

Wooden Town Tradition and Town Fires in Finland

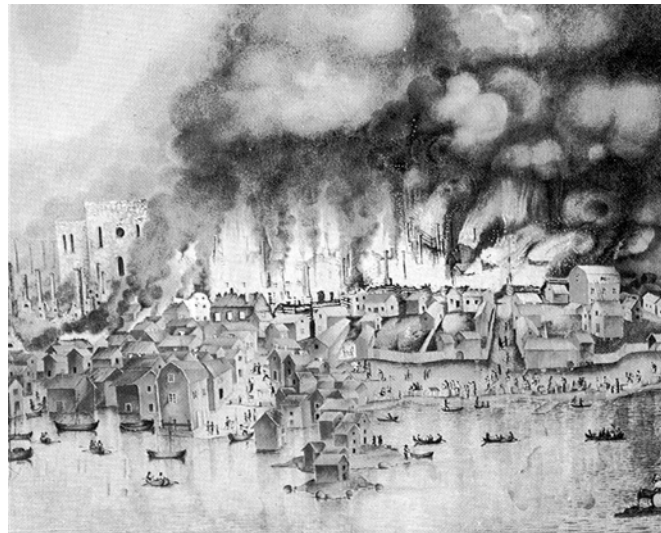
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1. Introduction

Finland's location is both geographically and topographically advantageous in the sense that there are no natural catastrophes such as earthquakes, hurricanes or floods that threaten cultural milieus as so often happens elsewhere in the world. Finland does have minor floods, but they usually occur only in low-lying countryside during the break-up of ice in the rivers in springtime. Throughout history, however, our towns have been tormented by a recurrent catastrophe that could well be described as a *Scandinavian phenomenon*, as it has been a serious problem for countries in the conifer belt, Finland, Sweden and Norway. This phenomenon is the frequent fires of the wooden towns.

Throughout its history the Finnish town has characteristically been a wooden town originating over five hundred years ago. Six towns were founded in Finland during the Middle Ages, but today only three of them, Porvoo, Rauma and Naantali, still remain some Medieval features in the sizes of the lots and in the street network. Disastrous town fires and several wars have destroyed the most of the buildings built before the middle of the 18th century. In spite of this, the towns were rebuilt out of wood just as before.



Town of Oulu in flames 1822.

Jacob Wacklin's watercolor of the Oulu's most destructive town fire in which total of 330 houses burnt down.

2. SOME STATISTICS ABOUT FINNISH WOODEN TOWNS

Statistics from 1747 including all the towns in the country of Sweden-Finland as well as statistics from 1845 including towns in Finland reflect in a very impressive way the scale of building using wood. According to the statistics from 1747, 98.7% of all buildings in Finnish towns were made of wood [1].

A hundred years later, year 1845, as much as 97% of all residential houses and 53% of public buildings in Finnish towns were still made of wood [2]. The statistics on the towns of Turku and Vyborg, *the two cradles of stone building* in Finland, are worth noting: in 1845 526 of the 566 residential houses (93%) and 15 of the 35 public buildings (43%) were wooden. The town of Turku, recovering from the great fire of 1827, was rebuilt out of wood as before, even though town planning expected new ideas. In the fortress town of Vyborg, 511 of the total of 595 residential houses were of wood (86%). The share of public buildings made of stone was greater, however, as only 10 of the 41 public buildings were made of wood (24%). These statistics do not include the outbuildings in the back of the plots, which naturally were mostly made of wood.

Most of the Finnish towns were founded before 1900 in the spirit of the wooden town tradition. The total amount of the towns back then was 38. (Appendix 2) At the end of the 19th century, stone apartment buildings started to rise in the town centres of a few rapidly industrialised towns. Even in these towns, construction in the wooden town tradition continued immediately outside the core centre. For example, 1502 wood and 348 concrete residential apartments were constructed in 1918 – 1921 in the town proper of Tampere, nowadays one of the biggest industrial towns in Finland. An entirely wooden part of town called Puu-Käpylä (Wooden Käpylä), with 524 residential apartments, was constructed in Helsinki in the beginning of the 1920's. This long tradition of town-like timber construction began to die out with the coming of new ideas and ideals of the Functionalism in the 1930's. From that on the history of wooden towns has included both contradictions and decline.

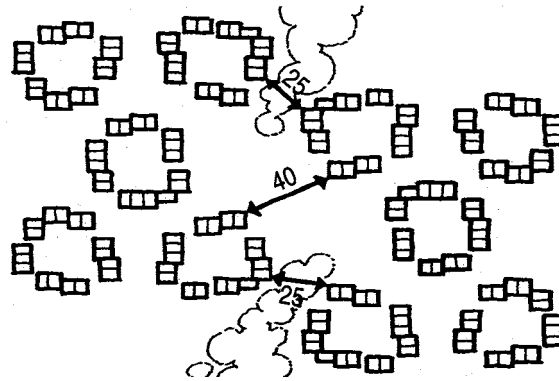


Model of Oulu 1938 before the WWII. Town is still mostly a wooden town. Model by Malliakopio, photo R.S.

