Old Crown magazine in Ruokolahti, eastern Finland.

Characteristics of the historical Finnish wooden town
– alternative clues to modern town planning

Risto Suikkari

Since 1930´s, the long tradition of building wooden towns in Finland has been replaced by an open spatial structure and large concrete houses. On the other hand, those towns that have survived this process of dramatic change in the townscape are becoming more and more popular as living areas. These towns have positive qualities which modern construction usually does not recognice any more, but which still could be used in modern town planning

During nearly its entire historic existence the Finnish town has characteristically been a wooden town. The history of Finnish wooden towns has roots extending over five hundred years back. Six towns were established in Finland in the Middle Ages, but today traces of Medieval towns can only be found in the street networks of Porvoo, Rauma and Naantali. Destructive town fires and continual wars have destroyed most of the buildings constructed before the mid-1700s. Some remnants of Medieval Turku have been found in archeological excavations conducted in 1998, but no models of Medieval streets have been made in Finland. We can examine what a Nordic Medieval town may have looked like from illustrations drawn on the basis of excavations made in Trondheim, Norway.

It is possible to still experience the dimensions of a 17th century small town in Finland in Kokkola and Kristiinankaupunki, for example. Many Finnish wooden towns reached the peak of their splendor at the end of the 1800s. Examples from this period are the trading town of Rauma, and Naantali, Tammisaari and Hanko, which established themselves as spa and vacation towns quite early. The historic building value of Old Porvoo was also noticed at the time. It can be said that the Finnish wooden town reached maturity at the beginning of the 1900s.

The tradition of timber construction was not only prominent in agrarian small towns. A small historic stone town center was built in only a few of the largest towns. At the end of the 1800s stone multi-story apartment buildings were erected in the center of a few rapidly industrialized towns. Even in these towns, construction

Similarity throughout the nations and centuries.
On the left is an artist´s view of Trondheim in Norway year 1250, Karin S. Binns 1986. The drawing is based on archeological excavations made in the center of the town in the 1970's. On the right is 1800th century street in Tammisaari on the south coast of Finland. Photo Jouni Koiso-Kanttila.

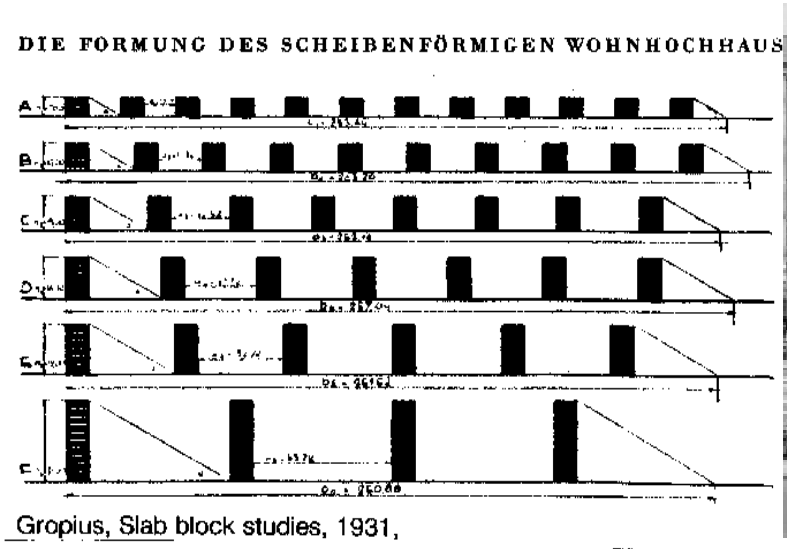
in the wooden town tradition continued immediately outside the core center. For example, 1502 wood and 348 stone residential apartments were constructed in 1918–1921 in the town proper of Tampere[1]. The entirely wooden town part called Puu-Käpylä with 337 residential apartments was constructed in Helsinki in the beginning of the 1920s[2]. This long tradition of town-like timber construction began to die out with the coming of new ideas and ideals in the 1930s. From then on the history of wooden towns has included contradictions and decline.

