Rural Densification and the Linear City

a Thought Experiment

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Thesis booklet
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ABSTRACT

Densification of the urban structure is a hot topic in urban development, but densification is almost absent as a strategy in rural settlements. This project studies densification in rural settlements in a Nordic context by using the “dense and low-rise” design strategy. The study tries to give an answer to what kind of densification is suitable for a rural settlement and if such a development is a viable strategy for the settlement.

Linear settlements are common throughout the world. Settlements have developed naturally along rivers, canals or roads, often constrained by topography and other physical restrictions. Later side turnings may have been added from the main street.

The linear city is an urban planning concept for a stretched out urban development. One of the first ones to propose this was the Spanish engineer Arturo Soria y Mata with his “La Ciudad Lineal” (1882), where he proposed a 55-kilometer-long linear city around Madrid. Five kilometers of it was actually built. In the beginning of the 1900s other urban planners continued to develop the concept, such as Tony Garnier, Le Corbusier and Nikolai A. Milyutin. Today the concept is more used at a regional scale, where a series of smaller towns are developed along transport corridors between larger cities.

The idea is to use the linear city concept as a densification scheme on a site that already has linear characteristics or potential. Especially small rural settlements, that already are somewhat linear, can use such a scheme as a way of growing internally instead of spreading out concentrically.

The application of the concepts will be tested on the small town of Kimito in south-western Finland.

AIM AND PURPOSE

The aim of this master’s thesis is to investigate if the old concept of linear cities can be applied as a densification scheme in a rural settlement. Many places either have linear characteristics or they are planned in a linear way without specifically mentioning their linearity or using the potential linearity can give.

The investigation will look into the benefits and disadvantages of linear city developments and examine what prerequisites are needed when the concept is applied. The aim is also to explore in what situations the concept can be used and what kind of implementation of the concept is the most useful and what scenarios that will create.

Buildings in small rural settlements are usually low and therefore an appropriate strategy for densification in such settlements could follow the principles of “dense and low-rise”.

Despite the fact that most densification theories and designs are aimed at larger urban settlements and most of “dense and low-rise” projects are residential, the frameworks will be combined and reinterpreted to suit a small rural settlement.

The investigation will be done both through theoretical research as well as by implementing a design proposal.

RESEARCH QUESTIONS

1. Can a linear city strategy be a functioning densification scheme in rural conditions?

2. What kind of building typologies, street patterns, functions, uses, etc. can be useful in the chosen context when applying a linear city densification strategy?
THE CHALLENGE

Rural municipalities are facing a decline in population and in the Nordic countries municipalities are usually trying to fight this by offering spacious properties located away from local services to attract new inhabitants as a counterurbanization strategy (Harvold & Falleth 2005; Overbeek & Terluin 2006; Westlund 2002).

This results in a landscape in the town center that doesn’t have the good qualities of the countryside and neither the good qualities of the city.

At the same time the numbers of families in general are shrinking in society, which means that the municipalities are targeting a shrinking population group, while the number of elderly are increasing in rural municipalities (Finland 2015a).

Furthermore, housing preferences change: Living in a house with a huge garden is just one of many wishes depending on your life situation.

What to do?

THE SOLUTION

Rural municipalities need to attract more population groups by diversifying their urban/rural “assets”, i.e. using the good qualities they have and improve the ones that are problematic.

Densification is the key to improve the urban assets of rural towns. It means giving built-up areas – that now lack urban qualities – that good urban feeling that many small towns have.

In order to not destroy the countryside-feeling a “dense and low-rise” design strategy should be used to keep the small-scale environment.

In order to address the full length of the settlement, and not only the center, a linear design strategy can be implemented.

These three concepts
- urban (rural) densification
- dense and low-rise
- linear cities

will be tested on one site as a thought experiment.

Finns: I would like to live in... (Aho & Rahkonen 2014)
URBAN (RURAL) DENSIFICATION

Urban densification, also known as infill development, refers to building new homes, offices, shops and other buildings within the existing urban fabric, on e.g. vacant lots, on underutilized sites like parking lots, and modifying and enlarging existing buildings. It is worth mentioning that not all infills have created attractive environments, but there is a lot of understanding nowadays of which “tools” to use in meeting both the needs of existing inhabitants as well as future residents and workers (Wheeler 2002).

Densification can help create compact and vibrant communities where mixed land use is emphasized using well-connected street patterns and community resources like parks, kindergartens, shops, cafés, restaurants, schools and walkable public spaces. This can also improve safety in the community. Infill development helps in creating a “sense of place” and can add a wider selection of housing options, a more diverse mix of work places, businesses and municipal services. Although densification schemes are mostly aimed at reshaping older central cities, it can also be used in e.g. suburbs (Wheeler 2002).