3. BREAK-DOWN OF THE TRADITION OF WOODEN TOWN

The long tradition of building towns out of wood started to break down in the late 1800's. New town planning ideals and idealisation of new materials, rapid growth of the towns and overestimated prognoses of the increase of population in towns are often named as causes to this change. Numerous town fires and destruction caused by wars can also be found in the background as a notable reason effecting on the disappearance of the old wooden town structure. The fear of town fires still comes up every now and then in public discussion and in the opinions of town officials. The risk of town fires is used as an excuse not to allow building

of dense wooden town-like areas. The fear of town fires deep in our minds can be a partial reason for the process replacing individual wooden buildings in old towns with stone buildings almost whenever it is possible.



Drawing: The Finnish Ministry of the Environment's instructions on how to design a group of wooden buildings fire safely [3, p.110]. Instructions based on the fear of town fires make it impossible to handle the street space as a positive architectural element of the area. These kind of instructions are leading to anonymous suburban areas with an open spatial structure. Reasons for re-evaluation?

It is generally believed that the recurring, destructive town fires in wooden towns were brought under control in the late 1800's by widening the street space, making the structure of the towns less dense by increasing the size of the plots and by using greenery to divide the blocks and the town in parts. All this was done in the spirit of the building order for Finnish towns from 1856. This general tendency was identical with the later trends of Functionalism and the *spatially open town structure* in the early 1900's. This may be one of the reasons why Functionalist ideals were adopted so easily in town planning in Finland.

And yet, there are still a number of dense wooden towns in Finland that have been spared from major fire over several hundreds of years. Towns like Porvoo, Naantali, Rauma, Kristiinankaupunki and Tammisaari can be mentioned as examples. Is there a threat, then, that these old milieus should be regarded as ticking time bombs? Today building out of wood has revived and few new, modern wooden town milieus are developing. Do these new areas face the same threat, as well?



Narrow lot based on Medieval town structure in Old Porvoo on the south coast of Finland. Photo R.S.

4. TOWN FIRES AS A NUISANCE FOR WOODEN TOWNS

According to town histories and chronicles there have been at least *120 major disasters* considered as town fires. Some towns burned down almost once in every generation. 25 of these disasters were caused by warfare before WWI. [Appendix 1] In addition some towns suffered from the bombings during WWII but none of the towns were totally devastated. These damages are not included in this discussion.

Studying the history of wooden towns, construction methods and conditions during the times when devastating town fires occurred indicates that fire safety involves many other factors than plot size, wall material of the houses and the space between them. Life in a wooden town was very much like life in the countryside, although in a more compact milieu. Besides the main building, there were many different outbuildings side by side on the plot, e.g. a horse stable and a cowshed. Hay, firewood and tar were stored in the plots. Roofs were made of combustible material. Inflammable birch bark was used as water insulation under wooden board or turf roofs. Fire protection was inadequate as far as both the equipment and organization of fire brigades was concerned. People seemed to think that there was not much they could do in advance to prevent town fires - whether or not a town escaped a fearful town fire was in higher hands.

