwC)

Image: Adapted from PwC (2005), Cities of the Future (p. 9)

1. INTELLECTUAL AND SOCIAL CAPITAL

2. DEMOCRATIC CAPITAL

3. CULTURAL AND LEISURE CAPITAL

4. ENVIRONMENTAL CAPITAL

5. TECHNICAL CAPITAL

6. FINANCIAL CAPITAL

"WITHOUT EFFECTIVE PERFORMANCE MANAGEMENT, CITIES WILL NOT BE ABLE TO CREATE A CULTURE OF CONTINUOUS IMPROVEMENT."

HOW TO PLAN AND MANAGE THE WHOLE?

SIX CAPITALS OF CITIES. PricewaterhouseCoopers wanted to understand the challenges and opportunities of the cities of tomorrow by interviewing the leaders of over 40 cities around the world (*PwC, 2005*). The data compiled was assessed to ascertain what elements form the starting points for the strategic development of communities. *Six capitals of cities* were identified: *Intellectual and social capital*, *Democratic capital*, *Cultural capital*, *Environmental capital*, *Technical capital* and *Financial capital*. These capitals are integrated and strongly dependent on each other. The coordination of sometimes different and even competing interests and objectives poses challenges for managing these capitals. Therefore, the interviews focused on a holistic approach in urban and regional development. Interlinking the capitals also means stronger cooperation between various actors and new forms of partnerships.

The report also called for future-oriented planning, and a debate on how city strategies will respond to changing conditions, and to the dynamic social, economic and political environments. The interviewees considered identifying existing situation, resources and strengths important. Only then it will be possible to ask what kind of a future the people want. According to the interviewees, management and leadership based on the six capitals identified are increasingly value-driven.

KEY QUESTIONS ON THE SIX CAPITALS IDENTIFIED BY PWC:

How can the intellectual capital of communities be measured and assessed?

What kind of models will increase the transparency of decision-making processes?

What makes citizens interested in management and governance? What activates them to participate?

What factors or functions are attractive in communities, and, above all, what factors maintain the interest?

How to fit economic development with ecological sustainability?
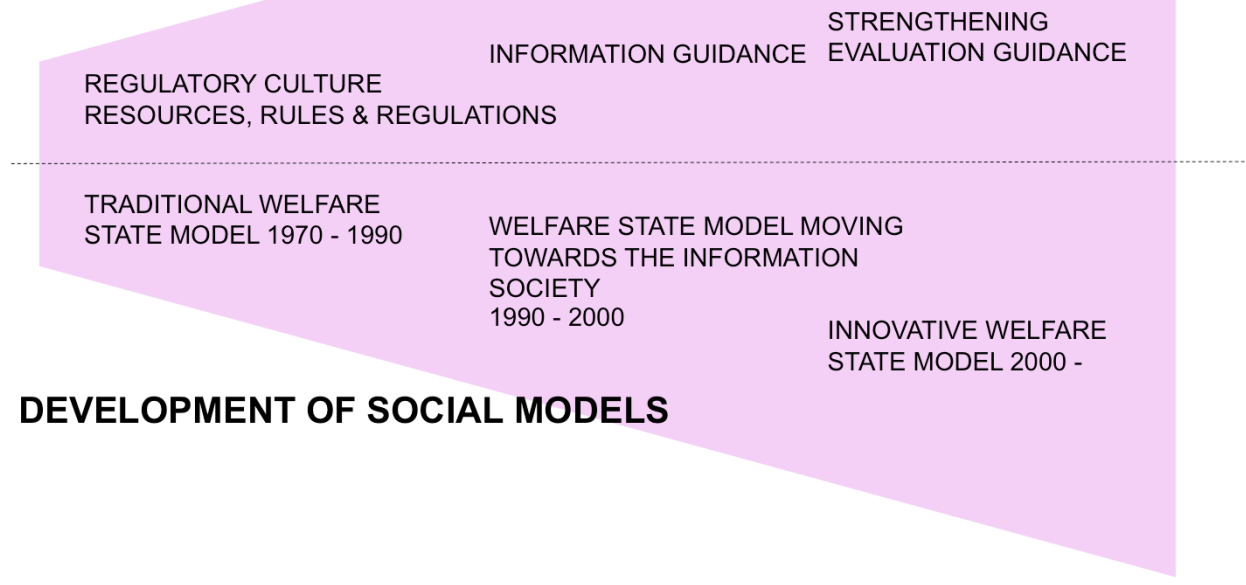
INTEGRATION AND PARTNERSHIPS

Image: Tiina Merikoski

Cities and communities of the 21st century are those of continuous and rapid change. Changing conditions require the communities and its various actors to be able to identify the need for change, and to have the capabilities to react to these needs, i.e. the ability to manage uncertainty. In these situations a stronger cooperation and new partnerships of various actors, systems, and planning levels and tools are needed. Communities and their planning has to be increasingly understood as a system created by various factors and features.

URBAN STRUCTURE - SERVICE STRUCTURE. The position of municipalities, and public administration more broadly, is strong in communities. They not only control but also produce numerous of the basic services themselves – the entire notion of the welfare society is based on this structure. The "redefinition" of the service structure, which is currently being undertaken in Finland, may be the most concrete example of the problems we are facing with the equation of urban structure, well-being and economic efficiency. What does sustainability mean in this context? The service structure is part of the urban structure, but the possibilities to effect on the locations the services by planning are, however, limited. The continuous cutbacks in neighbourhood services have raised the question of the efficiency of service provision and the role of the municipalities themselves in this issue: should municipalities concentrate on specifying service quality requirements and hand over the provision to those who can provide the services most efficiently?

Public private partnership concerns land use planning too. The Association of Finnish Local and Regional Authorities is currently preparing a proposal on how municipal town planning and cooperation with the private sector can be achieved. The project is looking for solutions, above all, to speeding up the regional planning and implementation processes. Recently, several regions have implemented demonstration projects on planning and construction based on new partnership models. The public and private interest can, however, also be conflicting. One currently debated conflict of interest concerns the locations of large shopping centres. Shopping centres that depend on car traffic do not support sustainable development. In the USA, "the home of the shopping centres", shopping centres have started to become outdated; of the country's 2000 largest regional shopping centres, i.e. malls, an estimated 19% are currently in difficulties; the situation can be monitored online at www.deadmalls.com. Some examples already exist of how old centres are being transformed into a part of a sustainable urban structure.

SOCIETAL GUIDANCE IN
REGIONAL DEVELOPMENT

MODELS FOR GUIDING REGIONAL AND COMMUNITY PLANNING

STRENGTHENING
INFORMATION GUIDANCE   EVALUATION GUIDANCE

REGULATORY CULTURE
RESOURCES, RULES & REGULATIONS

TRADITIONAL WELFARE
STATE MODEL 1970 - 1990

WELFARE STATE MODEL MOVING
TOWARDS THE INFORMATION
SOCIETY
1990 - 2000

INNOVATIVE WELFARE
STATE MODEL 2000 -

DEVELOPMENT OF SOCIAL MODELS

MODELS FOR GUIDING PROGRESS AND DEVELOPMENT. Society and its communities are increasingly multidimensional. At the same time, people's values, attitudes and ways of life are more diverse than before. This trend has resulted in challenges also in directing regional and community planning. The change has been seen in the diversification of guidance models. The traditional welfare state and the development of its communities was guided through the regulatory culture as well as through resources, rules and regulations (*Stenvall & Syväjärvi, 2006*). As the development of the information society has gained strength, the role of information guidance has increased (op.cit.). The latest trend has been the strengthening of evaluation, i.e. evaluation guidance (*Vedung, 2003*; *Roininen, 2008*). The change has also signified the substitution of the rationalist-linear line of development with an evolutionary development perspective (*Sotarauta, 1996*; *Valovirta, 2007*). An evolutionary development perspective includes the idea of the complexity, dynamics and emergent nature (unconscious development and partial randomness) of society and social development.

1) Guidance through resources and rules is based on strong centralism where the role of individuals, regions and local communities remains that of implementing rules and regulations set from above. The fragmentation of development has made guidance through resources, rules and regulations alone difficult.

2) Information guidance is well-suited to the information society, but it has been found to be very insignificant in terms of its impact. It has been difficult to engender the commitment of individuals and actors responsible for the development of local communities to sustainable development activities through information alone. Humans operate in a complex information society, essentially in an irrational way. Information does not always lead to action.

3) Evaluation guidance is based on the (self) reflection of actors and is able to consider the value choices underlying factual information and which impact on activities better than information guidance. The value-bound nature of evaluation guidance makes it the most enduring guidance model. The most effective form of evaluation guidance may be self-evaluation guidance as a kind of path towards the self-regulation of sustainable development by individuals and local communities.

EVALUATING THE IMPACTS. Various evaluations of impacts became established as part of social guidance during the 1990s. The most important in terms of urban structure are the evaluations included in large separate projects (EIA projects) and land use planning processes. An extensive methodology and expertise exists for various evaluations of impacts, such as environmental impact assessments (EIA), human impact assessments (HuIA), social impact assessments (SIA), cultural impact assessments (CIA), gender impact assessments (GIA) and child impact assessments.

