Wooden Urban Villages

Kimmo Kuismanen
Dr. Tech., architect-SAFA, CASE consult Ltd
FI-Oulu

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1. Bioclimatic Architecture

1.1. Goals

The main goals of a climate-conscious town plan are:

- Harmonize the needs of nature environment, functions, traffic, built structure and the needs of inhabitants.
- Acclimatise actively and passively urban structure and buildings to local circumstances.
- Protect and strengthen the circular processes of nature, especially water cycles.
- Take pedestrian and public transport as the starting points of planning.
- Strengthen social community, boost safety and health, and secure inhabitant's participation in planning.
- Develop sustainable ways of using nature resources in urban infrastructure and industry; minimising the ecological footprint.
- Create a harmonious multi-functioning urban structure; abandoning the zoning of mono-functional areas.
- Create a continuous net of nature spaces.
- Plan areas dense enough to maintain services, employment, local economy and public transport.
- Unify and harmonise the cityscape, and create a pleasant environment and a good micro-climate.

1.2. Urban Planning

The most important decisions about ecology are made during he urban planning when the structure and infra are planned.

- Living, working and services inside walking distance.
- Linear urban structure along public traffic corridors.
- Most part of the cities of tomorrow exist already today: ecological redevelopment and supplementary-building.

Modern wooden towns can be divided in four categories:

1. *Functionalistic town;* open plan, free-standing buildings, open street space.
2. *Court block town;* closed blocks, continuous built structure, distinct street spaces.
3. *Garden town;* isolated houses in a green environment, bounded home streets or park streets. From this developed *Suburbia*; islands of efficiently built isolated areas dedicated to different purposes or low density detached houses, hierarchic traffic network, flowing outdoor space, idle land.
4. *Mega-structures.* Interconnected systems of structures and indoor spaces in a continuous structure.

TABLE: URBAN TYPOLOGY AND CLIMATE

CLIMATE	**URBAN STRUCTURE**				
	FUNCT. TOWN	COURT BLOCK	GARDEN TOWN	OPEN SUBURBIA	MEGA-STRUCTURES
• cold	--	++	++	--	--/+
• temperate	-/+	++	+	-	-/+
• warm-dry	+/--	++	--/+	--	--/+
• warm-humid	++	--	+	++	--/+

++ very appropriate, -- unsuitable.

2. Projects

2.1. Low-Dense Urban Structure

Low-dense urban structure consists of small-scale 2-4 stories high urban buildings constructed with different building types and sizes. The goals of the use of this building typology are:

- Lower building costs.
- Social control, security, neighbourhood with contacts.
- Joint facilities.
- Synergy of generations.
- Makes public transport economically possible.
- Mixed functions.

Issues of fire-safety and earthquake resistance have been solved.

2.2. Linnanmaa, Oulu Finland

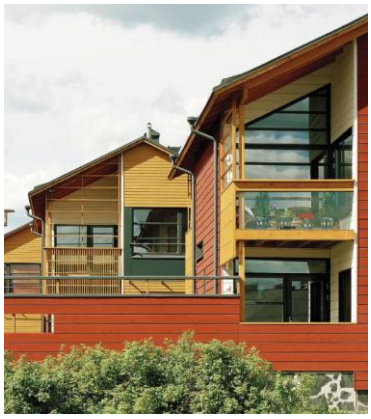
Linnanmaa was the first modern wooden town in Finland, and was built with multi-storey wooden buildings and terraced houses. Planning, and fire and sound isolation systems development was carried out by the University of Oulu Wood-studio during 1990's.

Our project started with wooden-element system development. Different solutions for construction and sound isolation were developed and tested. Many inhabitants say that the sound isolation and acoustics of these wooden buildings are better that in concrete ones.

Multi-storey wooden block, Linnanmaa Oulu. Kuismanen 1998.

2.3. Jokineito, Porvoo Finland

This modern dense wooden block in the nearness of the medieval wooden Porvoo town was designed keeping in mind the context. The modern architecture is reminiscent of traditional Finnish wooden town building.



Jokineito, Porvoo. Siitonen, Hedman & Matomäki architects.

2.4. Linnanfältti Area, Turku Finland

A project to build new wooden housing near the historic centre of Turku. The target is to build dense garden town which has an urban character, safe social milieu and high quality architecture in wood.

Linnanfältti, Turku. OPTIPLAN architects and SIGGE architects.

2.5. Kairatie, Rovaniemi Finland

Different building types in wood are mixed in this area. Low-dense building is an alternative both for detached houses and multi-storey housing. Both families with children and senior citizens will live here thus forming a balanced social milieu. The eco-efficiency consists of solar architecture, good micro-climate, protection against cold north-winds, use of rainwater and nature area preserved.

Kairatie, Rovaniemi. Kuismanen 2007.

