



NEXT STOP: ÖNERED

Karin Backlund | Lina Jonsdotter | Hannah Larqvist | Sofia Park



The project presented in this booklet is based on an extensive analysis of Vänersborg municipality, carried out by us and our fellow students in the studio “*Planning and Design for Sustainable Development in a Local Context*” at Chalmers Architecture during the autumn of 2014.

This is the final report where we, a group of four, deep-dive into the station community of Öxnered, situated around four kilometres from the town centre of Vänersborg.

/Karin, Lina, Hannah & Sofia



This is a compilation of material from a project work within the course *Planning and Design for Sustainable Development in a Local Context*, 22,5 credits, part of the Master Programme Design for Sustainable Development, Department of Architecture, Chalmers University of Technology Oct - Jan 2014-2015

Authors:

Karin Backlund - Architect
Lina Jonsdotter - Architect
Hannah Larqvist - Architect
Sofia Park - Interior architect

Examiners and supervisors:

Lena Falkheden lenaf@chalmers.se
Björn Malbert malbert@chalmers.se
Assistant teacher: Anna Kaczarowka
Course assistant: Lisa Kihlström
Tutor: Lena Falkheden

MEETING PEOPLE IN ÖXNERED 2025

“I moved to Öxnered in the seventies when my husband got a job in Vänersborg. Oh my, 50 years have passed already! Lately a lot have happened here - new houses and new faces, but it is still quiet enough. I was really happy when they decided to build apartments. Now I don't have to take care of a whole house or worry about the stairs anymore. Sometimes I meet the family who bought my house in the park. I usually go there every morning

after breakfast to look after my plants. It is good exercise for my little doggy and me. Now when I live so close to the station, it is much easier to catch the train to Vänersborg where I have coffee with my friend Gunnel. Sometimes she comes here too, the new café in the old hotel serves fantastic cinnamon buns.”

- *Sivan, 75, retired*



“When I graduated from HDK I had a hard time to find affordable studio space in proximity to Gothenburg. Someone, now I don't remember who, tipped me off and here I am in Öxnered. I actually love the travelling away from the city to a less busy place where it is easier to focus on my work. On the train I prepare for or reflect upon the day.”

- *Maximilian, 27, graphic designer*



“To wake up in the mornings and watch the sun through the morning mist...spring evenings with birdsong in the sunset..the whispering wind in the trees, long walks in the forest. I just love to live close to nature! And to work! Having my office in the old hotel means that I have enough time to take care of my garden plot in the afternoon.”

- *Lena, 58, translator*



“I never thought that I’d catch an interest in growing things, but here I am with the largest squash in Öxnered! When I started studying to become a nurse at Högskolan Väst, I wanted to live nearby. It was really hard to find an apartment in Trollhättan so Öxnered is a really great option, only five minutes away with train. “

- *Emma, 22, student*



“A calm area is a good environment to raise kids. The travelling time to work is important for me and the train means that we save a lot on gas and housing. I like the non-traditional “villa-clusters”; environmentally friendly, no need to move the lawn and the nature right around the corner for bird-watching. I don’t regret that I moved back here.”

- *Pål, 40, biology teacher*



“The lady who lives next to us is really nice, she usually gives me cookies. I like to play around the shining blob where we throw our trash. You can hide in there too! Mum never finds me. The water is also fun. Yesterday I found a spider that I’ve never seen before. My dad says that we’re going to build a tree house soon.”

- *Hugo*, 7

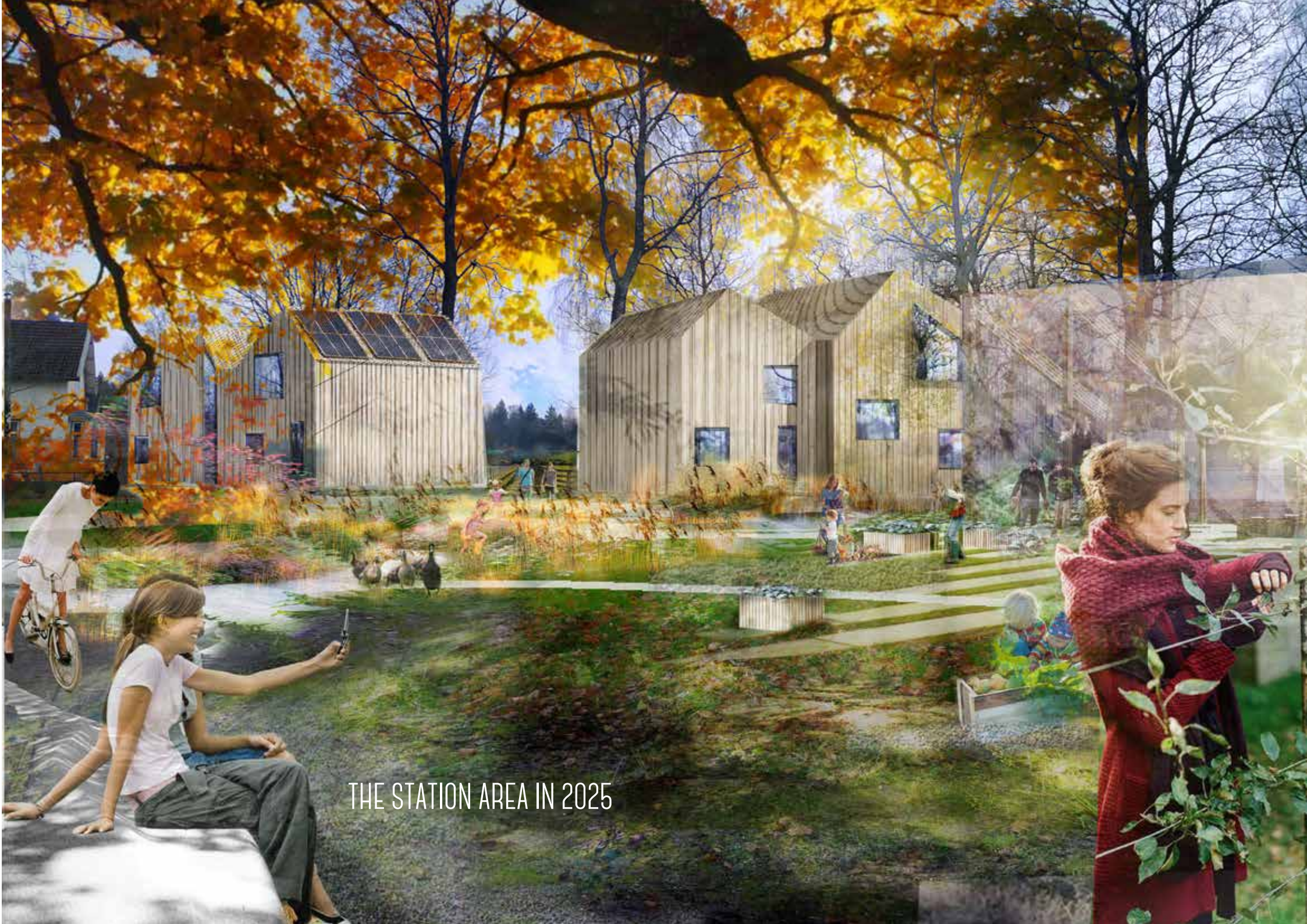


“I came to Sweden quite recently. We moved from Iraq two years ago. My parents are used to have a garden but we could never afford to buy a house in Sweden. Now we are renting and using the common garden and greenhouse. My mum really loves Öxnered. I go to school in Vänersborg. There is more stuff to do there or in Göteborg but here is fine. I get to work a few hours in the café

every weekend so I can afford to go into town with my friends sometimes. I like Sweden in summer. It is very close to the lake from here. I got a bike last year so now it’s easy to go swimming when it’s warm outside. A group of people arrange movie nights in the station building once a month and sometimes they actually show good films.”

- *Hajar*, 16





THE STATION AREA IN 2025

SUMMARY

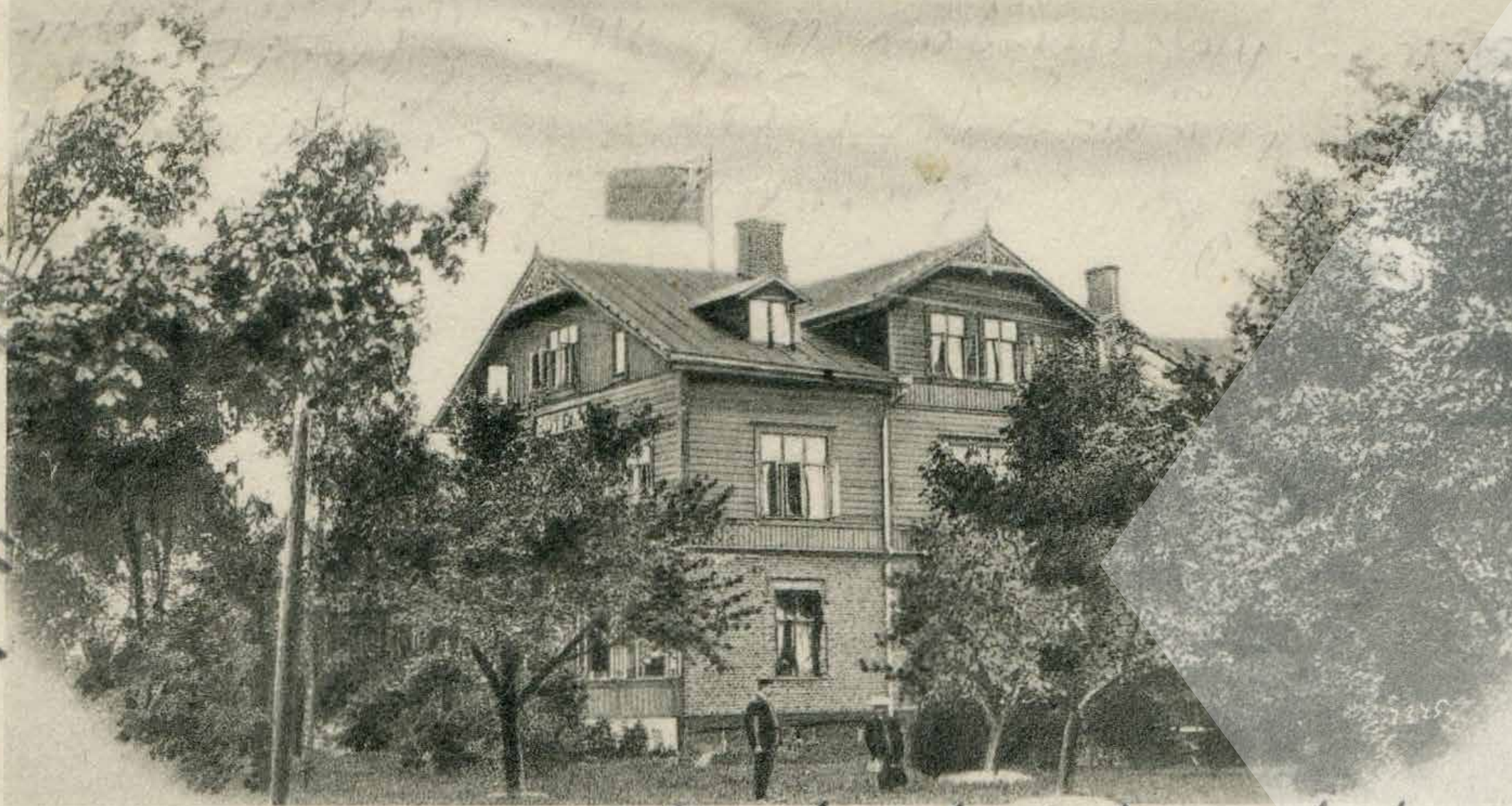
Recently in Öxnered, a local initiative has managed to save the old station building and the station hotel from demolition. This opens up the question of what should happen in these buildings now, and how their cultural and social values can best be preserved and enhanced. The engagement from the local community in this issue has been extensive and there is a great possibility to strengthen this engagement further and build on existing initiatives.

The location with great public transport connections provides possibilities for sustainable rural lifestyles and the local engagement is a basis for working with habits and attitudes. Focusing on Öxnered is also relevant in the light of the unbalance between rural and urban areas in architectural practice.

With the station area and its buildings as a point of departure we will visualize how the station could be developed as a node in a vibrant rural society. The proposition is based on the existing qualities of Öxnered where the countryside and nature is right outside your doorstep. Here, the railway is the artery and the station can become the heart – a catalyst for development and social interaction.

We believe in the station area's potential to facilitate a comfortable, fun and pedagogical way to live a sustainable life outside the city through strengthened functions and activities.

Stor och vacker byggnad.



Jernvägshotellet, Trädgården, Öxn. Käraste Ersa! Inmärkt ta
för onsdagsbrevet. Jag blev så glad. Ur nu p
Öxnered i affären, samt får att möta Karin, s
spåll till Ramneby. Pärnt Carlsson har
dig att få ta hos henne 14 dagar, är do in

Postcard from the station hotel. [1]

K. & E. VIKNER

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Photo of the interior of the hotel dining room. [2]

JERNVÄGSHOTELLET, MATSALEN, ÖXNERED. K. & A. Vikner.

*Uppringning Naturlgras
växer och Konserver
Lacten*



INTRODUCTION

ÖXNERED

THE RAILWAY SOCIETY

LOCAL DEVELOPMENT OBJECTIVES & STRATEGIES



ÖXNERED

Öxnered is a small community along the railway around four kilometres from the center of Vänersborg, near a small lake and surrounded by small scale farm land and forest.

Around 700 people live in Öxnered, which consists mainly of two housing areas built in the 50's and 70's and some older housing in the farmland and along the railway, a school, a local candy shop, pizzeria and some other small scale businesses.



To create a vision for a local area the ideas and knowledge of the inhabitants are necessary. This project is partly based on interviews and conversations with local people, both spontaneous and planned.

Preceding this course was an extensive work by two master thesis students at Chalmers Architecture, Freja and Maria, who explored possibilities of co-creating communities on the countryside. Since their material is recent and thorough this project is partly based on their interviews and findings.



Photo[3]: Katarina Frändberg

”On the countryside with the vibrant city well within reach”

“Rural tranquillity in the middle of Trestad”

*“Countryside without having to take the car everywhere -
the train!”*

”Community in adequate size with good communications”

”A station community without community”

*“A noisy environment, almost on the countryside with trains
in all directions”*

- From the Co-create community project

*“We choose to move to Öxnered because it has very
good connections but still has all the qualities of a rural
area, gravel roads, nature “*

- Woman 50+, from the earlier work in the course



Photo [4]: Katarina Frändberg



THE RAILWAY SOCIETY

First railway line between *Uddevalla - Vänersborg - Herrljunga* (UVHJ) opens for the public

The line between Göteborg and Falun (BJ) is completed and connects to the *Norway - Vänern* line. The cross is created and Öxnered becomes an important node.

Around this time the station building and the hotel are built.

The first trains with German soldiers from Norway on leave are passing through Öxnered. Traffic runs until 1943. UVHJ railway nationalised.

A detention camp for communists is established and run at the former farm Karlsrogården.

••• 1867 •••••••• 1879 •••••••• 1880 •••••••• 1940 •••••••• 1941-42 ••••••••



One of the oldest photos of the station [5]



Häradskartan ca 1890 [6]

The Bergslagen railway is nationalised.

The line between *Uddevalla - Vänersborg - Herrljunga* is electrified.

The railway crossing is removed to be able to introduce high speed trains between Göteborg and Öxnered.

The station buildings are for sale in november.

..... 1948

..... 1949

..... 2004-05

..... 2014



OUR INTERVENTION!



Kiosk and café where the new station building is now [7]



New station building [8]Photo: Jernhusen

TO SUMMARIZE THE COURSE

In this course we have together provided a set of goals and strategies for Vänersborg municipality as a whole. Here our group have made a selection relevant to the specific context of Öxnared, which have been the point of departure for this project.

LOCAL DEVELOPMENT OBJECTIVES

PRESERVATION AND ENHANCEMENT OF UNIQUE RESOURCES:
Protect the unique cultural heritage and closeness to nature - provide equal and open access for everyone.

AN ACTOR FOR SUSTAINABILITY

A SELF-SUFFICIENT MUNICIPALITY

GOOD ENVIRONMENT FOR LOCAL BUSINESSES

WELL CONNECTED SUSTAINABLE TRANSPORTS

DIVERSE HOUSING:

There is a mix of accommodation that is affordable and environmentally friendly.

A MINIMAL ECOLOGICAL FOOTPRINT AND ZERO WASTE

STRATEGIES

FIND NEW FUNCTIONS FOR UNUSED HERITAGE BUILDINGS

Maintains the cultural values while creating new attractions and meeting places.

BUILD MORE VARIED RENTAL HOUSING

Enables a diversity of people and creates a good social mix.

CREATE MORE OPTIONS IN RURAL AREAS

To provide an opportunity for everyone to live in rural areas and to prevent segregation.

CREATE STRUCTURES FOR INCREASED SHARING

Encourage sharing of physical things are one way of helping with affordability, social interactions and exchanges.