Infill development needs to be adapted to local conditions of the community in question. Depending on the site it can be more appropriate to introduce infills in the form of single-family houses than multi-storey buildings or an appropriate mix of both and everything in between, not forgetting about offices, commercial space and open public space (Wheeler 2002).

Despite many benefits, infill development also comes with problems, faces opposition and encounters obstacles. Obstacles can for instance be related to regulations, like parking requirements that increase the costs too much, or landownership, where neighbouring landowners might have conflicting standpoints about an infill development. Residents are afraid of increased traffic, lost open space, and overcrowded local services. Residents also associate infill development with negative mental images they have. Residents can also have a “status quo bias”, i.e. they are okay with the situation as it is and don’t see that infill will make a change for the better. There might also be a view that current residents won’t gain anything; it’s the new inhabitants that can enjoy the benefits of the infill development. Some studies also suggest that infill, contrary to what its advocates say, can increase the cost of infrastructure, depending on location (McConnell & Wiley 2010).

The challenge is to combine infill development with inhabitant-oriented policies so that the perceived quality of the environment by the inhabitants isn’t compromised. The connection between dense or sparse residential areas and perceived qualities is far from simple. Infill development has been seen by inhabitants as both detrimental and beneficial for the quality of the living environment. Inhabitants are good assessors of their environment as they have both a functional knowledge as well as emotional bindings to the area. Planners and designers often stress the physical and aesthetic qualities of an environment, which can be different from what the inhabitants perceive. E.g. child friendliness is an example of a quality that is seemingly an important factor for residents (Kyttä et al. 2011).
DENSE AND LOW-RISE

Building dense and low-rise has a long tradition in the Nordic countries already in towns built centuries ago, but the concept was theorized starting from the 1970s in Denmark (Danish ‘tæt-lav’) and gained popularity as an urban strategy in the 1990s. The concept doesn’t have a very strict definition but often a reference to a higher floor space index, economy, and efficiency is used as well as solutions that better can adapt to residents’ wishes for housing solutions (Lahti 2002).

But what is density? Density can be physically measured and is commonly measured as inhabitants per hectare or as floor area ratio (FAR) or floor space ratio (FSR) which can be compared to the lot, the block or the whole area. FARs that have been suggested to describe a “dense and low-rise” development can be considered to be 0.25 for an area, 0.35 for a block or 0.45 for a lot. But density can also be a perceived quality that can be studied through psychology or sociology and the perceived quality is dependent on the situation and the cultural background of a person (Lahti 2002).

The definition of low-rise is not very clear. In general, buildings should be lower than the surrounding trees meaning two or three stories. Lowness could also mean a “closeness to the ground”, i.e. that entrances to apartments open directly to ground level and outdoors (Lahti 2002).

Building “dense and low-rise” has encountered practical problems. Quite often densely built individual buildings are difficult to adapt to fire safety regulations when they are built separately compared to large building complexes built at the same time where fire walls are thought of already from the start. Also achieving a harmonious result can be difficult when individual builders and land owners are all realizing their own solutions. To solve this certain regulations regarding e.g. floor levels, building height and building materials should be enforced. In a Nordic context storing snow has turned out to be a problem in “dense and low-rise” areas where streets are narrower than in modernistic neighbourhoods (Ilveskorpi et al. 2007).

In the end, the functionality of “dense and low-rise” is dependent on cultural prerequisites (in some cultures closeness and a direct view into apartments is more accepted than in others), climatical prerequisites (snow and rain, sunlight), and geographical prerequisites (topography, vegetation, water bodies, open fields) (Lahti 2002).

Säterinmetsä in Espoo, Finland, is planned according to the principles of dense and low-rise.
THEORY AND BACKGROUND OF LINEAR CITIES

The concept of a linear city is a much discussed theoretical idea, but it has rarely been applied. It is based on a continuous transport corridor, or a series of parallel corridors, along which all urban functions take place. When moving away from the line one reaches rural open space, and this fact presumably combines the best of both worlds for the inhabitants. The line can be extended endlessly and adapt to the terrain. There is no center and everyone has equal access (distance) to urban functions and services. (Public) transport is efficient along the corridor (Lynch 1981).