HOW CAN WE MEASURE AND MONITORE SUSTAINABILITY?
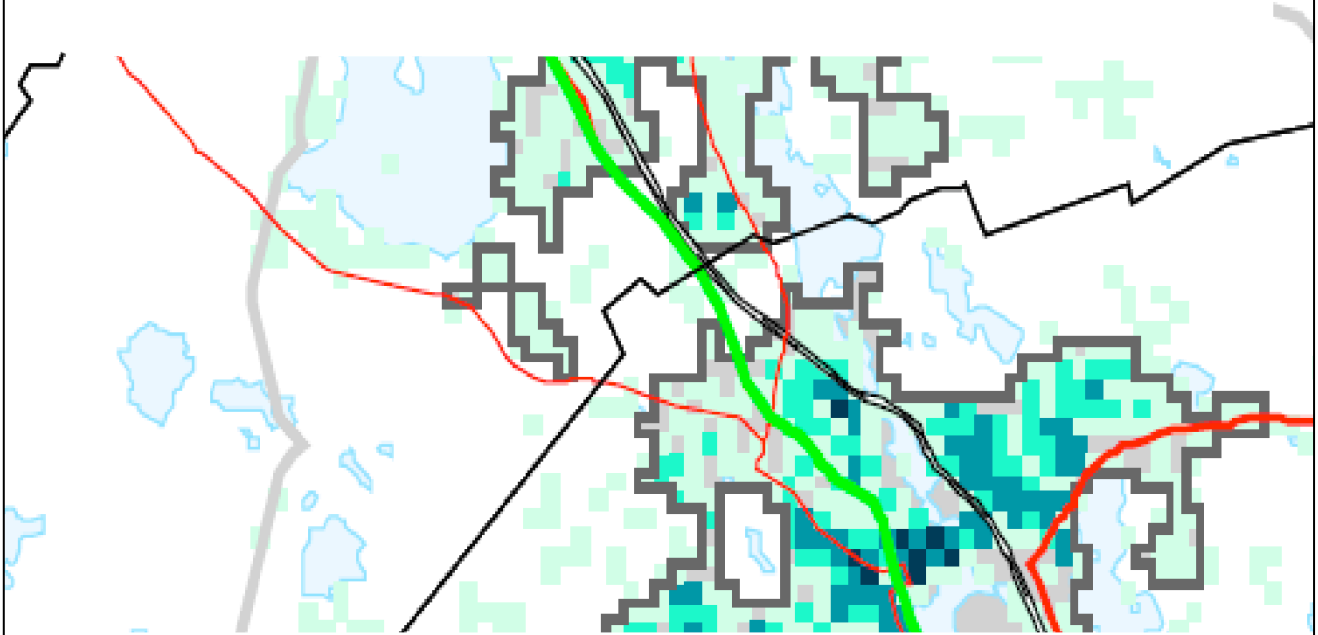
ECO-EFFICIENCY? ECOLOGICAL FOOTPRINT? GREENHOUSE EMISSIONS?

ECO-EFFICIENCY. Evaluation of eco-efficiency is based on life-cycle assessment of materials and energy needed for the provision and use of the different structural constituents of society, and the mobility. EcoBalance is a tool to measure eco-efficiency in residential areas developed in Finland by VTT (Technical Research Centre of Finland). Its specific computational effects have been compiled from Finnish and international sources since the 1990s. The indicators of the EcoBalance model are divided into six main groups: construction materials, fuels, energy consumption, water consumption, emissions and waste. Each feature has its own measurement unit (kg, tonne, kWh, MWh, l, 1000 l), and they are frequently presented as proportions /apartment m^2 or /resident. Other examples of environmental certifications of buildings include the North American LEED system and the Finnish PromisE system. .

ECOLOGICAL FOOTPRINT. The ecological footprint is a resources management tool that measures how much ecologically productive land and water are needed to cover our consumption and to dispose of the waste created. The tool has been developed since the 1990s and currently WWF, the World Wildlife Fund, manages the international data bank on the subject. Companies, states and municipalities around the world have calculated their ecological footprints. The footprint is generally expressed as hectares per resident; the footprint of a city is the sum of its residents' footprints.

GREENHOUSE EMISSIONS. The importance of climate change can be seen in the fact that the development of communities is increasingly being evaluated by the greenhouse gas emissions they produce. Agreement was reached for the first time on greenhouse gases with the Kyoto Protocol in 1997. Through the EU's internal agreement, Finland aims to reduce emissions to the 1990 level by the year 2012. Greenhouse gases include carbon dioxide (CO_2), methane (CH_4) and nitrogen dioxide (N_2O); the emissions are usually converged in comparisons into carbon dioxide. Finnish cities have been working since 1997 to reduce greenhouse gasses: 43 Finnish cities currently belong to the international Cities for Climate Protection network. The cities use the KASVENER program for calculating emissions, which calculates emissions on the basis of consumption and production.

Ministry of the Environment is currently preparing a model for linking the urban and regional structure, and the greenhouse gases. The work is based on a geo-information system (GIS) that describes the development of the urban structure (YKR data), and is connected to re-evaluation of the national land use guidelines.

OPPORTUNITIES IN INFORMATION TECHNOLOGY

REGIONAL DEVELOPMENT

PROCESS

INTERNET

GEOGRAPHIC INFORMATION

MONITORING THE STATE OF THE ENVIRONMENT & REGIONAL DEVELOPMENT – POTENTIAL FOR NEW INNOVATIONS?

GEOINFORMATION. Finnish cartography has a long and renowned tradition. Information technology has gradually turned the map into a dynamic depiction of various databases, enabling more effective monitoring of regional development in a completely new way. Databases in GIS usually include information, for instance, on real estate, infrastructure and population. These databases are maintained by various authorities. Alongside this "factual knowledge", participatory sensing i.e. information provided by citizens and users is becoming more important all the time. The amount of information is increasing and its quality is changing; as the number of information providers increases, the question of the reliability of the information also arises.

INTERNET. According to the Finnish Technology Barometer 2007, use of the Internet does not quite surpass the level in Denmark, Sweden and Holland: in 2006 71% of Finns used Internet every week. In obtaining public services online, and online trading Finland also ranked below the international top spot - Sweden, Denmark and Great Britain came out above Finland.

GIS data, maps and the Internet are a powerful combination of tools when we aim to reach a large network of actors, or present and compile extensive data and comments on the environment and regional development. For example, the GIS databases of the City of Vancouver comprise around 300 different themes, and of those around half are open to the general public online. In Finland, official maps and GIS data have not been widely available to the public, but the rapid spread and good availability of e.g. Google Maps have boosted opening up the official data sources too.

Research projects on urban planning and land use planning have developed several applications to support monitoring of regional development. These applications include local planning and development platforms and survey applications that utilize place-based data. There lies considerable development potential in the interactivity and usability of these applications: How can they best be integrated as part of cities' information, guidance and decision-making systems?

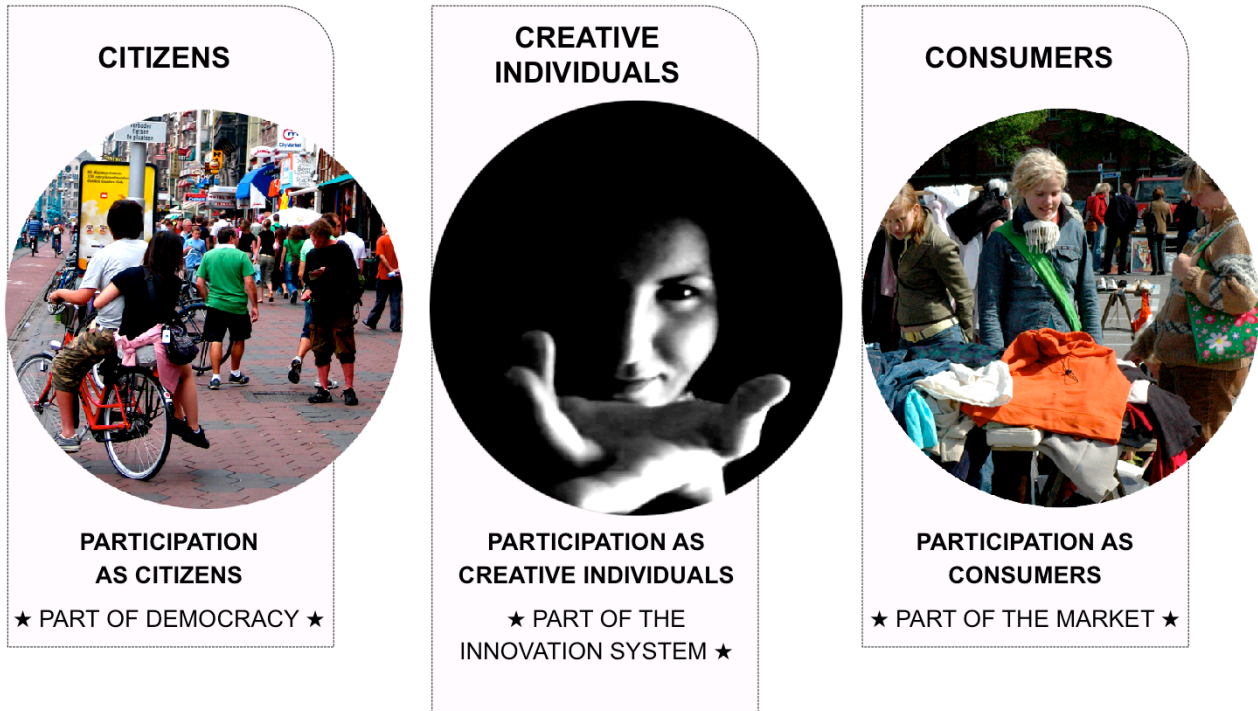**Monitoring the state of the environment –possibilities for new innovations?**

HOW CAN EACH OF US INFLUENCE?

Sustainable development will require changes in policies and planning principles, but also in the daily practices of individual people. Basically, environmental awareness has become mainstream. However, attitudes do not directly translate into daily practices. There are numerous other factors that influence our action, such as the lack of resources (time, money, information, and skills), familiar routines and other objectives conflicting with the pro-environmental attitude.

Prerequisites for sustainable everyday-life are twofold. On one hand conscious environmentally responsible activity, which here is called environmental agency, needs to be encouraged and enabled. On the other hand, we need structures to guide and produce environmentally friendly activity also when it is not intentional for the actor.

Participation may promote acquisition of motivation and skills necessary for environmental agency. Successful structures of sustainable everyday-life will likewise be created through knowledge, skills and ideas provided by participation. Sustainable communities and their creation will require wide and deep participation of citizens.

PEOPLE SHAPING THEIR ENVIRONMENT

CITIZENS

CREATIVE INDIVIDUALS

CONSUMERS

PARTICIPATION AS CITIZENS

★ PART OF DEMOCRACY ★

PARTICIPATION AS CREATIVE INDIVIDUALS

★ PART OF THE INNOVATION SYSTEM ★

PARTICIPATION AS CONSUMERS
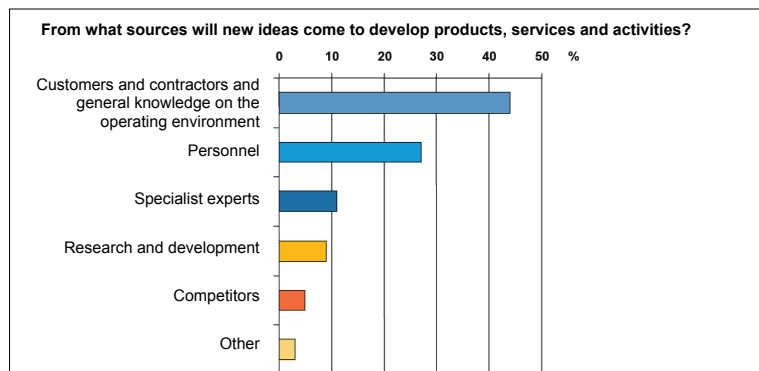
★ PART OF THE MARKET ★

PEOPLE SHAPING THEIR ENVIRONMENT. Individuals take part in shaping their living environment at various levels and in different roles on a continuous basis. Participation traditionally refers to the civil society (e.g. NGO's) and to participation in political decision-making by voting. In sustainable communities, participation should be viewed in a holistic manner.