By creating car pool programs for private owners there will be a reduced usage of cars and a reduction of the carbon footprint.

ENABLE AN CREATIVE AND EXPERIMENTAL ARENA

Change is built on innovation, listening and good attitudes which triggers new solutions and changes mindsets.

A cultural center, as an creative arena for experiments, flexible and multitude events can encourage activity and personal engagement.

CREATE COHESIVE NEIGHBOURHOOD

Local food production provides activities and healthy foods to the neighbourhood while creating a stronger community feeling.

Local food stores in each neighbourhood creates new local jobs, supports the local food production and minimize car dependency.

VISUALIZE AND INTEGRATE WATER MANAGEMENT

Showing water management systems is a way of creating awareness and understanding of the water cycle and can create new functions rather than just protection. Examples can be open dams, drainages, floodable playgrounds and parks, which also creates recreational and biological values.

MULTIDIMENSIONAL VALUE

- *“There is more to life than just money!”*

The importance of measuring values, not only in classical economical terms but also ecological costs and community benefits. A time perspective is of interest where a life cycle costing is included. Cultural or emotional values are also important to take into account.

PLACE-MAKING

- *“We need spaces we can connect with.”*

New or existing meeting places that highlight or change the perception of a place can be considered as place-making. It invites you and intrigues you through unexpected and/or temporary activities as well as more permanent changes such as new installations or buildings.

ENCOURAGE SMALL BUSINESSES

Develop possibilities for new entrepreneurs through e.g. temporary uses, co-owning or rentables.



ANALYSIS

DESCRIBING ÖXNERED

INTERPRETING THE CULTURAL HERITAGE

VALUING THE CULTURAL HERITAGE

LIFESTYLES

DENSIFICATION SCENARIOS



2.1

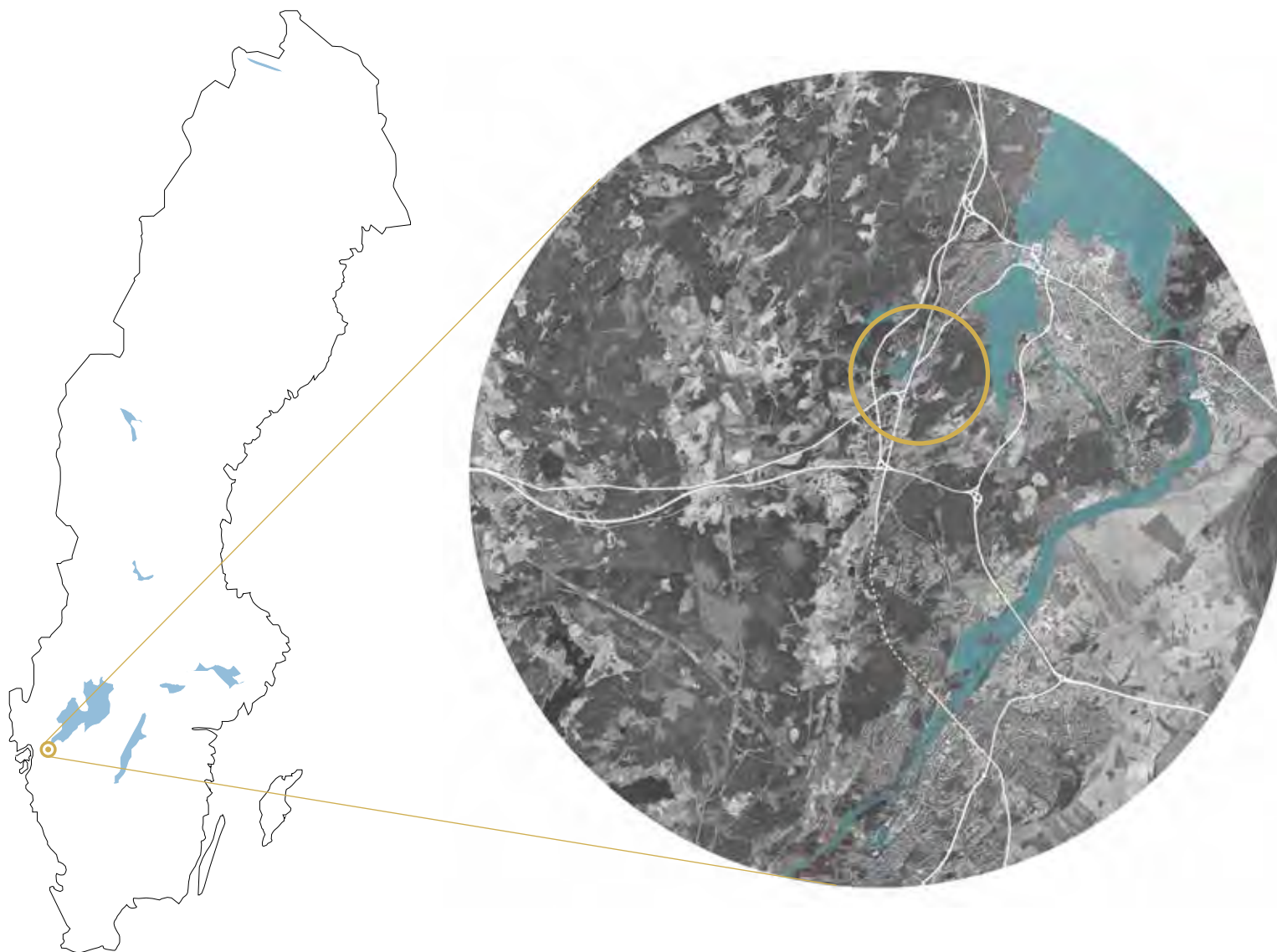
DESCRIBING ÖXNERED

HOW WE ANALYSED

Working with a site rich in cultural history we have structured our analysis according to the DIVE format. This means that we start by *describing* different aspects of the area and the site, continue by *interpreting* what significant meanings and historical layers can be read from the current situation, and *valuing* these findings and discussing their importance.

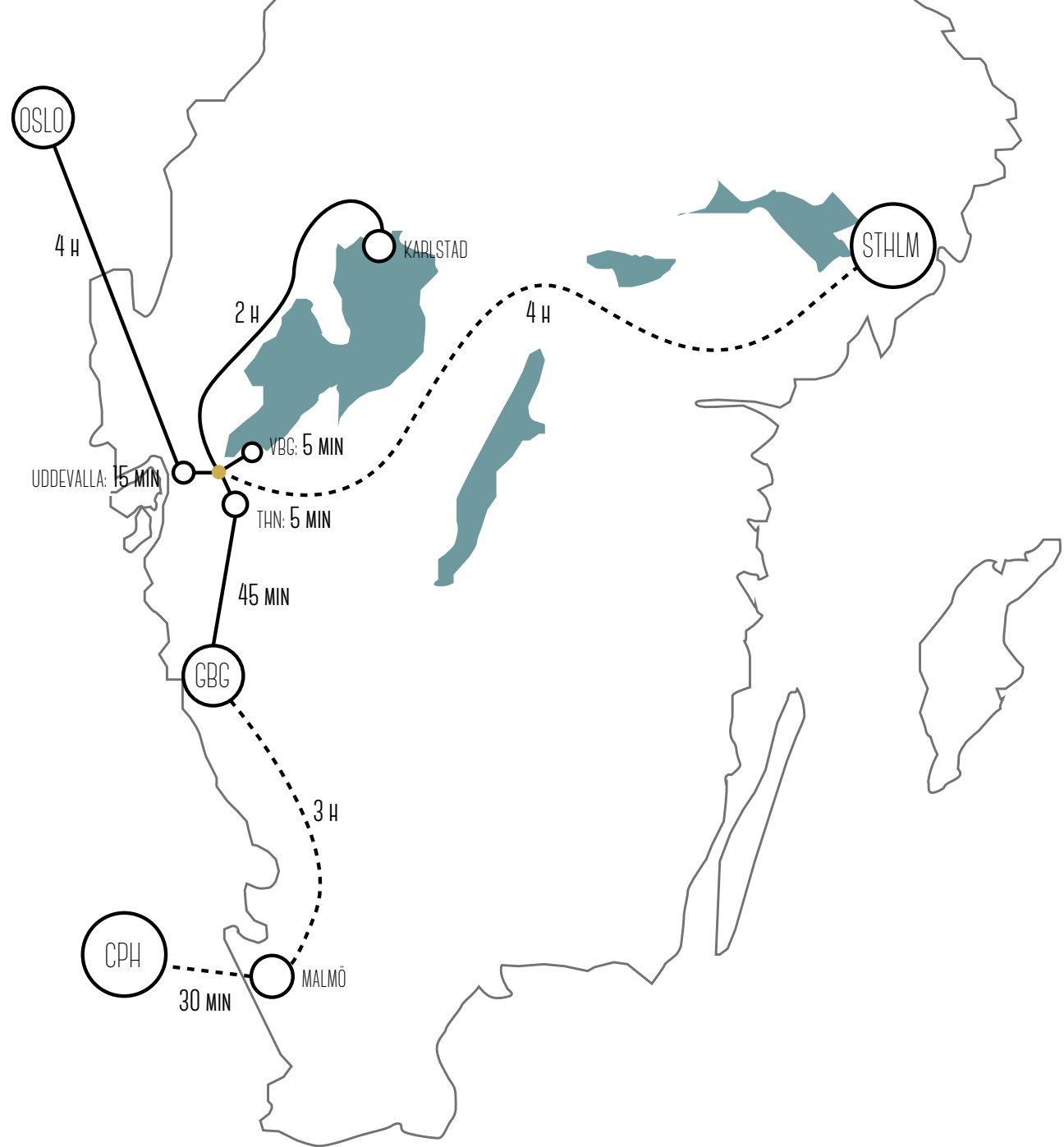
The last step, *enabling*, we discuss in the end as we believe that our proposal is an answer to how to manage and develop the valuable culture-historical assets in Öxnered.

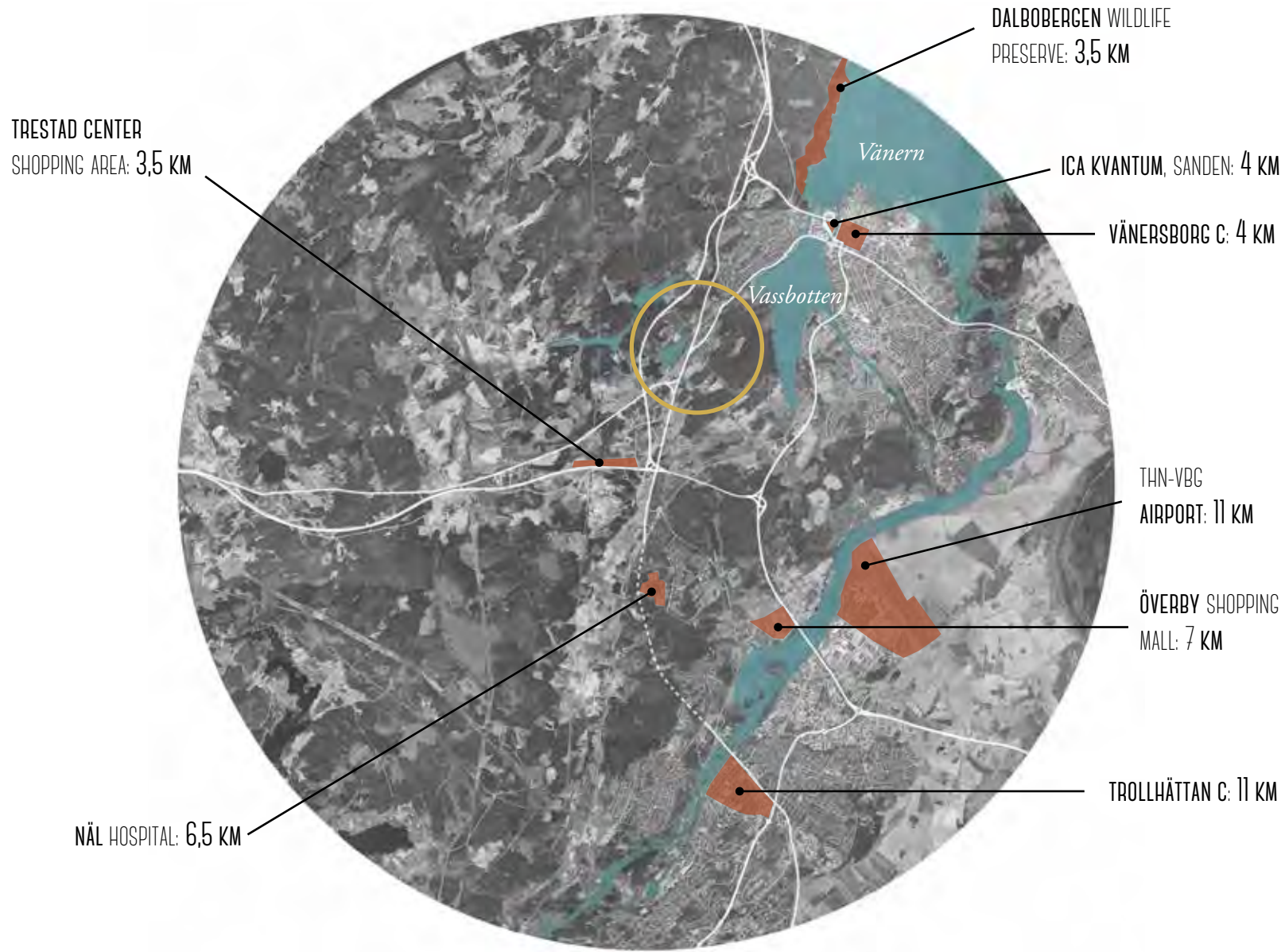
CONTEXT



CONNECTIONS:

Approximated
travelling time by
train from Öxnered
station



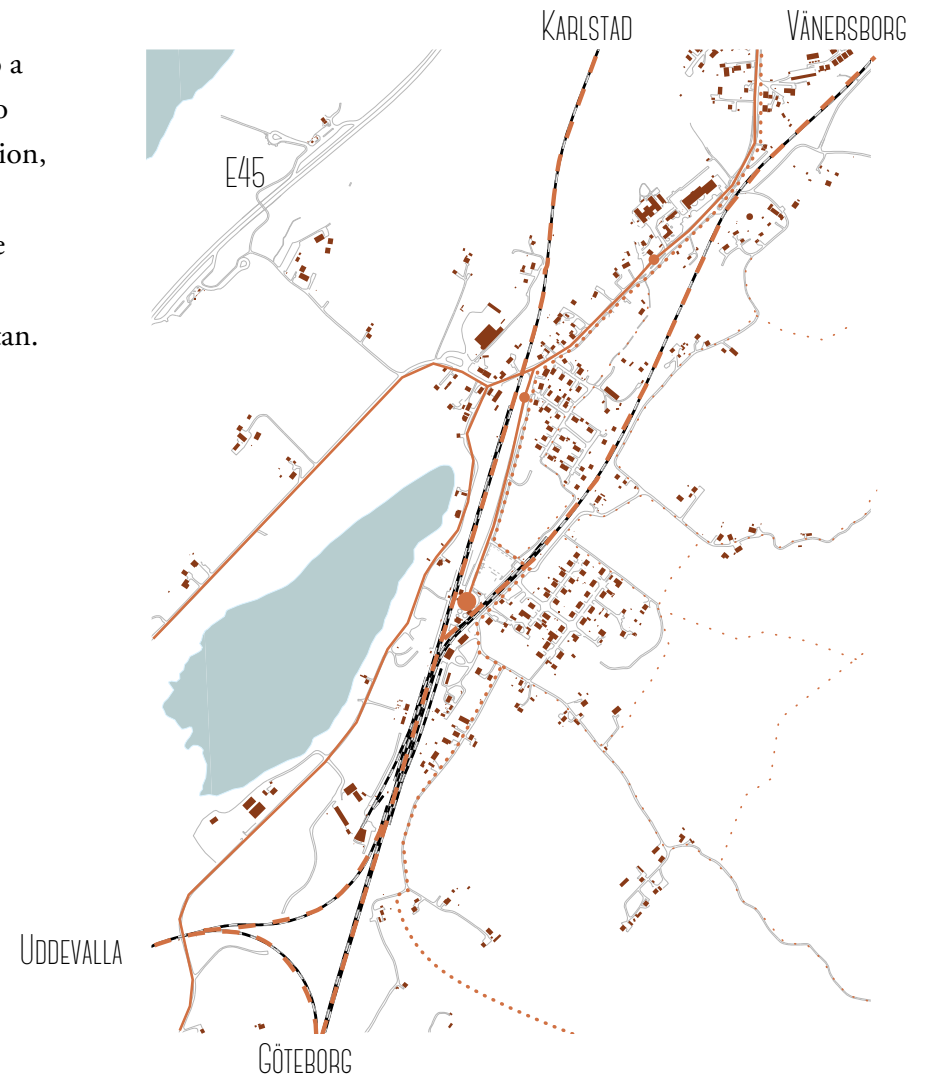


SERVICES &
APPROX.
DISTANCES

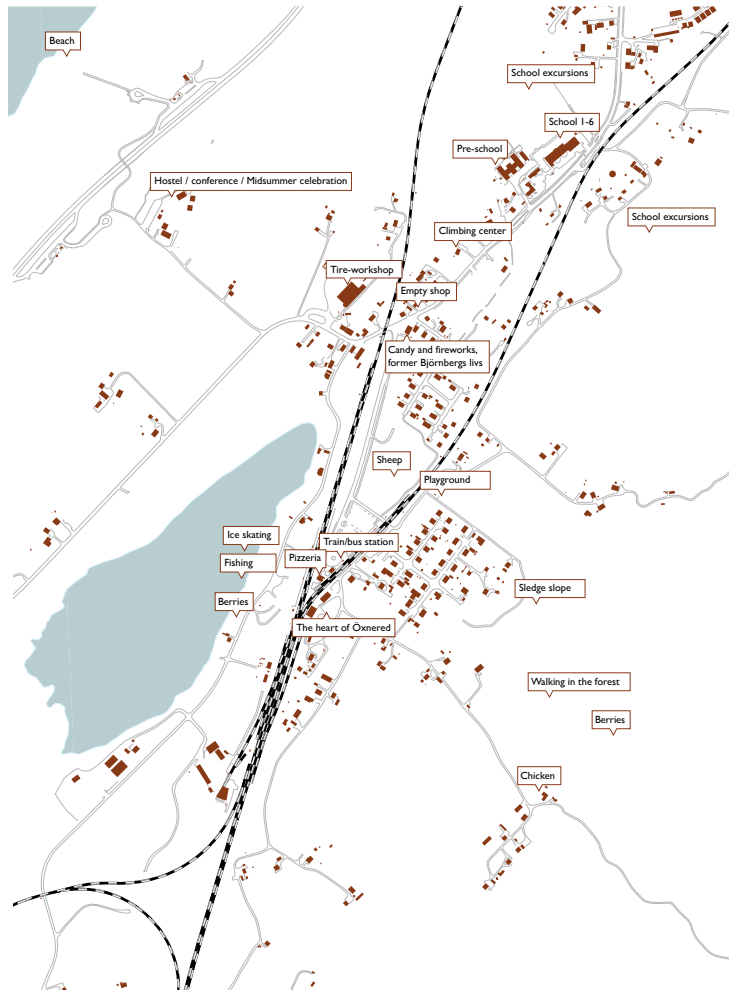
INFRASTRUCTURE

The infrastructure is a great asset but also a barrier. Currently the only access point to south-eastern Öxnered is a level intersection, meaning cars, bikes and pedestrians are stopped whenever the train passes. There are good bike connections to southern Vänersborg and further towards Trollhättan.

- station/stops
- - - railroads
- main car roads
- bike paths
- foot paths

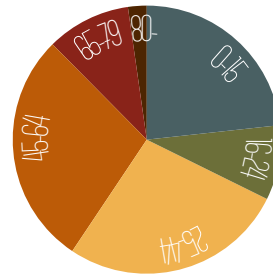


MENTAL MAP & STATISTICS

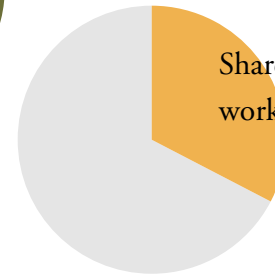


Number of inhabitants (2007): 709
 Number of cars/person over 19 years old: 0.9
 Average income/family/year: 649 000 SEK

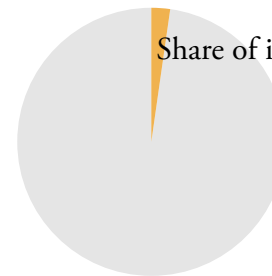
Age distribution in Öxnered



Share of inhabitants between 19-65 working in Öxnered



Share of inhabitants born outside Sweden



*Data from Lars Rudström, Vänersborg municipality,
 original source: SCB. E-mail 2014-10-09*



- (1) Housing from the 1950s. Built on open farmland in a grid structure. Mainly one story in brick with basements.



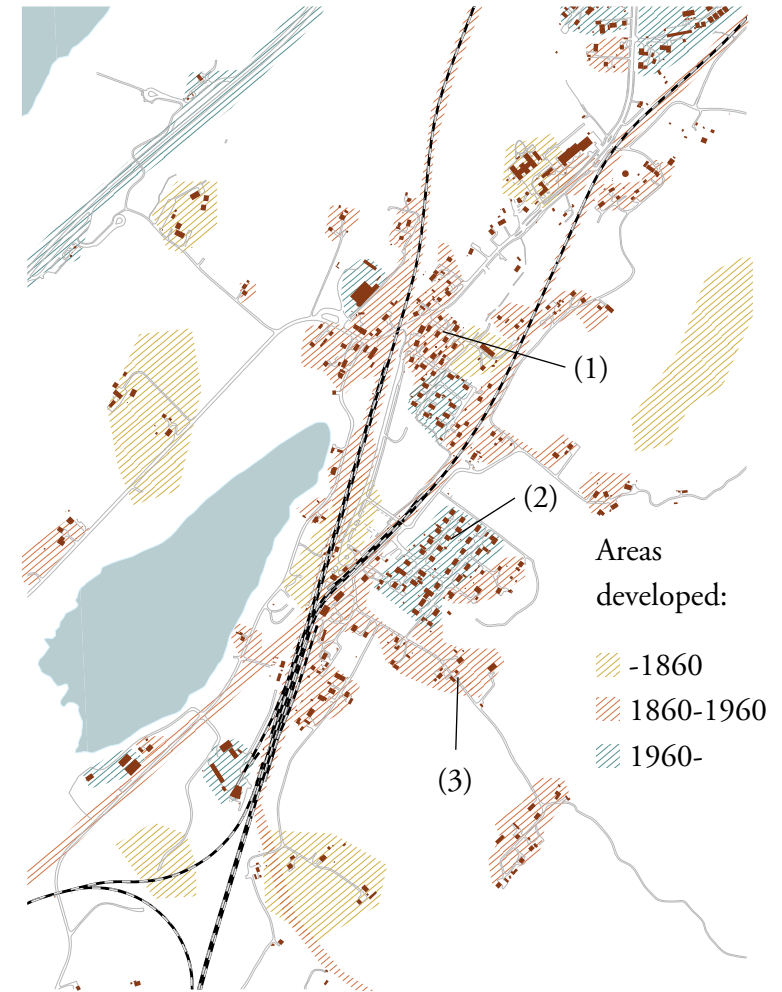
- (2) Housing from the 1970s. Also built on open farmland in a grid structure.



- (3) Housing from the late 19th century to the mid 20th century, mainly in wood. Built along gravel roads and forest edges.

The existing housing in Öxnered (except Skaven in the north-west) are connected to the municipal water and sewage system although the pipes are not sufficient enough to support new development and large investments would have to be made¹. The heating systems are local, mainly furnaces fuelled by oil or biomass, or electric heaters.

¹ According to Magnus Wängblad, town architect Vänersborg. Tutoring 2014-11-25





The nature around Öxnered and Skaven consists mainly of coniferous forest, but you also find smaller deciduous forests and centuries-old pine trees. Mountain ridges run in a north-easterly/south-westerly direction and have rocks covered in lichen and heather. The area is popular for hiking with several walking paths that is widely used by the local residents. Berry and mushroom picking are common activities when in season.

The area around Öxneredssjön has reeds immediately on the shoreline and then moist forest of deciduous trees and shrubs. This vegetation forms an important filter for drainwater from the surrounding fields.






Annual precipitation is 900 mm and 120 24h periods with 1 mm of rain or more (SMHI 2014)

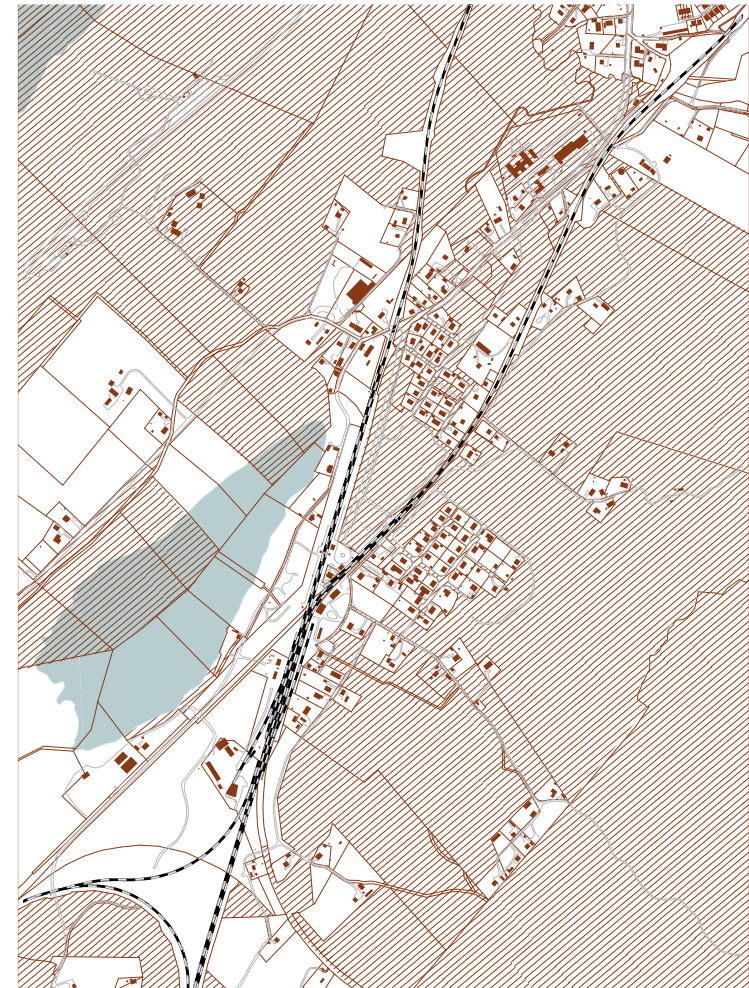
- farmland
- forest

NATURE & TOPOGRAPHY

Walking path in the edge of the forest [9]. Photo: Katarina Frändberg

The municipality owns most of the land in Öxnered and are planning on developing the area further. The current program for detail plans places the major part of new development on the east side of the first ridge. Where the ambition is to build a whole new town district and connect it to the south side of Vänersborg, around lake Vassbotten (Byggnadsförvaltningen 2012, p.34).

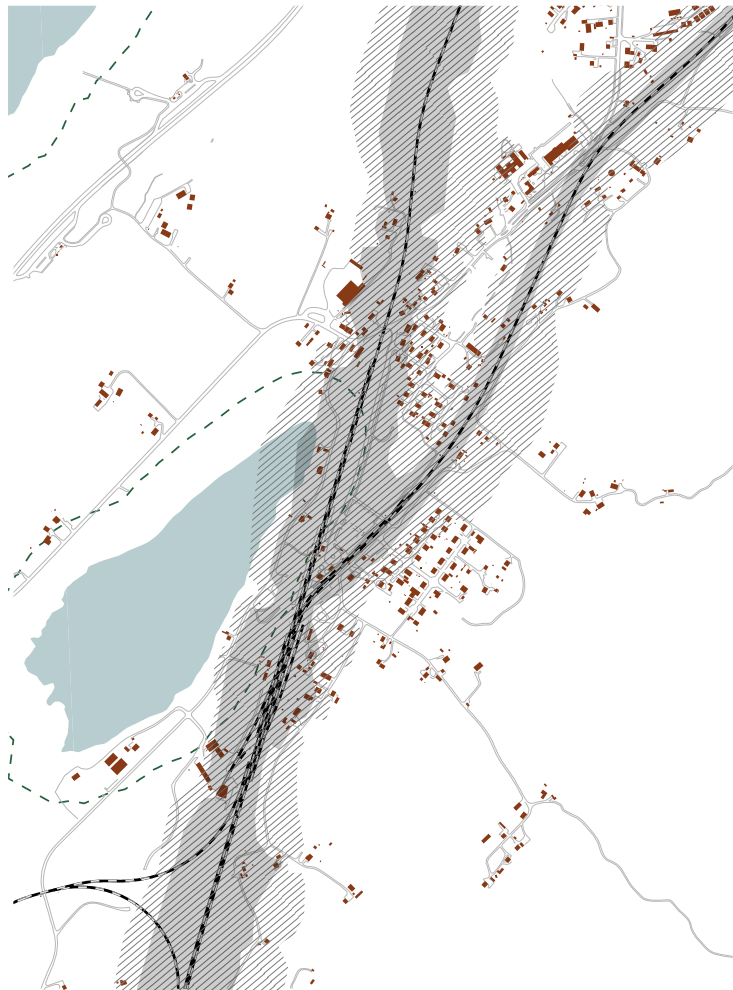
-  land owned by the municipality
-  new development
-  preserved nature
-  car connections
-  bike connections



OWNERSHIP



*Illustration of the municipal plans
(Byggnadsförvaltningen, 2012, p.34)*



- ┌┐ 100 m shore protection
- > 55 dBA
equivalence level 2020
- ▨ > 70 dBA
maximum level 2020

The railway brings with it risks and limitations. Due to safety reasons new development is not permitted closer than 30 m from the tracks (Tiricke et.al. 2009 p.15). Traffic noise also limits new development. In the marked zones protective measures have to be taken (Byggnadsförvaltningen 2012, p.15)

THE STATION AREA

- (1) Platforms will be extended and the intersection moved further north
- (2) Commuter parking has been doubled in size, parking is free and the lot is full everyday
- (3) Ice skating in winter
- (4) Pizzeria in the new station building
- (5) Summer parties are held in the park
- (6) Now empty station hotel
- (7) There is currently an architecture office on the upper floor of the old station building

- Pedestrian/bike movements
- - - Train movements
- Car movements

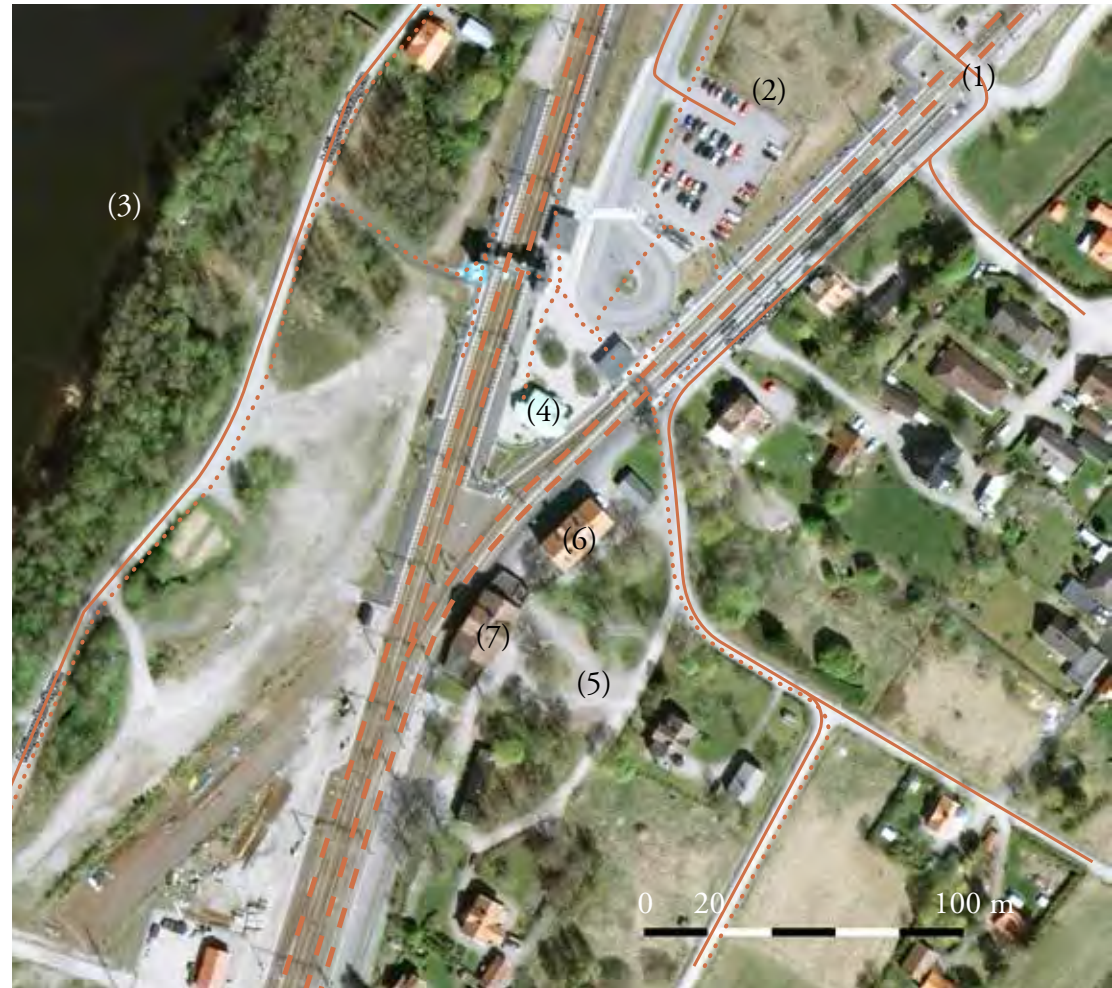


Photo from Google Maps[10]

THE STATION BUILDINGS

The station and the hotel were built when the railway junction was formed in 1879. They have undergone changes but are relatively well preserved together with the common park. The area is marked as of cultural historical value by the county museum of Älvsborg (Vänersborgs kommun 2013).