The strong urbanization process that took place after the reconstruction period of the 1940s and 1950s and the transition to concrete multi-story apartment building construction that favored large volumes and open town spaces led to disintegration of the traditional town structure and partial or complete destruction of wooden towns. The tradition of timber construction continued in rural areas, but town-like timber construction lapsed into an undervaluated status. Idealization of modern concrete technology replaced the ideal of traditional antique stone construction. Furthermore, construction using the new "everlasting materials" was inexpensive enough for everyone's pocket. In part, the undervaluation of timber construction was affected by stories passed down of destruction caused by wars and recurring town fires.

In spite of it all, entire wooden towns and town sections have been preserved to this day. As a rule, these preserved wooden town milieus are conceived as pleasant residential areas. Although they have been built over a long period of time when different styles have dominated, they all have features labeled by similarity. Thus, the coziness of wooden towns is not dependent on the architectural styles. This gives reason to believe it is also possible to find modern architectural means of expression for modern town-like timber architecture and construction that will carry on the long tradition of wooden towns.

Formation of the town structure, ideals vs. reality

Early on, the rigidly rectangular street network of the ancient model was incorporated in traditional Finnish town structures. Johan III strove toward this in a few isolated cases already at the end of the 1500s[3], but beginning in the early 1600s it became the general principle. The old town structure and the topography of the landscape was scarcely taken into consideration when planning new towns and regulating old ones. The ideal landscape for a new town was flat. Usually,



On the left is a daylight schema of Functionalism from the year 1931. On the right is the disintegrated town structure of Hämeenlinna today. Photo R.S.

however, construction of an ideal Renaissance town did not work out due to local topography and insufficient surveying equipment and a lack of experience using it. Attempts to straighten the layout of Medieval-type towns during the Enlightenment period at times resulted in mixed street networks where some of the main streets were laid out according to the new arrangement, but the side street network and layout of plots remained irregular. The townspeople usually were against these attempts at regularization that the central administration advocated, sometimes even by force[4]. "Straightening" of towns to make them rectangular was most successful during Russian rule. However, the new street lines were laid out more or less according to natural formations or the existing town structure. This brought diversity to the street lines in both the vertical and horizontal levels. Block and plot sizes also varied considerably in different towns.

These local variations of a rectangular street layout created in different periods are important from the standpoint of the formation of the towns' own identity. By comparing Nordic wooden towns surveyed in 1972[5] it can be said that overall the wooden town structure in Finland became more rectangular and in that sence more organized than in the other Nordic countries.

Formation of the street space during different periods

In Sweden, the town law of Magnus Eriksson which was valid up till 1736 specified the minimum width of a public street as 8 cubits (about 4.8 m) in order that a horseman and a pedestrian could bypass each other[6]. This dimension came from existing street networks of old towns, for in 1664 the Organization of Inns (Gästgiveriordningen) specified the minimum width of a street in new town as 20 cubits (12 m). Correspondingly, the construction ordinances of 1736 and 1763 in Stockholm specified the minimum width of new main streets and shoreline streets as 24 cubits (14.4 m), while 16 – 20 cubits (9.5 – 12 m) sufficed for side streets (cross streets) and lanes. The actual width of the streets fell short of this goal, though, and 12 cubit wide streets (about 7.2 m) were common in the towns of Swedish Finland, such as Kristiinankaupunki, in the 1700s[7]. In the beginning of the 1800s the common width of main streets in Finnish towns like Raahe was 20 cubits (12 m), and side streets were 16 cubits (9.6 m) wide.