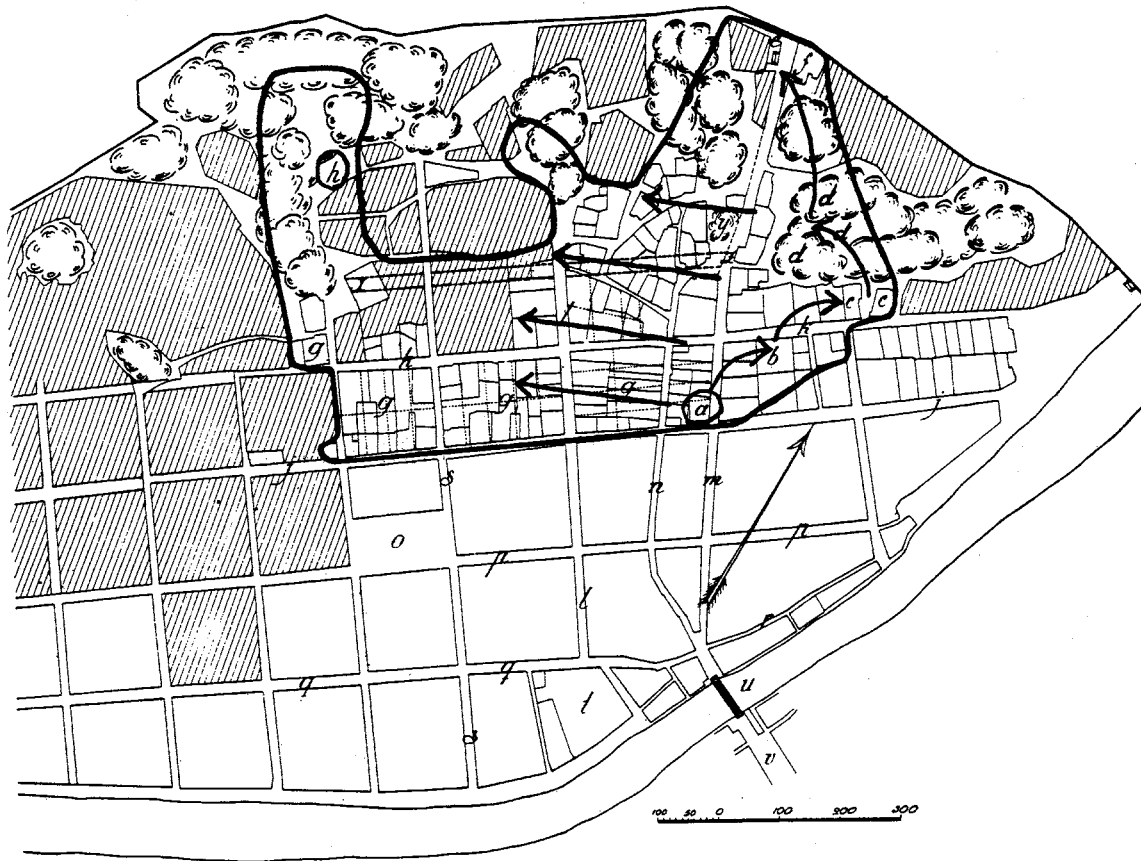


Picture. Fire fighting in 16th century according to a drawing by Olaus Magnus. Burning particles are being pulled down from the roof by fire hooks. Ladders and water buckets made of leather can be seen as other fire fighting equipment. These methods were used in Northern countries until late 18th century.

Fire fighting in towns was based on a method where the building on fire was demolished and surrounding buildings were protected by using wet fire sails. Fire sails were still in use in some Finnish towns as late as the 1920's. The first primitive fire pumps emerged in Finland in the late 17th century. On many occasions the fire pumps were so powerless that the water did not reach the roof of a two-story building, sometimes not even the roofs of lower ones.

5. The 1775 town fire of Turku, an example of how the town fires spread

The 1775 fire in the town Turku illustrates well the spreading of town fires of the Gustavian era. The fire started in the coppersmith's yard (a) on August 8, 1775 at half past four p.m. A slight wind was blowing from the south. There had been a long dry season. The buildings in the next block across the street caught fire first (b). Next the buildings in the plots (c) caught fire and spread the fire to the hill of Anikaisenmäki. The five windmills on Anikaisenmäki as well as a big storehouse (d) ignited. Next, the customs house (e) and the neighbouring plot on the other side of the street began burning (f). At about seven p.m. the wind got stronger and shifted to the east. The fire spread as a wide front, setting fire in the quarters on the east side of the burning area (g). The fire went out at two a.m. the next morning at the (h). A total of 126 town plots, including the buildings, were destroyed, as well as the windmills and warehouses [4, pp. 160-161]. The town of Turku had at its disposal three fire pumps with leather hoses, a big fire pump acquired in 1728 and the pumps from the Academy and the Cathedral acquired in the beginning of the 1770's. Furthermore, there were several smaller manual fire pumps in the residential houses [4, pp.277-278]. As the fire pumps in the 18th century at their best had a capacity of only some ten litres per minute, they did not have much significance in putting out fires.



Map of the extent of the 1775 fire in the town of Turku according to Jonas Brolin. The thick black line shows the burnt out area. The dotted line in that area shows the new division of the plots after the fire. The slashed line marks an unbuilt meadow [4, p.61]. The black arrows have been added to demonstrate the spreading of the fire.

According to the map of Jonas Brolin, the width of the streets in the fire area in 1775 varied from 10 to 16 ells (from 6 to 9,6 metres). There were two alleys that were even narrower. The street of *Keskimmäisen Brahen poikkikatu* (j-j) located in the upwind direction had a width of 7,2 – 9,6 metres, which was enough to prevent the fire from spreading. This width was enough to prevent the facades across the street from catching fire as a result of heat radiation. The fire spread downwind with great leaps and the street width had only minor significance. The fire was spread from roof to roof by sparks carried by the wind.

Before the fire there had been efforts to forbid the use of wooden board roofs in new buildings, and thus increase the use of brick instead. In practice, this led to the increased use of turf roofs waterproofed with birch bark [4, p. 254]. There were still a lot of old coverings of wood. Some of them may have been in bad shape, as repairing was forbidden in 1774 [4]. Birch bark showing from under a neglected roof is always especially inflammable. Thus, the efforts to increase the use of brick by forbidding the use of wood, and in this way improve fire safety, led to a result that was contrary to what was expected – the increased use of inflammable materials and thereby decreased fire safety. This kind of episode happened in several Finnish towns.