The hotel, with a ground floor in red brick and two upper floors in wood, has served as an apartment building for many years until recently when the national traffic authorities owning the buildings terminated the contracts to apply for demolition permits. The ground floor housed the post office for many years.

The station in red brick was designed by Axel Kumlien, a Swedish architect at the time



Vest facade of the hotel from 1992 [11]

employed by the State railway architecture office. Öxnereds station was one of four stations (the other were Trollhättan, Åmål and Mellerud) built according to the drawings of station type 1, the largest of four type stations he designed for Bergslags railway (Linde Bjur 2010 p. 70). The station has been extended and the ground floor redesigned.

Both the buildings are heated by a small scale district heating system fuelled by a oil furnace in the hotel basement.

There was an ambition from the state railway company to make the station areas role models for landscaping. Also the private railway companies adapted the idea of spreading new ideas for gardening, for household use and

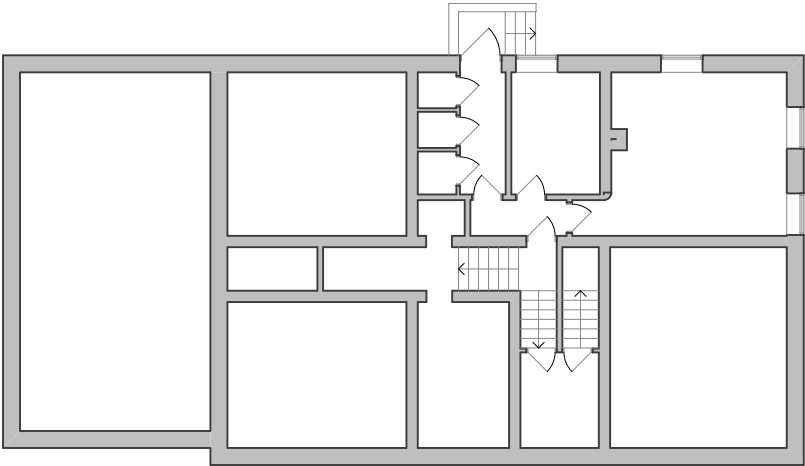
as recreation for the families attached to the railway (ibid. p. 43).

The houses are now for sale. Bids should have been submitted by the 8th of december. There are some restrictions as to what the uses can be allowed and there are some changes that have to be done according to the risk assessment commissioned by the traffic authorities in 2013: The buildings cannot be used for housing of any kind. Only the hotel can be used for open public activities and no windows or doors facing the tracks can be opened or used. All tenants need to be well informed of the potential risks and ventilation have to be mechanical (Vänersborgs kommun, 2013).

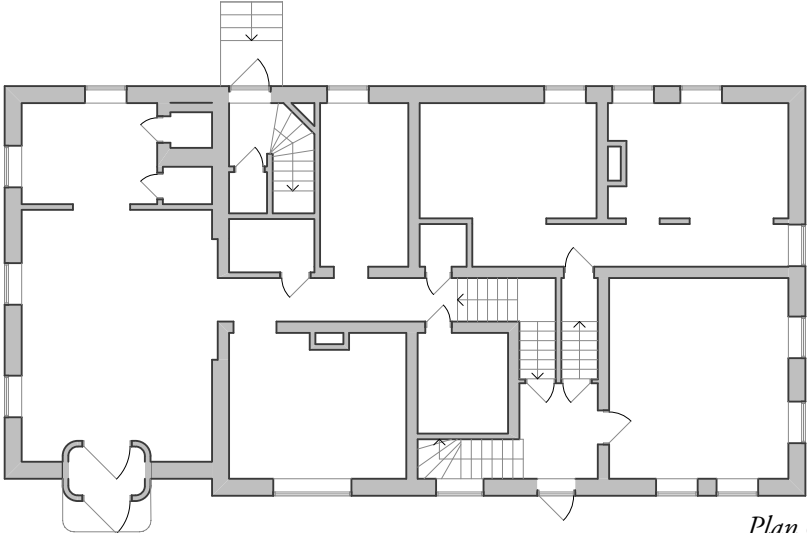


Vest facade of the station from 1918 [12]

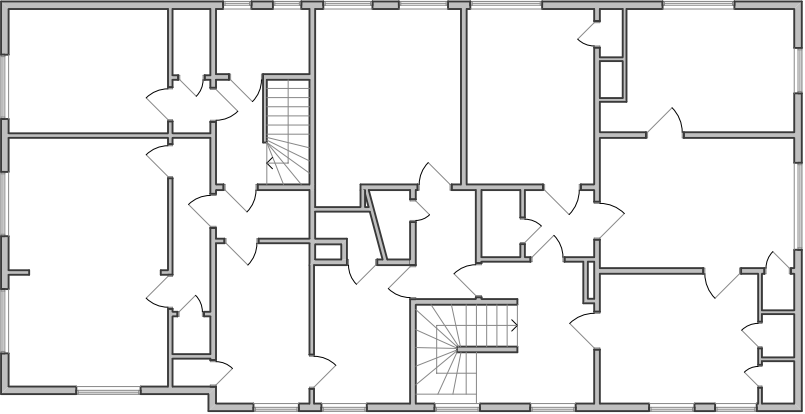
HOTEL - CURRENT FLOOR PLANS



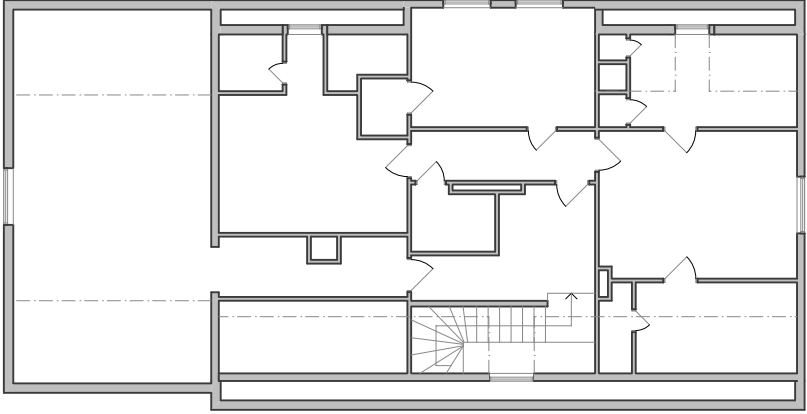
Basement plan 1:200



Plan 0

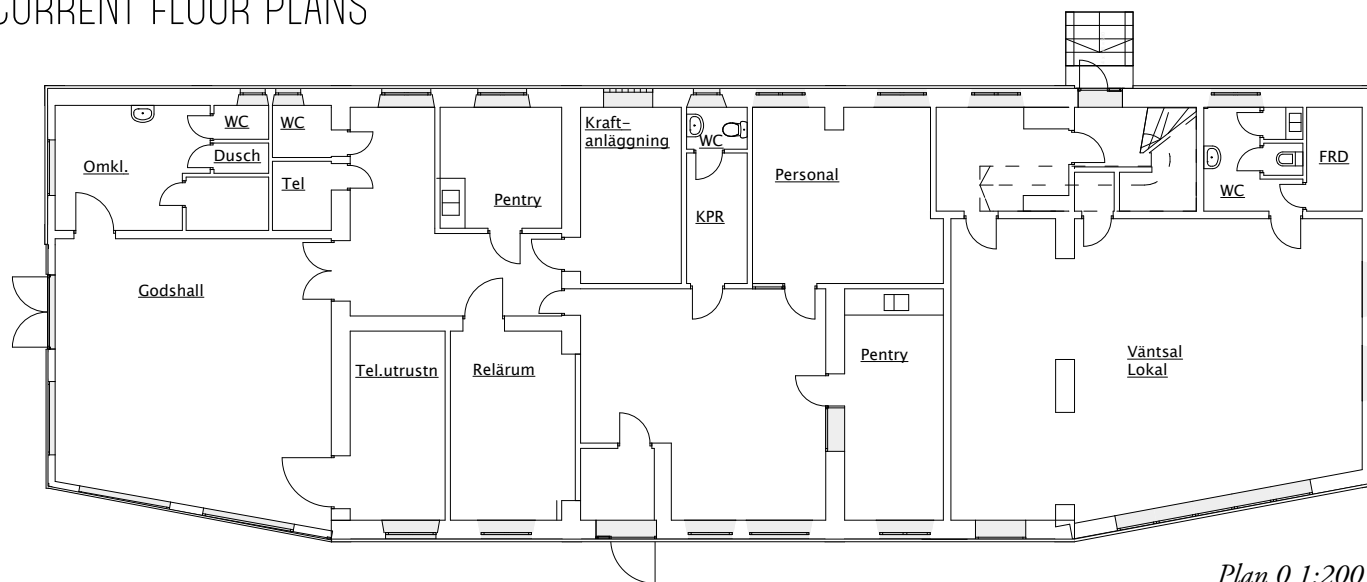


Plan 1

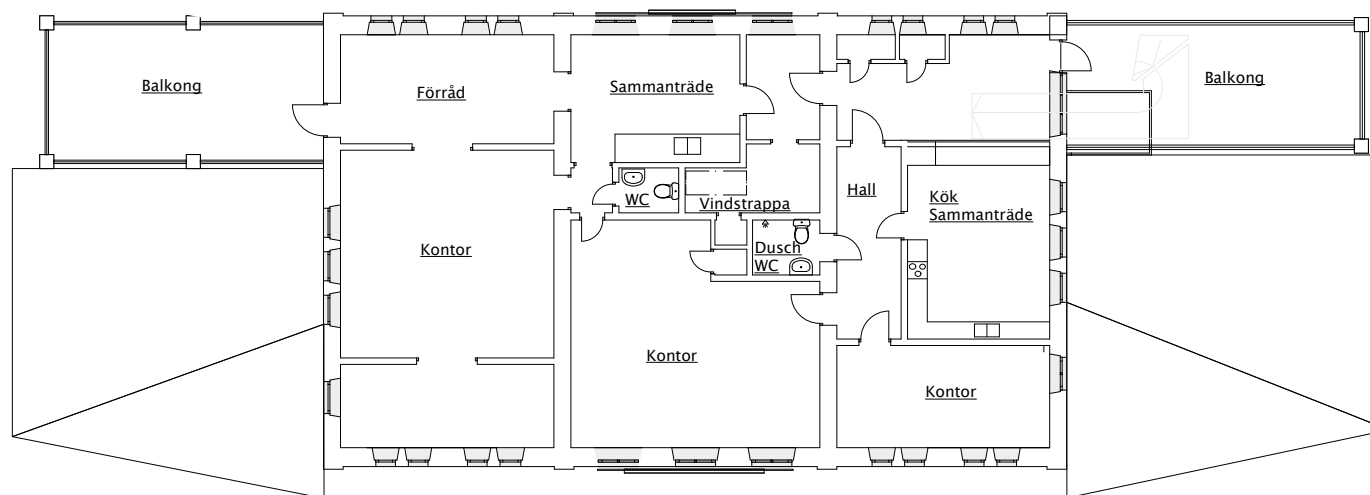


Plan 2

STATION - CURRENT FLOOR PLANS



Plan 0 1:200



Plan 1 1:200

2.2

INTERPRETING THE CULTURAL HERITAGE

One can definitely say that the railway is the reason Öxnered exists. Without it, the area would probably still be cultivated, sparsely populated farmland since development in e.g. Onsjö and Holmängen is more accessible from Vänersborgs point of view.

The station in Öxnered gained its main importance in 1878-79 when the Bergslags (BJ) railway from Gothenburg intersected the Uddevalla-Herrljunga (UVHJ) railway. The intersection was made in Öxnered rather than in Vänersborg because the route was less difficult to build and the citizens of Vänersborg could not agree on the importance of having the intersection in Vänersborg (Hasselberg 1944, p. 190-192). At its peak of importance it is said that the station employed up to 100 people².

Öxnered clearly shows the historic layers of development. Farms are evenly distributed as a result of the 19th century land reforms. Housing related to the railway is oriented

²Interview with Anders Andén, Tenant in the station building 2014-11-17

around the station or between the station and the school and are built along the roads and up against the edge of the forest.

During the 20th century a new type of planning made an impact when villa areas were developed mainly during the record years of the 1960's and 70's.

With the growing importance of the car, the center of the village gradually moved from the station to the road intersection a few hundred meters to the north where grocery stores were developed.

Now increased mobility and centralization has moved nearly all commercial activities to the center of Vänersborg and Överby in Trollhättan.

The station area was built according to a prototype, but unlike other stations there was no town or village behind the station, only farmland, still the park was designed in a very formal way, expressing the importance of the place, and a private residence was built as a pendant across from the station.



Photo of the station and hotel taken sometime before 1919 [13]

2.3

VALUING THE CULTURAL HERITAGE

As buildings alone the station and the hotel represent a proud period of technical progress in Sweden, in the breakingpoint between modern efficiency and past formality. The architectural and symbolic values (Robertsson, 2002, p. 48-49) are high, but not unique, as mentioned above there are more stations built from the same type drawings remaining.

The local importance of the station in practicality has decreased; it hardly offers any job opportunities today, but the societal and identity values (ibid.) are great and important. Many inhabitants express that the old station area is the heart and identity of Öxnered (Frändberg, Johansson, 2014). The cultivated landscape is the other side of the identity of Öxnered, the open views provided by fields and the presence of grazing animals.

- The station buildings and park should be kept and be made accessible for the community to re-establish the station as a center of activity. Traditionally the station has been

a meetingplace, the place where the world outside meets Öxnered, a public and accessible centerpoint. The area was designed for this and can once again function this way.

- The exteriors of the buildings should be restored with care for the historic layers, using materials, colors and techniques that harmonize with the original. Additions reflecting the local history like the modernistic entrance to the post premises in the old hotel should be preserved, it cannot remain in its current position, but it can be moved. The vest



*Facade details of the station [14].
Photo: Katharina Frändberg*

facades represent the face of Öxnered to the passerby but cannot be activated due to safety reasons, but activities in the buildings can be present and visible in the park.

- Technical installations such as ventilation and additional insulation should be done in a way that does not compromise the spatial or visual qualities.

- The active farmland should be preserved both for the visual qualites they constitute in the landscape and for providing physical connections to food production.



*The cultivated landscape [15].
Photo: Katharina Frändberg*

2.4

CONCEPTUAL SCENARIOS

WHY SCENARIOS?

To be able to create a future vision for the station area it is important to have an idea of in what context that development can take place.

The three following pages show conceptual future scenarios for the development around Öxnered and an evaluation of them in relation to the objectives chosen in the project and in relation to the ambition of making the station area **a node for a future sustainable Öxnered.**

The different scenarios are conciusly sketchy and conceptual to highlight different aspects of the development.

THE LOCAL DEVELOPMENT OBJECTIVES

Preservation and enhancement of unique resources: Protect the unique cultural heritage and closeness to nature - provide equal and open access for everyone.

An actor for sustainability

A self-sufficient municipality

Good environment for local businesses

Well connected sustainable transports

Diverse housing: There is a mix of accommodation that is affordable and environmentally friendly.

A **minimal ecological footprint** and zero waste

THE CITY PERSPECTIVE: TO BUILD AROUND THE WATER

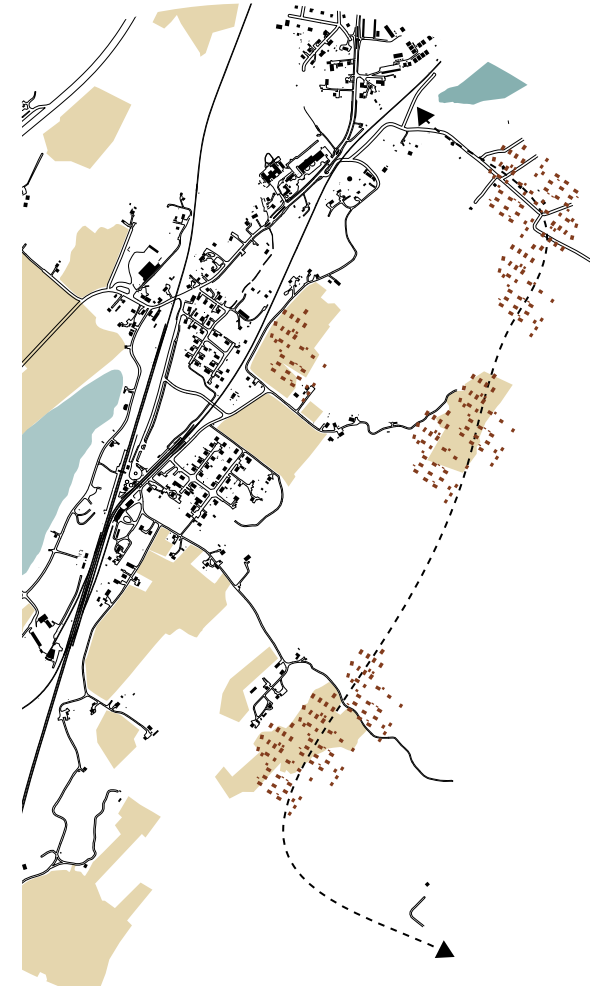
This concept aims at developing Vänersborg around Vassbottnen. Vänersborg as a city has a goal of growing to 40 000 inhabitants to 2015 and 50 000 inhabitants to 2030. To reach this goal the city aims at being able to compete with other cities by housing development in attractive areas (ÖP Vänersborg 2006).