During Russian rule and the period of Empire style, an attempt was made to widen the street space in the towns. Broad boulevards and esplanades were built. In the new town plan drawn by Engel after the 1827 fire, 40 cubit wide avenues (24 m) divided Turku into fire sec-

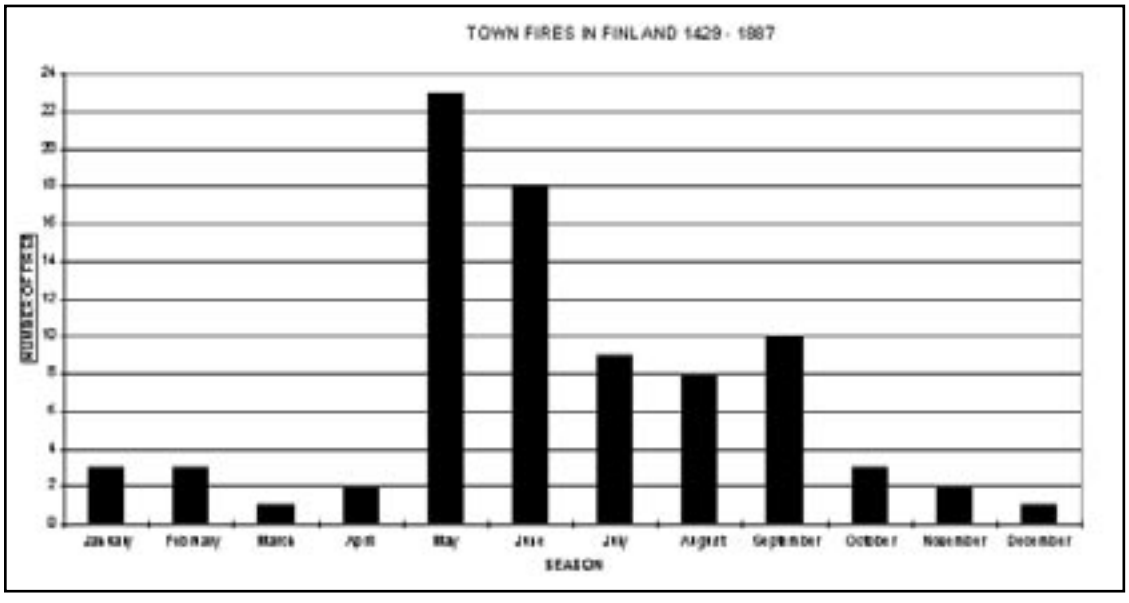
tions. The new street network was made 30 cubits (18 m) wide. In Helsinki the width of main streets was 30 cubits (18 m) and side streets were made 25 cubits (15 m) wide. Because of the stone buildings located along the streets, the width of the old streets in the city center was left at 15 cubits (9 m) for economical reasons[8]. All in all 15 meters became the most common street width in Neo-classical towns.

Green areas started to become common in European towns beginning in the 1600s, especially in Holland. The general problem in the Medieval-based towns of Swedish Finland was that the plots extended to the shoreline, which was thus isolated and enjoyed only by the property owners. The waterfront did not provide recreational service to the townspeople, and water was not readily available in case of fire. In the king's letter 1.7.1751 Swedish towns were exhorted to construct streets along the shoreline to facilitate fire extinguishing, to prevent backyard smuggling via the waterway and to give the towns a better, more pleasant appearance[9].

The significance to the town image of shoreline streets and parks was not emphasized in Finnish towns until the end of the 1700s, which was dominated by a naturalistic trend. Wide avenues that highlight public buildings were constructed within the town structure the first time in Vaasa and Heinola in the 1780s. After that green areas were an essential part of town plans. In some fire safety plans of the late 1800s these green areas went to extremes, like in the 1882 town plan of Oulu, which was not realized.