AS CITIZENS – DEMOCRACY. To an increasing extent, people want to participate directly in taking care of matters important to themselves at various stages of life, rather than commit themselves to, for example, political activities. This need to have an influence can be met by increasing opportunities for direct participation of citizens in municipal activities, such as in developing services and in planning residential areas.

AS CONSUMERS – THE MARKET. Where people choose to live and shop as well as their means and needs of mobility have direct impact on the sustainability of the community. Service provision is guided by consumer choices and demand. For example: does the energy solution affect choosing the model of a prefabricated house? Or, in the end, does the supply guide the choices we make?

AS CREATIVE INDIVIDUALS – THE INNOVATION SYSTEM. The majority of new ideas are created in the interface of service-users and providers, and in open environments. Input of residents and consumers is required in the development of participation and sustainable everyday-life structures and practices. Joint development promotes the establishment of distinct regions and opens up opportunities for decentralised innovation. Residents as product developers of their environment as well as wikidesign and -planning are concepts that contain the idea of users as active producers of the environment.

From what sources will new ideas come to develop products, services and activities?

	%
Customers and contractors and general knowledge on the operating environment	
Personnel	
Specialist experts	
Research and development	
Competitors	
Other	

Source: Sitra: *Productivity, Innovation ability and innovative procurement* / Tuottavuus, innovaatiokyky ja innovatiiviset hankinnat, J. Yliherva 2006

ATTITUDES AND BEHAVIOUR MAY BE CONTRADICTORY

Image: Brian Ulrich, Source: http://www.polarinertia.com/may04/shopping01.htm

SUSTAINABLE DEVELOPMENT REQUIRES CHANGES IN POLICIES AND PLANNING PRINCIPLES BUT ALSO IN EVERYDAY LIFE PRACTICES, ACTIVITIES AND VALUES OF INDIVIDUALS Conceptions of nature, attitudes to environment and awareness of environmental problems are shaped, on the one hand, in direct and practical relation to the environment, and on the other hand, in relation to various expert systems and the media. Our everyday actions and choices are shaped by these cultural and subjective understandings of the world and by infrastructure or conditions of everyday life – the coalescences or of material, socio-cultural and temporal arrangements
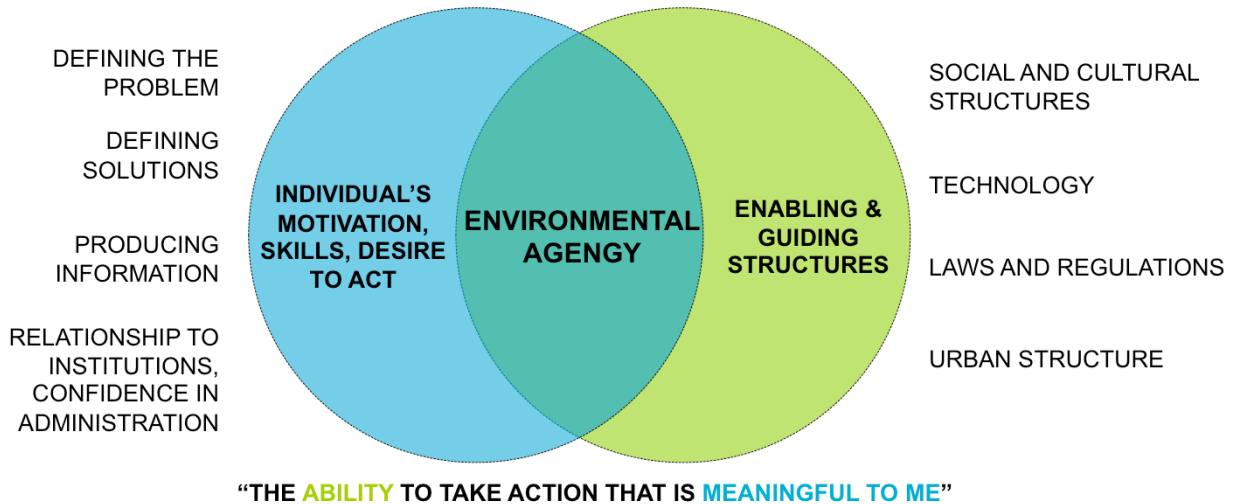
VALUE—ACTION-GAP. Awareness of environmental problems and environmentalism have in some sense become fairly pervasive and institutionalised in our society. The aim of sustainable development is often seen as a process where scientific knowledge about the state of the environment and environmental problems is communicated to citizens. It is presumed that this information will affect people's attitudes and in this way their behaviour and daily activities. The communication of expert information to affect everyday practices does not, however, take place in such a straightforward manner: we cannot presume that good practices with respect to the environment will automatically follow from environmentally positive attitudes and information. There is no direct causal link between environmental attitudes and sustainable daily activities even if the concepts of the environment or environmental problems and daily life practices are closely related to each other. In research literature this is often referred to by the concept attitude-behaviour-inconsistency or the value-action-gap.

OBSTACLES TO "ACTIVATING" PEOPLE have been identified as being manifold:

• It is often difficult to perceive and assess environmental problems and the impact chains and risks relating to them. The available information does not necessarily correspond to people's everyday experiences or it is not applicable to their daily practices.

• Individuals may lack the sense of agency -- the resources to act (time, money, information, and skills) or moreover, power or trust in the government

• The rationality of day to day activities is a very complicated issue. Therefore, economic instruments, for example, are not always effective in daily life in the desired or presumed manner.

• Legislation, incorrectly targeted incentives, the available technology, social norms and expectations and the socio-technological infrastructures may restrict the alternatives available for sustainable daily life. Practices and routines relating to structural factors shaping activities can hold up sustainable transitions of everyday life.

(e.g. *Ahonen 2006*; *Macnaghten & Urry 1998*)

REQUIREMENTS FOR SUSTAINABLE EVERYDAY LIFE

DEFINING THE PROBLEM

DEFINING SOLUTIONS

PRODUCING INFORMATION

RELATIONSHIP TO INSTITUTIONS, CONFIDENCE IN ADMINISTRATION

INDIVIDUAL'S MOTIVATION, SKILLS, DESIRE TO ACT

ENVIRONMENTAL AGENGY

ENABLING & GUIDING STRUCTURES

SOCIAL AND CULTURAL STRUCTURES

TECHNOLOGY

LAWS AND REGULATIONS

URBAN STRUCTURE

"THE ABILITY TO TAKE ACTION THAT IS MEANINGFUL TO ME"

SUSTAINABLE DAILY LIFE MEANS EASY ROUTINES AND CONSCIOUS CHOICES. Our daily life always has impacts on the environment, although we can influence them within certain limits. Environmental agency is the field of conscious environmentally friendly activity and choices. Our opportunities to choose, however, are defined by very different structures – both physical and social. The various structures interlinking physical and social structures form the infrastructure of everyday-life (*Horelli & Wallin, 2006*); for example the urban structure may open up or close opportunities for sustainable daily life. It is not possible for us to continuously make conscious choices weighed up on the basis of the environment. Routines, unconscious "eco-performance" and structures guiding people to that end are also needed as the basis for sustainable daily life.

DAILY ROUTINES. Daily practices, that are framed by the material and physical environment, such as work, living or going to the shops, include culturally common and established practices, rules, skills and tools. Day-to-day activities become routine and established under these terms and conditions. It can be difficult to specify in this kind of habitual activity, what is constituted of people's "own responsibility" and what is not. For example, energy consumption is in most cases not a conscious choice, but an indirect need that is created by devices and infrastructure providing mobility, cleanliness, comfort, and protection, etc. The connection between energy use and daily routines linked to, for example, household management and mobility, has developed over the long term and the need for energy is bound up in cultural concepts and norms. Nevertheless, it may be that practices that have become routine need to be rethought, for example, as the price of oil and electricity increases. (e.g. *Shove 1997*). Daily life is mainly about following routines and not about making conscious decisions. How then can possible fault lines to routines harmful to the environment be identified, along with opportunities to do things differently? How can these opportunities be enhanced?

ENVIRONMENTAL AGENCY. Environmental activity must, to a certain extent, be made meaningful to individuals through personal signification and conscious assessment of practices. The purpose of various structures is also to reinforce an individual's experience of one's own agency, management of daily life and inclusion in the development of one's environment. These are prerequisites of pro-environmental activity and the continuity of it, especially when such activity demands changes in habits. The experience of one's environmental agency is also dependent on the individual's relation to those institutions that have "official" responsibility for the environment, i.e. how people perceive their own ability to bring about change. Simply carrying out the objectives set by others will not be enough.
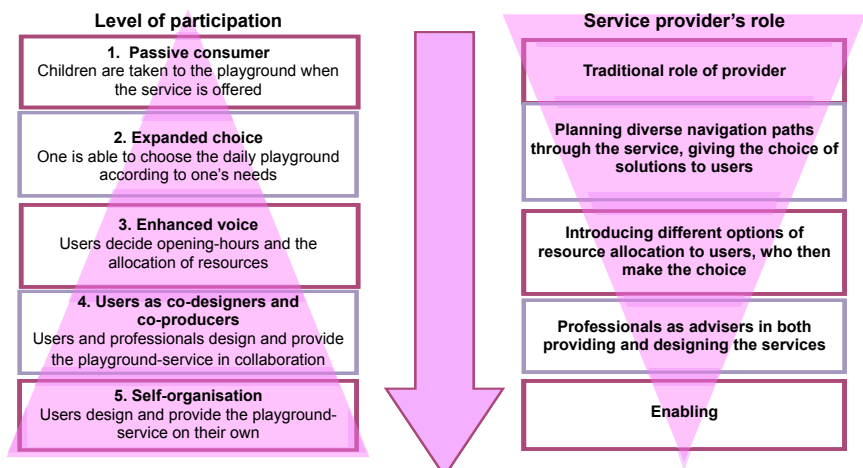
PARTICIPATION IN SERVICE PROVISION

Image: http://www.flickr.com/people/7128-50©

USERS AND INNOVATION. The majority of new ideas is nowadays created in the interface between users and service providers in open environments (*Yliherva, 2006*). Social innovations (structural, everyday-life and democratic innovations) in particular, require an input from citizens due to, for example, the limited amount of the public sector's own product development and a lack of competitive incentives for innovation (*Hautamäki, 2008*). The cultural and social nature of sustainable everyday-life may also mean, that effective interventions are time and space –specific - they cannot be universally applied as such. The experiences, knowledge relating to local lifestyles and tacit knowledge of residents and users must be included in the development and adaption work.