In this concept Öxnered is bypassed and connections are more focused on the north and south. From the city's perspective this could be an attractive but resource-consuming development. From Öxnered's point of view however it is less beneficial:

- The area is close to the train station and within cycling distance from the city centre, but there is also a risk of car dependency since the development is more focused to the north and south bound car connections than to the train station.
- There are good possibilities of creating mixed housing here but since there is no

cityscape to connect to and since villas close to nature and water are attractive it might become a less varied villa area.

- An increased number of inhabitants in the area might create an opportunity for business in Öxnered, but development is well connected to Vänersborg and to car-connected shopping. There is a need something extra for Öxnered to be able to compete.
- The scenario shows housing development on previously undeveloped land and farmland which requires large infrastructural investments and limits the future farming possibilities close to the city.
- The proposal limits the quality and access to large nature areas.
- On the other hand there are possibilities to connect the summer house area Skaven to the municipal sewage system and also to co-use schools and other services if the city is linked around the water.



Conceptual footprint from today's villas in Öxnered

URBAN TRAIN STATION SOCIETY

This scenario describes densification of Öxnered with the train station as the center of development. The map shows a conceptual footprint from the inner city of Vänersborg, not meant to be a proposal but to illustrate the difference in density.

The scenario is focused on Öxnered as autonomous from Vänersborg and lifts the identity as a dense and accessible train station node. However it is radically opposite to the qualities formulated by the inhabitants and risks destroying the identity and uniqueness of Öxnered.

- This development is focused on the train station and makes public transport accessible.
- There is a possibility for variation in housing typologies and costs since development is dense and large-scale. This could attract and enable many different socio economical groups to live here.

- The station area as the core of development could become more of a living center with a lot of new inhabitants nearby. Since it is based on existing infrastructure the nature areas are preserved and less virgin land have to be developed.
- However densification close to the station means that farmland needs to be exploited. Also rather resource-intensive investments might be needed to develop the noise polluted areas near the tracks if the nature areas outside are to be preserved.
- Changes which will transform the community radically are opposite to the qualities of nature, calmness and small scale community that the inhabitants of Öxnered and others who move to the countryside value.
- Considering the present situation it can be difficult to attract developers and new inhabitants to this kind of scenario.



Conceptual footprint from Hamngatan in Vänersborg center

THE RURAL ROAD VILLAGE

This scenario shows a low density old type of road village development which links together new and old development. The concept builds on existing infrastructure and connects to old rural ways of building. This way of developing old cultural settlements has been used in for example Strängnäs where many smaller villages were connected with a historical pattern as role model (Öhrling 2004).

From the perspective of the train station area as a node in Öxnered it has the benefit of adding to what is currently appreciated in the community, but the low density creates challenges in diversity, transportation and resource efficiency.

- Development is spread out and means long traveling distances
- Diversity can be a problem since the principle builds on detached typologies
- The low number of new housing developments means a smaller basis for

service or local businesses

- The scenario exploits low levels of virgin or farmland
- The low density enables small scale private gardening and farming
- The structure follows the countryside qualities of today and fulfill many of the values of living and moving to the countryside that people who move to rural areas appreciate
- There is a potential in creating decentralised local systems and build on many smaller initiatives rather than depending on large infrastructure and development projects.



Conceptual footprint from old villa in Öxnered

CONCLUSION

The sketched scenarios presented are meant to be a discussion material for the process and for the development strategies of future Öxnered.

They show a potential conflict between resource efficiency, attractiveness and preservation of unique resources and identity. While the dense urban development on the one hand is enabling sustainable transport and mixed use development, the road village development enhances the rural character and local identity, and the development around the lake is beneficial from the perspective of the city.

The overall goal is to develop a vision for the station area as a node in a future sustainable Öxnered, taking care of the qualities and resources of Öxnered and the station area today. The following proposal is built on that vision, with the knowledge drawn from the analysis above.

2.5

WANTED AND UNWANTED LIFESTYLES

TODAY: UNSUSTAINABLE LIFESTYLES

Living sustainable on the countryside could seem impossible since this often means longer travel distances and larger homes. However, many people dream of living closer to nature and this project wants to exemplify what a sustainable semi-rural living in Öxnered could be like, with the specific preconditions of the village.

The SPREAD Sustainable Lifestyles 2050 project points out four key areas of unsustainability in current lifestyles: consuming, living, moving and health & society (Backhaus et al 2012). For a life in Öxnered, the following unsustainable trends are specifically important:

CONSUMING

Increasing long distance transportation of goods, e.g. nonseasonal and exotic foods

Increasing consumption of processed food and use of chemicals in food production

LIVING

Increasing number of households and individual living spaces

Increasing consumption of energy and water

MOVING

Increasing numbers of passenger cars

Oil dependency

Increasing mobility needs related to urban sprawl and urban structures that favour car use, e.g. external shopping facilities

HEALTH & SOCIETY

Increasing levels of obesity and heart disease associated with poor diets and inadequate lifestyle choices

Increased availability and low prices for highly processed, unhealthy food products

High or rising social inequity: Low income groups are more affected by adverse sustainability effects, e.g. climate change, local air pollution, rising energy prices

OPPORTUNITIES FOR ÖXNERED

CONSUMING

Growing your own food, ecological food

Sharing things

Clothes swapping library/second hand shop

“Railway services”, e.g. a food distribution hub

LIVING

Variation in housing typologies, prices, sizes etc to promote local diversity

Housing developed in proximity to public transport

Energy-efficient houses

Local energy production

Local water and waste management systems

MOVING

Using the train instead of private car

Vehicle pool and electric cars

Cycling instead of driving cars

Facilities for bikes: racks, roofs, air stations, repair shop

HEALTH & SOCIETY

Local, non-processed food

Environment suitable for walking, cycling and being active outdoors e.g. developing paths and outdoor play areas

A close-knit community with shared functions and activities but also individual freedom and closeness to nature



TOMORROW: LETS MOVE TO THE COUNTRYSIDE

According to a number of Swedish studies people tend to focus on the *living* when moving to the countryside, rather than e.g. work (Stenbacka 2001 p 101). In a survey by the government agency for rural communities in 1999 the most popular places Swedes dreamed of moving to were big cities or countryside communities, even though most people in Sweden lives in something in between (Glesbygdverket 2001).

Qualities often mentioned with a countryside living are closeness to nature, having your own plot of land and the sparseness of traffic, houses and people. In research interviews with people who have moved to the countryside following values have been significant (Stenbacka 2001, p103):

FREEDOM

This refers to both emotional and actual freedom of deciding over your own plot and house, being able to be and act on your own and engage in your own interests. Also knowledge about the access to nature and

being able to let the children play freely is a part of the freedom idea.

CALMNESS

Silence, in comparison to the stress of the city is mentioned in connection to calmness. This also includes the connection to the nature and being close to for example woods, meadows, cliffs and water without people everywhere.

BREATHING SPACE

Having your own territory and not being too close to other houses is an important quality. This connects to a sense of ownership and space but also to the ability of easily finding a calm and undisturbed space for e.g. a pick-nick.

PARTICIPATION

An idea of the tight-knit community or village life: caring about each other. Two important unifying factors: the always present such as school or post office, and the seldom recurrent events such as markets or festivals.

SETTLING IN THE LANDSCAPE

Living close to nature has a big impact on health and quality of life. Nature inspire mind and body and research shows that children improve their motor skills and ability to focus when they spend a lot of time outdoors and elderly and sick need less medication if they spend time outdoors regularly (Grönplan 2008 p.10)

In the past the natural landscape set the framework for settlements. The possibilities for agriculture was a precondition, meaning that care was taken not to build on fertile land (ibid. p.10-11). Instead one would settle on stable, dry land, close to terrain formations or edges of forests, in locations facing the sun, protected from the north winds.

The border between forest and open landscape is very rich in biodiversity and an important area for many species (Skogsstyrelsen [2014-12-17]) which means that when planning these areas, gaps for green connections and biodiversity have to be maintained.



INTERVENTION

BUILDING PRINCIPLES

THE STATION AREA

FLOOR PLANS

DISCUSSION

3

3.1

BUILDING PRINCIPLES

“... The buildings are the landscape’s costume, how it fits is up to us. The body of the landscape as well as the human body has its dimensions and proportions - one can not put on all kind of clothes ... “ (Sotenäs kommun 2014)

CHOOSING THE SITE

“If Gnesta builds villa sprawl out on the fields we become just a suburb to Stockholm. Why would one then want to live in Gnesta? We want to be an alternative, where you can live close to nature but with culture and living landscape. Built with the historical structure as inspiration.”

- Torbjörg Sekse, city architect in Gnesta (Öhrling 2004).

Placement of new development is a delicate matter; dealing with culture, climate, resource management etc. The following guidelines describe how new housing development in Öxnered could be organized, based on historical patterns, site analysis and eco-building knowledge.

ALONG EDGEZONES

Placing buildings along edgezones is a traditional way of preserving farm land through avoid building on fields.

Edgezones are also biologically rich; perfect for small scale farming and gardening.

KEEP SIGHT LINES THROUGH FIELDS & FOREST

Preserves the countryside qualities and green biological corridors.

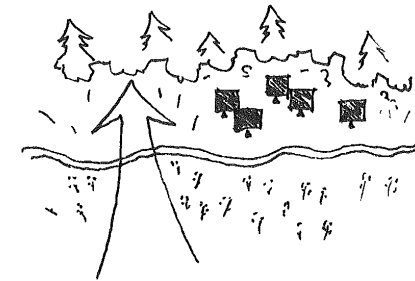
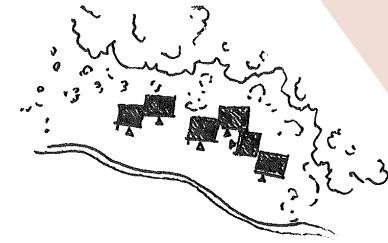
CAREFUL PLACEMENT

Facing the sun if possible and avoid shade to take care of solar insolation and enable solar power generation.

Protection from wind is preferred to decrease need for heating (Ekobyggportalen).

A slope will ease drainage (Drakenberg, Sonnsjö & Widahl 1992 s.16).

Preserve the natural topography and valuable existing types and species; adjust the building to the site and not the other way around (Ekobyggportalen).



TYPOLGY

BUILD CLUSTERS

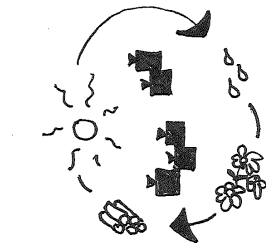
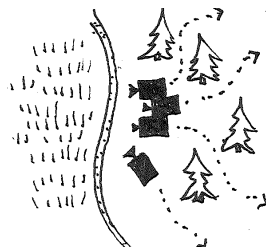
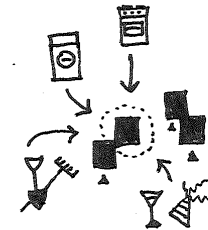
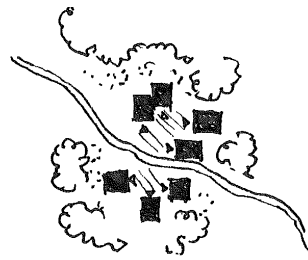
Sharing walls means higher energy efficiency.

Placing the buildings close together enables a better micro climate, saving energy for indoor heating, improving conditions for small scale farming and outdoor activities.

BALANCE BETWEEN COMMON & PRIVATE SPACE

Sharing facilities like laundryroom, storage and common guest rooms means less heated space and use of resources. Shared facilities can also be an appreciated social quality.

An own garden, sightlines to untouched nature and possibilities to “sneak away” to the forest protects the values of freedom and independence.



KEEP SYSTEMS LOCAL

Local infrastructure (water, sewage, waste, heating, electricity) is a sustainable option which enables a lower level of exploitation in the area. Small scale gardening and farming plots creates opportunities of more sustainable food consumption.

DIFFERENT FORMS OF TENURES

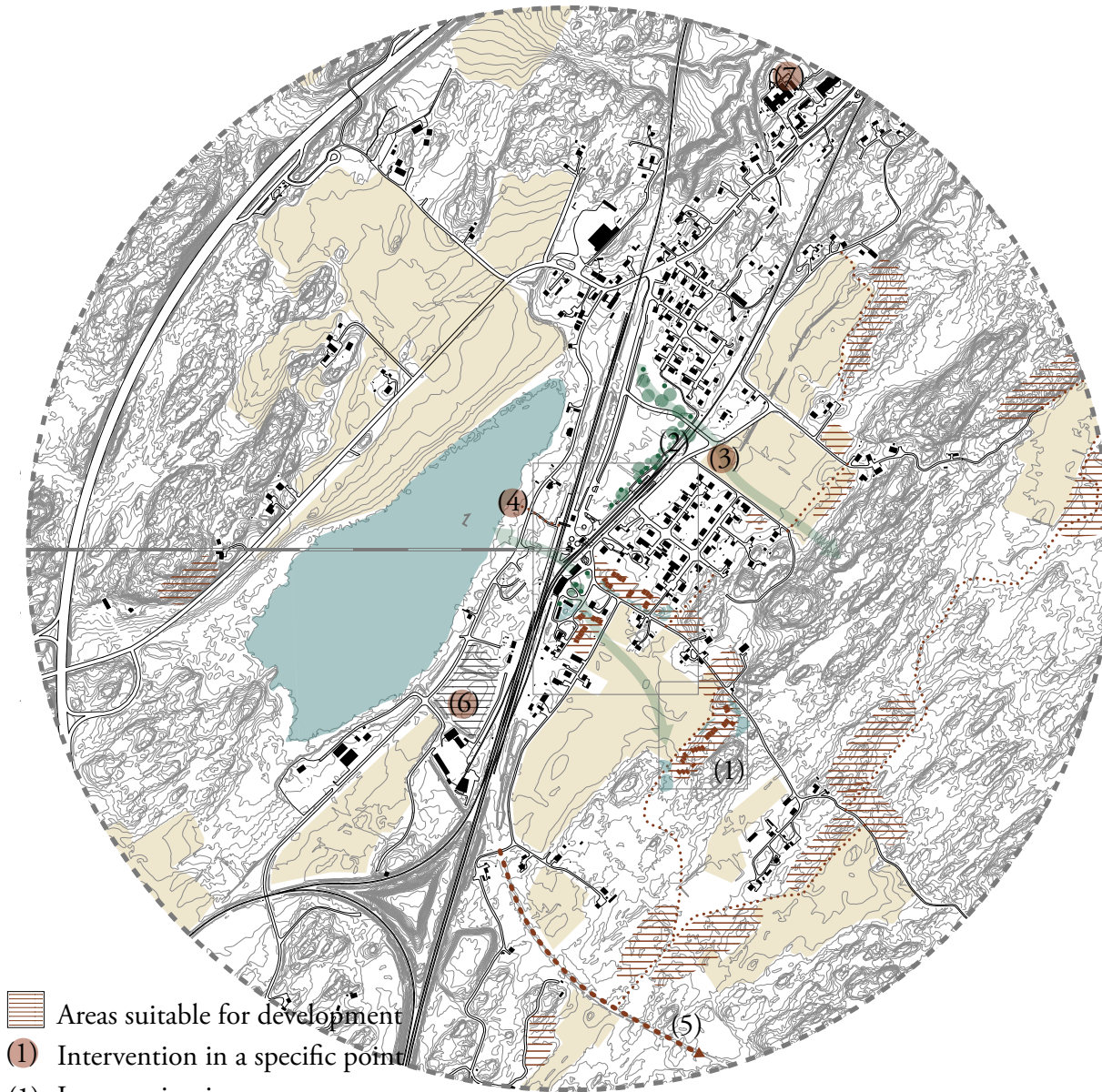
Rental or co-operative apartments and rowhouses enables countryside living also for them who is lacking funds to buy a house.

With some shared spaces such as laundry rooms or kitchens it could be cheaper to live on the countryside and still have the qualities of nature and private space.

STRATEGIC PLAN

The map shows areas suitable for development according to the building principles previously mentioned and exemplified on the next page (1). A path lined with apple trees (2) is developed when the train platform is rebuilt and continues the old fruit tree area between the tracks while connecting the housing area in the south and the north. In the intersection between the areas a new playground (3) is built, with direct connection to the forest.