In 1809, as Finland became a part of Russia, building out of stone was promoted by the authorities. The immediate result was merely that the architecture of wooden buildings started to imitate the architecture of stone buildings (the Empire style). There were several extremely disastrous town fires in the beginning and in the middle of the 19th century. Examples are the fires in the town of Oulu in 1822 and in the town of Turku in 1827, the last being the most disastrous in the Nordic countries. These fires started a thorough reform of

both the fire prevention system and the fire insurance organisation. Nevertheless, town fires continued to occur until the turn of the 20th century.

6. THE TURN OF THE 20th CENTURY AND THE RAPID CHANGE IN CIRCUMSTANCES

It is generally believed that at the turn of the 20th century, fires in wooden towns were taken under control by town planning measures such as limiting building out of wood, widening the street space and plot size, increasing the amount of tree plantings and leaving more space between the buildings. However, implementing these town planning measures was a slow process and they were not fully carried out in all of our towns.

7. Roofing material vis-à-vis town fires

There were also some very rapid technical changes in the building materials of roofs and in the development of fire-fighting equipment at the end of the 19th century. These have not been taken into account sufficiently when regarding the fire safety of survived wooden towns.

Accidental town fires increased in number during the 18th and the 19th century roughly in step with the growth of town populations, but they suddenly started to decrease and finally ended at the turn of the 20th century [table 1]. This reflects the rapid development of technical solutions rather than the long reform process of town planning. In particular, town renewal destroyed a significant part of the wooden town structure as late as the 1960's and 1970's.

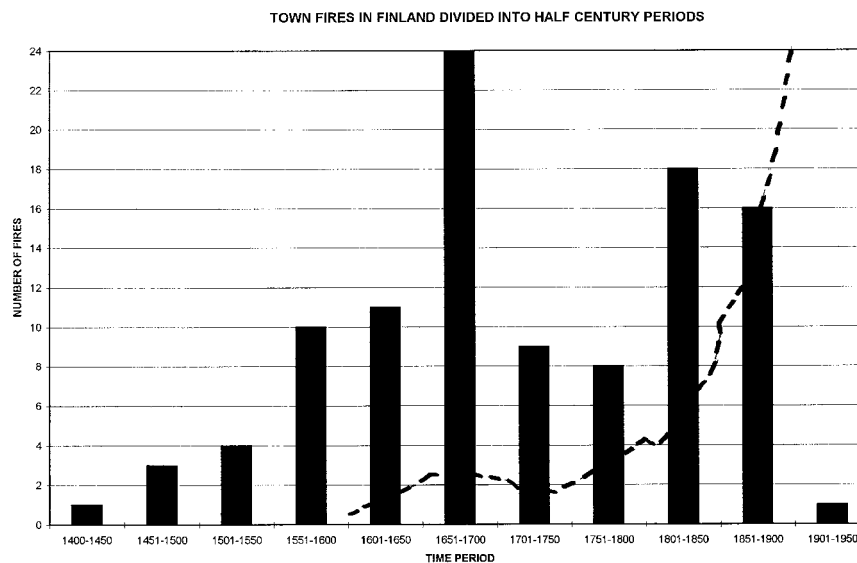


Table 1. The amount of town fires divided into half-century periods. The dashed line marks the population in towns (x 10 000 inhabitants). The table does not include town devastations of the wars. A town fire includes any accidental fire that destroyed at least one quarter and spread across the street. [6]

Statistics on wooden town show that the wooden towns in Finland burned down during the summer when there was *no snow protecting the roofs*. The most “dangerous” months to Finnish wooden towns seems to be May (table 2). Fire reports often mention wind as one factor that spreads fire and results in fires in buildings far away from each other, even simultaneously at several different places.