SERVICE PROVISION. The deepening of participation can be seen in the provision of services [1] as so-called personalisation and joint service provision models. Public-Private-People (PPP) is a partnership-based model of service provision that includes not only associations but also the unorganised civil society, i.e. individual persons without an NGO –background. Personalisation broadly refers to individual people affecting their own environment. In the personalisation process of services, the service is split into parts (process, concept and resources) that experts/providers and users plan together based on the needs of the users. At the extreme are self-organised groups that plan and provide the service that they use themselves.

Due to a shortage in resources, the Laurinniitty playground was about to be closed (*Helsingin Sanomat newspaper 27.8.2008*). The mothers of Lassila and the Mannerheim League for Child Welfare planned to offer the City the idea that the mothers would organise the park activities themselves and would also be able to use the park's indoor premises and play equipment. In this instance, the City decided, however, to continue the activities of the park in the usual manner (*Helsingin Uutiset [Helsinki News] 28.8.2008*).

Level of participation

| **1. Passive consumer** Children are taken to the playground when the service is offered |
| **2. Expanded choice** One is able to choose the daily playground according to one's needs |
| **3. Enhanced voice** Users decide opening-hours and the allocation of resources |
| **4. Users as co-designers and co-producers** Users and professionals design and provide the playground-service in collaboration |
| **5. Self-organisation** Users design and provide the playground-service on their own |

Service provider's role

| **Traditional role of provider** |
| **Planning diverse navigation paths through the service, giving the choice of solutions to users** |
| **Introducing different options of resource allocation to users, who then make the choice** |
| **Professionals as advisers in both providing and designing the services** |
| **Enabling** |

[[1] 'Service' is understood very broadly in this context. Public health care is a service, likewise business activities in residential areas offer services. In this context the playground is also a service, as is, for example, a website that calculates an individual's carbon footprint.

INNOVATIONS TO SUPPORT
SUSTAINABLE CONSUMER CHOICES

INNOVATIONS TO SUPPORT SUSTAINABLE CHOICES IN EVERYDAY LIFE. Commitment and motivation towards a sustainable way of life is based e.g. on awareness of personal actions as well as on practical and critical approach to knowledge. The most effective information, for example, to improve the energy efficiency of housing is simple, focuses on the essential, is personally relevant and easily comparable. The perceived reliability and credibility of the information, and the service provider are also important.

Below are a few examples of calculators and data banks created online that facilitate consumers to make their choices.
• For example, KESKO has promised to include the carbon footprint on the price label of its market products by the year 2015. Receipts will in future include the strain of your shopping basket not only on your purse but also on the planet.
• Productwiki. A wiki-based site pioneered by Dodo, a Helsinki based environmental organisation, to which anyone can add information on any product. The aim is to create a data bank of sustainable consumption.
• The TV-based home energy dashboard, Low Carb Lane, Dott project 07 are ways to visualise energy consumption by using a TV-based "home energy meter"→ real time feedback, making energy budgeting possible and a "pay-as-you-save" payment model that removes financial barriers to investing in energy efficiency improvements in the home.
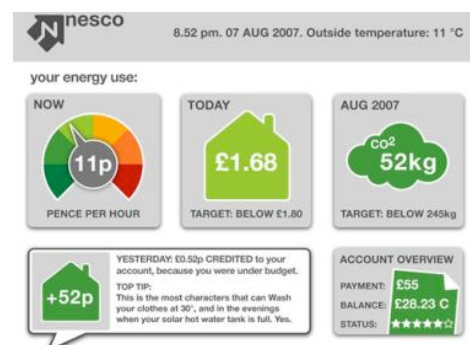
CAN INNOVATIONS CREATE MORE POSSIBILITIES FOR ACTION -- ROOM FOR MANOEUVRE -- IN EVERYDAY LIFE? The aim of innovation research and development can also be seen as helping people when they are in a "tight spot" of everyday life (see *Massa & Ahonen, 2006*). This specifically refers to enhancing an individual's ability to act – actual room for manoeuvre to make sustainable choices when squeezed by the various demands and time pressures of everyday life. Good examples include innovations relating to time planning [1]. Research should be carried out to ask how these "tight spots" are created and how they can be alleviated.

[1] Time policy refers to policy instruments and participatory planning, which impact on timetables and the organisation of spatio-temporal arrangements and structures. Organising various activities into a sensible overall solution, improving housing and the local environment, and the subjective experience of managing one's own time and space are the objectives of time planning (*Horelli & Wallin, 2006*).

PLANNING AND HEALTH IS BIG NEWS*

*Editorial, Journal of American Planning Association 2006

THE CONNECTIONS BETWEEN THE URBAN STRUCTURE AND RESIDENTS' WELL-BEING AND HEALTH have become the focus of intense interest over the last decade, especially in the USA and Australia. Interest in the connection between the urban structure and health is especially strong with regard to lifestyle illnesses such as the continuous increase in health problems relating to stress and obesity, and the inadequacy of traditional public health measures. The part played by the urban structure in promoting healthy lifestyles has therefore become increasingly important.

The research to date has already demonstrated the complexity of the connections between the urban structure and health. What makes research challenging is mainly the fact that health has come to be defined as an overall entity of physical, mental and socio-cultural health. In this way, the perceived safety of the environment, community spirit and regeneration prospects, for instance, may become as important phenomena to be studied as the quality of the city's air. On the other hand, the health of residents is affected not only by the physical environment but also a huge number of other factors and it is often difficult to distinguish the effects of the urban structure from other effects.

While it would be possible to integrate well-being and environmentalism, new research data and innovations are needed so that well-being could be increased with fewer resources. There would also be a need to redefine the content of well-being and the quality of life.

HOW FINLAND IS PLACED ON THE HAPPY PLANET INDEX

$$\text{Happy Planet index} = \frac{\text{Subjective well-being} + \text{Objective well-being}}{\text{Consumption of environmental resources}}$$

Table 2: Life Satisfaction in Europe

Rank	Country	0-10
1	Denmark	8.4
2	Switzerland	8.2
3	Iceland	8.0
4	Finland	7.9
5	Sweden	7.9
6	Luxembourg	7.7
7	Ireland	7.7
8	Netherlands	7.5
9	Austria	7.5
10	Norway	7.5
11	Malta	7.4
12	Belgium	7.4
13	Cyprus	7.2
14	Spain	7.2
15	United Kingdom	7.2
16	Germany	7.0
17	Slovenia	6.9
18	Italy	6.6
19	France	6.6
20	Czech Republic	6.4
21	Greece	6.3
22	Poland	6.1
23	Portugal	5.7
24	Estonia	5.6
25	Hungary	5.5
26	Slovakia	5.5
27	Romania	5.4
28	Latvia	5.1
29	Lithuania	5.1
30	Bulgaria	4.4

BEST / WORST

Table 3: Life Expectancy in Europe

Rank	Country	Years
1	Switzerland	80.5
2	Sweden	80.1
3	Iceland	79.6
4	Italy	79.6
5	Spain	79.6
6	Norway	79.5
7	France	79.3
8	Cyprus	79.1
9	Greece	78.8
10	Belgium	78.7
11	Austria	78.7
12	Malta	78.7
13	Netherlands	78.5
14	Germany	78.5
15	United Kingdom	78.4
16	Finland	78.4
17	Ireland	78.3
18	Luxembourg	77.9
19	Denmark	77.4
20	Portugal	77.3
21	Slovenia	76.4
22	Czech Republic	75.3
23	Poland	74.6
24	Slovakia	73.8
25	Hungary	72.4
26	Bulgaria	72.1
27	Lithuania	71.9
28	Romania	71.6
29	Estonia	71.3
30	Latvia	70.7

BEST / WORST

Table 4: Carbon footprints in Europe

Rank	Country	Global hectares per capita
1	Luxembourg	5.68
2	Estonia	3.54
3	Finland	3.39
4	United Kingdom	3.33
5	Greece	3.17
6	Denmark	3.17
7	Ireland	3.13
8	Belgium	3.04
9	Switzerland	3.04
10	Austria	2.82
11	Netherlands	2.80
12	Czech Republic	2.73
13	Spain	2.69
14	Germany	2.59
15	Malta	2.53
16	France	2.52
17	Italy	2.50
18	Cyprus	2.26
19	Slovenia	2.19
20	Norway	1.98
21	Portugal	1.96
22	Hungary	1.87
23	Poland	1.83
24	Bulgaria	1.63
25	Slovakia	1.61
26	Sweden	1.60
27	Lithuania	1.34
28	Romania	1.09
29	Iceland	1.09
30	Latvia	0.49

WORST / BEST

Table 5: The European Happy Planet Index

Rank	Country	HPI
1	Iceland	72.3
2	Sweden	63.3
3	Norway	56.0
4	Switzerland	51.6
5	Cyprus	51.3
6	Denmark	49.8
7	Malta	49.4
8	Slovenia	48.5
9	Netherlands	48.4
10	Austria	47.9
11	Latvia	47.5
12	Spain	47.4
13	Ireland	46.5
14	Italy	46.4
15	Germany	46.3
16	Finland	45.7
17	Belgium	46.5
18	France	44.8
19	Poland	43.9
20	Romania	43.7
21	United Kingdom	42.3
22	Portugal	41.8
23	Slovakia	40.8
24	Czech Republic	39.7
25	Lithuania	39.0
26	Hungary	38.3
27	Greece	38.3
28	Bulgaria	29.7
29	Luxembourg	28.6
30	Estonia	29.3

BEST / WORST

HAPPY RESIDENTS IN A HAPPY ENVIRONMENT? Can an ecologically sustainable community be one that at the same time strengthens well-being and encourages healthy lifestyles? The subject has been researched around the world with the aid of the so-called Happy Planet Index. The simultaneous evaluation of people's well-being and environmental impact has revealed that Finland comes out quite well in the measurement of well-being, but its carbon footprint is considerable, meaning that the ranking on the index is only average. All the other Nordic countries come within the top six countries in Europe, with Iceland number one. Although the rankings of the Happy Planet Index can only be indicative, and naturally the results are totally dependent on the measurement methods, Finland clearly has challenges ahead if we intend to succeed in constructing an eco-socially sustainable society.

