

THE ROLE OF URBAN DESIGN WITHIN THE
CIRCULAR ECONOMY CONCEPT

- EXPERIMENTING WITH A FUTURE URBAN SCENARIO -

Master Thesis Booklet
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ABSTRACT

Contributor to climate change, cities are the major responsible for a great amount of natural resource consumption and global waste production as a consequence of the "take, make, dispose" aspects of our linear economic model. In face of this issue, Circular Economy (CE) is a new concept that seeks to decouple economic growth from the consumption of finite resources by shifting the linear economic system into a circular one.

Currently, the discussions within CE literature are focused on government and company policies once they are considered the most influential actors when it comes to the economy. However, even though the literature frequently mentions how the changes would highly depend on many aspects, there is a lack of discussion on several subjects that are equally important for a full understanding of the economical, social and environmental consequences of its implementation. These groups are consumers, urban contexts and what would the future look like on a daily bases aspect.

Sweden has a reputation for being one of the

most innovative and sustainable countries in the world, and even though the ecological footprint of Sweden is significantly high, the Swedish government has admitted that a transition to a circular society is necessary. The project site is located in Lund, where the rapid growth, research, and innovative atmosphere creates a positive environment for an experiment within the Circular Economy Concept.

With this in mind, utilizing the prospect on future scenarios as a tool to discuss the impacts of the CE on the lifestyle of consumers the project aimed to understand what is the role of urban design within the future economic scenario and how can urban interventions support the new lifestyle at the same time it supports the specific need of the site.

ACKNOWLEDGEMENTS

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01 INTRODUCTION

01.1 CONTEXT

Cities are the major contributors to climate change and even though they occupy less than 2% of the planet's surface, they are responsible for

75% of natural resource consumption
50% of global waste
60% of greenhouse gas emissions.

These are the consequences of our "take, make, dispose" of our linear economic model, in which we take raw resources, use them, sometimes for a very limited time and dispose of them, only to take them again.

"It's madness that valuable material is used just once and then thrown away. We're going to change this now. The green recovery that society now needs will accelerate the transition to a climate-neutral and circular economy. Approximately 50% of our climate emissions and more than 90 % of the world's water shortages and biodiversity losses are a result of inefficient resource management. A circular economy is smarter, much better for the environment and also allows

us to create opportunities for many new jobs and sustainable business," says Minister for Environment and Climate Isabella Lövin.

With the projection that by 2050, two-thirds of the world's population will be living in cities, we must reflect on the impacts that our heavy consumption is leaving behind. (Foster, 2017).

"We treat the future like a distant colonial outpost devoid of people where we dump our ecological degradation, risk, nuclear waste and public debt."

Roman Krznaric



Image source: © IE Ideas (edited by author)

01.2 CIRCULAR ECONOMY CONCEPT

The concept of Circular Economy (CE) is a new concept that enables us to rethink how we use our resources, once it:

"seeks to reduce resources extracted from the environment and reduce the wastes that human activities generate" (Foster, 2017).

The circular economy system is based on the principles of designing out waste and pollution, keeping products and materials in use, and regenerating natural systems.

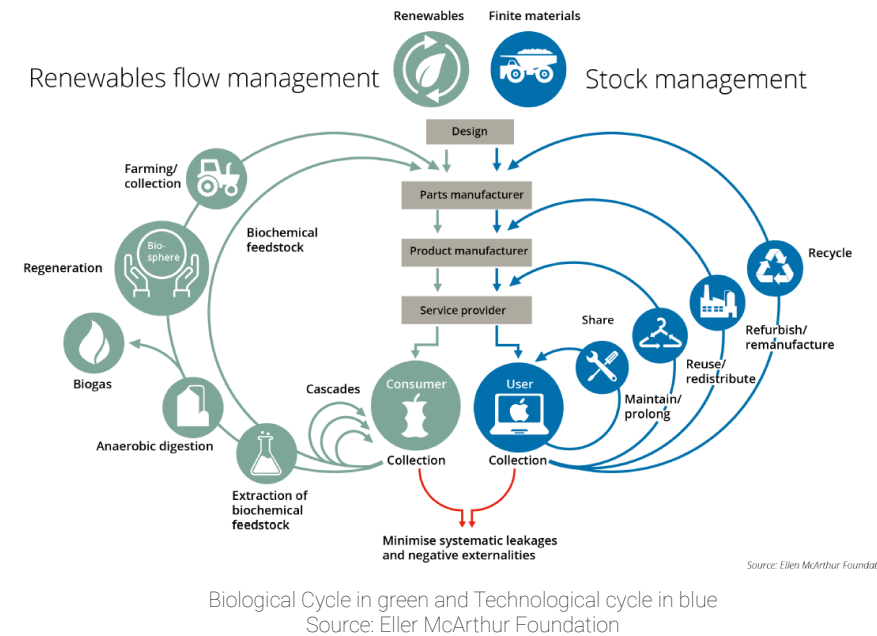
These principles aim to transform the economic linear system into a circular one, by keeping the resources in use by recycling, repairing, or reusing rather than throwing away, and in which waste from one process becomes an input into another. To obtain a desirable outcome of pure materials as possible the concept presents two cycles where materials can flow. These cycles are:

The biological cycle contains consumption products such as food and bio-based materials that are suitable to return to nature after use in society, as long as they do not contain toxic substances.

The technological cycle contains both bio-logical and non-bio-logical materials. Here flows materials and products that can be recovered, restored, through strategies like reuse, repair, re-manufacturing, and in the last resort, recycling.

Even though the term recycling is often used in the literature, it is important to mention that recycling today is not the main goal of CE.

According to Ellen MacArthur Foundation, one of the main goals is to have a change at the beginning of the production chain, meaning that, companies design their products and components to be long-lasting and so that they can be repaired, upgraded and finally recycled when they can no longer be used.



01.3 CIRCULAR ECONOMY & SWEDEN

Sweden has a reputation for being one of the most innovative and sustainable countries in the world. However, the ecological footprint rate indicated that in 2017 green gas house emissions has reached nine tonnes per person per year, with two-thirds of these emissions coming from households, in which consumption-based emissions are dominated by transport, food, and housing.

Considering that no later the 2050 global emissions need to decrease to an average of less than one tonne per person, alongside the European Commission and many other countries, Sweden has admitted that a transition of the society is necessary. and the government, academia, and the civil society have been taking initiatives in order to make this transition happen such as "Circular Economy - Strategy for the transition in Sweden" and "Sharing Cities Sweden"

1.3.1 CIRCULAR ECONOMY – STRATEGY FOR THE TRANSITION IN SWEDEN

Considering that CE is a new concept, in 2020, the government has taken a step forward and presented a strategic plan in order to coordinate this transition. Seeing Circular Economy as a tool to achieve the national and international environmental and climate objectives, as well as Sustainable Developments Goals in the 2030 agenda, the plan envisions:

"A society in which resources are used efficiently in toxic-free circular flows, replacing new materials"

Furthermore, the plan points out general guidelines for the transition by defining four focus areas of importance:

- Circular Economy through sustainable production and product design
- Circular Economy through sustainable ways of consuming and using materials,

products, and services.

- Circular Economy through non-toxic and circular material cycles
- Circular Economy as a driving force for the business sector and other actors through measures to promote innovation and circular business models

The plan also prioritizes certain materials streams from a national perspective considering that they involve short flows, with short product cycles, large volumes, and a low level of recycling.

These streams are Plastics, Textiles, Renewable and bio-based raw materials, Construction and property sector (including buildings and demolition waste), Innovation-critical metals, and mineral and also Food.

Circular economy

- Strategy for the transition in Sweden



01.3 CIRCULAR ECONOMY & SWEDEN

1.3.2 SHARING CITIES SWEDEN

Sharing Cities Sweden is a national program that is part of Viable Cities, a strategic innovation program for small and sustainable cities that aims to develop world-leading testbeds for the sharing economy.

In Sweden, Stockholm, Gothenburg, Malmö, and Umeå are the cities in which sharing services and digital solutions will be developed and risks and opportunities will be tested and evaluated in the next years.