TOWN FIRES IN FINLAND 1429 - 1916

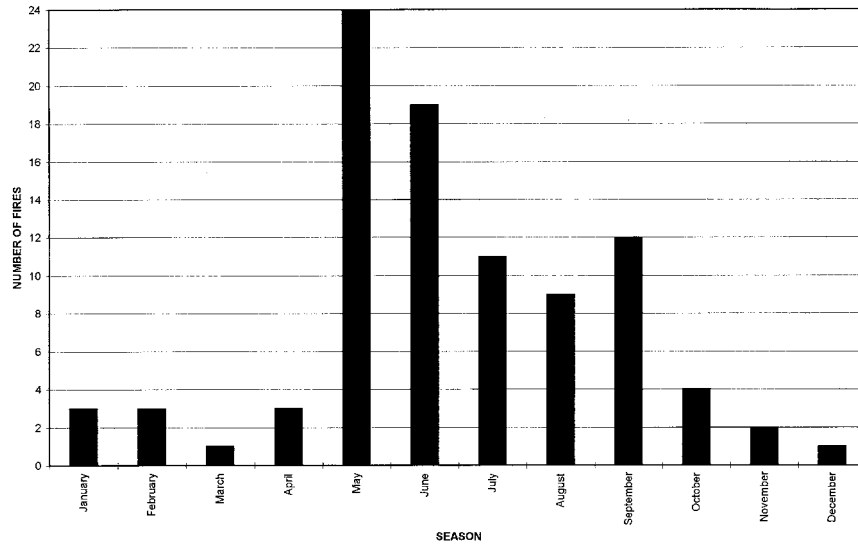
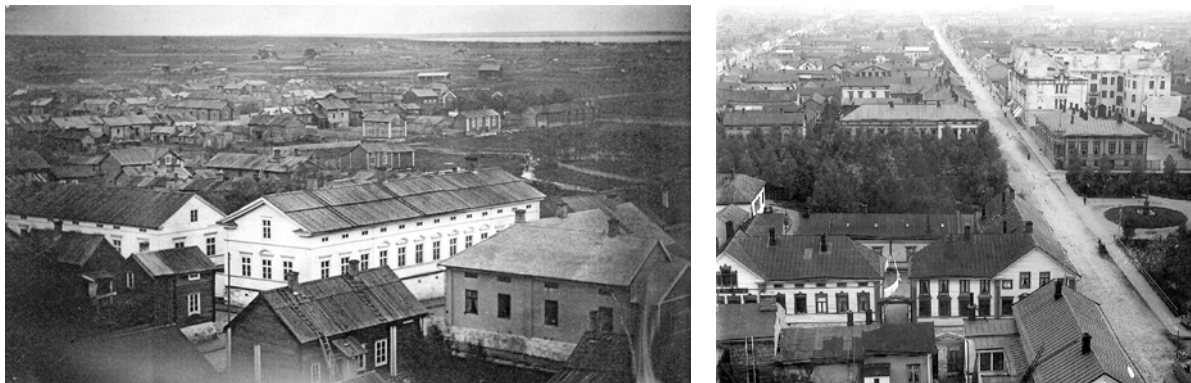


Table 2. 92 town fires in Finnish towns whose scope and time of occurrence have been determined. The table clearly shows that the month of May was a particular threat to wooden towns. 23% of the fires were said to have started at night or early in the morning. In more than 50% of the cases a strong wind was mentioned as spreading the fire. [6]

A wood covering was common in towns until the turn of the 20th century. At the end of the 19th century even the shingle roofs were popular for a while in towns. According to fire insurance documents, the most common roof cover in the town of Oulu in 1865 was a board roof. At that time there were at least two shingle roofs in town, as well. Both brick and sheet metal were yet extremely rarely used. [7]



Pictures. View of the town of Oulu in the 1870's (left picture) and in 1900 (right picture). Wooden board is the most common roofing material 1870'. Year 1900 the roof covers are no longer of board but of felt and sheet metal. Northern-Ostrobothnian Museum.

At the end of the 19th century both felt and sheet metal became common roof covering materials in towns, displacing the less fire-safe wood materials, such as shingles. For instance, in the town of Hamina, the amount of board roofs decreased from 44% to 15%, and the amount of shingle roofs from 15% to 0.4% between 1890 and 1900. [8, pp. 268-269]

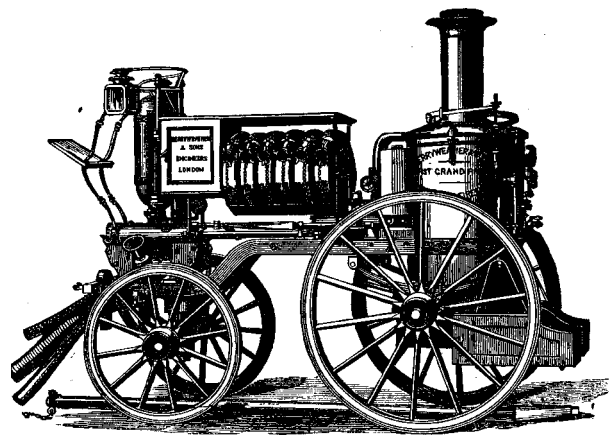
8. Development of fire fighting equipment and the fire fighting organisation

Another factor in the same period of time is the development of fire fighting equipment and the fire fighting organisation. Before actual fire brigades were established, fire fighting was based on the common duty of the town citizens to participate in so-called "common" or

“obligatory” fire brigades, which only operated at random. It was at the end of the 19th century, usually after the last devastating town fires, that the first volunteer fire brigades, the VFBs, were established in Finland. These organisations improved fire fighting by introducing three important factors: *the brigades were well trained, they had modern equipment and they fought fires with great persistence* [9, p.8]. This was something that the former obligatory fire brigades could not achieve. The founding of permanent fire brigades started in the beginning of the 20th century, and at the same time the activities of the volunteer fire brigades became of more secondary and supportive in nature.

The increasingly common use of a steam fire pump in fire fighting equipment in the late 19th century was a turning point that led to more effective fire fighting. In the 1940's the fire brigade of Vienna estimated based on 25 years of experience that water consumption of 5 litres per minute was needed for each burning square metre in a building. The average use of water had been 2,2 litres per minute [10, p. 161]. Consequently, to put out a fire in a 100 square metre house (e.g. a small wooden residential building) would require one main hose and a fire pump with a capacity of at least 500 litres/minute.