On the basis of the existing research data, the perceived well-being, health and happiness are also connected to the perceived quality of the environment. Although many other areas of life naturally impact on people's well-being, the living environment plays its own, considerable role. Empirical research carried out using the softGIS method in Järvenpää (*Kyttä & Kahila, 2006*) and in Kerava, Mäntsälä and Nurmijärvi (*Kyttä et al, 2009*) demonstrate that the experience of the residents in all these locations with respect to the quality of the environment has a significant association with their perceived quality of life, health, wellbeing and happiness.

THE PERCEIVED QUALITY OF THE ENVIRONMENT

β = .23*** → PERCEIVED HAPPINESS
β = .19**
β = .19*

β = .21** → PERVEIVED QUALITY OF LIFE
β = .18**
β = .22***
β = .27***

β = .17* → PERCEIVED HEALTH
β = .18**

β = .18** → PERVEIVED WELLBEING

Järvenpää
Kerava
Mäntsälä
Nurmijärvi
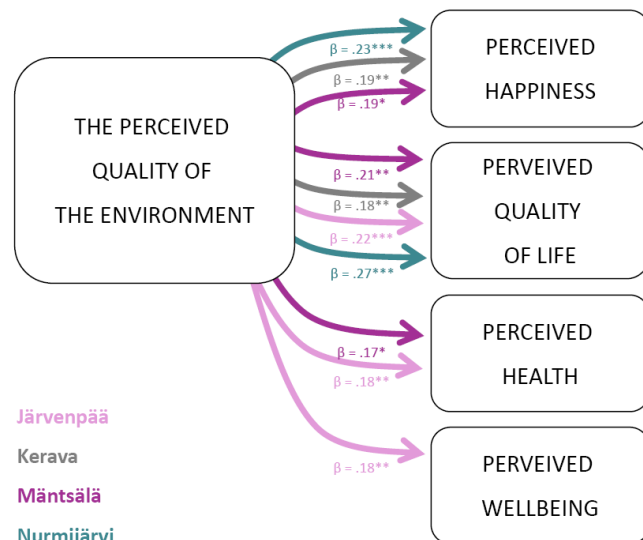
THE TWO WAVES OF RESEARCH ON

THE ENVIRONMENT AND HEALTH

SECOND WAVE

POSITIVE EFFECTS ON HEALTH

EFFECTS PREVENTING ILLNESSES AND

PROMOTING HEALTH

INDIRECT EFFECTS ON HEALTH

- physical
- mental
- social
- cultural

effects on health associated
with lifestyles & effects
experienced

FIRST WAVE

NEGATIVE EFFECTS ON HEALTH

EFFECTS PRODUCING ILL HEALTH

DIRECT EFFECTS ON HEALTH

- air
- water
- soil

pathologic effects relating to pollution

THE SECOND WAVE RESEARCH ON ENVIRONMENT AND HEALTH. Research on environment and health has been at a crossroads over the last decade. The traditional, first wave of research on the environment and health focused on pollution of the air, water and the soil and the direct physical health hazards connected to them (*Srinivasan et al, 2003*; *Killingsworth, 2003*). New research on the environment and health focuses on the features of the environment that promote health and indirect health effects. The 'new wave' of research on the environment and health has achieved an international breakthrough over the last few years, although a very limited amount of this type of research has been conducted in Finland.

The indirect health effects of the environment are connected to the quality of the living environment experienced by the residents and likewise they relate to various lifestyles and more broadly to the connections between the physical and social environment and health. Alongside the traditional, restricted definition of the environment and health, a new, broader definition that aims to cover the diverse spectrum of factors affecting human health has gained currency. The idea is that people live in multidimensional environments in which physical and chemical environmental factors are only one dimension, in addition to the physical, social and cultural factors experienced by people.

The health effects of the environment can be both negative and positive: effects causing illnesses or promoting health. In addition to the morbidity rate and direct health hazards brought about by the environment, the environment can act in a preventive way by preventing illnesses and actively promoting health. The environment can therefore both promote healthy lifestyles and hinder them. The environment may be stressful, but may also actively reduce stress.

A community that promotes health and well-being can also promote an ecological way of life. As is apparent from the previous sections, it has been known for a long time that it is difficult to encourage environmentally friendly behaviour by residents through education, for example, and there is no direct link between ecological attitudes and environmentally friendly behaviour. Could caring for one's own well-being and that of close relatives act as a 'secret weapon' for more ecological behaviour? If a community that produces well-being is also ecologically sustainable, the lifestyle of the residents could secretly become ecological. It may give rise to caring for one's own well-being as a by-product. There is no research data on this new type of integrated way of presenting questions.

ENVIRONMENT & HEALTH AS A HOLISTIC CONCEPT

OPPORTUNITIES & RESTRICTIONS PROVIDED BY THE ENVIRONMENT

MENTAL HEALTH

• SUPPORT FOR MENTAL WELL-BEING

SOCIAL HEALTH

• IMPROVING SOCIAL WELL-BEING AND THE QUALITY OF LIFE

PHYSICAL HEALTH

• PROMOTING PHYSICAL HEALTH AND HEALTHY LIFESTYLES

IMMEDIATE ENVIRONMENT
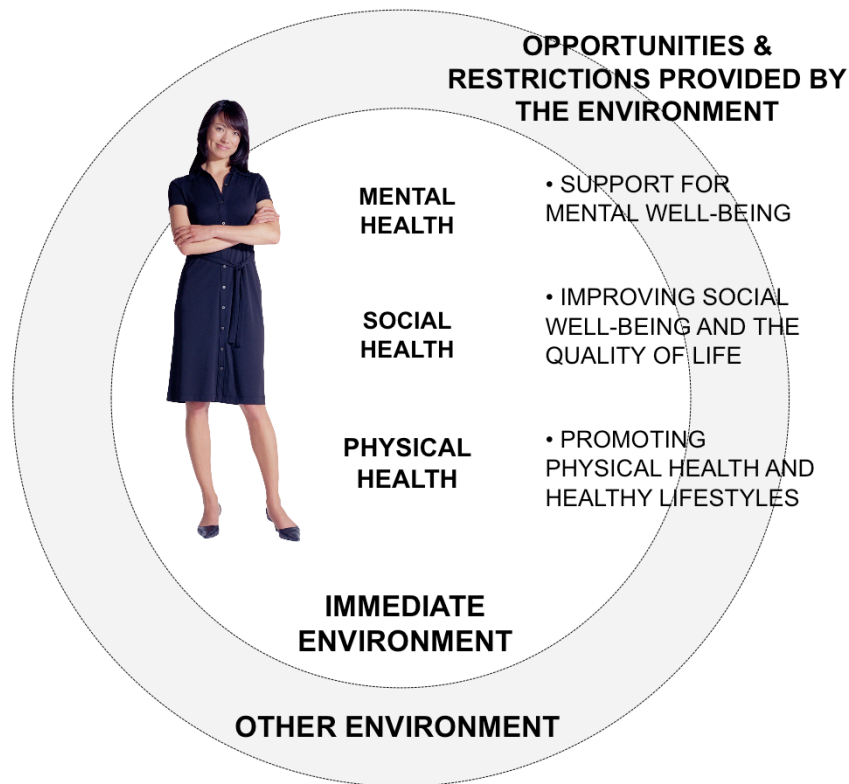
OTHER ENVIRONMENT

NEW, COMPREHENSIVE CONCEPT OF THE ENVIRONMENT AND HEALTH. The comprehensive concept of the environment and health within the new wave environment and health research covers physical, mental and socio-cultural health as an overall entity. At the same time, the studies also include causal links between environmental factors and the comprehensive psychophysical and social well-being of people, which are more difficult to study. Social and behavioural approaches guide the research methods. Functionality is emphasised alongside biomedicine. Functionality is related to the feedback between the phenomena, such as the environment and health as a lifestyle choice. (*Sairinen et al., 2006*).

The new, broad concept of health in research on the environment and health means studying people's holistic well-being and perceived quality of life, alongside perceived and measurable health. Resource-based and future-oriented research on positive experiences, such as happiness, launched by so-called positive psychology (*Seligman, 2001*; *Argyle, 2002*), is emerging as a new dimension in the field of research on the environment and health that has hardly been researched. The features of a sustainable community should include the possibility for new and surprising experiences, in addition to the fact that the environment should support basic well-being. At the same time, the connection between the quality of life and happiness to the standard of living is being questioned: research on happiness has convincingly demonstrated that happiness does not increase in direct proportion to a rise in the standard of living (*Layard, 2005*).

It is most important, in terms of planning an ecologically sustainable community, to study the features and characteristics of living environments that support and restrict well-being. What kind of opportunities and/or restrictions do certain environments and their planning solutions provide in terms of mental, social and physical well-being? Do these influences differ in different population groups? When conducting this type of research, it is important to connect the experiences, functions and health of people to specific environments and to approach the wider context, as well as study those obstacles that are related to exploiting the various opportunities. The environment's potential for promoting health and well-being will only be implemented if the opportunities are actually enabled and are easily and equally accessible. The activities, that are meaningful for the residents, will be achieved mainly in an ecologically sustainable manner and in a way that promotes individual well-being.