One of these examples is the Sege Park in Malmö that has been nominated to the Plan Award 2018.

The project is an urban development located on a site with historical heritage and will be developed into a pioneering area for sustainability, in terms of social, ecological, and economical aspects.

The neighborhood will be an experimental workshop for sustainability with large-scale

systems such as open storm management systems, local recycling of food waste and self-sufficient street lights, more diverse green roofs and small-scale solutions such as bicycle and carpool, recycling station and greenhouses, and sharing products. (Malmö, 2021).

Among these and other initiatives, Sweden has presented a positive scenario when it comes to working towards a Circular economy. With actions and programs ranging from top-down to bottom-up, the Swedish context has shown itself open to experiment and try different approaches in different scales and levels of interaction.



Image of Sege Park
Source: Mandaworks

01.4 DRIVING QUESTIONS

Circular Economy is a new concept based on long-term thinking in which a lot of the discussions in the literature are focused on government and company policies since they are considered the most influential actors when it comes to the economy. However, even though the literature frequently mentions how the change would highly depend on several aspects, there is an actual lack of attention to several subjects that are equally important for a full understanding of the economical, social and environmental consequences of its implementation.

According to several authors, among these many subjects that need to be more deeply discussed are the consumers, urban contexts, and what the future would look like.

Even though, the norm in the literature is to assume the consumer engagement with innovative forms of consumption as a central key for the concept to work, a more detailed view of the domestic sphere is constantly

left out. The lack of discussion on the time dimension in the discussions and what would be the impacts on people's lives at the present moment and also future generations compromise the understanding of what a future may look like and what changes would happen on a daily basis.

At the same time, when it comes to urban contexts there is also room to discuss what it takes to implement the CE principles in cities in general. Even though this subject has been an object of increasing attention in the past few years there are still only a few discussions emphasizing what cities are doing to transform urban economies.

Taking this into consideration and seeing the need for a discussion on these subjects as an opportunity this project is driven by the following questions:

1. What is the role of urban design within the circular economy future?

2. How can urban interventions support a new lifestyle promoted by this shift in the economic system?

02

FUTURE SCENARIOS

02 . FUTURE SCENARIOS

To answer the driving questions it was necessary to understand what the circular future look like and what the implications would be on daily life, so the following steps were done:

1. PROSPECT ON POSSIBLE FUTURE SCENARIOS:

This step was focused on the study of different plausible scenarios for a circular future proposed in the following literature:

- Circular Futures: What will they look like? by Bauwens, Hekkert, and Kirchherr (2020)

- Report Futures Beyond GDP Growth (2018)

2. PROSPECT ON SWEDEN'S POSSIBLE FUTURE SCENARIO

Based on these two studies and the current context of Sweden regarding the circular economy it was studied what would be the possible future scenario for Sweden

3. PROSPECTION ON FUTURE LIFE-STYLE

After the decision of what would be the plausible future scenario for Sweden a parallel between the studies was drawn to define what would be the most suitable future life-style.



Image source: Report Beyond GDP Growth (2018). Edited by author.

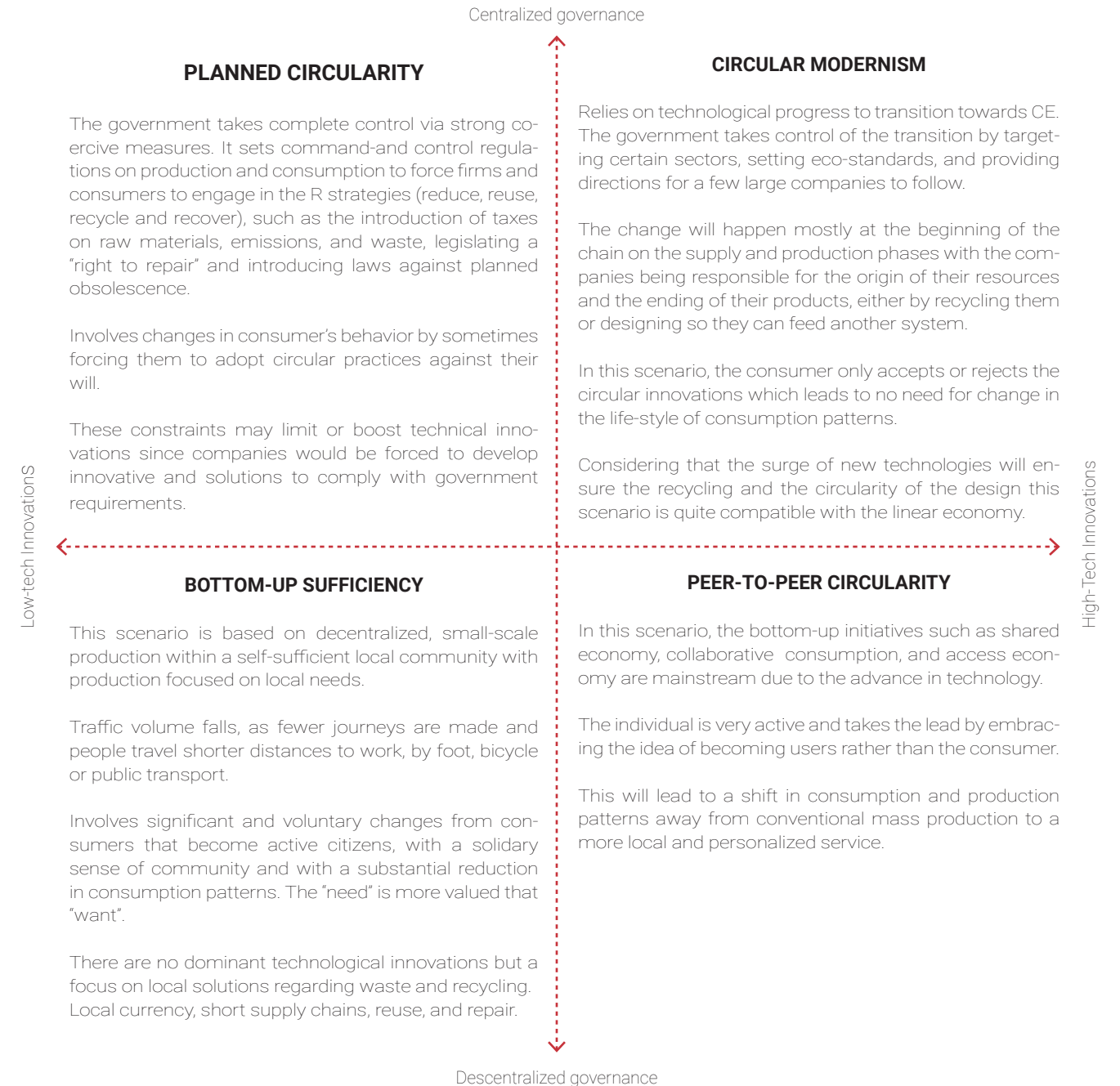
02.1 PROSPECT ON FUTURE SCENARIOS

02.1.1 CIRCULAR FUTURES: WHAT WILL THEY LOOK LIKE? Bauwens, Hekkert and Kirchherr, 2020

In this study, the authors aimed to fill in the gap of discussion on what a circular future might look like.

They proposed four different plausible scenarios using a 2X2 matrix method. The key drivers are: High-tech or low-tech innovations, and the configuration of the governance regime, centralized or decentralized.

Their resulting scenarios show that CE can be organized in very contrasting ways and according to the authors they can be considered as extreme cases of continuums with them not being mutually exclusive and with the possibility of co-existing to some extent.



02.1 PROPECT ON FUTURE SCENARIOS

02.1.2 FUTURES BEYOND GDP GROWTH: SCENARIOS FOR A SUSTAINABLE BUILDING AND PLANNING KTH - School of Architecture and the Built Environment, 2019

In this report, the research program aimed to contribute to the research field of what a sustainable society and what a sustainable economy that is not based on growth might look like.

The authors proposed four scenarios for Sweden 2050 in which they show different directions society could take to reach sustainability goals. Their scenarios do not necessarily have to be built on the current economic logic.