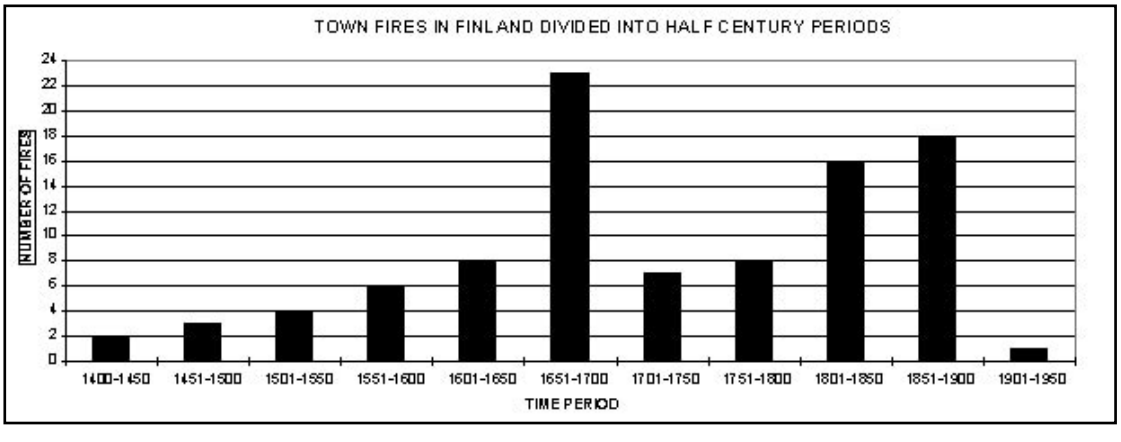
Because of recurring town fires, it began to be a requirement that buildings at the backs of plots had to be separated from each other by fire lanes. The first fire safety plan apparently was Kuopio's town plan of 1775, where blocks were divided into parts by 7 m wide alleys, which formed an essential part of the street network. A citizens' meeting held after the 1810 fire in Raahe decided that the "intermediate streets" between

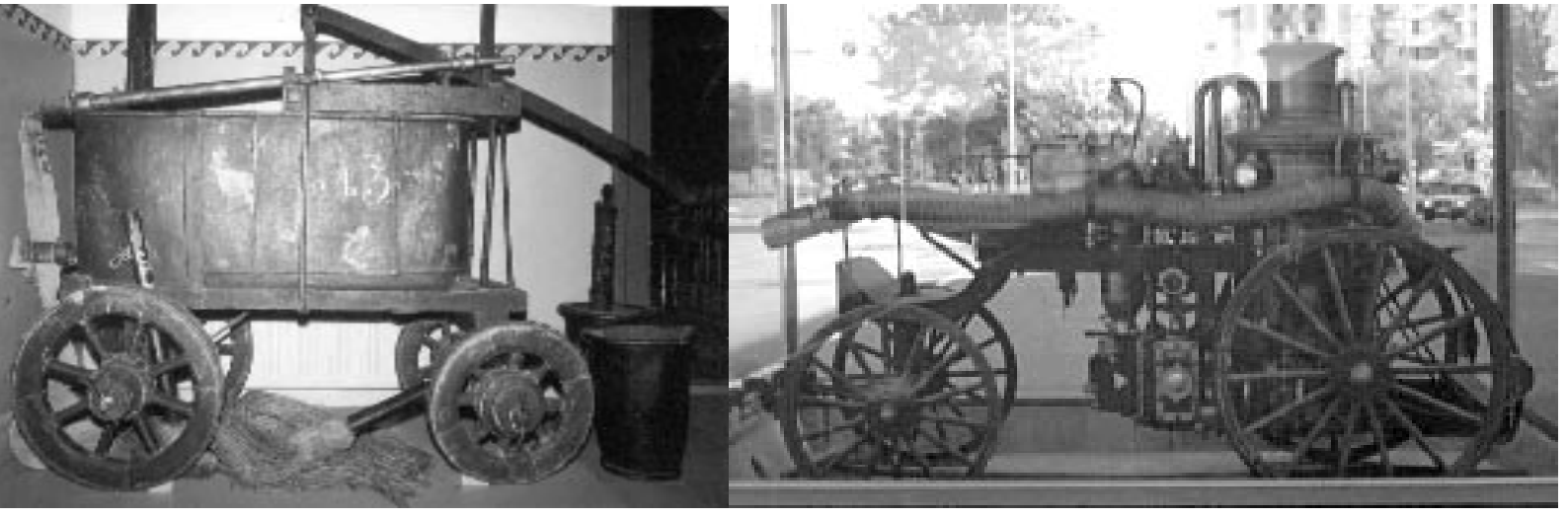
Ideals and Results
Above, the ideal plan of the 1640's made for the town of Pori. Below, different solutions; the town structures of Naantali and Rauma from the 17th century – some medieval street lines can still be seen, Raahe from the early 19th century and Puu-Käpylä in Helsinki from the 1920's – a late example of a town structure based on tradition.