PHYSICAL HEALTH & THE ENVIRONMENT

Image: Chaval Brasil, http://www.flickr.com/photos/chavals/
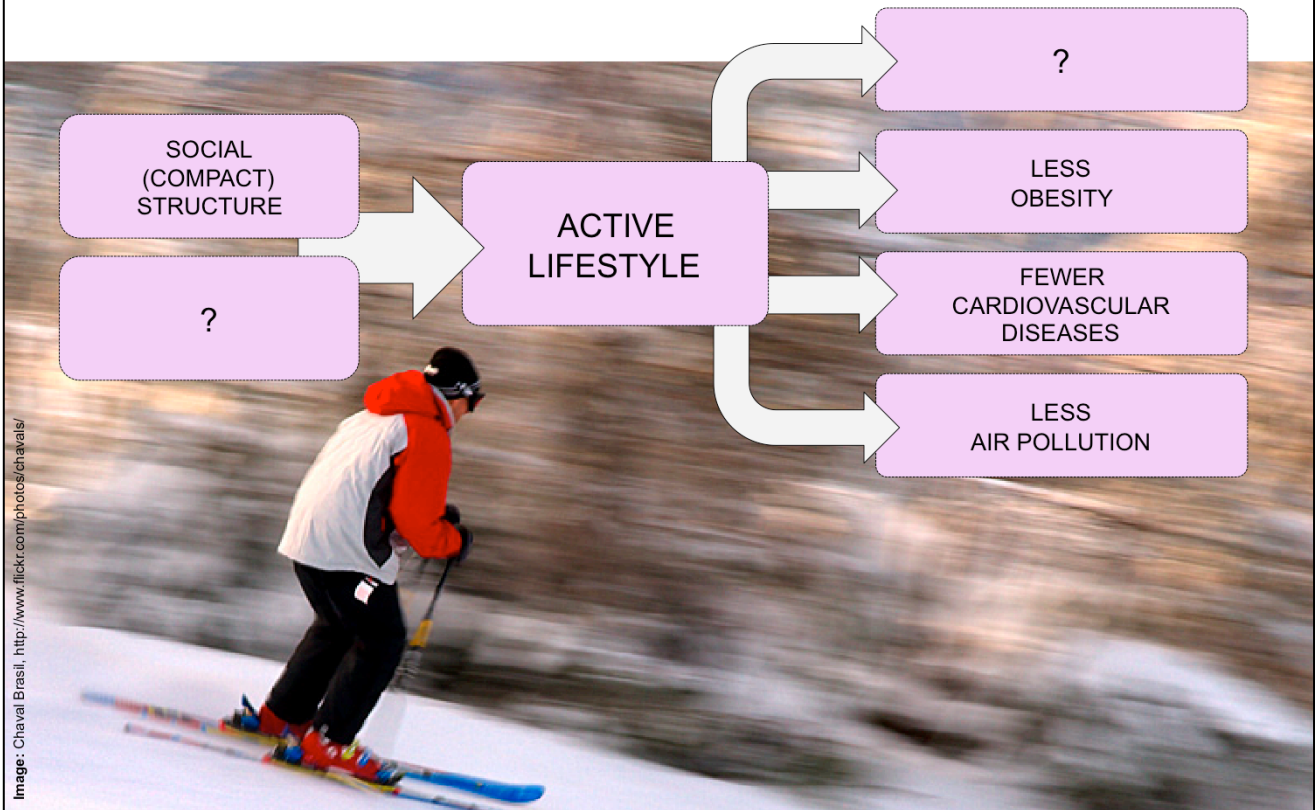
URBAN STRUCTURE & DAILY PHYSICAL ACTIVITY. Daily physical activity, children's school trips by foot and food shopping trips undertaken without a car may be surprisingly important in terms of adopting healthy lifestyles, maintaining health and preventing illnesses. The general result of research to date on the connection between physical health and the urban structure indicates sprawl is significantly associated with the amount of walking and daily physical activity and lends itself to increasing obesity and high blood pressure. On the other hand, a compact urban structure integrating several functions resulting good neighbourhood accessibility has been proven to promote daily physical activity, such as in going to work, school, shopping etc., and in this way to promote physical health. (*Ewing et al. 2003*; *McCann & Ewing, 2003*). The studies to date on the subject matter have mainly been broad-based studies at the macro level on the connection of the urban structure to information contained in registers on the health of citizens. (See the examples below).

Many international studies have called for meso- and micro-level studies on the impact of the local environment on the health of residents. Not even the best community planning solutions or investment in the local environment alone can, of course, get people to undertake more physical activity and make their lifestyles more healthy. Several researchers point out that the features that the health promotive qualities of the environment should be treated as opportunities offered to residents to lead a healthy lifestyle and not as mandatory or an illusion of deterministic processes (*Handy, 2004*).

Example articles	Residents studied & method	Evidence
Hamer & Chida, 2008: Active commuting and cardiovascular risk: A meta-analytic review.	meta-analysis of 8 studies N = 173,146	Daily physical activity on foot and by bicycle significantly reduced cardiovascular diseases (the mortality rate, heart attacks, blood pressure, diabetes). This connection was stronger in women than men.
Doyle et al. 2006: Active community environments and health.	N = 9252 National survey data	Residents in safe communities that promote walking walk more and their body mass index is lower than others.
Frank et al. 2006: Many Pathways from Land Use to Health.	2 empirical data studies: N = 1228, King County, Survey N = 5766, King County, Survey	The more 'walkable' the residential area (compact, mixed urban structure, good commercial services) in which residents live, the more the residents walked and the less they travelled by car and the lower their body mass index and the air pollution produced.
Ewing et al. 2003: Relationship between Urban Sprawl and Physical Activity, Obesity, and Morbidity.	N = 206,992 Survey	As the degree of sprawling of the place of residence increases, the residents' body mass index increased and blood pressure rose. The sprawl index had no association with the rate of occurrence of diabetes and heart disease.
Giles-Corti et al. 2003: Environmental and Lifestyle Factors Associated With Overweight and Obesity in Perth, Australia.	N = 1803 Perth, Australia Interview, observation	The lack of pavements, poor availability of bicycle and pedestrian traffic lanes and the lack of local shops were connected to obesity.

SOCIAL HEALTH & THE ENVIRONMENT

OPPORTUNITIES IN THE ENVIRONMENT FOR SOCIAL ENCOUNTERS

OPEN PUBLIC SPACES

SEMIPUBLIC SPACES

PARKS

FRONT TERRACES

?

SENSE OF COMMUNITY IN EVERYDAY LIFE

PERCEIVED WELL-BEING

PERCEIVED SAFETY

?

Image: Tiina Merikoski

URBAN STRUCTURE & SOCIAL HEALTH. The physical environment and its planning solutions may not, perhaps, produce a sense of community, but they can at least create the conditions or opportunities for it. A sense of community and privacy go hand in hand: in order for residents to have the desire for a communal life, their privacy must be guaranteed (*Silvennoinen & Hirvonen, 2002*). A good environment supports the balance between privacy and community spirit.

It is often claimed that modern city residents no longer need social bonds to people in their own residential area because they lead a mobile life and create their social network outside the residential area. However, it has been shown that a light, everyday local sense of community strengthens the well-being of residents and that it is still important to residents (*Aura et al., 1997*). Physical planning solutions are best for increasing this type of community spirit. Sustainable housing is often mentioned as a counterbalance to lifestyles that are becoming increasingly disorderly and as a characteristic of an ecologically sustainable community (*Thwaites et al. 2007*; *Kyttä, 2004*).

The fairly substantial amount of foreign research literature on the relationship between planning solutions and a sense of community shows that neighbouring is mainly linked to unpredictable, everyday situations and the sense of community is often the by-product of some other activity. The features of an environment that supports a sense of community include a large number of open public and partially public spaces, parks, the opportunities for social control, front terraces, sunlight reaching courtyards etc. The idea still prevailed during the 1970s that a densely built residential environment, i.e. 'a compact city', would be, without question, favourable for creating social connections and would therefore also be a 'city of contacts'. It turned out, however, that a densely built environment can conversely give rise to the situation where people withdraw from social relationships.

In the USA, there is a conscious effort to increase social interaction in fairly densely built communities following the principles of New Urbanism. This is being pursued by investing in public spaces and parks, by trying to create places that facilitate social encounters and by making the street space attractive for walking and interaction. Traditional American front terraces constructed in many of these areas are a special detail. Studies on new urban areas show fairly convincingly that a sense of community is stronger in new urbanism areas than in traditional American suburbs. A densely constructed environment can therefore actively encourage social interaction.

There have been an inadequate number of studies on the characteristics that strengthen social well-being relating to the Finnish way of life. Directly applying foreign research findings on this subject in particular is extremely difficult. Future research will hopefully reveal the characteristics of Finnish living environments that strengthen social well-being, which could be included in planning at all levels, from detailed planning to regional planning.

PERCEIVED SAFETY

PERSONAL VULNERABILITY

SENSE OF COMMUNITY

SIGNS IN THE ENVIRONMENT OF DISORDER & OF CARING

?

PERCEIVED SAFETY

ATTACHMENT TO THE NEIGHBOURHOOD

MOBILITY IN THE NEIGHBOURHOOD

PERCEIVED HEALTH & WELL-BEING

?