The scenarios were:

- Collaborative Economy
- Local Self-Sufficiency
- Automation for Quality of Life
- Circular Economy in the Welfare State

Taking into consideration that Circular Economy is the central factor of this project, this analysis will only take into consideration the last scenario Circular Economy in the Welfare State.

All the scenarios proposed in this report can reach the goal of 0.82 metric tons of CO₂. However, it is assumed by the authors that Sweden will be fossil-free by 2050 and that a vegan diet is assumed by all of them. International air travel was excluded from the scenario calculations.

CIRCULAR ECONOMY IN THE WELFARE STATE SCENARIO

This scenario relies on the state making the majority of decisions concerning governing society and uses both carrot and stick to encourage resource efficiency in all parts of society.

The government gives conditions and incentives for the efficient use of resources via policies that are aimed to reward sustainable design and innovation, reduce the extraction of raw resources and encourage lower consumption patterns.

In this scenario waste is a nonexistent concept since all products are now designed to be dismantled and reused. Recycling only takes place when materials can no longer be reused and consumables are made of biological ingredients that contain no hazardous substances and can be safely returned to the environment.

The population is centralized and concentrated in metropolitan regions such as Stockholm, Gothenburg, and Malmö but also with hubs of activity in regionally and central cities with universities and colleges. The urban land is intensively used and the ecosystems included and the countryside is sparsely populated but intensively used to supply the population in the cities.

The economy is based on the consumption of services such as welfare, culture, and outdoor activities in nature. Tasks are taken by the public sphere, private, cooperative, or social enterprises.

This scenario reached a total of 830 kg CO₂ eq./capita and it is the one that most resembles contemporary society.

02.2 PROPECT ON SWEDEN'S FUTURE SCENARIO

Looking at the studies one can see similarities between the Circular Economy in the Welfare State by the GDP report and the Circular Modernism and the Peer-to-peer Circularity scenarios by Bauwens et. al.

According to Bauwens et. al. (2020), the Circular Modernism scenario is the one that most likely would happen due to the similarities with the current discussions of CE literature that often promotes a high-tech innovation overseeing socio-cultural changes and leaving economic growth unquestioned.

However, specialists define the desirable scenarios as a combination of many rather than one in its pure form.

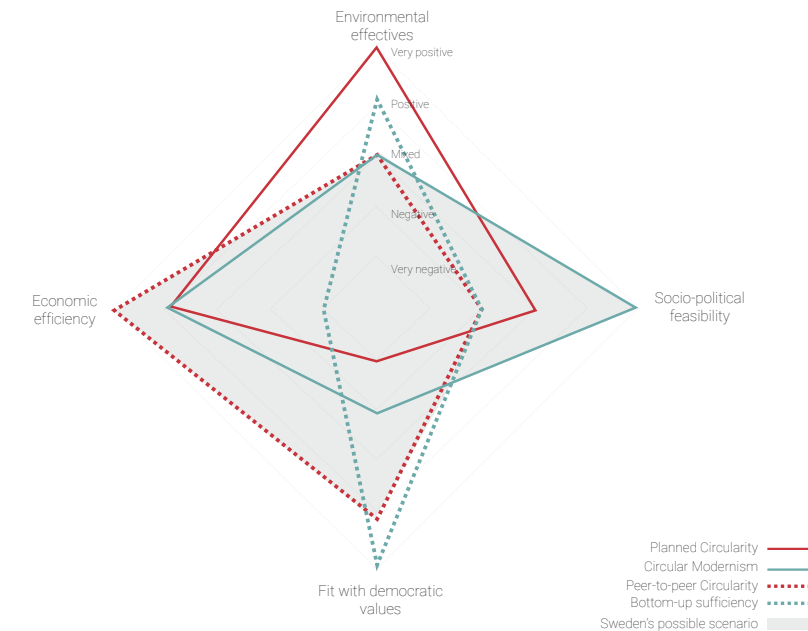
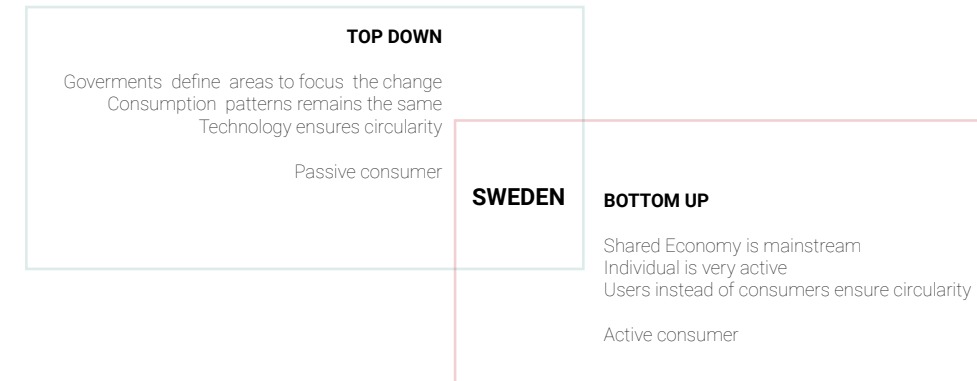
The ideal aspects included in this mix would be the product reuse and sharing practices facilitated by certain enabling technologies such as 3D printing, collaborative platforms as well as decentralized production, and governance of multilevel framework in which the government would provide directions

to safeguard the CE objectives and also encourage innovation and experimentation at the local level.

These characteristics, which can be found in both Circular Modernism and Peer-to-peer Circularity, when faced with the Swedish context can already be found in the society.

The sharing initiatives coming from the government, academia, and civil society alongside with government first actions to create guidelines and directions on broader perspectives lead us to the conclusion that Sweden has the potential to reach the desirable scenario, especially if one considers the strong welfare state and the strong role that research and technology innovation takes on the country.

In the next few pages, the individual aspects and the consequences on daily life will be explained in more detail.



Core upsides and downs from the scenarios.
Souce: Bauwens et. al. (2020) Edited by author.

02.3 PROPECT ON FUTURE LIFESTYLE

RESOURCES

The use of raw materials is heavily taxed, therefore exploitation is at a minimum.

Companies are mostly circular and there is no waste due to high technological advances in recycling and redesign of production systems.

Energy will be decentralized to release pressure on the national system.

Local materials will have priority over imported ones and technology will increase the capacity of production.

A large proportion of food production is domestic and greatly improved due to technology.

Large-scale investments in the electrification of roads in order to keep the size of batteries down and reduce the use of rare materials.

Food waste is no longer a problem, everything is composted locally for food and energy production.

No water is wasted and a maximum is reutilized locally.

Recycling is highly developed in a few sectors where the government gives priority.



Image source: Rhett A. Butler.

02.3 PROPECT ON FUTURE LIFESTYLE

GOODS AND SERVICES

There will be a mix of circular companies and sharing systems. Trading and repair centers will become key places.

People will have a better relationship with companies and they will allow more use of their data in exchange for personalized services and products from circular companies.

Products will be rented and upgraded when necessary and returned to the companies, which means people would be able to come back to physical stores more often.

Products will also be customized and produced locally with 3D printing with biomaterials.

Consumption will be reduced to some extent due to bottom-up initiatives such as sharing economy, which will become mainstream and turn individuals into active consumers where they are part of a more collaborative society by sharing spaces and working together to develop practical skills in order to live more resource-efficiently. The younger the generation, the more active they are.

Some part of the society will still be passive consumers that don't want to be part of the popular shared system.

The government will encourage and incentivize bottom-up initiatives.