LINEAR SETTLEMENTS

One form of human settlement is the linear form. It is made up of a village along a road, the coastline or a waterway. The road functions as the spine along which all functions in the village occur: habitation, manufacture, storage and trade. The linear character is often a spontaneous one dictated by external factors that affect building conditions, such as the already mentioned road, a river or a valley. Linear urban areas have appeared long before the concept of linear cities was theorized (Furundzic & Furundzic 2012; Lynch 1981).

In the German Straßendorfs (street villages), and other similar settlements, farm houses are built along a single street, and the farmland is located in long rectangular blocks perpendicularly from the farm house and the village street (Hopcroft 1999).

“LA CIUDAD LINEAL”

The Spanish engineer Arturo Soria y Mata was the first person to theorize the concept of a linear city when he presented his “La Ciudad Lineal” in 1882. In 1892–1894 a project was launched to build a 55-km-long linear city in the form of a circle around Madrid, and a five-kilometer-stretch of it was actually built (Furundzic & Furundzic 2012; Lynch 1981).
The concept included one central avenue lined with ribbons of buildings. The avenue would take care of transportation of people and goods on both rail and road. The development would stretch through the countryside and would thereby encourage agricultural production along the linear city and raise living standards (Boileau 1959).

The linear city can be realized on three levels. On a global level, linear cities could connect “Brussels to Beijing”, on a state level the linear city could unite each village with each other until reaching the capital city. On the third level a linear city could circumvent an existing city to form an independent parallel satellite city (Le 2011).

On a more practical level, Arturo Soria y Mata set up some principle design guidelines. The central avenue was the backbone of the city, and would cater for all traffic, but especially rail traffic in the form of trains or trams. Its width was set to be between 40 and 100 meters. The edge of the linear city was defined by two streets that run parallel to the central avenue and outside of these streets the countryside begins. Perpendicular streets would run from the central avenue at right angle thus forming blocks. Mostly single family houses were planned on lots inside the blocks with a minimum lot size of 400 m². Only 1/5 of the lot was to be built and 4/5 to be planted. Streets were to be lined with trees and for the delight of strollers flowers, benches, fountains and kiosques should be placed along the streets. Squares could be placed along the streets to battle monotony (Le 2011).

The linear city shares many similarities with Ebenezer Howard’s “Garden City” concept, presented 10 years after the linear city, in emphasizing fresh air, sunshine, vegetation and blending the town with the countryside, and fighting city congestion. However the question of transportation was treated differently: Howard separated his new towns from the old town with empty transportation corridors, while Soria y Mata incorporated the transportation corridor into his town (Collins 1959).

La Ciudad Lineal as presented in 1882.

[source: Boileau 1959]
The only realized project, La Ciudad Lineal in Madrid, had lost momentum by the 1930s, but the idea was actively promoted by Arturo Soria y Mata and his associates during the first half of the 1900s and other planners picked up the concept in one form or another (Velez 1983).

THE SOVIET ADAPTATION

One of a few other places where linear cities actually have been built to some extent is the Soviet Union. The most extreme advocates propagated for an abolishment of the city altogether and replacing traditional cities by linear cities, but a more moderate suggestion was professor N.A. Milyutin’s idea of industrial linear cities of 100,000 to 200,000 inhabitants. Milyutin’s 1931 plan was to separate the functions of the city into parallel linear zones (see picture). This way factory workers could walk from their homes in the residential zone to their work in the factories. Also rural workers were supposed to live in the residential zone and walk to their farm work (Collins 1959).

Milyutin might have been aware of Arturo Soria y Mata’s concept but he was probably more influenced by the French architect Tony Garnier’s project “Cité industrielle” (1901–1904), where the functions of the city were located in different zones, although not parallel. The residential zone was placed along a linear central avenue, but otherwise the transportation philosophy of “cité industrielle” wasn’t linear, because it relied on a central station (Collins 1959).
OTHER LINEAR CITY ADAPTATIONS

Outside of Spain, the direct adoption of Arturo Soria y Mata’s vision was most enthusiastically received in Chile. Many projects were close to be built in several locations from the 1910s to the 1930s, but failed at the finish line for various political or economic reasons. In Chile the concept was used more as a settlement scheme for rural areas than for industrialization (Collins 1959).

In the USA architect Milo Hastings suggested an altered version of the English Garden City concept in 1909–1919. Houses would be placed along U-shaped roads or in some cases simply on either side of a highway, as opposite to the Garden City, which is a town surrounded by a farm belt. Another American linear utopia was writer Edgar Champless’s “Roadtown” published in 1910. He suggested a single line of houses along a transportation line in three levels (Collins 1959).