2.6. CO_2-neutral Brøset, Trondheim Norway

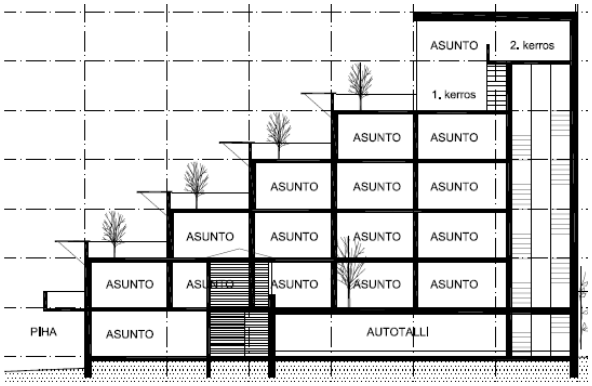
The demanding target is to build a CO_2-neutral area (CO_2-emissions today 11 tn/inh/a in Norway, target 3 tn/inh/a in Brøset). The project started with town planning, architectural design, and traffic and energy concepts planning. Environment protection, social milieu, wastes, recirculation, and life style change were considered as well. Local economy is enhanced.

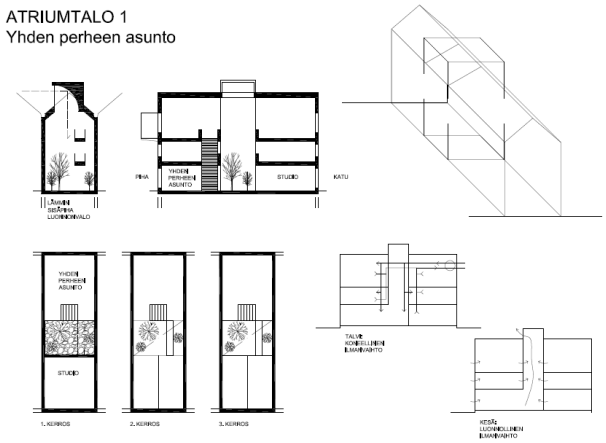
Our proposal is dense, liveable, multi-functioning wooden town, where everyday life is within walking or biking distance. Starting point is ecological wooden architecture with

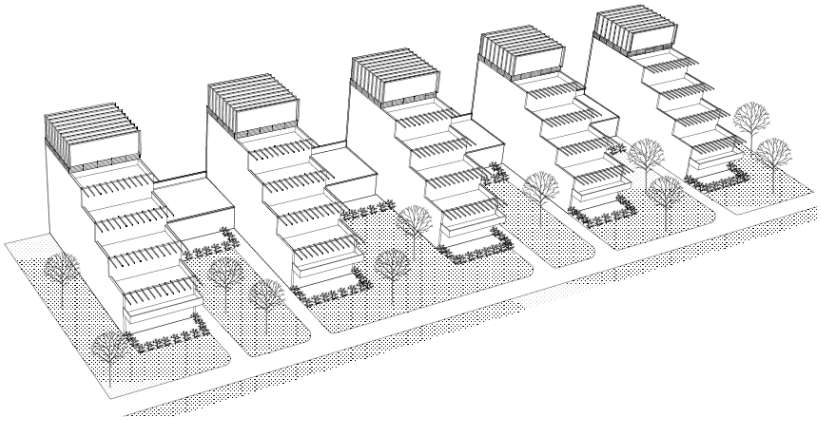
new energy efficient building types. A milieu that resembles small town will be created. Wooden multi-storey buildings and deep atrium-houses are planned.

The process continues with quality analyses, CO2-calculations, and planning guidelines made by the University of Trondheim.

Dense wooden detached houses that need very small building sites (right). Multi-storey wooden buildings (below). Kuismanen 2011-.







2.7. Jyrkkälä, Turku Finland

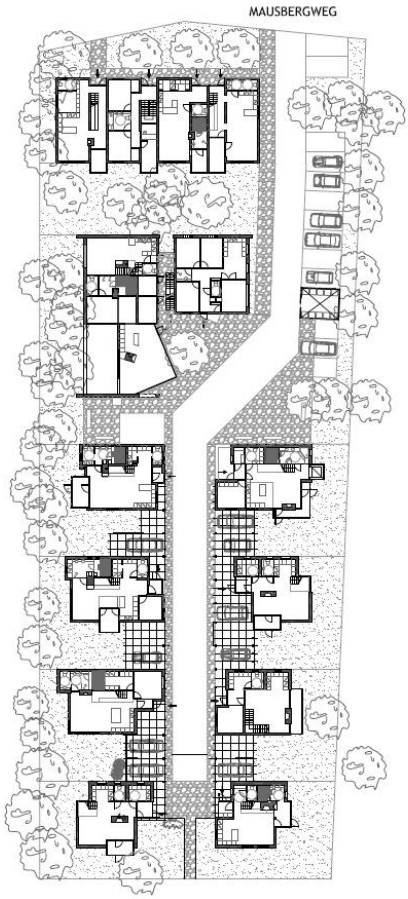
Most part of the buildings of future cities exist already, and therefore renovation of old buildings is an essential task. The target of the Jyrkkälä project is CO_2-neutral urban renewal of an existing suburban concrete neighbourhood, built in 1968-72.