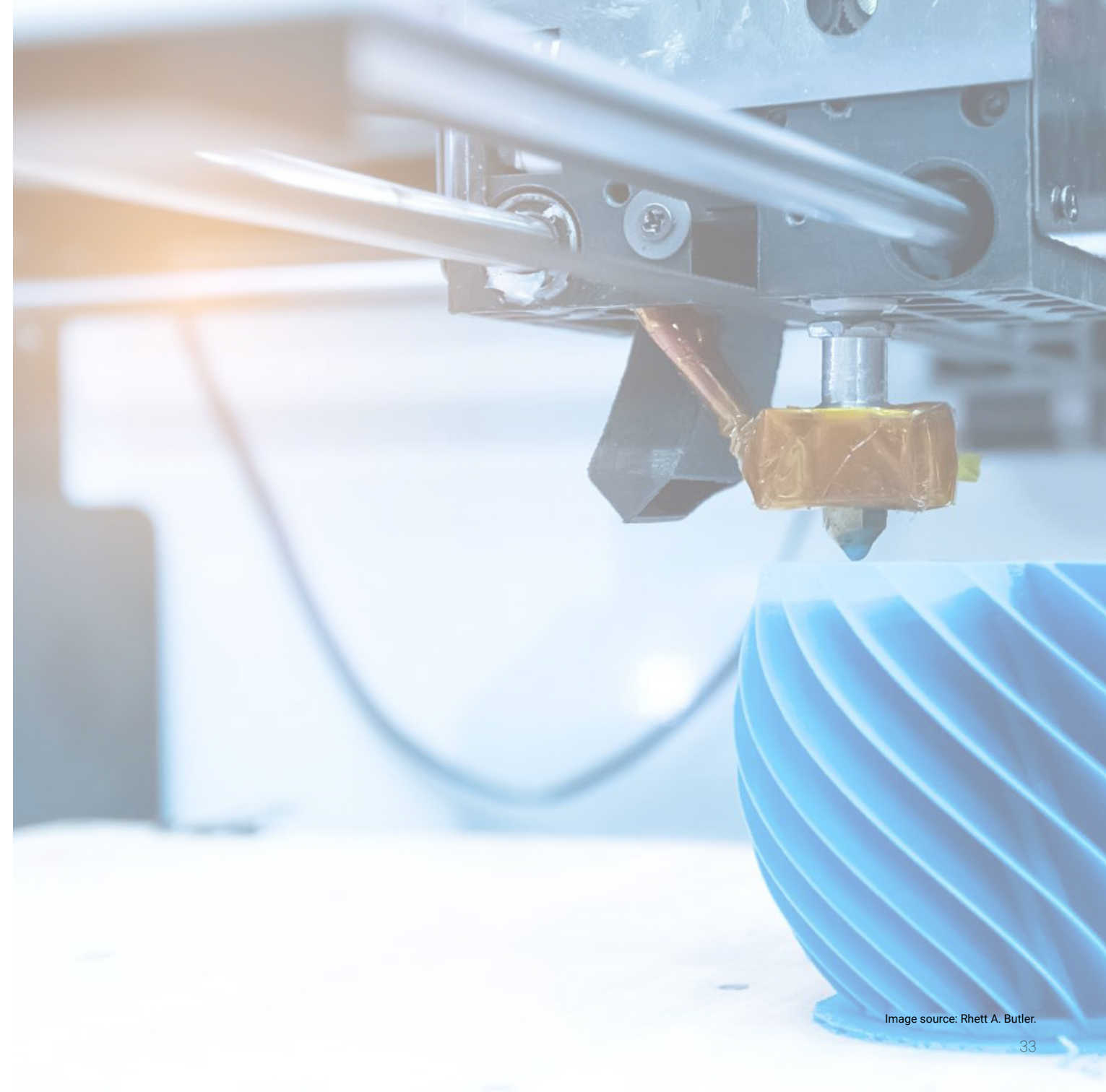


Image source: Rhett A. Butler.

02.3 PROPECT ON FUTURE LIFESTYLE

LIFESTYLE

There will be a high demand for creative and high technology jobs, which will lead to more people with higher education.

Fablabs and universities will have a strong local foothold.

People will work less, 30h per week will be the norm and this will entail people investing their time in their welfare and place more value on experiences.

People will eat less meat due to growing awareness of the climate impact and grown lab alternatives, which will also lead to more interest in growing their own food.

Independence and the opportunity for genuine experiences are valued, entailing the greater importance of outdoor life and quality of the urban public spaces, nature will be highly valued.

People will live, work, shop, and spend their free time at the same place.



02.3 PROPECT ON FUTURE LIFESTYLE

MOBILITY

Due to the advance of technology people's exchanges will take place primarily digitally.

Physical boundaries between work and other activities have been blurred and relaxed. Virtual meetings, especially for work have been increased, there is no need to commute to work every day anymore.

The majority of physical travel is local, where a large proportion consists of walking and cycling.

Transportation now consists of shared services. Most public transportation is electric-powered on the road and transportation has decreased.

At the national and European levels, high-speed trains have become the main choice.



02.3 PROPECT ON FUTURE LIFESTYLE

BUILT ENVIRONMENT

The private heated living space per person has decreased, but instead, people have access to larger and common areas in the same building. Shared home functions that occur to a large extent are kitchens and common uses such as office and living room.

Through technical solutions, buildings will be flexible with movable components with the capability to be assembled and disassembled when necessary. Adaptable to different users and different places.

Due to the high cost of building materials and high taxes for waste, construction is highly optimized, often in connection with existing buildings.

Workplaces will be tied to locations instead of the employer. An office will host people from several companies.

There will be less need for parking lots for cars but a great increase for bikes.

The ground floor will be always active with public functions.

Green infrastructure that promotes biodiversity in public spaces will be extremely valued.



02.4 LIFE STYLE CHARACTERS

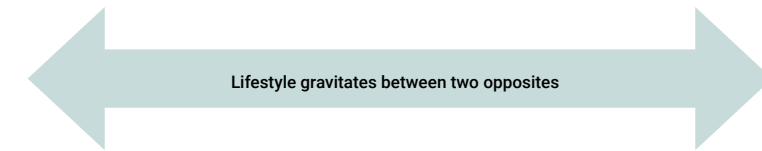
To better understand the impacts of the circular economy on daily basis and to comprehend and translate them into an urban design proposal, a few lifestyle stories were created. These stories were created based on a few characters whose consumption behaviors would gravitate between two opposites, the Passive Consumer and the Active Consumer, according to the future scenarios presented.

The active consumers would represent people that engage in sharing/repair initiatives, consume less, or use materials that are not harming the environment. Their consumption behaviors are based on "need" before "want."

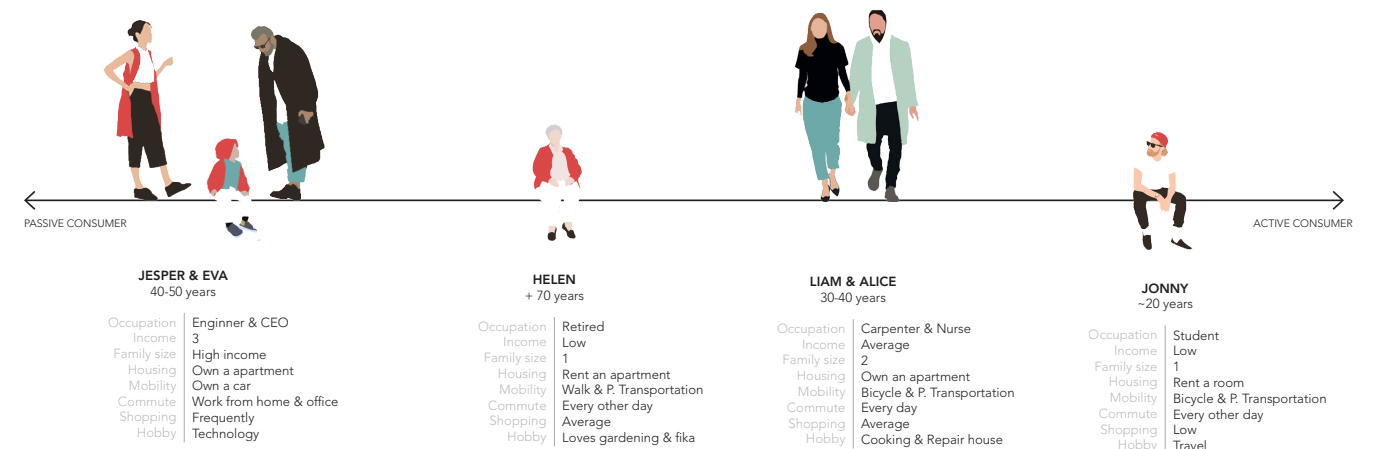
Passive consumers are the people that rely on the economic circular system to have their carbon footprint reduced to a minimum. Their consumption behaviors would be the same as today - buy and discard - and based on the "want" over "need."