The American architect Frank Lloyd Wright presented a project called “Broadacre City” from 1932 onwards. It was an automobile-centered plan, where each family was given one acre to build their house on – a kind of linear suburbia (Collins 1959).

The Swiss-French architect Le Corbusier presented his project “La Ville Radieuse” in the 1930s – a linear plan centered on transportation. Later, in the 1940s, Le Corbusier and his companions presented “La cité linéaire industrielle”, a scheme close to Arturo Soria y Mata’s philosophy of linear cities stretching over continents (Collins 1959).


In the 1960s linear new towns were planned in several countries, spiced with traffic separation and brutalist architecture (Shadar 2011).

REGIONAL PLANNING

Since the original linear city proposal by Arturo Soria y Mata, the concept has included a regional, or even a global dimension. After the Second World War corridor development became a popular version of linear planning, and e.g. Stockholm developed suburbs along

rail corridors and Copenhagen developed the “5-Finger Plan” (Shadar 2011). In these schemes the planning is not linear at the local level, only on a regional level. In the USA similar plans were presented in 1961 to connect Baltimore with Washington D.C. with a rail corridor (Shadar 2011).

In the 1990s the European Union suggested “eurocorridors”, important transportation routes between key node cities, such as London or Brussels. The aim was to physically integrate Europe and spur economic activities along the corridors (Priemus & Zonneveld 2003).

CRITICISM

First of all, the linear city concept has been criticized for not being a city because it lacks centrality. Centers are psychologically important (Doxiadis 1967; Lynch 1981). The model has been criticized for being too simple and the geometric application too stiff (Boileau 1959). The linear city can only grow at each end and one activity cannot expand quicker than its neighbor. It is very difficult to hinder expansion at the edges along the line because they are access-wise attractive locations (Lynch 1981).

The linear city has been derogatively called a rationalized ribbon development and criticized for proposing a too radical decentralization (Collins 1959). The very important transport network of linear cities in fact makes them more nodal than linear, since trains only stop at stations and cars can only leave at designated places. On foot and by other slowly moving vehicles the linearity can, though, be realized. Basically the linearity doesn’t work at the very small scale (Lynch 1981).

Although the intention in the linear city is that everyone has equal distance to elements, distances are in the end longer than in compact cities. Furthermore, derived from its form, the choice of connections or direction of movement is very limited in a linear city (Lynch 1981).

In Madrid, in the only implementation of La Ciudad Lineal, the placement of shops was not thought of, and inhabitants relied on existing villages nearby La Ciudad Lineal to do shopping. In fact, the development was called just another suburb and was criticized for not being self-sufficient. Also the general expansion of Madrid has made the original concept of La Ciudad Lineal obsolete as it didn’t provide a solution to ease the expansion of the city (Boileau 1959).

Lynch (1981) comes to the conclusion that the linear shape does appear naturally at local scale and that the concept might have some use at particular scales and in particular situations and for particular uses.

Linear settlements offer similarity, and perhaps monotony, in the direction of the central path, but in a section at right angle across the central path you find all local land use forms and environments in a short distance.
THE THEORETICAL CHARACTER OF RURAL LINEAR CITIES

ALONG

homes  homes  offices  homes/ shops  pocket  park  homes/ shops  public  building  senior  home  homes  homes/ shops  school  homes

ACROSS

forest  recreation  forestry  berry/mushroom picking

urban  living  working  shopping  amenities  private/public meeting

transport  public meeting

urban  living  working  shopping  amenities  private/public meeting

agriculture  recreation  primary production  landscape/views

LOW-RISE DENSIFICATION POSSIBILITIES

Split property

New building: apartments + commercial spaces

Extension

Accessory apartment

Extension of accessory building

Empty lot: Any of the above
CRITERIA TO CONSIDER IN DENSE AND LOW-RISE

(Lahti 2002: 105–121)

LOW-RISE
- How many floors?
- Closeness to the ground
- Below the tree line

DENSE
- Physical density
- Psychological density
- Numbers: floor area ratio, inhabitants/hectare

BUILDING TYPE
- Diversity of types
- Look for alternatives
- People's preferences

HUMANE
- Consider the needs of different inhabitant groups
- A place where people are "at home"
- Human scale

NUMBER OF FLOORS
- Usually max 3 floors
- Visibility across yards
- How to enter the apartment?

SIZE OF BUILDING
- Not necessarily influencing the experience of small-scale
- How is the scale experienced?
- Numbers: m², m³

YARD
- An important element of dense and low-rise
- Public (front) and private (back)
- Visibility, sunshine, etc.