To connect the station area to the water a recreation point (4) is developed with a small pier, windbreak and barbecue. Here the inhabitants of Öxnered can have sunny evening barbecues and the school children can use it as a site for education about the water. A new road connection to Brätte (5) is built on the old railway track and a future biogas plant (6) is located in the industrial area west of the tracks. The school of Öxnered is expanded (7) since it today has too small premises but a strategic location.



*View from Mankärrsvägen
towards the new housing
development along the forest
edge [1].*



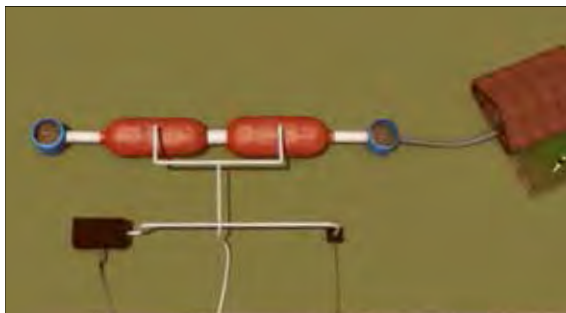
SMALL LOCAL SYSTEMS



Vakuüm solar panel [16]. Photo: Ra Boe



Photovoltaic cells [17]. Photo: Free photo Pixabay



Biogas plant [18]. Photo: FOV biogas

Living on the countryside means that economies of scale is more difficult to gain than in the cities, such as tapping on to district heating or saving domestic heating energy from sharing walls and roofs. On the other hand countryside living means possibilities of creating smaller, decentralised and autonomous systems where every unit or cluster of units takes care of its own water, grows parts of its own food etc. Local systems also means possibilities of developing a little at the time without having to carry through large infrastructural projects.

SOLAR ELECTRICITY

Using the energy from the sun is an environmentally careful and in the long run also economically profitable way of producing electricity. Around ten years after investing in photovoltaic cells in a villa roof the electricity is more or less free (Lewitschnik 2014). If photovoltaic cells would be installed on all existing roofs facing at least 70 per cent of

the solar insolation Sweden would produce 60TWh electricity from the sun, which is approximately what the nuclear power plants produce today. (Lewitschnik 2014). The panels should be mounted facing south without shadows and with an angle between 35-50 degrees. If integrated in the building construction the excess heat that is produced on the back of the cell can be used for preheating the supply air (Energimyndigheten 2014).

SOLAR AND BIOMASS HEATING

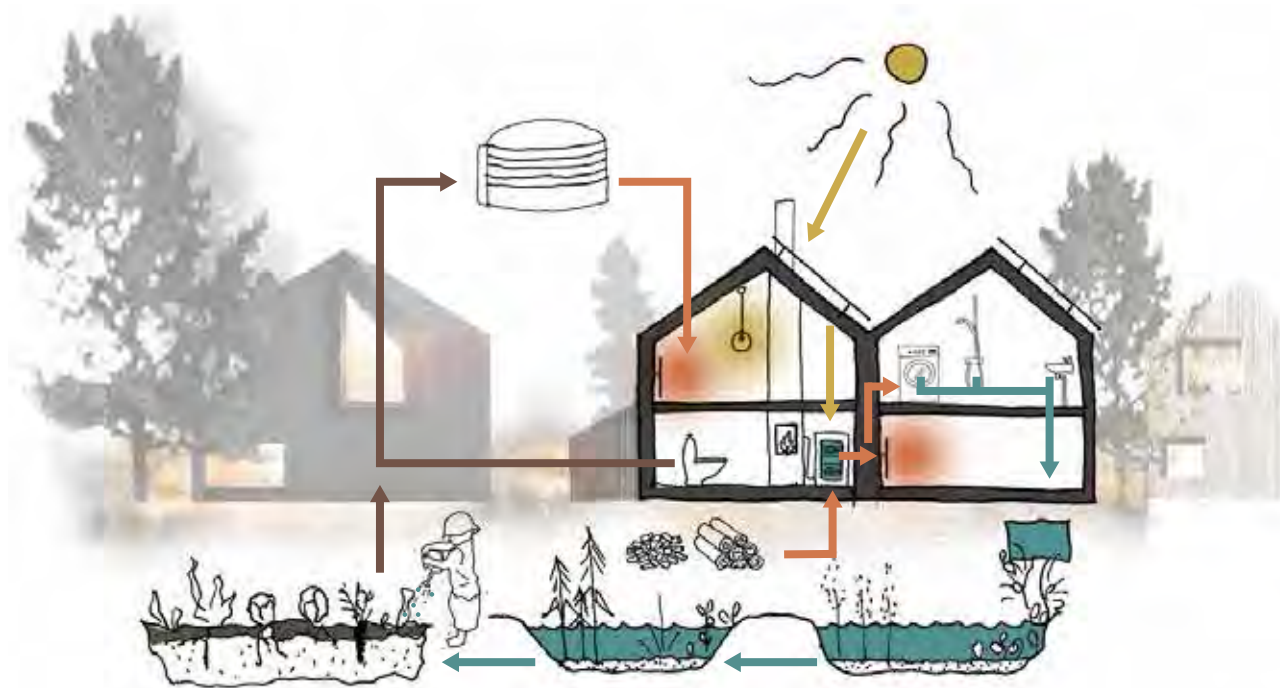
Using a combination of sun-based and renewable resources such as solar panels for hot water circulation and pellets or wood for complementing in the sun-scarce time of year is an environmentally friendly way of domestic heating, recommended in the ecovillage literature (Bokalders & Block 2004, Ekobyggprotalen 2014, Energimyndigheten 2014). Every unit has its own solar panels and wood or pellets burner, heating an

accumulation tank with circulating water. The benefit of building in clusters is also that a small pellet-burning heating plant can distribute heat to the whole area, lowering the work and transport. Since combustion is inefficient during low-load periods and thereby increasing the environmental impact an option is to use electricity directly produced by the photovoltaic cells in short periods. (Bokalders & Block 2004).

Another option is to create heating with geothermal heating which is already quite common in Vänernborg, and which also is possible due to the ground conditions in Öxnared (Sandell 2014). However the initial cost is quite high, around 120-150 000 kr.

PURIFICATION PONDS

Waste water from bath, shower, washing and surface water can be managed locally and thereby unburden the sewage system, and benefit farming through heat buffering, moistening and production of nutrients.



*Purification pond in Bergum, Gothenburg [19]
Photo: Olof Pehrsson 2007*



Root zone purification in India [20]

The dams adds to the biological diversity and becomes homes for birds, dragon-flies, butterflies and snail-eating frogs (Gård och Torp 2014).

There are many different ways of natural purification, for example through a system of shallow ponds where sludge sediments on the bottom and is digested by micro-organisms. Different ponds host different micro-organisms adapted to the level of nutrients. These dams need a footprint of approximately 30-50 square meters per household and direct sunlight to work best (Magnusson 2007).

A more compressed type is the root zone dam where wetland plants grow in dams with sand and hold enough oxygen to attract purifying organisms. These dams are full of plants like reed and cat-tails and has no open surface water (Bokalders & Block 2004)

BIOGAS FOR DISTRICT HEATING

Sludge separated from the black water combined with biological household waste

from both old and new development and local agricultural waste can be digested locally and support a small scale district heating system. The process of converting biogas into heat is less complex than producing engine fuel or electricity, and there is ongoing research on how to make small scale plants viable (Ejervall, Rydman 2013). The left over sludge can then be pasturised and used as soil fertilizer locally.

KEEPING COSTS DOWN

Small local and solar driven systems needs an initial investment but since solar energy is renewable and free it costs less the longer it runs.

Since the municipality owns most of the land it is possible to develop housing without need to buy the land. One way of keeping costs down is also to initially make only basic equipment of the houses. This was made in “Understenshöjdens” eco-village in Stockholm. The tenants could later chose

when they wanted or could afford to build porches, storages, glass verandas etc (Berg, Crass-Saar, Saar 2002). Another way of saving costs is self-management, where part of the rent can be lowered without taxation in exchange for e.g. garden work, simple reparations and maintenance of common space (Skatteverket 2015).

A last example of making development less expensive is to use modular techniques. One example could be to build together with the wood industry in the region and develop housing typologies such as the BoKlok-houses that IKEA has developed together with the building company SKANSKA, and use high environmental standards (BoKlok 2014).



BoKlok modular houses [21]. Photo: BoKlok

*View from the new
development towards the
forest area in the east*



NEW HOUSING DEVELOPMENT

The new housing development (8) is two or two and a half story twin houses or row houses keeping the height of the surrounding buildings but adding apartment sizes and tenure to the area. The development uses the local systems previously mentioned and provides the old station houses with energy and water management.



View over new housing in Amneredsvägen

3.2

THE STATION AREA



View over the square and train station park towards the new greenhouse

ILLUSTRATION PLAN

THE SQUARE

The station area is developed into three main sites: Outside the station hotel with good sight connections to the train stop is an open square (1), which works as an entrance to the area. Here, strategically placed near the train stop is a new playful recycling station (2).

Plantations of heather and other local flowers creates stripes of colour towards the center of the area. A new building (3) frames the square and defines the outdoor room, creating a new kind of space between the old and new houses. This building acts as noise protection for the new development along Amneredsvägen and has in the ground floor bike parking for commuters, storage space and shared facilities such as laundry rooms and part rooms for the rentals. The second floor facing the square is noise disturbed and is constructed with an interior corridor and single sided student apartments.

THE HISTORICAL PARK

Next part of the station park is the historical park (4) where the original relation between the old station building and the private villa is kept together with the roundabout and single tree in the middle. From this point are sight lines preserved to the nature, to keep the connection to the surroundings.

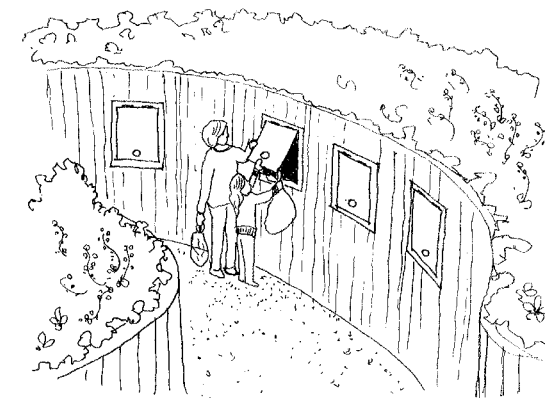
THE PEDAGOGICAL PARK

The last part of the park is a pedagogical park with green house (5) and purification ponds. The greenhouse is constructed with gardening boxes on tracks, connecting to the spirit and culture of the area and enables a flexible use of the green house space. When the boxes are rolled out the space can be used for e.g. conferences or local food markets.

Together with the purification ponds and the water recreation point by the lake (6) this is a resource for the school in e.g. biology lessons. Theories can be tested in reality

and teaching can be connected to outdoor activities. For other inhabitants of Öxnered the park works as a recreational and social space whilst creating pedagogical interaction with human and natural systems. Being able to with multiple senses and different kinds of knowledge create understanding of the surroundings is one prerequisite for change towards a more sustainable development (Falkheden 2003).

In the north, the fruit tree path (7) leads over the parking space to the northern part of Öxnered and links the old fruit trees there with the productive greenhouse garden in the station park.



A playful walk through recycling station (2)



Öxneredssjön

(6)

(7)

Møjeredsvägen

Perrongvägen

Konduktörsgatan

B

(2)

(1)

(3)

(4)

(5)

(8)

Amneredsvägen

- (1) The square
- (2) Recycling station
- (3) Student apartments, bike storage
- (4) Historical garden
- (5) Green house
- (6) Recreational water spot
- (7) Fruit tree path
- (8) New housing development

(8)

Mankärrsvägen

0m 50



THE STATION AREA AS THE CATALYST

STAGES OF IMPLEMENTATION



1. An association buys the station buildings. The existing condition, possibly with minor adjustments, enables space for small scale businesses.



2. Close-to-nature housing developments no further than one kilometer from the station are initiated.



3. The added housing is creating a demand for developing the central plots surrounding the station area, adding inhabitants, housing variation and providing the station buildings with energy and water management.

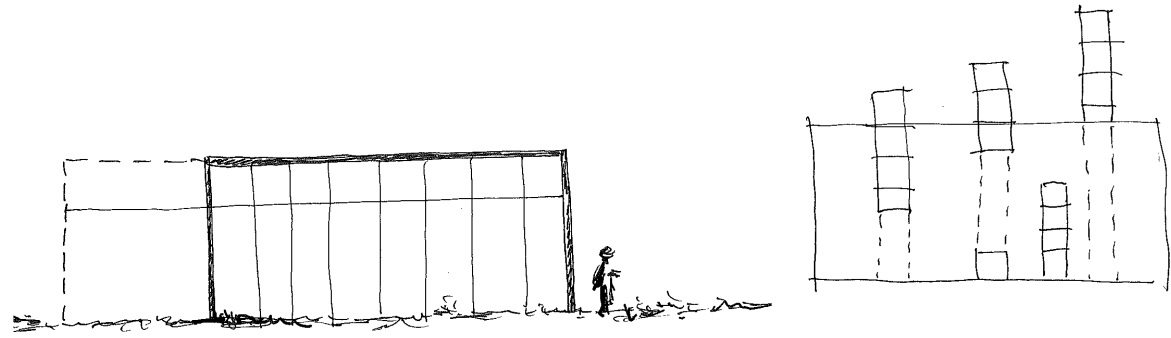


4. The station area is developed into a living node in Öxnered where people work, play and rest in the park, learn about eco-systems and engage in community activities in the station building premises.

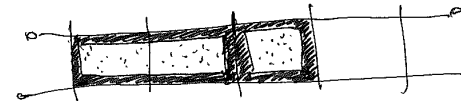
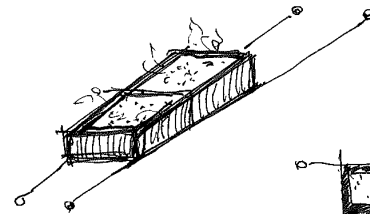
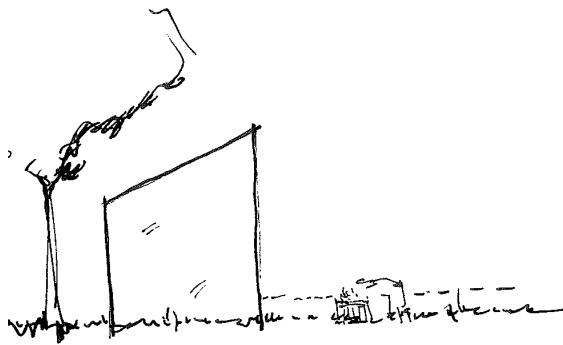
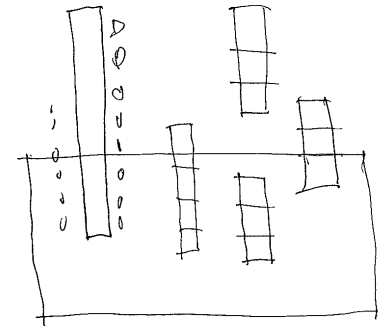
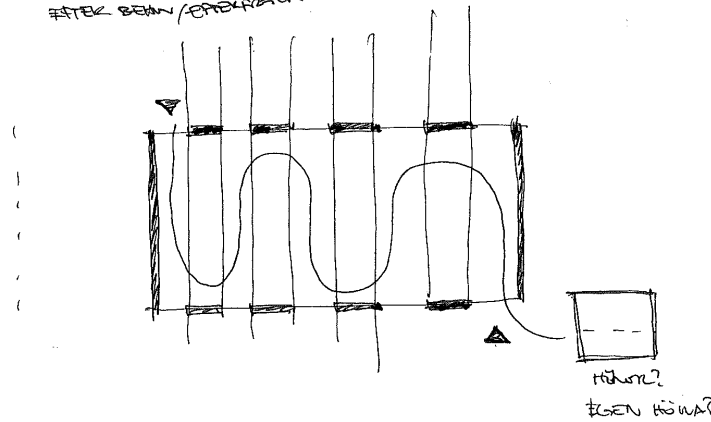
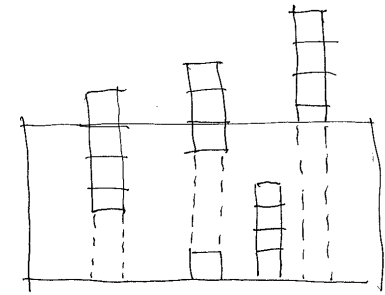
SKETCHES: GREEN HOUSE CONCEPT

The greenhouse is a community gardening house where inhabitants of Öxnered can rent a box for growing plants or just participate in seed swapping events, harvesting feasts, or gardening courses.

The gardening beds runs on old railway tracks that connect the interior with the exterior and flirts with the railway history of Öxnered. This makes it possible to roll out the boxes and grow outdoors, or to use the greenhouse for other things than farming such as biology lessons, food market or parties.