Considering that Norra Fälåden presents great a diversity of the population in different life stages these characters should also represent this diversity as a way of ensuring that the design proposal would give support to inhabitants with different backgrounds in different phases of life.

The characters will be presented in this section, however, their life stories will be explained in more detail with the proposed design in section 06 Lifestyle Stories on page 124.



PASSIVE CONSUMER	ACTIVE CONSUMER
Belongs to Modern Circularism	Belongs to Peer to Peer Circularity
High consumption Commute everyday Private Transportation Rely on the system to be circular	Low consumption Minimize long distance commute Public Transportation or shared Collaborative with society
Values "want" before "need"	Values "need" before "want"



03 SITE ANALYSIS

03. LUND

Located in the south of Sweden, Lund is a city within Skåne province that integrates the Öresund region, a metropolitan area with a population of 4 million people that includes the cities of Malmö and Copenhagen.

Lund itself is the 12th largest city of Sweden and has a population of almost 125 000 inhabitants, with 95% of these living in urban areas and entailing a density of 4.852 inh./km².

In addition to the residents, up to 40 000 people commute to Lund to work while only 23 000 commute from Lund to another municipality.

As home to one of the oldest universities in Europe and one of the most prestigious in the country, the city has a strong student culture in which the students can reach up to half of the city's population.

The university also has several buildings and activities spread out through the city center and other parts of the city and has made Lund a regional center for research and technology innovation.



Regional context of Lund

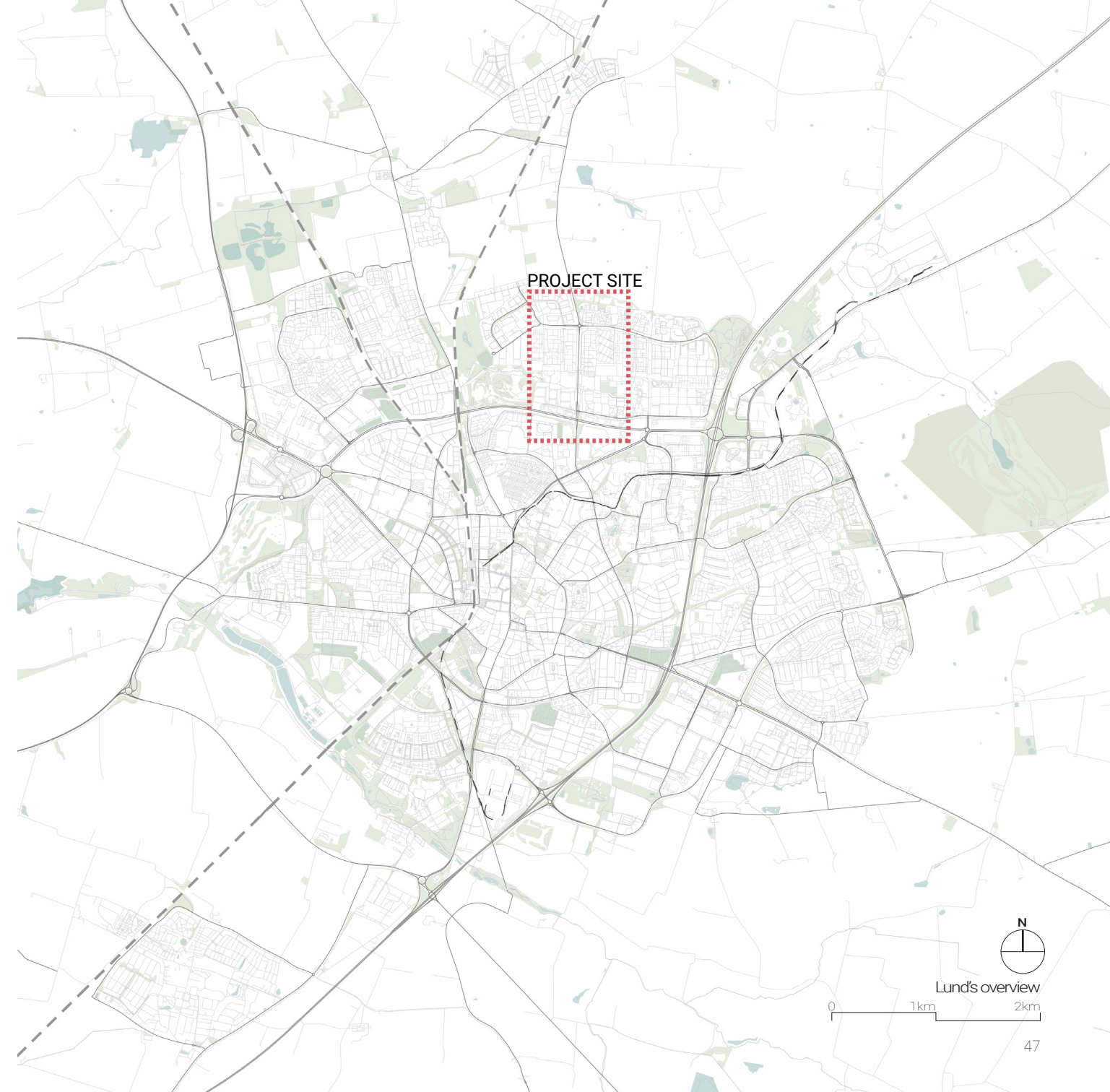
03.1 OVERVIEW

As part of the Öresund region and home to Lund University, the city is taking a new step as a regional and international center for innovation and knowledge.

Currently, the city is expected to grow at a rate of 1.3% per year and the municipality goal is to enable more housing in the next decades that will be built through densification in unused or disused sites within the urban perimeter rather than transforming rural sites into urban lands. (Lund, 2020).



26 000 new homes by 2040
1200 per year



REGIONAL CONTEXT

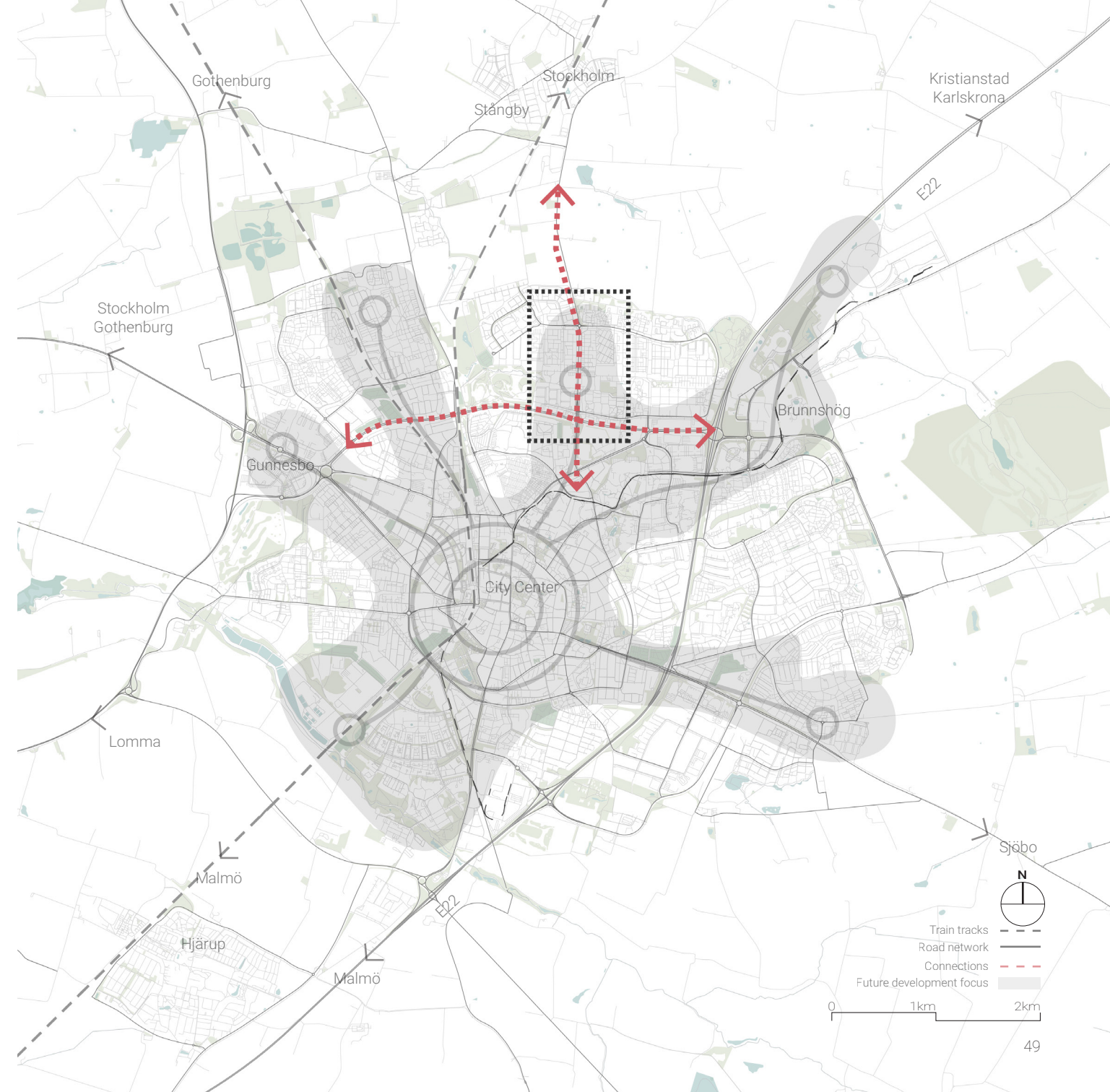
The site is located in the north of Lund in an area called Norra Fälåden. There are several important regional connections cutting through the site.