STREET
- The street's relation to the buildings
- Number and density of streets
- Parking issues

APARTMENT SIZE
- Supply and demand
- For different groups and needs
- Flexible apartments

MANAGEMENT
- Ownership apartments and rentals
- All types in all forms
- Independent builders and industrial production

TOWN
- Not a central area in a city
- Not an entire city
- New areas, extensions and densification

GENIUS LOCI
- Cultural acceptance of density
- Climate factors
- Geography: terrain, trees, water areas
REFERENCE PROJECTS
on densification, dense and low-rise and linearity

This project investigates how villa areas can be densified.

Sven-Olof Nyberg planned a careful densification of the village of Håbo-Tibble, by adding new buildings that are well adapted to the existing feeling of the village.
“Från tätort till stad”, Bålsta, 2012

The municipality of Håbo investigated how the center of Bålsta can be densified along a central road and the adjacent blocks, turning a dull traffic environment into a townscape.

Boulevardization, Helsinki comprehensive plan, 2014–2016

The city of Helsinki is planning to turn the motorways that enter the city center into city boulevards. The city has made several studies of how such linear developments can function from various aspects.

“Parc de la Villette”, competition entry, OMA, 1982

This project shows how linearity can be perceived in different ways depending on direction.
METHOD

The method chosen to conduct the study is called research-by-design. It is concerned with producing new knowledge through the act of designing (Hauberg 2014). According to the EAAE Charter on Architectural Research, research-by-design is defined in the following way:

“In architecture, design is the essential feature. Any kind of inquiry in which design is the substantial constituent of the research process is referred to as research by design. In research by design, the architectural design process forms the pathway through which new insights, knowledge, practices or products come into being. It generates critical inquiry through design work. Therefore research results are obtained by, and consistent with experience in practice.” (EAAE 2012).

Compared to scholarly research, research-by-design has an almost opposite starting point. It is about examining how new knowledge can appear and be generalized by the design process, compared to scholarly research that is constantly looking for generalizable patterns. The design plays both a methodological role as well as it is the outcome itself. Design is forward-looking, seeking new solutions and even trying to change things (Hauberg 2014). Design can be regarded as a practical science where the research question is often posed in the form ‘does it work?’, compared to empirical science that asks ‘is it true?’ (Klaasen 2007).

Klaasen (2007: 476) describes the process of research-by-design the following way: “Start with a number of basic elements from the object under study and manipulate them in such a way that the resulting theoretical designs are logically plausible, internally-consistent and possessing certain qualities with regard to accommodating (a range of) societal processes: constructions which, in the light of our available formal and empirical knowledge, are likely to function stably when implemented.”

The design process is about testing, selecting and rejecting solutions based on a program and acquired knowledge in a specific context. The process is reflective, involving assessment, comparison and evaluation in an iterative process where problem and solutions is constantly compared. The tools used include objects, sketches, diagrams, notations and texts (Hauberg 2014).

It is important to note that research-by-design isn’t hypothesis-led. It begins with a topic or problem, e.g. in the form of a research question, that culminates in a solution, which has been drawn from methodological reasoning. New knowledge arises from the design (Hauberg 2014).

The methodology to conduct the study will follow four steps:

1. Theoretical analysis and case studies
2. Site selection and site analysis
3. Design proposal
4. Evaluation

See the timetable page for more details about the steps.
1. In the first stage the theoretical framework presented earlier will be examined in more detail, especially looking at examples where the theoretical framework previously has been applied.

2. The site will be analyzed to get a basic understanding of its layout and functionality. The analysis will include looking at the development history of the site, analyzing its urban morphology, identifying both the internal networks tying the settlement together as well as the external connections tying it to the outside world, and looking at the functionality of the site (services, events, movement patterns, etc.).

3. Based on the theoretical framework and the site analysis a design proposal will be made based on the guidelines in the theoretical framework and the site analysis. The design will be made according to the principles of research-by-design: solutions will be tested, selected and rejected iteratively based on the site specific context and the theoretical framework.

4. Finally the result will be evaluated. Is it possible to apply a linear city concept on the site and what kind of solutions are working? What would the possible consequences be and how is it received? This could possibly include a public exhibition or interviewing municipal officials and local politicians.
KIMITO

The site is the small town of Kimito [tjimitÅ] in the middle of Kimitoön Island in south-western Finland, with 1,400 inhabitants. It is one of two administrative centers for the municipality consisting of the island. The town is actually a conglomeration of three villages, which gives it its elongated form. Apart from some old farm houses and the medieval church, most buildings are built after 1930, and especially after 1970 in what has become the commercial center. The length of the settlement is about 2.8 km. The town has grown with a “one lot at a time planning”.