Modul?
#TEK BEAN / #PREKADITION



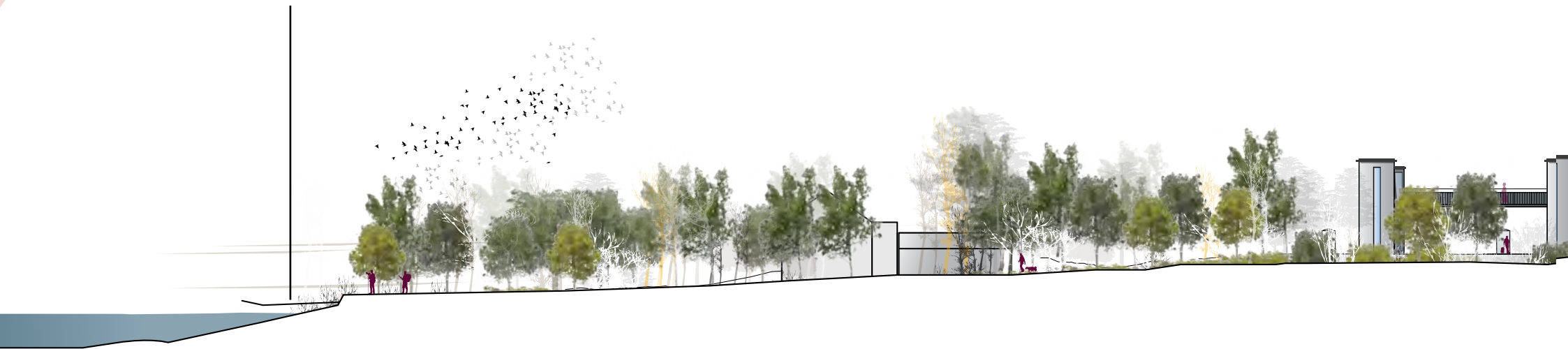
SECTIONS

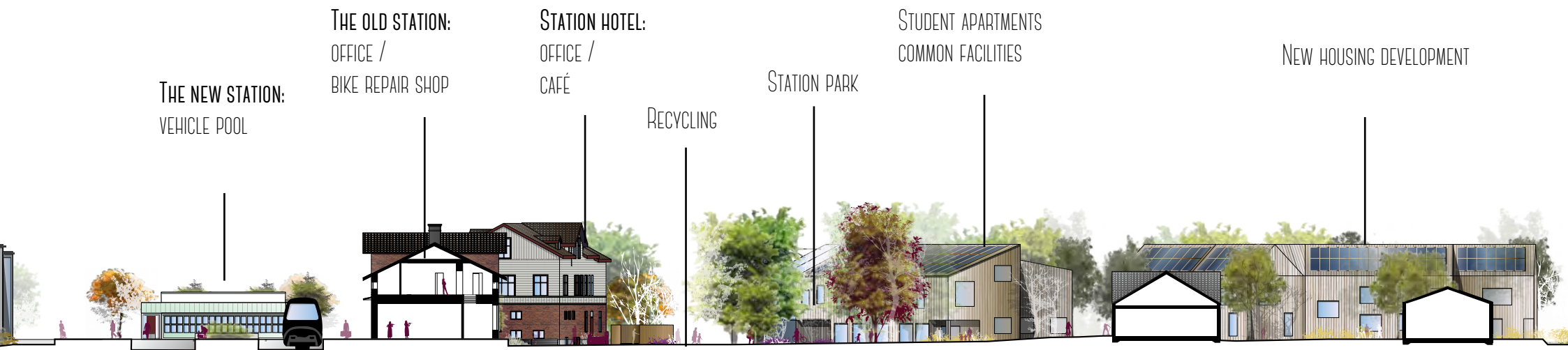


Section B across the train station park 1:500

RECREATIONAL SPOT:

BBQ / SHELTER





THE NEW STATION:
VEHICLE POOL

THE OLD STATION:
OFFICE /
BIKE REPAIR SHOP

STATION HOTEL:
OFFICE /
CAFÉ

RECYCLING

STATION PARK

STUDENT APARTMENTS
COMMON FACILITIES

NEW HOUSING DEVELOPMENT

Section A alongside Amneredsvägen 1:500

NEW HOUSING DEVELOPMENT

PURIFICATION PONDS

FIELDS



NEW HOUSING DEVELOPMENT ON THE EDGE OF
THE FOREST

FOREST CLAD RIDGE



Section A alongside Amneredsvägen 1:500

3.3

FLOOR PLANS

HOTEL - MINIMAL INTERVENTIONS



To revitalise the station area stepwise changes are proposed for the existing buildings. With small interventions both the old station house and the station hotel can be transformed into accessible and functional workspace for small scale offices to rent. This can be a first step towards a living community center in Öxnered. More comprising renovations can then be carried out gradually.

RISK ASSESMENT

A risk analysis was carried out 2013-09-09 (Vänerns kommun 2013) which stated that the station hotel was acceptable to use for activities where people are awake and can manage to get out on their own, such as offices, storage or café. First, the risk analysis demands the following:

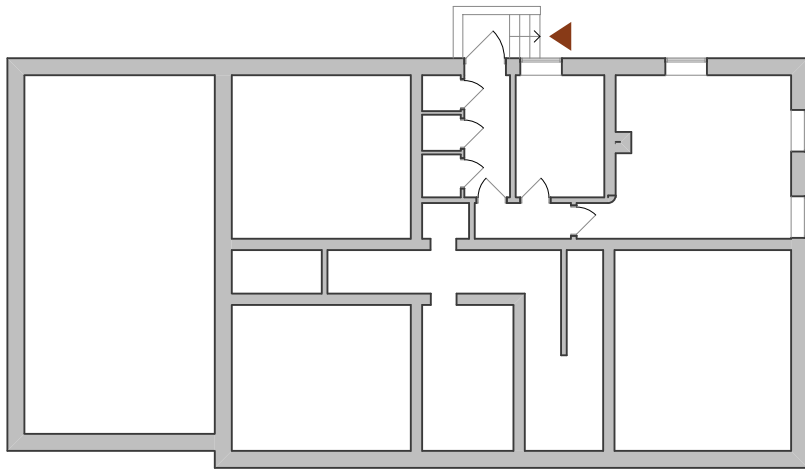
- The ventilation should be of mechanical supply and exhaust air that is possible to shut off.
- Sealing of existing natural ventilation

- Entrance only from the back of the house
- Windows to the railway must not be openable
- Information to tenants of how to act in case of an accident

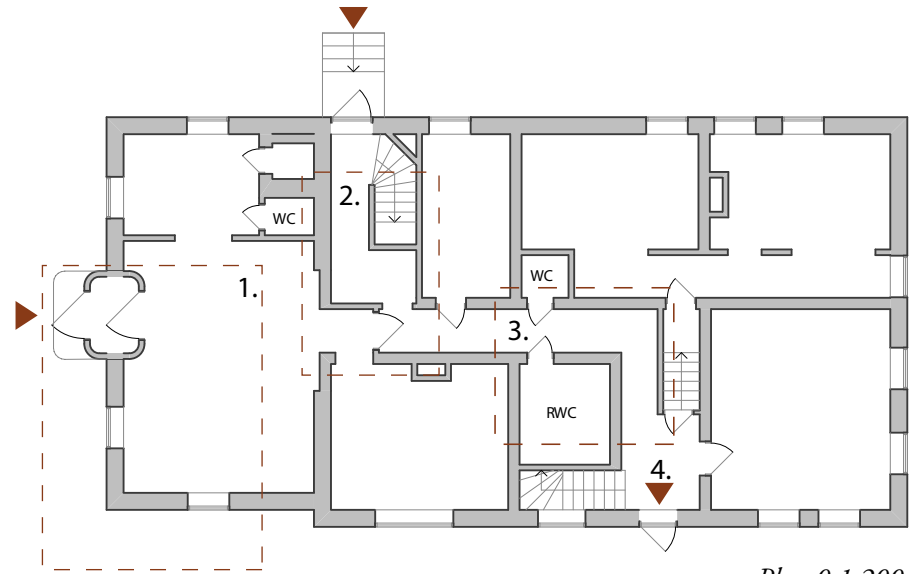
Minimal changes to create safe, accessible and functional space is therefore:

THE HOTEL - FIRST STEPS

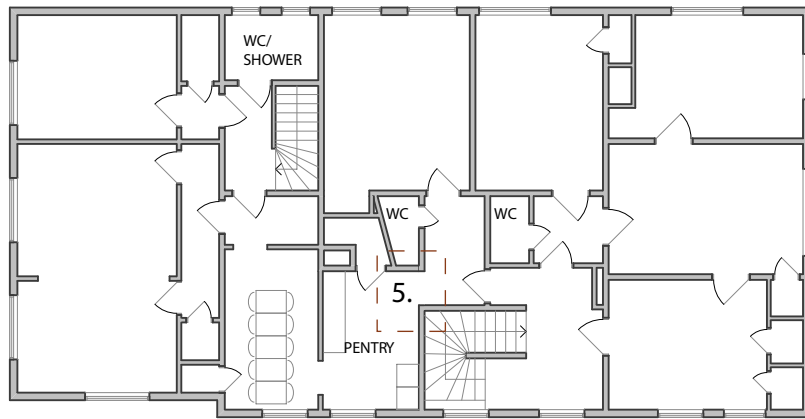
1. Move the entrance from the western facade to the north facade
2. Remove the kitchen and open up the corridor from the eastern entrance
3. Remove the half-floor stairs to the basement. This connects the whole ground floor on the same level.
4. Shut the south-western entrance but keep it as a fire escape route.
5. Open up the passage between the corridor and the pantry on plan 1 to connect the whole floor.



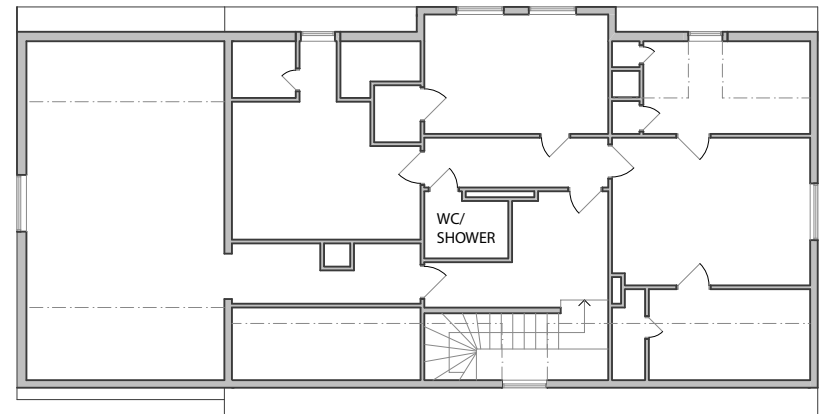
Basement plan 1:200



Plan 0 1:200



Plan 1 1:200



Plan 2 1:200

HOTEL - DEVELOPED PLANS

PLAN 0

Since it is allowed to use the station hotel for public daytime purposes and since the north facade faces the train stop this space is suitable for a small café with kitchen and storage. The storage space in the basement is reachable from outside and can also be used for storage of e.g. food grown in the green house or in private gardens for a local food market. The café can also serve as a distribution hub for groceries delivered by train.

PLAN 1

Plan 1 is connected by a common hallway and pantry. It could host offices for six different firms. The position for a future elevator makes the whole house accessible.

PLAN 2

The north wing has not been used for living in recent times, but can become e.g. an art studio.



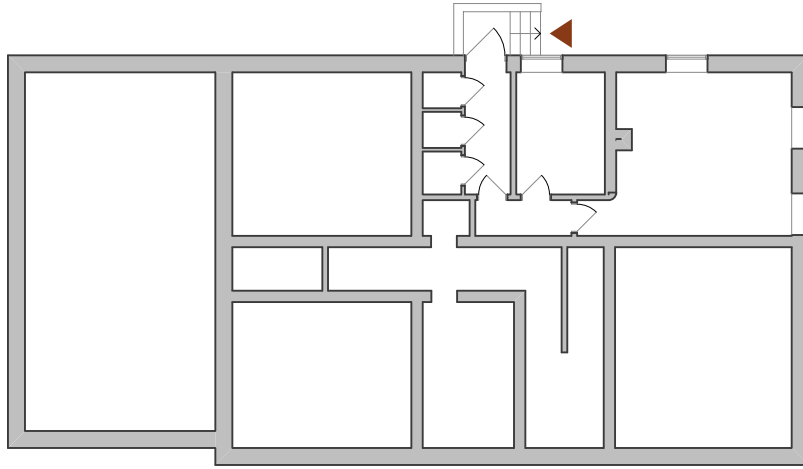
Example of micro brewery [22]. Photo: Michael Trolove



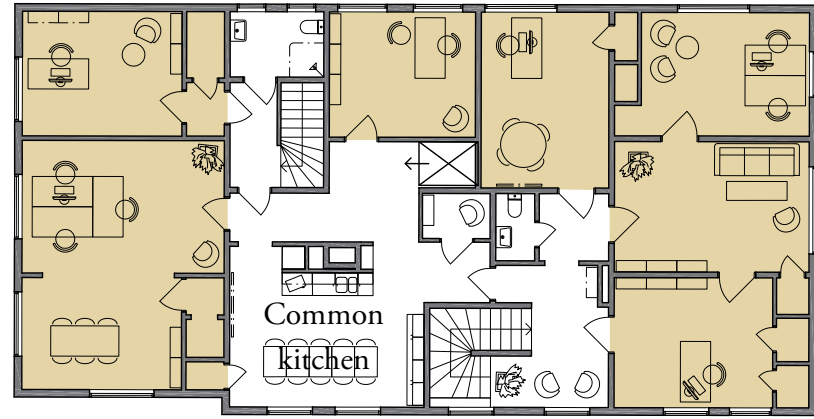
Large windows in the future office spaces



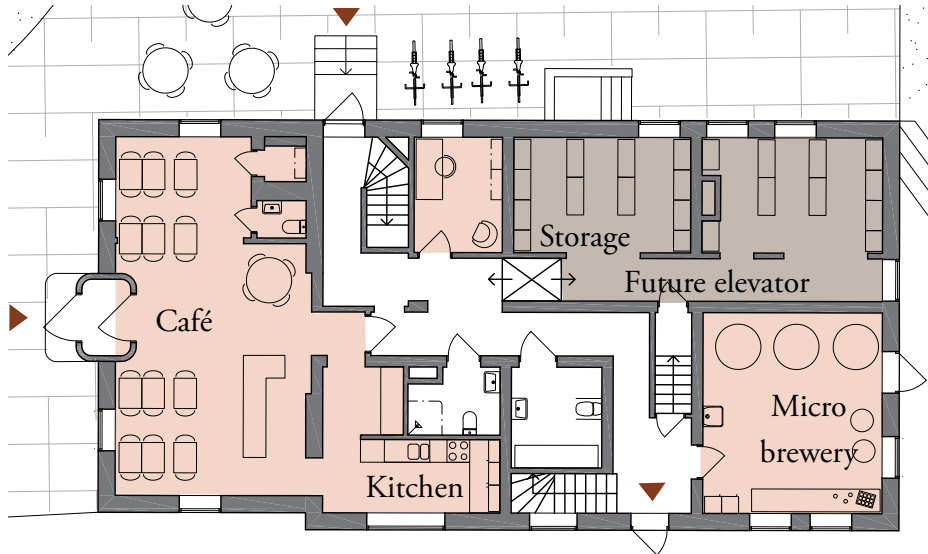
The unique entrance is moved to the short end of the house and becomes entrance to the café



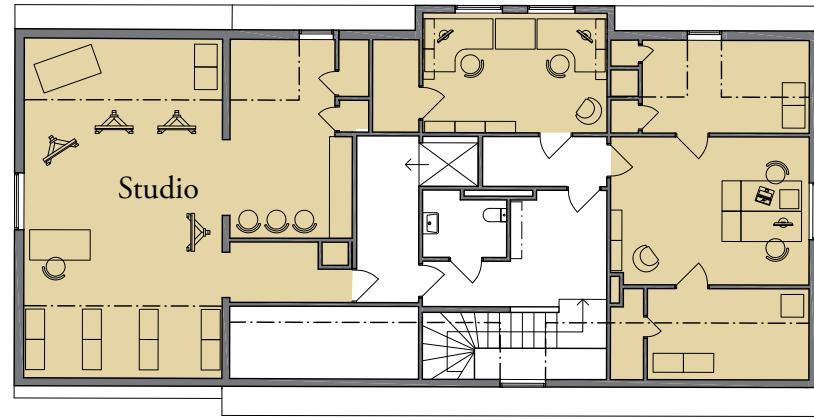
Basement plan 1:200



Plan 1 1:200



Plan 0 1:200



Plan 2 1:200

- Rentable office space
- Rentable public business space
- Storage

STATION - MINIMAL INTERVENTIONS



The old station house needs the same risk assessment measures as the hotel, with the following addition:

- The stopping device for the railway needs reinforcement
- The use of the terraces needs to be limited

THE STATION - FIRST STEPS

1. The old entrance facing the railway is closed and a new entrance with a ramp is installed in the middle of the eastern facade, where the old entrance to the waiting hall originally was. This creates a neutral and accessible space that reaches four different rentable office spaces.