On the basis of experience in the 1950's, a capacity of 125 – 250 litres per minute was recommended in wooden residential buildings, whereas 125 litres per minute was sufficient in stone buildings. 250-500 litres per minute was recommended when putting out a fire in outbuildings. [11, pp. 228-230]



Picture left. Man powered fire pump from 1850's in museum of Pietarsaari. Pump capacity about 80 l/min. Photo R.S.

Picture right. Steam fire pump taken from a Swedish book for firemen 1879. Pump capacity about 600 l/min.

The approximately 80 litre per minute capacity of manual fire pumps used in the 1850's was increased to over a 600 litres per minute with the introduction of the steam fire pump. Instead of tearing off the burning part and covering the surrounding buildings with fire sails it was now possible to use the technique of actually putting out the fire in the burning building. The problem with the steam fire pump was, however, that it took a rather long time to heat up. It took some 15-20 minutes before it could be used. Steam fire pumps were used long after the turn of the 20th century, until they were gradually replaced by motorised fire pumps. I might mention that the capacity of a modern fire engine is from 2000 to 3000 litres per minute and the pump capacity as high as 6000 litres per minute.

FIRE PUMP AND YEAR OF PURCHASE	CAPACITY litres/minute, comments
Finlands first metal fire pump for Turku 1687	no hose
Finlands first fire pump with a hose for Turku 1728	purchase after town fire of 1728
Manual fire pumps of Turku Volunteer Fire-Brigade (VFB) 1827	100 l/min, after town fire of 1827
"Big fire pump" of Kaskinen 1838	approx. 160 l/min
Fire pumps of the Fire Help Society in Finnish towns 1840's	about 20-40 l/min
Fire pump of the Lappeenranta garnison 1850's	approx. 80 l/min
Fire pump of Pietarsaari from 1850's	approx. 80 l/min, preserved in museum
Portable fire pump of Tammissaari 1867	approx. 21 l/min
"Big fire pump" of Kaskinen 1869	approx. 210 l/min, probably the old one repaired
First fire pump of the Oulu VFB 1874	approx. 220 l/min
First big steam fire pump for Helsinki 1876	1385 l/min (2 pumps)
First steam fire pump of Tampere VFB I 1899	1500 l/min (2 pumps)
Sucking fire pump of Uusikaupunki 1890	450 l/min (Aug. Höning)
Manual barrel fire pump of Helsinki 1895	180 l/min (Vasenius), crew: 4-6 men
Big steam fire pump of Helsinki 1896	1500 l/min (Ludwigsberg), 4 wheels
Light steam fire pump of Helsinki 1900	500 l/min (Ludwigsberg), 2 wheels
Steam fire pump of Mänttä VFB 1904	700 l/min (Ludwigsberg), 25 years in active duty
Steam fire pump of Oulu VFB 1904	700 l/min? (Ludwigsberg)
Finland first motorised fire pump for Uusikaupunki 1907	6-800 l/min (New Centaury), still in shape 1980
Finlands second motorised fire pump for Helsinki 1910	6-800 l/min
Portable motorised fire pumps since 1920's	5-600 l/min (e.g. Köbe)
Motorised fire pumps on wheels since 1920's	over 800 l/min
Second motorised fire pump for Uusikaupunki 1929	1100 l/min (A.P.I.)
Finlands first fire engine (fire truck) for Helsinki 1916 (19?)	1500 l/min (Scania Vabis)
Fire engines generally in 1920's	200 - over 1000 l/min
Fire engines generally in 1930's	about 1500 l/min
Fire engines in 1940's and 1950's	1000-2000 l/min + portable motorised fire pump
Fire engines in 1960's and 1970's	2000-2500 l/min
Modern fire trucks with a water tank	2000 l/min, pump capacity 6000 l/min
Modern fire engines	3000 l/min, 6 branches, hoses 20-30 m.

Table. Evolution of the fire pump in Finland. Fire pump capacities and years of purchase. [6]

9. ON THE FIRE SAFETY OF WOODEN TOWNS

Old wooden milieus are a part of the most dense centers of towns. This means that they are usually regarded as *number one risk areas* according to fire law, where they are to be reached by the fire brigade within six minutes. As for the widths of streets and space between the buildings, the densest wooden milieus are the old towns of Rauma and Porvoo, both based on Medieval town structure. Both of these towns have three metre wide street-like passages and even narrower spaces between buildings in different plots, which are called fire alleys. Fire safety in the two towns is based on a modern fire organisation and fire fighting equipment as well as keeping the fire alleys open, having fire safety inspections more often and improving fire safety when renovating the buildings. The shed-like outbuildings at the back of the plots are often filled with all kind of stuff, making them most problematic from the standpoint of fire safety. During renovations non-combustible sheets (e.g. gypsum board) have been added behind the wooden boards in the facades, even in outbuildings. Some minor fires have occurred every now and then, but there has not been any real danger of the fire spreading across the street or even to neighbouring plots. The experience acquired from the renovations of the buildings and fire extinguishing during the last decades has essentially improved fire safety, and according to local fire officials, the risk of regional fires in the towns of Porvoo and Rauma is regarded as small. [12]



Town structure and a view of Old Rauma. Rauma is the only Finnish wooden town inscribed on the UNESCO World Heritage List in 1991. It is considered as the most complete and widely preserved living wooden historical centre in the Nordic countries. Photo R.S.