Kimito on a map from 1879. Kimito is formed by the villages of Vreta, Engelsby and Kyrkoby.
SITE ANALYSIS

Outdoors museum area

Supermarket

Town hall

Health care centre

School

Libraries & cultural centre

Medieval church & graveyard

Vocational school (agriculture)

Hotel

Shops

Police station

Bus station

Wrethalla society house

Sports

Outdoor museum area

Buildings

- Housing
- Commercial or public
- Industrial
- Other
- Cultural heritage building
Above left: The general building height of Kimito is one to two floors. This has been taken into consideration when applying the low-rise design strategy.

Above right: Most part of the project area is located on private land. Property borders have been considered in the design process. Large, completely new areas, have mostly been placed on municipal land.

Below left: In the design, fast car traffic are intended on the national roads that pass a bit outside the core of the town, while the local main roads are intended for slower internal traffic (cars, bikes, pedestrians, etc.)
COMMON BUILDING TYPOLOGIES
in Kimito and their relation to the street and the lot

- **traditional farm house**
- **traditional village house**
- **1930s commercial**
- **1980s commercial**
- **1970s apartment block**
- **1990s/2000s apartment block**
- **1980s/1990s row house**
- **post-war villa**

**STATISTICS**
(Finland 2015a, Finland 2015b)

**Population development 1990–2015**

- **Kimito town**
  - 1990: 1180
  - 1995: 1200
  - 2000: 1220
  - 2005: 1240
  - 2010: 1260
  - 2015: 1280

- **Kimitoön municipality**
  - 1990: 6500
  - 1995: 6700
  - 2000: 6900
  - 2005: 7100
  - 2010: 7300
  - 2015: 7500

- **Finland**
  - 1990: 1180
  - 1995: 1200
  - 2000: 1220
  - 2005: 1240
  - 2010: 1260
  - 2015: 1280

**Age groups**

- **Kimito town**
  - under 18: 20%
  - 18-24: 7%
  - 25-65: 45%
  - 65-75: 13%
  - over 75: 15%

- **Kimitoön municipality**
  - under 18: 16%
  - 18-24: 5%
  - 25-65: 47%
  - 65-75: 16%
  - over 75: 14%

- **Finland**
  - under 18: 20%
  - 18-24: 8%
  - 25-65: 52%
  - 65-75: 11%
  - over 75: 9%

**How do you live?**

- **Kimito town**
  - Small houses: 77%
  - Blocks of flats: 23%

- **Kimitoön municipality**
  - Small houses: 73%
  - Blocks of flats: 27%

- **Finland**
  - Small houses: 51%
  - Blocks of flats: 49%

**Owning or renting?**

- **Kimito town**
  - Owner-occupied dwellings: 57%
  - Rented dwellings: 41%

- **Kimitoön municipality**
  - Owner-occupied dwellings: 52%
  - Rented dwellings: 46%

- **Finland**
  - Owner-occupied dwellings: 58%
  - Rented dwellings: 40%
THE MUNICIPALITY’S MASTER PLAN

The municipality’s current land use plan, adopted in 2014, is mostly based on creating new villa properties at the edges of the town and expanding the commercial center to the south.

INHABITANT INTERVIEWS

people stopped at the street in Kimito one Saturday in March

I like that there are a lot of trees here and it’s nice to bike around.  
– school-aged boy

It’s a good place to live in if you lived all your life in the countryside. There are more things happening here in the summer.  
– young woman

It’s a calm and nice place. If you can’t get something here you can just drive into town [=Turku].  
– middle-aged man

I don’t really miss anything here. We have everything we realistically can wish for.  
– old woman

I recently moved here. I like the cultural events and the closeness to the sea. Local services still remain.  
– middle-aged woman

There are many amenities here. What I miss is a gallery space where artists can display their work.  
– old woman

Recently built projects in Kimito.
AN ALTERNATIVE MASTER PLAN

THE COMMERCIAL CORE
...contains commercial spaces in the ground floor of the buildings along the main shopping route. Above floors can contain apartments or offices. Back sides and the inner part of blocks can contain apartments and gardens. Shopfronts should occupy the most part of front façades. Buildings are at least two storeys tall.

THE COMMERCIAL FRINGE
...can contain commercial spaces in the ground floor of buildings (e.g., cafes, service companies), but not necessarily in every building. The most part of construction is housing and small office buildings if needed.