2. The small toilet is moved into a new accessible toilet

3. A corridor to the closed community premises in the south makes the whole building accessible.

4. A door is installed between the community premises and kitchen to make it more usable.



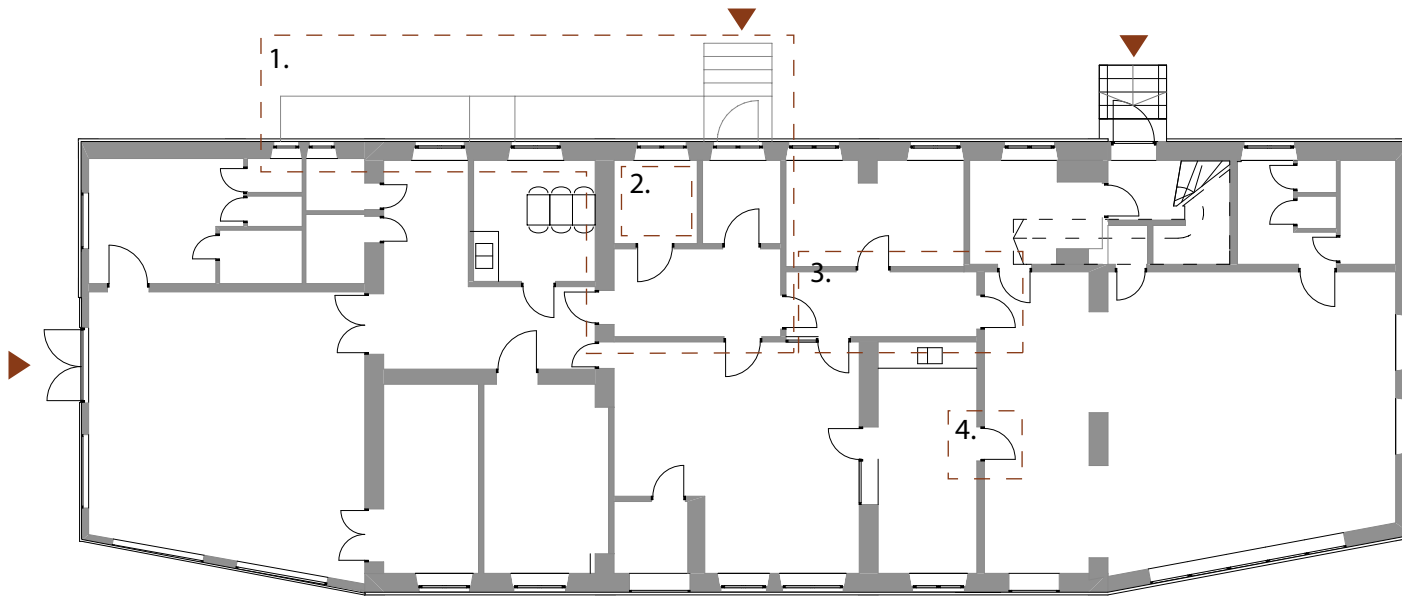
The old main entrance can be reopened



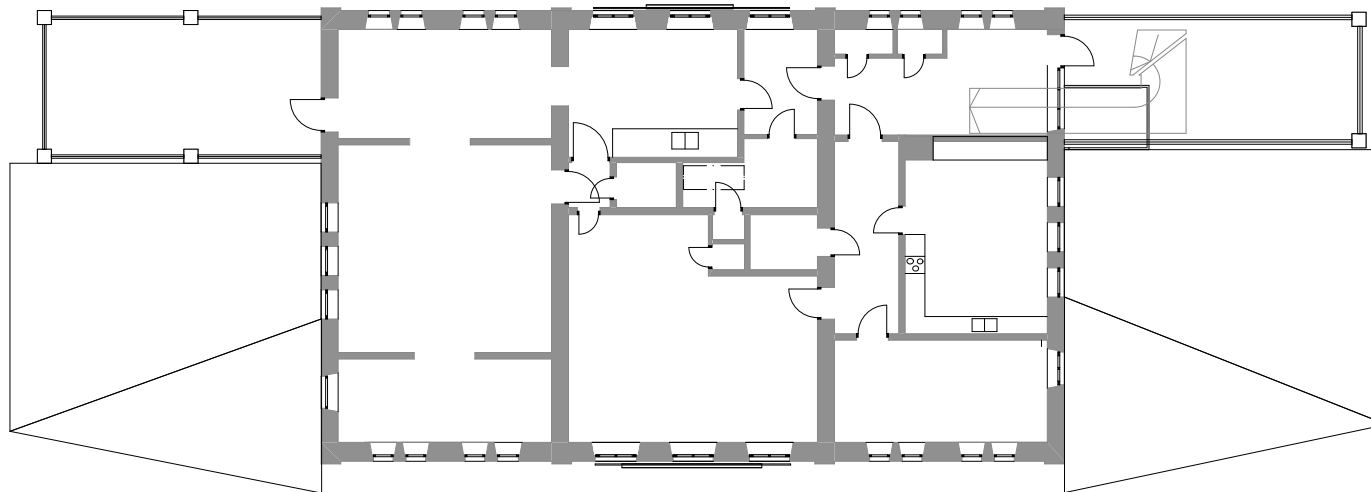
The kitchen on the ground floor



Big windows facing the railway



Plan 0 1:200



Plan 1 1:200

STATION - DEVELOPED PLANS

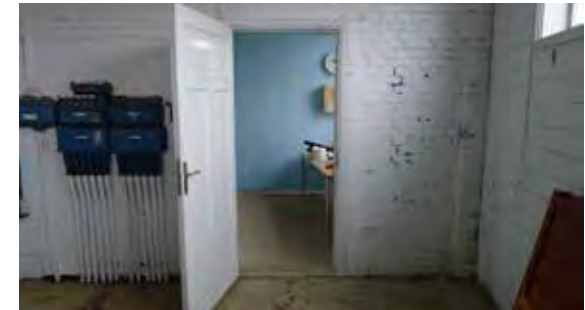
PLAN 0

The northern wing of the building is rougher than the other parts with brick walls and concrete floor, suitable for e.g. crafts or small scale mechanics work. A bike repair shop where commuters can leave their bikes on their way to the train and get them by the end of the day is perfect here.

A common kitchen can be used by all the tenants in the house and the southern premises with its own kitchen can be used for closed association activities or private daytime events such as rehearsal room for the local folk dance team or movie nights.

PLAN 1

The floor plan is currently rented by two architect firms and could either continue like today or be divided into shared offices.



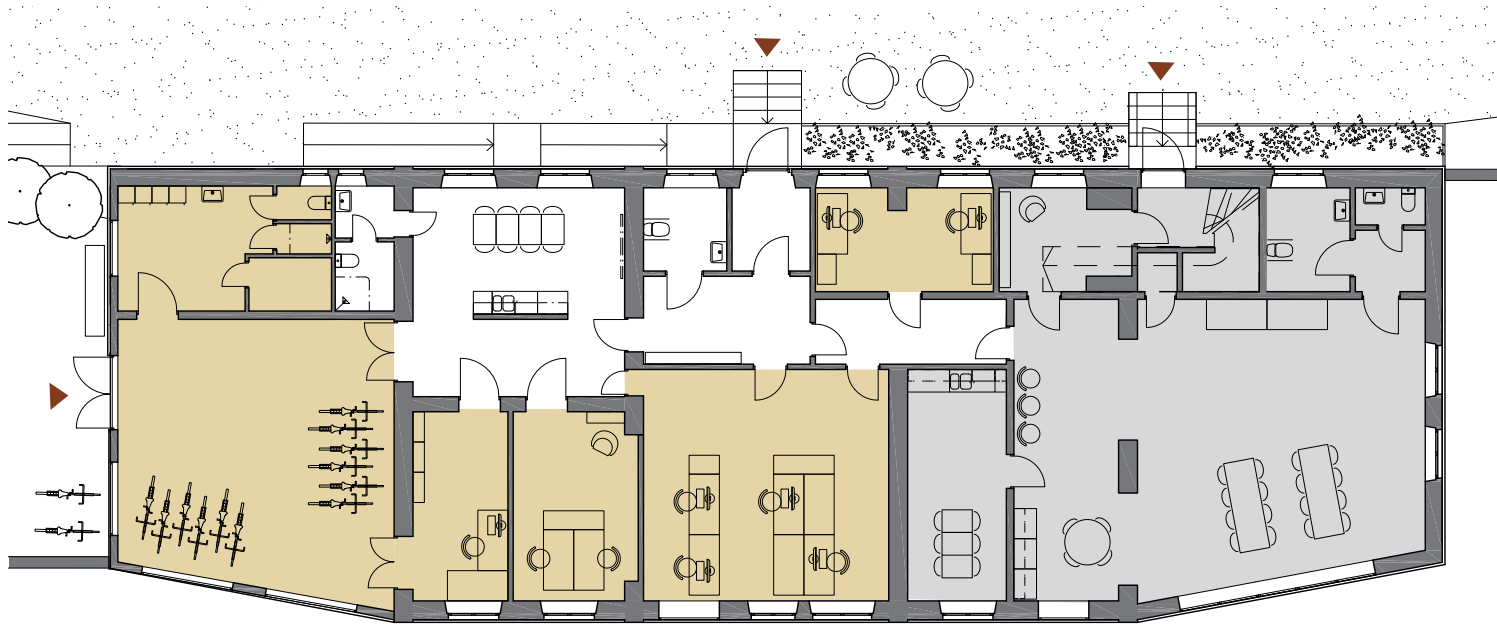
Premises suitable for the bike repair shop



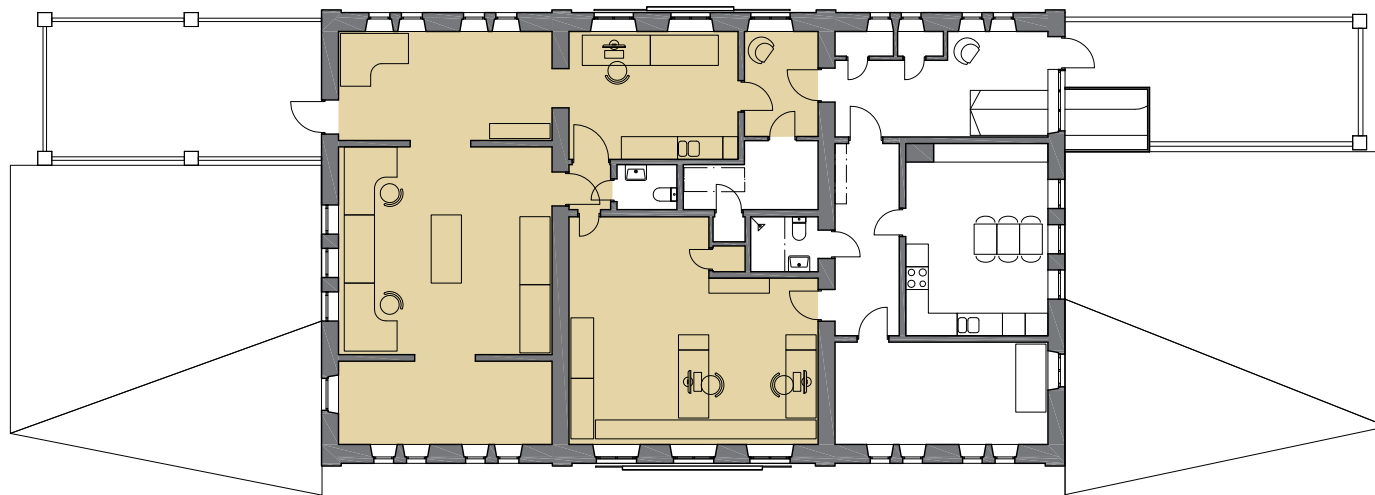
Folk dance! [23] Photo: Annelie Salo





View from the architect's office on plan 1



Plan 0 1:200



Plan 1 1:200

-  Rentable office space
-  Non-public community space

3.4

DISCUSSION



MEETING THE LOCAL DEVELOPMENT OBJECTIVES

- **Preservation and enhancement of unique resources:**

Protect the unique cultural heritage and closeness to nature - provide equal and open access for everyone.

The basis of our project is the ambition to build on existing qualities, hence we keep fertile land off bounds for development, enhance the access to the lake and connect to existing paths. We also propose local ownership of the station area to make it accessible for different activities.

- **An actor for sustainability**

For Vänersborg to be an actor for sustainability, many fields and actors need to be involved. We propose a possible arena for collaboration between the local neighbourhood and the municipal housing company, an arena that is also a testing and learning site involving schools in the municipality.

- **A self-sufficient municipality**

New housing should be built with self-

sufficiency, or the potential for self-sufficiency in mind, with power and heat production incorporated in new development.

Vänersborg is dependent on excess heat from Vargön Alloys smelting plant which makes it quite vulnerable to changes. The possibilities for increased small scale food production is also a key to self-sufficiency.

- **Good environment for local businesses**

Spaces at affordable rents with excellent connections to a large region can make it viable for small enterprises in Trestad area to base their business in Öxnered. The shared common spaces can bring inspiring meetings and synergies.

- **Well connected sustainable transports**

Öxnered is well connected. The key is to make it easy and comfortable to move between the station and your home by bike or foot and to make services flexible, use the train for distributing goods and services.

- **Diverse housing:** *There is a mix of accommodation that is affordable and environmentally friendly.*

We propose groups of housing, mixing different sizes, both rental, condominium and privately owned. Many shared functions is one way to keep costs down.

- **A minimal ecological footprint and zero waste**

Closing the loops of the systems and inspiring changes in unsustainable choice patterns.

ENABLING THE CULTURAL HERITAGE

Through our proposal we re-establish the station area as a center in the community, both physically and socially.

In our building principles we use much of the logic from the older existing housing typologies and we limit development to a radius of one kilometer distance from the station to decrease the car dependency. We also suggest that an association formed by locals should buy and manage the station area, thus making it accessible to the local community.

The park with the new greenhouse is a

common resource for gatherings and activities. It is also a testing and learning site for new methods of working with biodiversity and environmentally sound systems, addressing both children, students and locals.

We suggest a refurbishment of the station and the hotel to make it possible to lease out office and studio spaces and house a public café. The existing very general floorplans allow this with only minor changes and the interior spatial qualities can be kept.

ON URBANITY

When discussing sustainability the question of density always comes up. We have, based on our analysis and our perceptions made a stand for a rather low density in Öxnared. This is based on our appreciation of the existing natural qualities providing well-being, attractiveness and potentially food. It is also based on a critique towards the exponential growth norm, and a notion that density does not equal urban street life. We believe that more central areas of Vänersborg have greater potential of more housing to

strengthen the urban character and the basis for commerce and services.

CONTINUATION

Our hope is that the local group of engaged inhabitants find the means to buy the station buildings. When the buildings have been sold the municipality will start a detail plan process that will make it possible for the new owners to get a building permit for necessary initial renovations. In this we hope that our material can inspire a vision for the future.



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PICTURE SOURCES

Photos with no given source are our own.

[1] Postcard from the station hotel. Photo from Anders Andén.

[2] Photo of the interior of the hotel dining room.

[3] Photo: Katarina Frändberg

[4] Photo: Katarina Frändberg

[5] One of the oldest photos of the station. Photo from Anders Andén

[6] Häradskartan ca 1890, Lantmäteriet

[7] Kiosk and café where the new station building is now. Photo from Anders Andén

[8] New station building. Photo: Jernhusen <http://www.jernhusen.se/PageFiles/3409/Oxnered680x350.jpg>

[9] Walking path in the edge of the forest. Photo: Katarina Frändberg

[10] Photo from Google Maps

[11] West facade of the hotel from 1992, Trafikverket

[12] West facade of the station from 1918, Trafikverket

[13] Photo of the station and hotel taken sometime before 1919. Photo from Anders Andén

[14] Facade details of the station. Photo: Katharina Frändberg

[15] The cultivated landscape. Photo: Katharina Frändberg

[16] Vakuum solar panel. Photo: Ra Boe http://commons.wikimedia.org/wiki/File:Vakuumroehrenkollektor_02.jpg

[17] Photovoltaic cells. Photo: Free photo Pixabay <http://pixabay.com/sv/solceller-solenergi-f%C3%B6rnybara-352670/>

[18] Biogas plant. Photo: FOV biogas https://www.youtube.com/watch?feature=player_

[detailpage&v=tt1f_jbWf50](#)

[19] Purification pond in Bergum, Gothenburg. Photo: Olof Pehrsson 2007

[20] Root zone purification in India

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[21] BoKlok modular houses. Photo: BoKlok

[22] Example of micro brewey. Photo: Michael Trolove <http://www.geograph.org.uk/photo/3164656>

[23] Folk dance! Photo: Annelie Salo http://commons.wikimedia.org/wiki/File:Folk_dance_C_H6144.JPG