Image: http://www.flickr.com/people/71428150@N00/
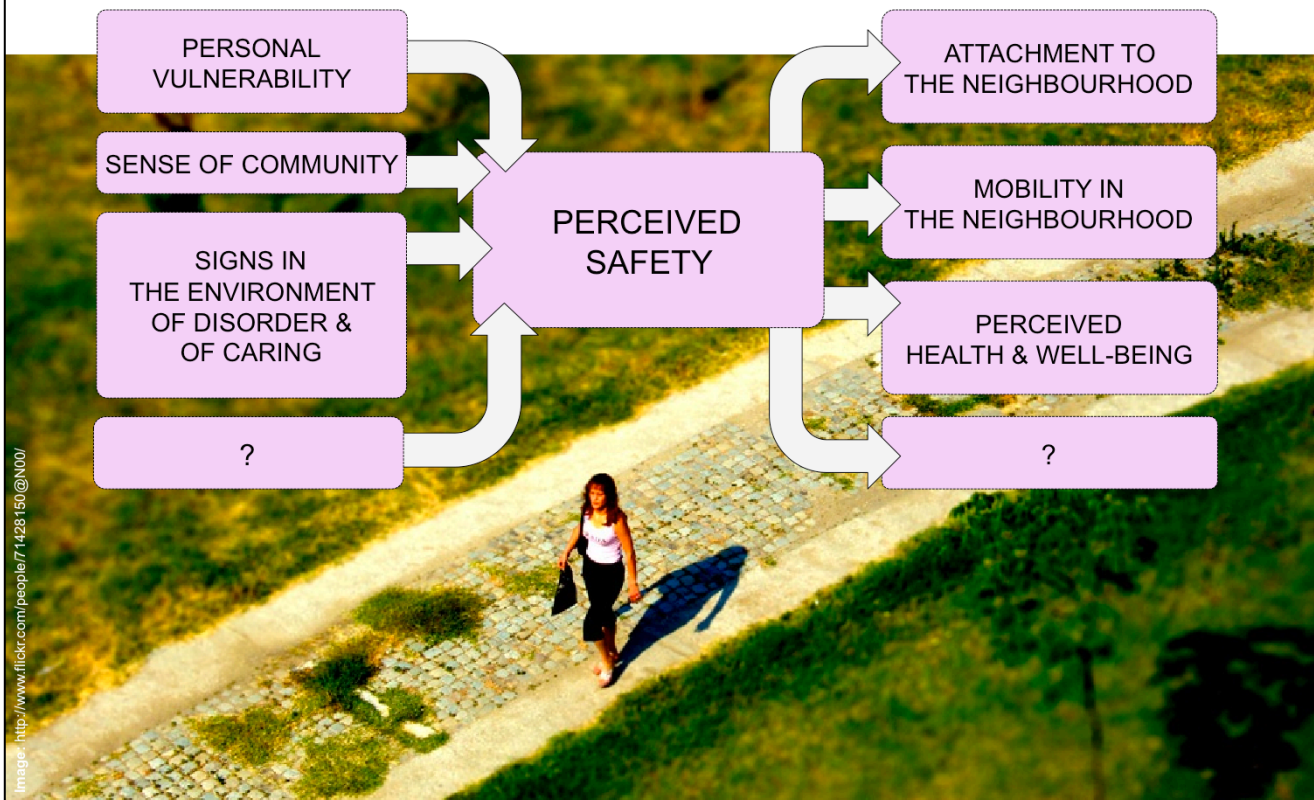
PERCEIVED SAFETY OF URBAN ENVIRONMENT. Perceived safety has been proven to have a very holistic connection to the well-being of inhabitants. Safety is one of the most important features of a good living environment listed by Finnish residents. At least so far, Finnish living environments are considered to be quite safe, and unlike many other countries, no noteworthy increase of perceived lack of security has been observed in Finland (*Suominen, 2006*). A perceived lack of security has increased in the last 10 or 15 years in many western metropolises, while the actual crime and accident statistics have gone down. This phenomenon, sometimes called the paradox of fear, has been explained with factors such as the climate of fear created by the media.

Research literature on perceived safety concentrates on crime safety, even when experientially people don't distinguish this type of perceived safety from other modes of perceived safety like social and traffic safety. Researchers have found three central factors behind the fear of crime. According to research, a high fear of crime is connected to the experience of personal vulnerability, signs of disorder in the physical environment or a crumbling sense of community. The latter two are perceivable characteristics of the environment and can be influenced with planning.

A perceived safety and danger do not only exist at an emotional level; they have been shown to be connected to physical activity and the willingness to move around in the environment, resulting in physical health effects (*Brown et al., 2007*). In addition to the effect on health and well-being, perceived safety may have many other connections to the lives and experiences of the people living in an area. According to Brown et al. (*2003*), for example, attachment to the neighbourhood is stronger among people who are the least afraid of crime, and who observe less signs of disorder in their own building block or yard areas.

A perceived danger is a characteristically urban phenomenon. From the sustainable community standpoint, this could be a central problem concerning the well-being of inhabitants and the attractiveness of an urban environment. The successful control of any experienced lack of security in relation to physical environmental planning would require extensive research on the relation of specific characteristics of the physical environment to people's behaviour and experiences.

MENTAL HEALTH & THE ENVIRONMENT

THE EXPERIENCE OF RESTORATION INCLUDES

- FASCINATION (FLOW PHENOMENON)
- AWARENESS MANAGEMENT
- PSYCHOLOGICAL PRESENCE
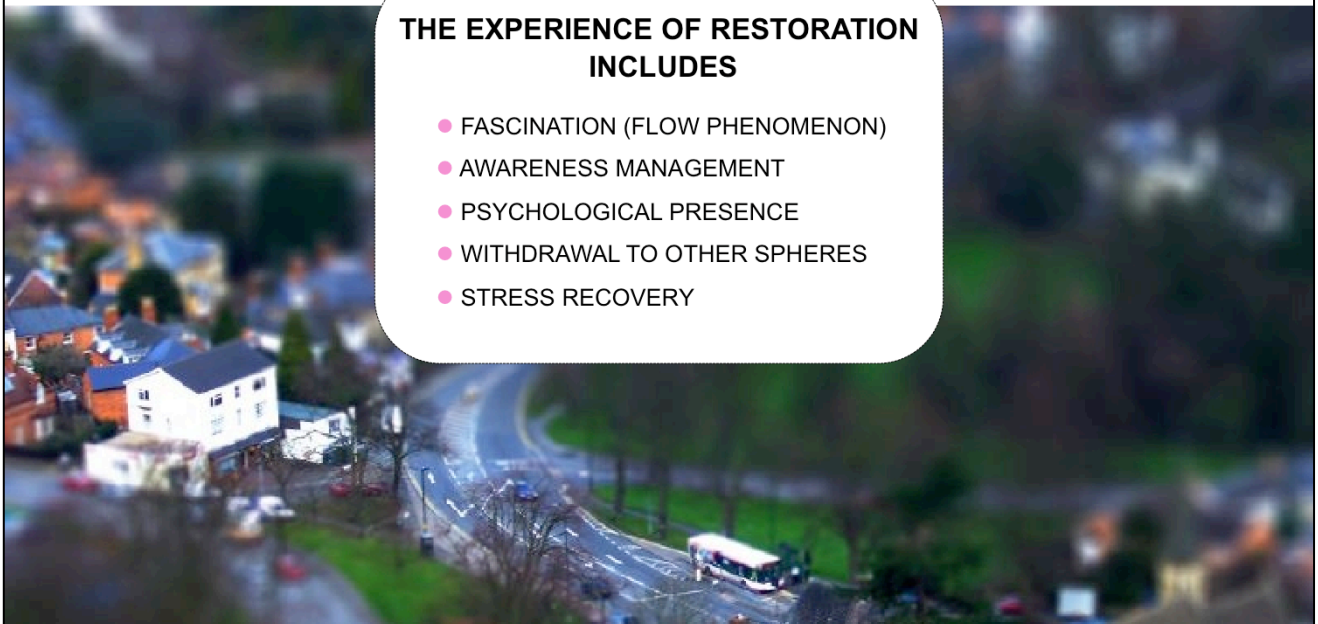- WITHDRAWAL TO OTHER SPHERES
- STRESS RECOVERY

Image: http://www.flickr.com/people/71428150@N00/

POSITIVE EXPERIENCES ASSOCIATED WITH URBAN ENVIRONMENTS?

RESTORATIVE ENVIRONMENTS. According to recent research, the environment's ability to help people reduce stress and regulate their psychological balance, for example, after stressful everyday situations, which may cause sensory overload and directed attention-fatigue, will promote the sustaining of mental health. Restorative environments offer such positive experiences. (*Kaplan & Kaplan, 1989*; *Korpela ym., 2001*) We need calming and balancing experiences to counterbalance today's busy urban lifestyle. The experience of restoration usually includes some experience of enchantment and control of one's own consciousness. In a restorative place, a person will feel a strong sense of presence, even of being transported to another realm, far from the problems of everyday life. In such a place a person will feel refreshed and recharged, and unburdened of stress. (*Horelli & Kyttä, 2007*)

Natural environments seem to possess particular potential for restoration. Proximity to nature refers to the possibilities of outdoor exercise, experiencing the peace of nature or having a view of nature from the window of your own home. The various roles that proximity to nature plays in the lives of the inhabitants, as well as the environments offering different experiences of nature do, however, require further research.

Sustainable urban design must focus on the question of whether the defragmentation process will decrease the availability or revitalisation potential of natural environments. This may happen if

• existing natural environments are used for construction,
• natural environments remain further away, becoming more difficult to get to,
• natural environments become too small, or
• the number of users of natural environments increases, the environment will begin to show signs of wear, or its quality will deteriorate as a result of increased use.

The uncovering of the restorative potential or an urban environment and the design and development of restorative places may be a crucial part of developing a sustainable community. Research concerning restorative environments has recently enlarged towards the study of 'instorative' environments, positive, 'upper register' environmental experiences. Which environments will help you not only to balance your mood, but also to gain positive experiences and feel joy and happiness? Socially sustainable environment should be able to offer both restorative and instorative experiences. The potential for finding new and surprising experiences could be the particular strength of an urban environment.

CLIMATE CHANGE AND PEOPLE'S WELL-BEING

Image: www.worldproutassembly.org

PEOPLE'S DEMANDS FOR WELL-BEING

| BASIC HUMAN NEEDS | PEOPLE'S WISHES | PEOPLE'S CHOICES |

CHANGE IN THE ENVIRONMENT

(e.g. environmental catastrophes)