THE VILLAGE CORE
...is a housing area that also can contain commercial spaces at some locations. It is dense, but houses have gardens and are low-rise.

THE BIG-BOX RETAIL
...area contains retailing that requires a lot of floor area and large car parks.

THE MUSEUM AREA
...consists of the existing Sagalund Outdoor Museum. It is kept intact.

THE INDUSTRIES
...are placed at the existing industrial area, which has space for many more activities.

THE OPEN LANDSCAPE
...should preferably be kept open as a valuable landscape asset. Open agricultural fields can partly function as a substitute for open water areas in the landscape and provides views over the area. The open landscape is also an important biotope for certain species.

THE FORESTS
...are valuable biotopes for many species and offers recreational services to the inhabitants.

THE COMMERCIAL CORE
...is formed along the main street of the town. The most part of densification is done around this street. The main street is given a cohesive identity by planting trees along the whole stretch of it, in order to make it recognizable.

GREEN LINEARITY
...is formed by the long-stretched open landscape, its forest-covered edges and the little creek that flows along it. The green linearity forms an important recreational, as well as ecological, corridor that connects important nodes in the town.

HOUSING (AND SERVICES) AREAS
...in the rest of the area consist mostly of already built areas. New buildings can be placed at suitable locations. Services such as schools and healthcare are placed here, if they are not in the core areas.

URBAN LINEARITY
...is formed along the main street of the town. The most part of densification is done around this street. The main street is given a cohesive identity by planting trees along the whole stretch of it, in order to make it recognizable.
SEQUENCE 1: DENSIFICATION OF VILLAGE
New buildings are added that have a similar size and character as the existing buildings in the area. New buildings are brought a bit closer to the street and accessory apartment buildings are used to densify existing lots.

FAR* 0,09 → 0,12

*floor area ratio

SEQUENCE 2: SMALL TOWN
The small town works as an extension of the core of the town. As not being in the very center of the town, the small town consists mostly of residential buildings. The new building type, the neo-traditional wooden town house, creates a dense and central character. In the particular case of Kimito, the area can be expanded to the east if the current activities there are replaced.

FAR 0,06 → 0,20
GREEN LINEARITY MEETS URBAN LINEARITY
At this intersection outdoor recreation, biodiversity and the urban meet. The urban character is created by housing, while the social character of the area is created by outdoor and indoor social spaces in the form of parks (e.g. playgrounds and outdoor sports) and public buildings (e.g. indoor sports or education).

SEQUENCE 3: DENSIFICATION OF CENTER
The center of the town will be densified by a mix of commercial and residential functions. Building types that are introduced are street-facing row houses and mixed commercial+apartment buildings. As the commercial core doesn’t lie on the linear street, this street has only a semi-commercial character. Inner alleys between the bigger streets are residential only with small houses.

FAR 0,15 → 0,23

SEQUENCE 4: DENSIFICATION OF VILLAGE
New buildings are added that have a similar size and character as the existing buildings in the area. New buildings are brought a bit closer to the street and accessory apartment building are used to densify existing lots.

FAR 0,04 → 0,09
NEW BUILDING TYPES
that enhance the linear character of the street.

- street-facing row house
- town houses
- accessory apartment
- neo-traditional wooden town houses
- commercial spaces + apartments

FUNCTIONAL EMPHASIS
based on area characteristics and potential

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<tr>
<th></th>
<th>Sequence 1: Densification of village</th>
<th>Sequence 2: Small town</th>
<th>Urban linearity meets Green linearity</th>
<th>Sequence 3: Densification of center</th>
<th>Sequence 4: Densification of village</th>
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<td>Housing</td>
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EXISTING STRUCTURES
In order to increase its acceptance, the densification has been done without suggesting demolishing existing buildings, with a few exceptions regarding sheds and storage buildings.

Furthermore, where it is possible, existing property borders have been respected when new buildings are placed or properties have been split into smaller properties. This way landowners can realize their construction plans regardless of their neighbors’ timetable and less rearrangement is needed.
At certain places it might be useful to move the street just slightly in order to tighten the streetscape.

This is an expensive solution, and does not necessarily directly pay off, but can create a better streetscape.

In the particular case shown on the left there are buildings on the south side that have entrances to the street, while the buildings at the north are facing away from the street.

Therefore it is more meaningful to move the street closer to the existing buildings in the south and add new street-facing buildings in the north where the old street used to be, than adding a new row of buildings to the south.