Number and time of year of 83 town fires with documented data[16]. The table demonstrates summer time more dangerous, and especially May is the most dangerous month of the year for wooden towns (28% of fires). In the half of the cases, the fire-spreading effect of hard wind is mentioned. Fire spreading at least over one block is defined as a town fire in this table. Deliberate destructions of warfare are not included.
Table above.

Table beneath.
Number of town fires divided into half century periods. The table demonstrates the dramatic change in number of fires at the turn of the century. The increase of fires follows roughly the increase of population in towns but the peak of the late 17th century gives reason for thought.





Evolution of the fire pumps.
On the left a fire pump from the 1850's in Pietarsaari. Pump capacity 80 liters/min. On the right a prize winning steam fire pump from the 1880's in Pori. Pump capacity 600 liters/min. The capacity of a modern fire engine is aproximately 2000–3000 liters/min. Photos R.S.

houses were to be at least 3 cubits (1.8 m) wide[10]. Later, Raahe's 1858 building ordinance specified that a 3 m wide fire lane was to be left between buildings[11]. In Raahe and many other towns, however, these alleys within blocks did not form special street-like passageways as they did in Kuopio.

The requirement of paving the streets of Swedish Finland's towns with stone is very old, and appeared as early as 1619[12]. Due to a lack of funds, many times only part of the street was paved. Even in the beginning of the 1800s it is mentioned that Kajaani had plank sidewalks[13]. This tradition from the Medieval period has been continued in some rural villages and towns in Karelia in Russia to this day. Cobblestone pavement did not become popular until the beginning of the1900s, but gravel side streets and alleys can still be found in our wooden towns. At its best, a street surface outlined with stone may form a third small-scale façade of the street space. A gravel surface is also live, contrary to today's most commonly used street and yard material – asphalt, which lessens the details of the surface.

Fire safety in the Finnish wooden town

It is generally believed that the recurring, destructive town fires in the wooden towns were finally brought under control late 1800s by widening the street space and making towns less dense. The size of plots was increased. Plots within a block were separated from each other by greenery – fire lanes. This may be one reason why the open town structure of Functionalism was so easily accepted in Finland later. Functionalist ideas supported the ongoing town planning trends. Nevertheless, old, closely built wooden town milieus have been preserved in Finland, where no destructive town fires have occurred in over 200 years. Examples include Porvoo, Naantali, Rauma, Kristiinankaupunki and Tammisaari. In some towns no town fires have occurred at all.

The density of the town structure is significant from the standpoint of fire safety. However, a study of the conditions, construction methods and fire-fighting equipment of the mid-1800s, when the most destructive town fires occurred, strongly indicates that fire safety involves many other factors, not just the space between buildings. Chimneys were often poorly constructed, fire codes and regulations were commonly ignored. Hay and other combustible materials were stored on the plots. The fire extinguishing equipment in most towns was lacking in both quality and quanti-


Visible human scale.
On the left main street of Old Porvoo with lot of impulses for perception. On the right courtyard scene from the town part of Käpylä in Helsinki. Photos R.S.

ty[14].