EFFECTS OF CLIMATE CHANGE

| DIRECT EFFECTS | INDIRECT EFFECTS | CONSE-QUENCES |

MITIGATION

ADAPTATION
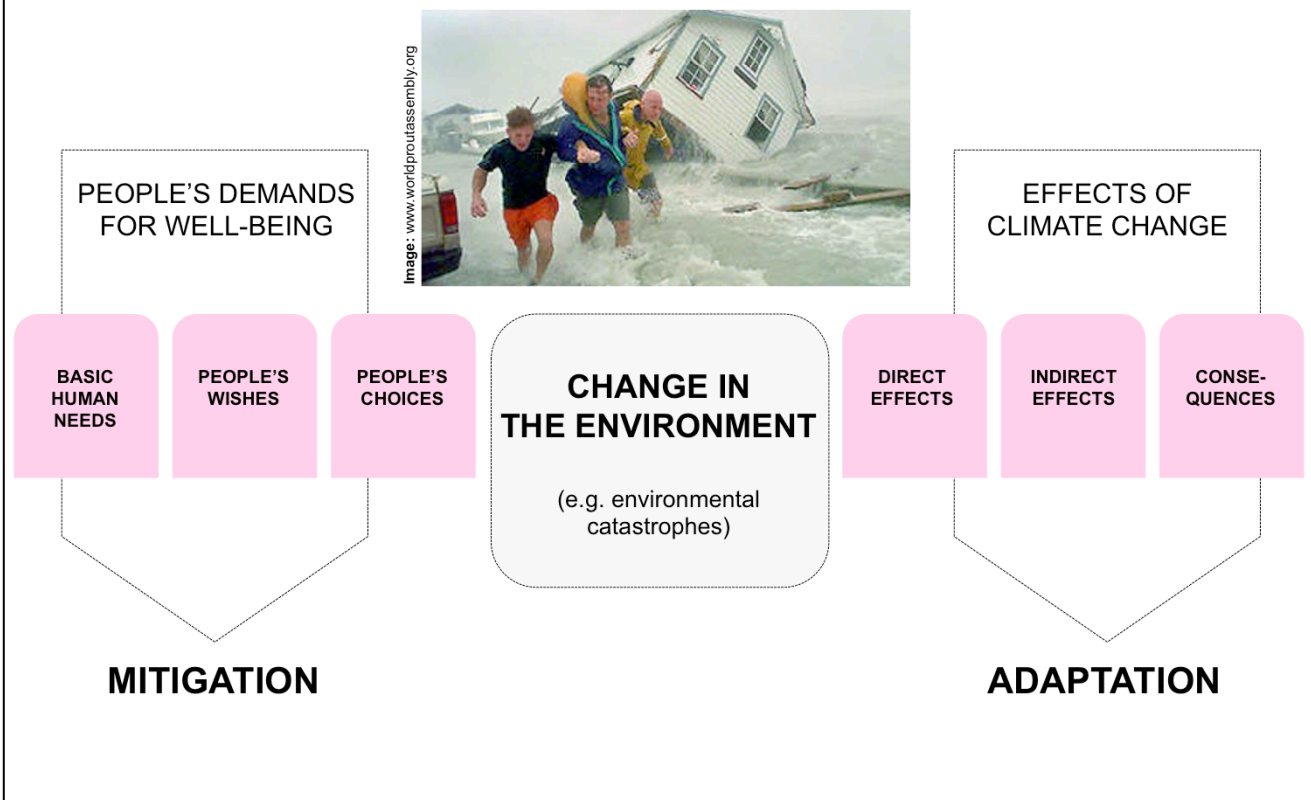
CLIMATE CHANGE AND WELL-BEING The question of climate change and well-being is a two-way process in which the current well-being requirements burden the environment and climate processes, on the other hand, have direct and indirect effects on people's health.

The prevailing western values such as scientism, economical orientation and consumption-based well-being are often in conflict with the objectives set for emission cuts. The deteriorating status of the natural environment reflects on the physical and perceived well-being of people. Various natural disasters have not only direct but also significant indirect effects on the physical and mental well-being of people. These effects also reflect on the interaction with other people and the natural environment, which has so far been a neglected area in the research of mental well-being (*Lyon & Halliday, 2005*).

Direct effects of climate change include the effect on death rates, people's health, nutrient supply and perceived health and well-being. These may result, for example, in either sudden (floods, storms) or long-term (heat waves) weather fluctuations linked to climate change. Indirect effects relate to the changes that climate change brings about in the operational environment of the people, as well as to changes in global market conditions and the operational preconditions of various sectors of the economy. Effects may be positive or negative depending on local conditions. Most of the effects of climate change on general well-being will be indirect. The indirect effects of climate change will be an interesting and challenging new field of research, so far only vaguely considered in Finland. The effects on social functionality and general well-being may also relate to changes in the productivity of work, global social equality and well-being at work (*Kasvio, 2008*).

Climate change will have the most drastic effect on people's living conditions in third world countries where the people's ability to adjust to changes is the poorest.

Research needs related to climate change emerge from the fields of effect chains, institutional adjustment and the examination of actors in the adaptation process. Even though the prediction of changes is a part of normal operations for many administrations, climate change is a new change factor with areas that are difficult to predict. Central challenges include the scaling of global effects on the local level and converting them to practical adjustment measures. The relationship between preventive measures and the potential and costs of recovery is crucial. Our attention is often caught in the recovery from the consequences and effects of various weather disorders, which has been found an increasingly expensive way of adapting to the changes. Urban planning can be used to predict and partially prevent the negative effects of climate change by responding to people's wishes in a sustainable way. However, it is also important to influence general attitudes so that people's wishes would be in line with the objectives of sustainable development.

A COMMUNITY THAT SUPPORTS WELL-BEING

EXISTING INNOVATIONS

URBAN ENVIRONMENT
• City 2.0
• Active living
• Healthy city
• Slow housing
• New urbanism
• Open space conservation
• Planning for happiness
• CPTED (Crime Prevention through Environmental Design)
• Liveable communities
• US*t*ED – Urban Sustainability through Environmental Design

PUBLIC SPACES
• Therapeutic gardens
• Communal gardens
• Settlement gardens
• Neighbourhood activity parks
• Third generation playgrounds
• Walking and cycling networks
• Stress free Areas

NEW INNOVATIONS?

EXISTING INNOVATIONS: Facilities and entire communities supporting the inhabitants' health and well-being have been developed with focus on various themes. Areas of focus include:

• Solutions supporting physical health (Active living, a healthy city, local exercise facilities, road networks for walking and cycling, three generation playgrounds)
• Solutions promoting social sustainability and perceived safety (CPTED, Livable communities, community gardens)
• Environments promoting mental well-being, offering release from stress (Slow housing, Planning for happiness, therapeutic gardens)
• Town planning with attention to both social and ecological factors (New Urbanism, Urban Sustainability through Environmental Design)
• Voluntary resident activity in the creation of eco-socially sustainable communities (City 2.0)

Many of these concepts may also promote an ecologically sustainable urban planning, even if ecological aspects were not the primary focus. The concept of New Urbanism has achieved wide popularity since its birth 15 years ago and aims at combining ecological and social sustainability. It has several things in common with the principles of urban infill policy Finnish urban planning (*Kyttä & Kahila, 2006*). The New Urbanism movement was created in the USA in the 1980's as a protest against the ecological, aesthetical and social problems created by American suburbs consisting of detached houses. As a response to these problems, a team of urban planners began to promote a relatively densely-built, clearly outlined town structure that is not based on private cars, but enables walking and the use of public transportation. In most areas representing New Urbanism, these basic principles are combined with neo-historical architecture, mostly American architecture from the beginning of the 20th century. For this reason, the movement is often called neo-traditionalism. The Kartanonkoski area in Vantaa is considered the only Finnish representative of New Urbanism.

Newer developments among the concepts focusing on social factors in an ecologically sound way include the UStED – the concept of Urban Sustainability through Environmental Design. This an international joint project of several universities, launched in 2004 but so far only existing in the level of ideas, not as practical applications. The UStED emphasises the quality of living in the environment, as well as high-quality environmental analyses and planning.

City 2.0 is an excellent Finnish concept of an eco-socially sustainable community. Compared to its foreign counterparts, City 2.0 places considerable focus on the active participation of the inhabitants. (For more detailed presentation of the concept, see the section discussing urban planning). It would be an appropriate time to find other Finnish ecologically sustainable community concepts as well as innovations concerning the public space. A sound basis in research should be a central feature of such innovations.

A SAFE AND SUSTAINABLE NORDIC COMMUNITY?

Images: Ulla-Kirsikka Ekman

AN EXAMPLE OF A PLAN TO REDUCE CRIME
IN THE CENTRE OF TAMPERE
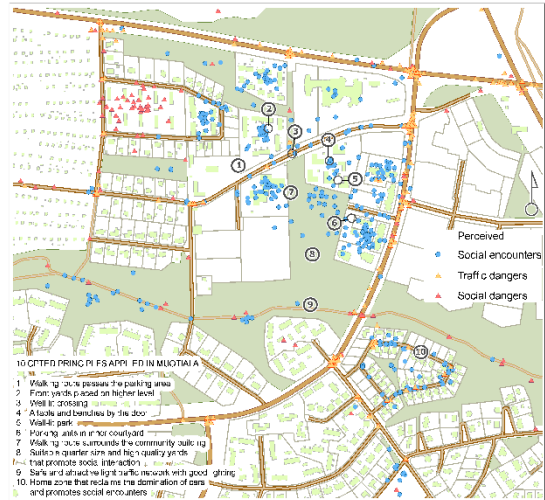
A SUMMARY OF THE EXPERIENCES OF THE
RESIDENTS OF MUOTIALA IN TAMPERE AND THE
SAFETY PLANNING CARRIED OUT IN THE AREA.

NEW FINNISH AND NORDIC INNOVATIONS? Crime Prevention Through Environmental Design (CPTED), an American design concept aiming at increased perceived safety and the prevention of crime, is an example of design focusing on increasing the well-being of residents. Various interpretations have been made of the concept, and the safety planning used in Denmark and Sweden shows considerable deviations from the original model.

In Finland, the Muotiala district in Tampere is the first to apply the CPTED model. Muotiala has thus been the test bed and laboratory of safety thinking. A recent study (*Kyttä et al., 2009*) described the Muotiala planning process, the solutions used in the area and the residents' experiences.

International research communities already discuss the second generation of CPTED. While the developers of the first generation safety-oriented planning wanted to understand the criminal's motives, the second generation models emphasise the residents' point of view and the significance of sense of community and cooperation. Organisations such as the international ICA, European EDOCA and British DOCA have been created to promote safety considerations. CPTED has also divided into various schools of thought with different areas of focus. For example in the United States, there are trends emphasising hard methods of crime prevention, such as guards, safety locks and window bars. These are believed to improve safety at both a physical and psychological level. The trend has also been criticised: bars and locks may just increase fears and turn safety into a big business.

Nordic experiments concerning safe living environments represent a softer approach, bringing an increased focus on the social environment (*Puustinen, 2008*). The Nordic safety thinking, represented by the renown Danish architect Bo Grönlund, among others, is based on the idea of an open society: fear of crime should not limit our lives so that we end up making our environment boring, closed and carefully guarded. A well planned environment is both safe and stimulating. A safe environment also guarantees children, the elderly and the disabled opportunities to freely participate in activities. The roots of Nordic safety thinking are perhaps closer to Jane Jacobs than Oscar Newman, whose ideas the original CPTED was based on. Nordic safety thinking could be more efficiently developed to a design concept and branded even for export.

In addition to safety planning, other new Finnish and Nordic innovations related to the high quality living environment and public facilities could be identified. A child- and senior-friendly environment that supports well-being could be an example of a concept with the potential for raising international interest.

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Livable communities: http://www.lgc.org/center/ ja http://www.livable.com/

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"Society will be actively developed so that Finland can flexibly adapt
to the changing global operational environment and cultural diversity.
Success in a changing world requires Finland to develop further as a knowledge and
innovation society which promotes the utilisation and development of national strengths:
education and know-how, technology, good governance,
a high level of environmental protection, and the sustainable use of its natural resources."

Finland's national strategy for sustainable development