There are no more combustible materials on the roofs in old towns, except on some churches and buildings preserved as museums. Nowadays battery-operated fire alarms are obligatory in every apartment, regardless of its age or building material. It is reasonable to claim that the fear of the recurrence of the historical wooden town fires as a threat to preserved wooden town districts and as a barrier to the birth of new wooden milieus should be re-estimated.

10. Rescue routes for the fire brigade and their dimensions in wooden towns

Instructions concerning the dimension of rescue routes cover both traditional and modern wooden town-like milieus. There must always be enough room for the fire fighting and rescue work of the fire brigade. *The length of the hoses is not a restrictive factor*, as they can be used from a distance. In bigger fires and in houses of several floors, however, it may become necessary to use a smoke blower or other heavy equipment, which makes it necessary for the fire engines to be able to reach all the facades of the building as near as possible.

When planning the roads, the 12 metre turning radius of the fire engines must be taken into account. The size of the ladder truck defines the criteria of the roads. The buildings in old wooden towns usually have two floors at the most, so a ladder truck is not usually required. Both the rescue truck and the ladder truck have a reverse gear, which means that the *rescue routes do not have to go around the buildings*.

The dimensions of a normal ladder truck are: width 2,5 metres, height 3,8 metres and length 12,2 metres. This means the minimum route dimensions (free space) for fire engines are: width 3,5 metres, height 4,0 metres. A ladder truck weighs about 32 tons and a fire engine about 22 tons. This means the carrying capacity of the rescue routes must be carefully planned. A ladder truck, if needed, must be able to drive near the balcony facade of the 3-4 story residential buildings. The range of a ladder truck is about 24 metres with the upper end of the ladder being at the height of 15 metres. The rescue route surrounding a 3-4 story building may thus be at a distance of 20-25 metres from the building, as long as the ladder truck can operate freely without any trees, electric wires or the like blocking its way. *Small non-reachable balconies* can be treated with special arrangements e.g. with folding or fixed staircases in the balconies. [14, pp. 27-29]

When comparing the requirements of rescue routes with the width of the main streets of old towns, the sizes of the buildings and rather small blocks, and the sizes of the town parts

themselves, it is fair to say that requirements for reasonable rescue routes in old wooden town milieus can be met.

11. FIRE SAFETY AND NEW WOODEN TOWN MILIEUS

Today approximately a half dozen so-called *modern wooden towns* are being built in Finland, and more than twenty are being planned. In these towns the rich use of wood as well as the use of the tradition of building with wood is a part of their milieu goals. [13, pp. 5, 7] A part of town consisting almost entirely of wooden structures is being built in the town of Oulu, with residential houses of 2-3 stories and numerous outbuildings, and with a gross floor area of more than 20,000 m².

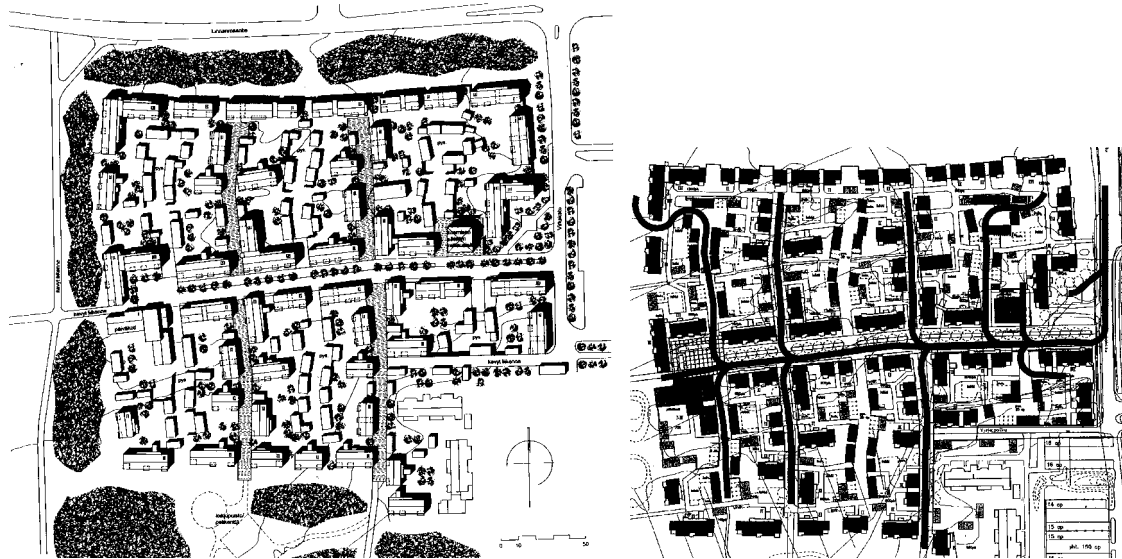


Illustration: Oulu Modern Wooden Town. The modern town part of Puu-Linnanmaa where the spatial qualities of traditional towns are used according to modern building code. On the left an illustration of the area, and on the right is a study of the rescue routes, compiled together with the local fire brigade. The width of the main street is 16 metres, and the width of the side streets (alleys) 8 metres. University of Oulu, Department of Architecture, Wood Studio.