An examination of Finnish wooden town fires indicates that roof materials had a significant impact on fire safety. Balk and thatch roofs were common in towns until the beginning of the 1800s. Board roofs were the most common roof materials at the end of the 1800s. Town fires usually spread in windy weather from roof to roof during the dry season, when there was no protective snow on the roof. At the turn of the century felt and sheet metal became common and gradually replaced board and shingle roofs in the towns. In Hamina, for example, the number of board roofs diminished from 44% to 15% and shingle roofs from 15% to 0,4% between years 1890 and 1900[15]. At the same time town fires occurred less often in Finland and finally ended completely.

When re-evaluating fire safety viewpoints today it is important to remember that the conditions in everyday living has changed radically over time. Fire alarms, fire fighting equipment and structural fire safety have been developed after the period of large town fires.

Characteristic features of preserved Finnish wooden towns

The hierarchical structure of the street network can be clearly seen in traditional Finnish wooden towns: main streets (8 – 15 m wide), squares, side streets (5 – 8 m), lanes (as narrow as 2.5 m). In a purely Empire style town during Russian rule the street grid was intended to be homogenous (street width 15–18 m). Variation was still achieved by alternating ordinary streets with very wide avenues, which formed fire barriers between town sections. In these nearly perfectly shaped towns or town sections it is possible to easily sense even small variations, such as gradations in streetside façades, caused by the clash between the geometric town structure and the topography of the landscape.

In most wooden towns it is possible to see social separation in the granularity of the town. Buildings and plots get smaller as one goes from the center of town, usually around the market square, toward the edges of town. The size of the blocks may still be the same. In Raahe, for example, the length of façades facing the street along Pekkastori square and crossing main streets varies from 20 to 30 meters. On side streets the façades are 10 to 15 meters long.

Several well-thought-out elements of town layouts can be found to a greater or lesser degree in old towns: placement of public buildings around squares

The nature of wood.
In the middle, imitation of stone in the wood architecture of a mid 19th century house in Porvoo. On the sides, texture studies for the first block of the Oulu Modern Wooden town. Photos R.S.

or at the end of a street, parks and avenues, integration with a waterfront. Nevertheless, all wooden towns are characterized by close, confined street spaces, where the degree of closeness varies.

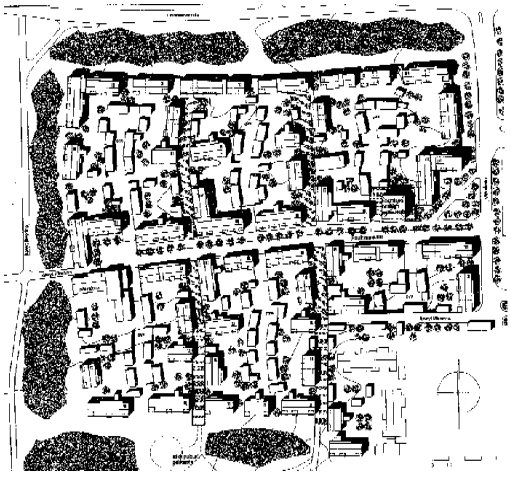
Differences in the size of buildings bordering the street, variation in eave heights, roof angles and façades make the streetscape more interesting. An inventory of Finnish wooden towns shows that not one traditional wooden town has been built without these variations. On the other hand, the streetscapes have similarities, primarily because of the granularity of the town image and the similar design of visibly important structural parts, like foundation, openings in the facades and pronounced eaves. The small details of the surroundings and short distances create a human scale – objects are close enough to be studied and there is much to observe.

The slatted nature of wood material is very important in outlining façades and understanding scale. A special characteristic of wood architecture in Finnish towns is the replication of stone construction, which reached its peak during Russian rule when the style of the Empire was dominant. Even so, these buildings can be comprehended as wooden buildings because of the nature of the wood material, cracking of boards, the dimensions of wood.