Problems that arise are related to property borders: Landowners in the south lose part of their property to the street. In order to compensate this they can trade in the former street ground in the north, which then can be sold for new construction.

Segments of the street have been moved in Sequence 2 and 3.

**STREET LAYOUT**

options for the main street.

Sidewalks + bike lanes + car parking + car lanes. Bike lanes between parking and sidewalk. Mixed car and bike lanes are not recommended when car traffic exceeds 2,000 vehicles per day.

Sidewalk moved to park where there are no adjacent buildings. Bike lanes next to car lanes. No car parking.
**SEQUENCE 1**

Densification of village

**ENHANCING THE PUBLIC SPACE**

The village of Vreta already has kind of a village center. Not that many new buildings have been added here, instead new buildings are placed behind the existing ones to expand the village. The village center could benefit from getting a more square-like character as a meeting place of the village.
SEQUENCE 2

Small town / Green meets urban

GREEN LINEARITY MEETS URBAN LINEARITY

The open field functions as a meeting place between urban and rural characters: the valley and the small creek meander through the landscape, and it is framed at this particular place by buildings around the edges. The field will keep its open character, but will be more like an urban park with small sports fields and playgrounds.
A SMALL TOWN CENTER

The current very wide streetscape will be narrowed down by moving the street 20 meters to the right (south) and adding a new row of buildings to the left (north). Additional commercial buildings are built on the parking lot on the right side.
SEQUENCE 4

Densification of village

A NEW ENTRANCE TO TOWN

Currently there are very few buildings before entering Kimito when passing the church. The last stretch before the church will have 5 new villas built next to the street to the left and villas higher up on the hill on the right.
CONCLUSIONS

Linear densification does not work in the very strict definition of the theory due to constraints caused by earlier development. However, linear densification is a good strategy to densify an already linear settlement. Linear densification can make the entire settlement more complete and cohesive, compared to densifying only the inner core.

There is a limit to linear development when it becomes inconvenient and unpractical. Where the limit lies depends on local factors, such as distance from the inner core and accessibility to services, as well as the existing urban structure.
CONCLUSIONS AND EVALUATION

EVALUATION

WHAT ARE THE BENEFITS?

FOR THE MUNICIPALITY

**Linear densification** uses mostly existing infrastructure. Less money is needed to invest in infrastructure per new inhabitant.

**Densification** can make the municipality afford to build new public areas, such as parks.

FOR THE INHABITANTS

**Linear densification** “saves” the landscape as less unbuilt land is used for construction.

**Dense and low-rise** creates a more social urban structure. Elderly can live closer to services and children have a shorter way to school.

**Low-rise linear densification** can create a feeling of a small town without massive construction.

**Low-rise densification** provides new types of housing. Makes a generation shift possible.

FOR THE LANDOWNERS

**Densification** means landowners can sell parts of their property or expand their buildings. E.g. accessory apartments can be rented.

**Low-rise densification** can make it possible for elderly to live closer to relatives, even on the same lot.

LOCAL COMMENTS

The finished project was presented to a group of local politicians and municipal officials.

Comments were mostly positive, such as

- **As a whole, the project seems like a positive thing. Conservative attitudes might become a problem.**
- **Interesting ideas. Seems better than the current development in town.**
- **As mentioned, densifying saves investment costs for the municipality.**

Also many detailed solutions attracted attention:

- **Moving the street seems like an interesting concept. We haven’t thought of that. Shouldn’t be too expensive.**
- **A stormwater retention pond is very much needed. The suggested place in the illustration seems like a good one.**
- **There have actually already been talks about planting trees around the street in the village of Vreta.**
- **It feels like you can’t have too many football fields in this town.** (comment to an illustration)
REFERENCE LIST


Hauberg, J. (2014). Research by Design—situating practice-based research as part of a tradition of knowledge production, exemplified through the works of Le Corbusier. Lusofona Journal Of Architecture And Education, 0(11), 057 / 076.


RURAL DENSIFICATION AND THE LINEAR CITY
– A THOUGHT EXPERIMENT

Densification of the urban structure is a hot topic in urban development, but densification is almost absent as a strategy in rural settlements. This project studies densification in a rural settlement in a Nordic context by using the “dense and low-rise” design strategy and the concept of linear cities. Is linearity the key to rural densification? The concepts are tested on the small town of Kimito in south-western Finland.

Master’s thesis by Dennis Söderholm
Studio SUPD, supervised by
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School of Architecture and the Built Environment
Sustainable Urban Planning and Design
(2-year master’s programme)