To the south, the site connects the neighborhood to the city center and to the north it connects to Stångby, a village of 1200 inhabitants.

From east to west one can find the Northern Ring that makes the main connection from several neighborhoods on the northern part of the city, including Gunnesbo to the west,

the main shopping center area after the city center, and Brunshög the newest municipalities development area with housing, offices, and parks. It also connects the surrounding neighborhoods to other important cities such as Karlskrona, Sjöbo, Malmö, and Stockholm.

The site is also located within the area defined by the municipality to be developed in the next decades to supply the housing demand in the city.



LUND & CE INITIATIVES

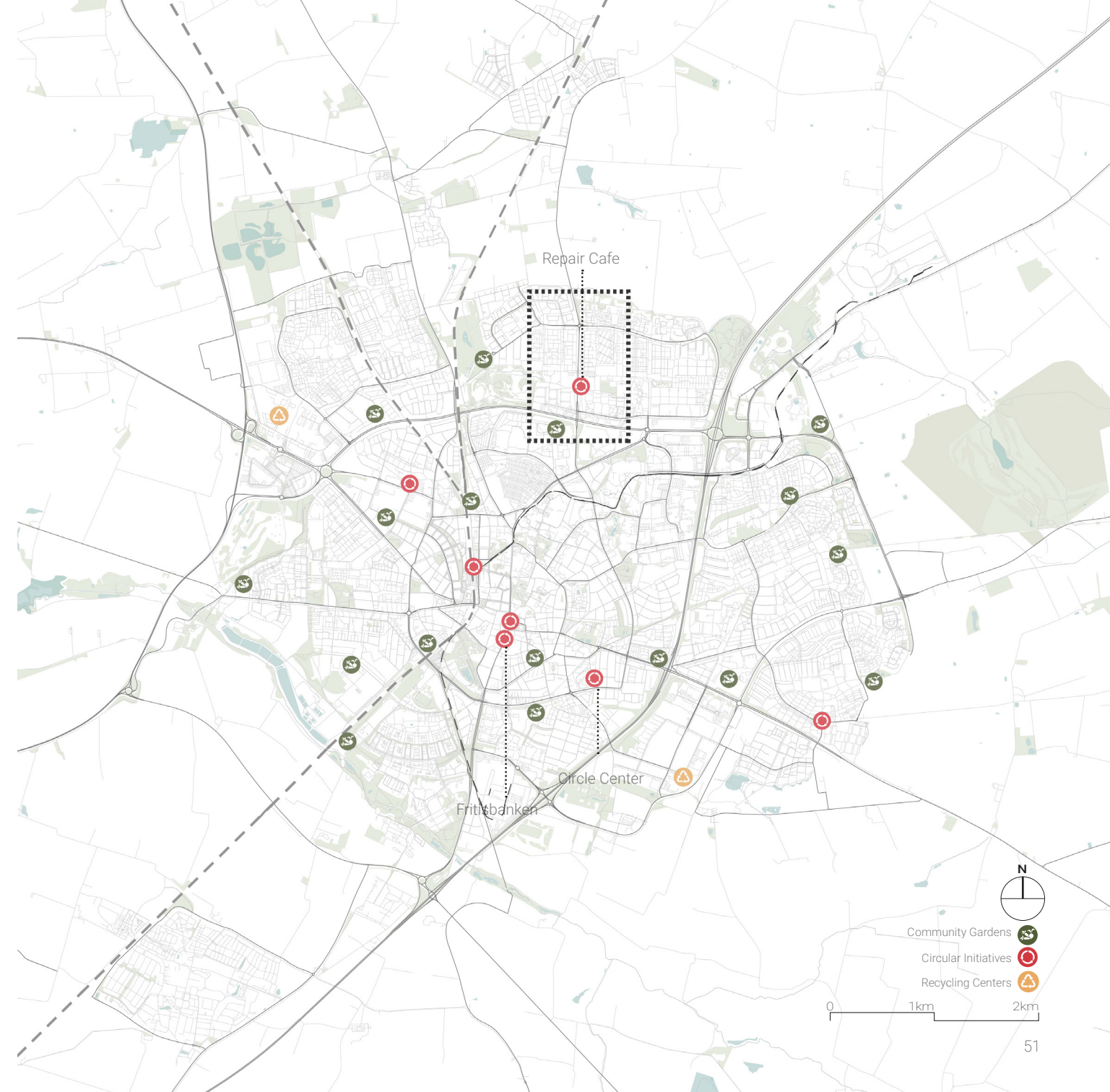
Lund has, just as the rest of Sweden, already started taking steps into promoting initiatives towards a sharing economy.

Among several community gardens spread throughout the city, there are several stores with a focus on extending the life of products, such as:

- Second-hand stores
- Circle center: an initiative from Lund university that rents products to the community
- Fritidsbanken: A municipality's store that loans for free different products
- Repair Cafe: an initiative that promotes workshops to repair items for the community.