At the beginning renovation methods with wooden elements have been developed and tested with the Aalto University. Wooden building parts shorten the building time, and there will be less noise and dust at building sites. During the planning possibilities of enhancing services and infill building, and even changes in life style are considered.

Jyrkkälä, Turku. Kuismanen, Lylykangas, 2011-.

2.8. Mausbergweg, Speyer Germany

The city wanted a proposal to use a narrow wasteland plot. The area is planned for housing with detached houses, terraced house and multi-storey building for seniors. All-generations housing make the living of senior citizens easier.



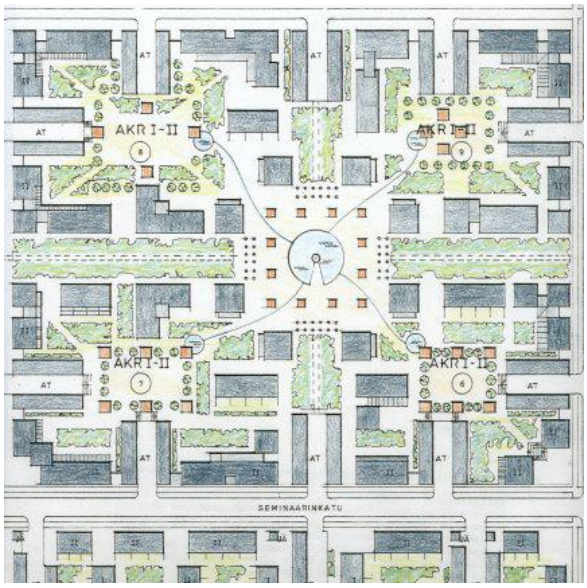
Low-dense housing, Speyer, Germany. Kuismanen 2010-.

3. New Challenges

3.1. Needs

In future there are new needs and challenges waiting for us.

Alternatives to the functionalist urban concept are needed. In Finland the building of livable wooden towns is growing in popularity. They can be reminiscent of the old Finnish wooden towns, or they can be new modern concepts.



New wooden block in the historic town of Raahe, project. Kuismanen.

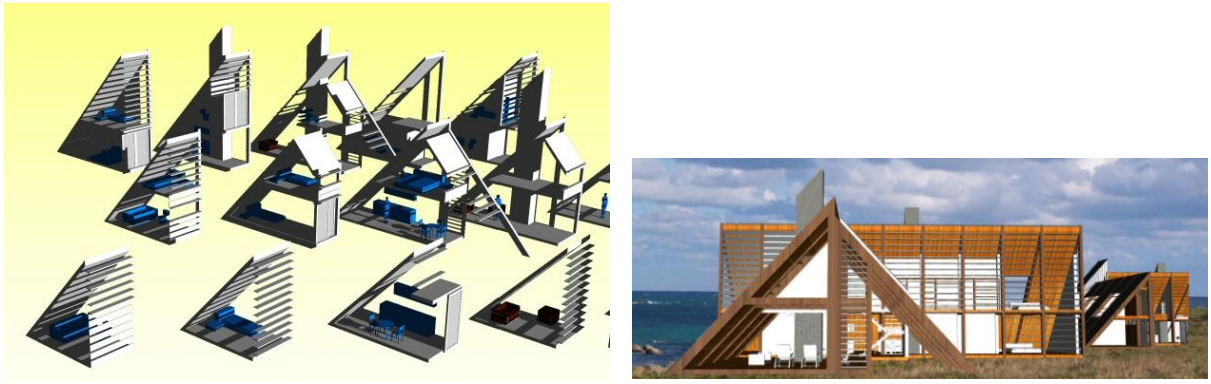
Because of the rising sea-level, floods, storms and tsunamis there is the need to develop new kind of coastal building. Wood is light and tolerates dynamic loads, which makes it suitable for new safer quayside architecture.

Project, Sendai Japan. Kuismanen 2011-.

3.2. Research

More research and development work is needed:

- Research into the climate change.
- Micro-climate analyses methods and planning guidelines.
- Research into CO_2-neutral planning and architecture.
- Bioclimatic architecture in different climate zones.
- Wooden town planning and architecture design guidelines.
- New climate-conscious wooden building systems.
- Building of pilot areas and buildings.



Wooden construction system, development project. Kuismanen 2011-.

A cluster of wooden buildings can resemble wooden town. A school centre with covered "pedestrian streets". Pudasjärvi Finland. Kuismanen 2012-.