The verdant yards of preserved Finnish wooden towns are particularly appealing. Protected yards bordered by buildings and fences are actively used extensions of living activity. This type of activity also enhances the sociality of the inhabitants of a block and the formation of a local identity (for example, we feel we belong to this or that area). Sociality is also increased by a mixing of commercial services and living activities, which is part of what makes a town-like atmosphere. In old wooden town milieus people often live in two or even three stories. An important question from the standpoint of modern town-like wooden milieus[17] is how large and many-storied a building can be and still make living feel close to nature and belonging to one's own yard.

So, part of the variation in the town structure of old wooden towns is the result of premeditated town planning, part is born from local modifications, and part is due to unintentional remnants of earlier town structures. All these small details enrich the town image and give the town an identity. A wooden town does not have to be merely a historic relic, it is part of our living cultural heritage. The characteristics of a wooden town could also be used in a modern town-like wooden milieu that combines traditional scale and the esthetics of wood material.

Continuing the wooden town heritage



Two different modern wooden town schemes utilizing features from the past.
On the left, the modern wooden town plan on the west bank of the Porvoo river. A mixed structure of medieval and neo-classical block systems. Architect Tuomo Siitonen. On the right, an illustration of the Oulu Modern Wooden Town area , a project that takes advantage of the three basic spacial elements of a historic town structure: enclosed streets, enclosed yards and public squares.

in the modern wooden town

About ten local construction projects are currently being planned in Finland with the intention of reviving town-like timber construction[18]. One of them is a wooden section of town which is being constructed in Syynimaa, next to the University of Oulu in Northern Finland. The town plan for the area as well as the general planning instructions were made by the research team in Wood Studio at the University of Oulu, consulting with the officials of the City of Oulu. The town plan was accepted by the town council in September 1998. The first block of the area was designed in Woodstudio by project architects under supervision of the research team as an example for the whole area. The

Continuing the tradition.
A view from the almost finished first block of the Oulu Modern Wooden Town area. Photo Tanja Rytkönen.

construction work has begun in late 1998. The total floor area will be approx. 18,400 m2. The block building density varies between e=0,53–0,60 when rear buildings and parking shelters are included. The number of floors in the blocks varies from 2 to 3. Part of the ground floor premises are available for commercial, work and office uses, thus enlivening the area without causing disturbances to the residents.

The main aim of the Oulu Modern Wooden Town project is to build a compact wooden townish area, using lessons learned from the past, to create new architecture characterised by wooden buildings. The perception of scale is basis for planning. The project takes advantage of the three basic spatial elements of historic town structure: enclosed streets, enclosed yards and public squares. The area will be used for researching and testing the environmental effects of wooden milieu, for experimenting methods of wood constructing in contemporary architecture and trying out new research results. Within the framework of the research, attention will be given to the creation of street and yard areas as well as structure and block size. The aesthetics, detailing, language of form and composition of wooden facades, as well as their durability and technical limitations, especially fire safety in relation to the planning of the whole area, will be treated as important research issues[19].

The results of architectural studies of modern medium rise wooden buildings have shown that wood can be used to construct modern wooden facades of high aesthetic quality. There are surveys indicating that people prefer living in wooden houses with human scale to high-rise concrete buildings[20]. There are still many difficulties to overcome. Building firms are still unwilling to change their methods from building in concrete to the much more precise but faster wood constructing[21]. The firms have also more financial connections with the concrete industry than with the mechanical wood industry, so the motivation for developing wood construction is not always high.

The city officials are another major group, in which there are people who are reluctant to the idea of a modern wooden town. The fact that many cities have quite recently seen the demolition of their wooden town structure is psychologically hard to overcome. The open town structure has become a norm which is hard to change.

In that sence these actual examples of wooden town areas under construction are of great importance. They bring credibility to town-like timber construction and create a base for continuing the tradition of wooden towns. In a country with large wood resources this would be a natural choice and a real alternative in community construction.

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