Fritidsbanken

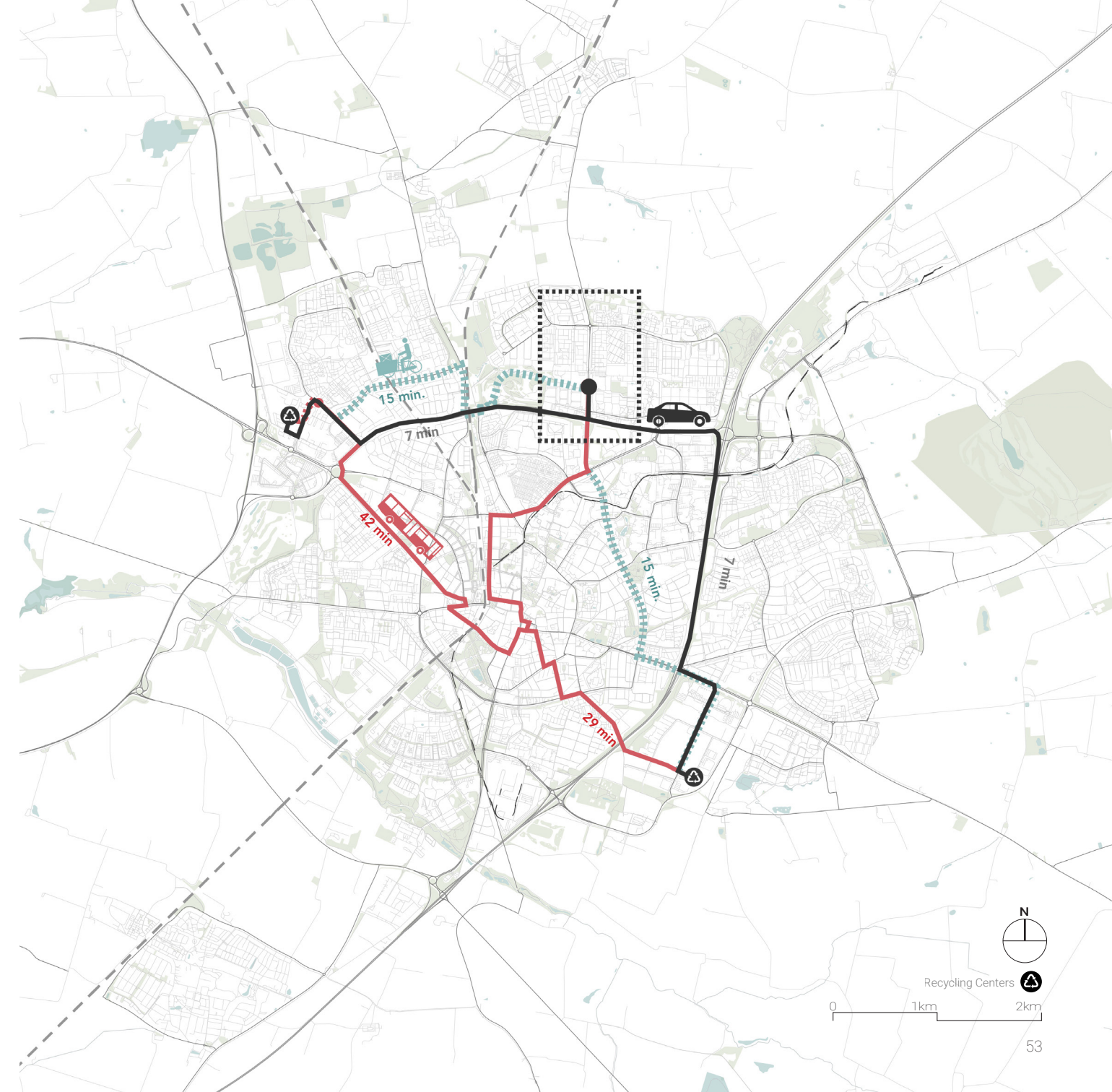


RECYCLING ACCESSIBILITY

Lund has an excellent recycling system where only 2% of the waste goes to landfills. Inhabitants separate their common waste at home and products that are no longer wanted are brought to the two recycling centers at the edge of the city.

At a first glance, the centers seem to be quite accessible, a car ride can take around 7 minutes. However, if a person doesn't own a car and depends on the bus the ride can take six times longer.

With the bike, the ride can be shorter than with the bus, but it also can be hard to carry bigger or heavy objects if you do not have a cargo bike. Considering that cargo bikes are an expensive product and there is no renting system for them, cycling can be the last option to be picked by a person.



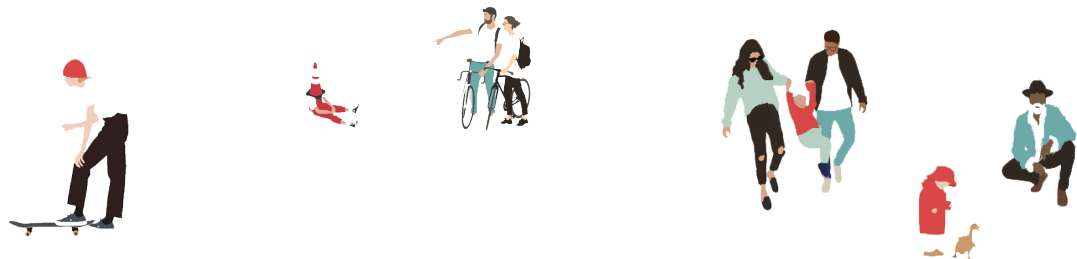
03.2 NORRA FÄLADEN

Norra Fälåden is the second-largest district of Lund with 13 127 inhabitants, reaching up to 15% of the city's population. The average age of the population is 33 years, just under the city's average of 38 years.

The district has a great diversity when it comes to housing, activities, and inhabitants. There are several parks, sports courts, and playgrounds including the Sankt Hans Park on the western part of the district, one of Lund's largest green areas.

The neighborhood is mostly residential and the key place is named Fåladstorget, a square with many activities for its residents such as schools, health center, pharmacy, cafés, church, elderly homes, among others.

In addition, several types of housing typologies for rent and owning and the location close to the university entails a variety of nationalities and lifestyles in the neighborhoods that goes from early to late stages in life such as young to mature students, young couples, mature couples with kids, and elderly.



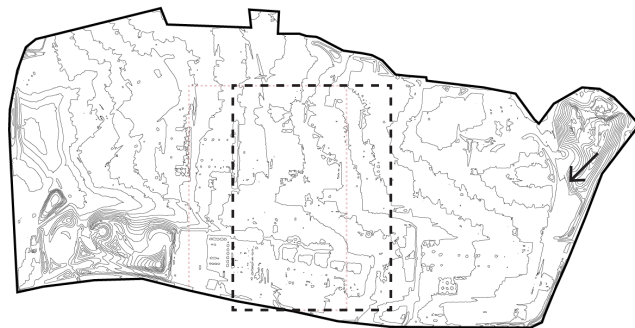
OVER VIEW ANALYSIS

TOPOGRAPHY

When analyzing the curves the site has a total high difference of 60 meters. However, when not including the hills on the northeast and the southwest the difference is only 30 meters.

When walking at the site the impression given is that the terrain itself is quite flat and easy to walk and cycle.

Within the site district, the height difference is only 12 meters.



ROAD NETWORK

The district has a limited network for vehicles. It has only a few main roads that circle the area and makes the connection to local roads with cul-de-sacs to access the residences.

The site has several bus stops along the main roads and in general, has a good bus connection to the city center with a trip lasting only around 15 minutes.



PEDESTRIAN & BICYCLE NETWORK

As a pedestrian and cyclist, the site has a network with a great capillarity where one can reach everywhere inside the district.

Even though a cyclist does not need to share lanes with vehicles the lanes are mostly shared with pedestrians and lack a proper signs.



BLUE & GREEN INFRASTRUCTURE

The district is very well served of green areas with several parks of different sizes and recreational activities in which some of them contain ponds and streams that are appreciated by the residents.

However, within the built environment, the green lacks biodiversity, and it is constituted mostly of grass and high bushes that can form barriers sometimes. The blue infrastructure within the streetscape is conventional and underground.

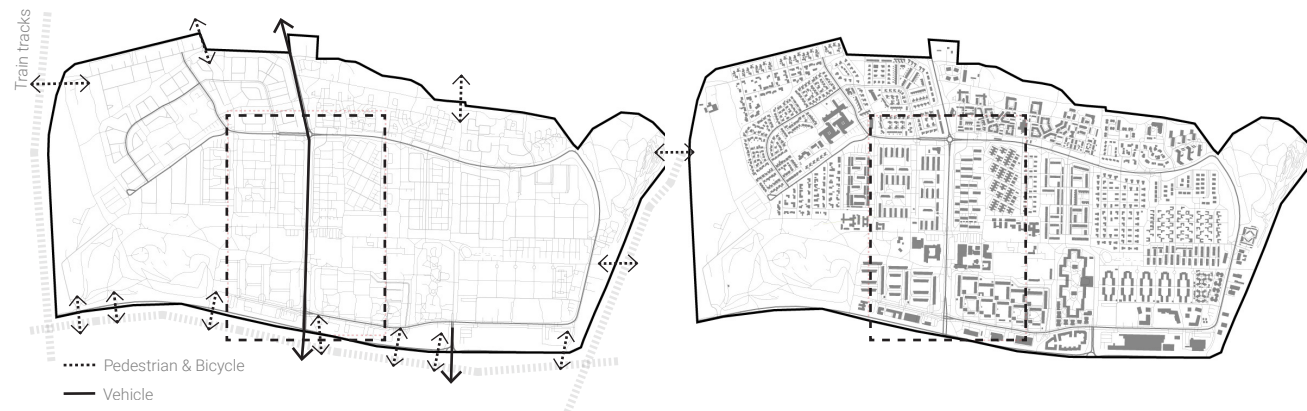


OVERVIEW ANALYSIS

CONNECTIVITY

The district is surrounded on the east and south by highways, and on the west by train tracks. The main vehicle connection of the entire district with the other parts of the city is the Svenhögsvägen within the design site and due to the lack of other connections and high use of vehicles the site is currently suffering from traffic jams during rush hours in the morning.