The renewed fire regulations of the Finnish Building Code (RakMK E1) introduced on September 1, 1997 permit the construction of 3-4 story wooden residential and office buildings (class P-2) with wooden facades in town milieus. There are no defined limits in E1 of the gross floor area or the amount of persons in such buildings, which means the *maximum size of the buildings is not defined in the code.*

12. On the requirements of regional fire safety

Regional fire safety in the RakMK E1 is defined as follows:

The space between buildings must be such that the fire does not easily spread to the neighbouring buildings and there is only a small risk of regional fires. If the space between the buildings is less than 8 metres, the spread of the fire must be restricted by structural or other means. The structure of the roof must be such that it does not easily catch fire from a fire in the neighbouring building. [15, 9.1.2.]

It is reasonable for the sake of the regional fire safety to build a larger wooden town-like area using the so-called open construction method, meaning that there is a minimum space

of 8 metres between buildings. According to the construction and fire safety authorities in the town of Oulu, this measure is enough for the light traffic alleys between the quarters. This measure can, however, be even lower inside a quarter, in which case the possibilities for the fire brigade to act inside the quarter must be taken into account. Furthermore, there must not be windows or vent holes in the external walls, as these could well contribute to spreading the fire from one fire section into another. Single-story outbuildings, different kinds of roof and wall constructions, fences, pergolas and lattices can be placed less than 8 metres from the buildings as long as *the operations of the fire brigade are carefully taken into account*. It is regarded as functional to use a class K1 covering in buildings that are close together, as these coverings are non-flammable and also protect their sub-structure from fire. Such materials include brick and sheet metal. [14, pp. 27-29] The E1 regulation even permits the use of felt covering (K2), as long as the risk of the spreading of fire is small due to *the small size of the building and the so-called open construction method*. [15, 8.4.1.]

The rescue routes of the fire brigade were tested in connection with the suggested plan of the *modern wooden town of Oulu*. Compared with the planning of more traditional housing estates, the consideration of the demands made upon fire safety in wooden towns means some additional planning work. However, the study shows that sufficient fire safety can be achieved even in a milieu that is denser than average suburban areas, and the demands on fire safety in wooden towns are not a barrier to the continuation of constructing wooden town-like milieus.



Similarity throughout centuries.

On the left 18th century street view from the town of Tammissaari, founded 1546. On the right view from the Oulu modern wooden town, finished year 2001. Photos R.S.

13. SUMMARY

Safety is an essential part of the quality of a built environment. In wooden town milieus, fire safety is still an important factor. The rapid technical development of fire equipment, renewal of the fire organisation and a change in roofing materials seem to have had a major role in getting town fires under control. Improved structural fire safety has been effective in those wooden towns which have survived the radical town renewal process of 1960's and 1970's. As a conclusion it is fair to say that the fear of town fires as they were experienced in the 1800's and the modern regional building instructions based on those fears should be re-evaluated. This re-evaluation could increase both the value of survived old wooden towns and wooden house construction in general.

The use of wood in construction together with forest cultivation has great ecological benefits compared to other building materials. [16] A wooden milieu and the aesthetics of wood and human scale can be a basis for a pleasant environment.

Some historians and parties interested in our historical heritage feel the continuation of the heritage of historical wooden towns in the form of a modern wooden town *could support the preservation of old towns*. The wooden town will become alive again and grow instead of becoming a frozen defense zone in the middle of city pressure. The old town could be integrated into the surrounding town structure by building modern town houses on the edges with human scale and the esthetics of wood material as a common uniting factor.

Surveys have been made indicating that people are aware of these aspects and prefer living in wooden houses with human scale than in high-rise concrete buildings. However, there are still many difficulties to overcome. Experiences in research concerning wood construction in Finland show that construction firms are still unwilling to change their methods of building out of concrete to much more precise but faster wood construction. City officials are another major group that includes people who are reluctant to embrace the idea of continuing the tradition of wooden towns. The fact that many cities have quite recently seen the demolition of their wooden town structure is psychologically hard to overcome. In that sense, besides their environmental impact, the new modern wooden quarters and town-like areas are of great importance in creating a belief in and general acceptance of wooden town construction and in maintaining our cultural heritage of historic wooden towns in the future.



View from the Oulu Modern Wooden Town. Photo Tanja Rytönen.

14. Sources

This report is based on post-graduate studies of the writer, which deal with Finnish wooden town tradition, the effects of scale and the preconditions of the “modern wooden town”.

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