The pedestrian connections are present in several places, however, 100% of them are underpasses or overpasses.

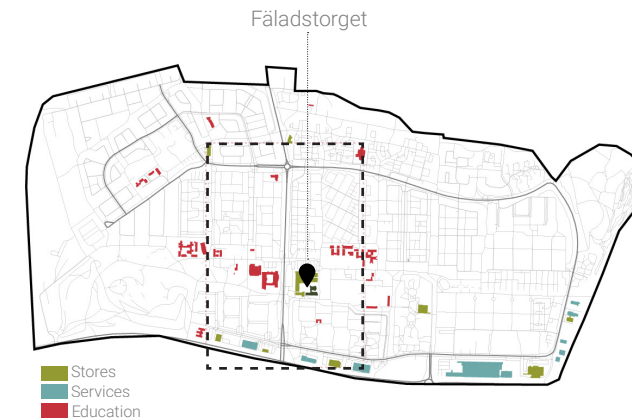


BUILT SCALE

The built scale shows a variety of spaces and housing typologies with buildings increasing scale in density and height as they get closer to the south, where the city center is located.

ACTIVE FUNCTIONS

The neighborhood is very well served with urban equipment and leisure activities, even though housing is the predominant use in the area. These services, especially the schools, are mostly located surrounding the Fäladstorget, the main square. But some can be found in the southern part of the site, close to the northern ring.



PARKING LOTS

As expected, the design of the street within the site is very car driven and a good amount of surface is dedicated to parking lots. Every single family has a private parking lot and some of the row houses and multifamily buildings have large parking lots nearby them.

The stores and service companies on the southern part also have a good amount of parking spots, even though some of them do not have car-related activities.



HOUSING TYPOLOGIES

Most of the housing in the area was built during the 1960s and 1970s during the Million Programme, a housing program implemented by the Swedish government that aimed to construct a million new dwellings during a ten-year period.

Situated close to the university the neighborhood has 30% of the student housing in the city, which is set to increase with new student housing being developed in the south-east in the next few years.

Norra Fälåden, of all of its housing stock, has a total of 70% of rentals, a high rate when compared with the rest of the city with an average of 45%. Which entails a need for housing for young people, more condominiums, and also ownership to achieve balance.

SINGLE FAMILY HOUSING
(own)



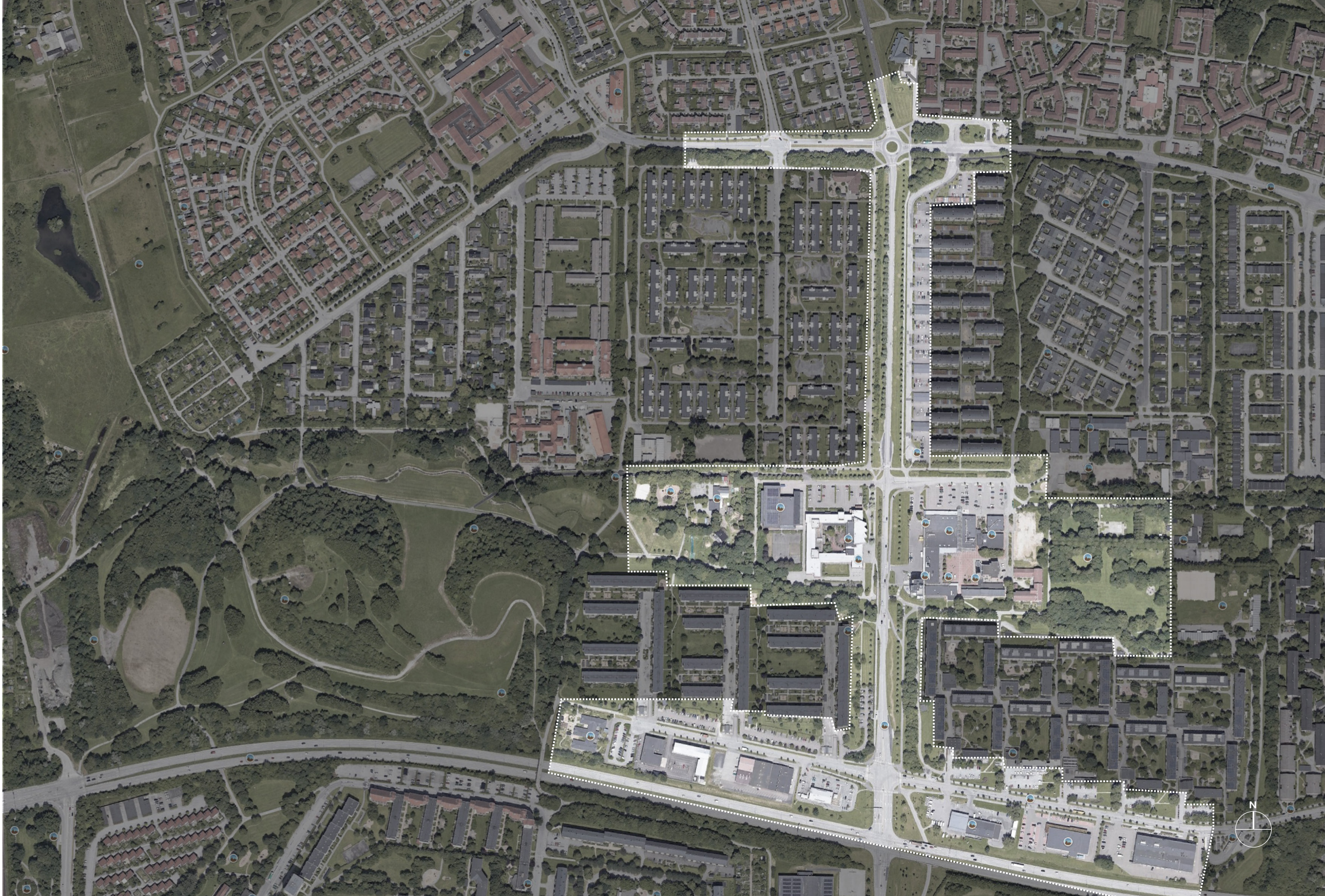
ROW HOUSES
(own)



MULTI FAMILY BUILDINGS
(own & rent)



03.3 SVENSHÖGSVÄGEN



CHALLENGES

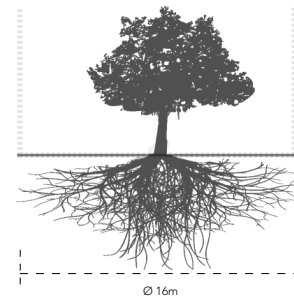
One of the main challenges faced during the project was the many rows of willow trees present on the site since in Sweden, a row of trees cannot be removed without permission.

At the same time, willow trees are also difficult to have around buildings since there cannot be any facade within a radius of 8 meters from their trunk. They have a shallow root system that can damage structures and can grow aggressively if not trimmed every year.

Another challenge was Fäladstorget that is located in front of the church but some entrances are unattractive. Some of them are

narrow and hidden and others are to back-side streets which doesn't offer an inviting atmosphere.

The buildings surrounding the square have their entrance to the square but their back-side to the street, with parking lots and docks making the interface between these buildings and the pedestrians, which causes the area to be not appealing for pedestrians and be mostly used for circulation rather than a place to stay.

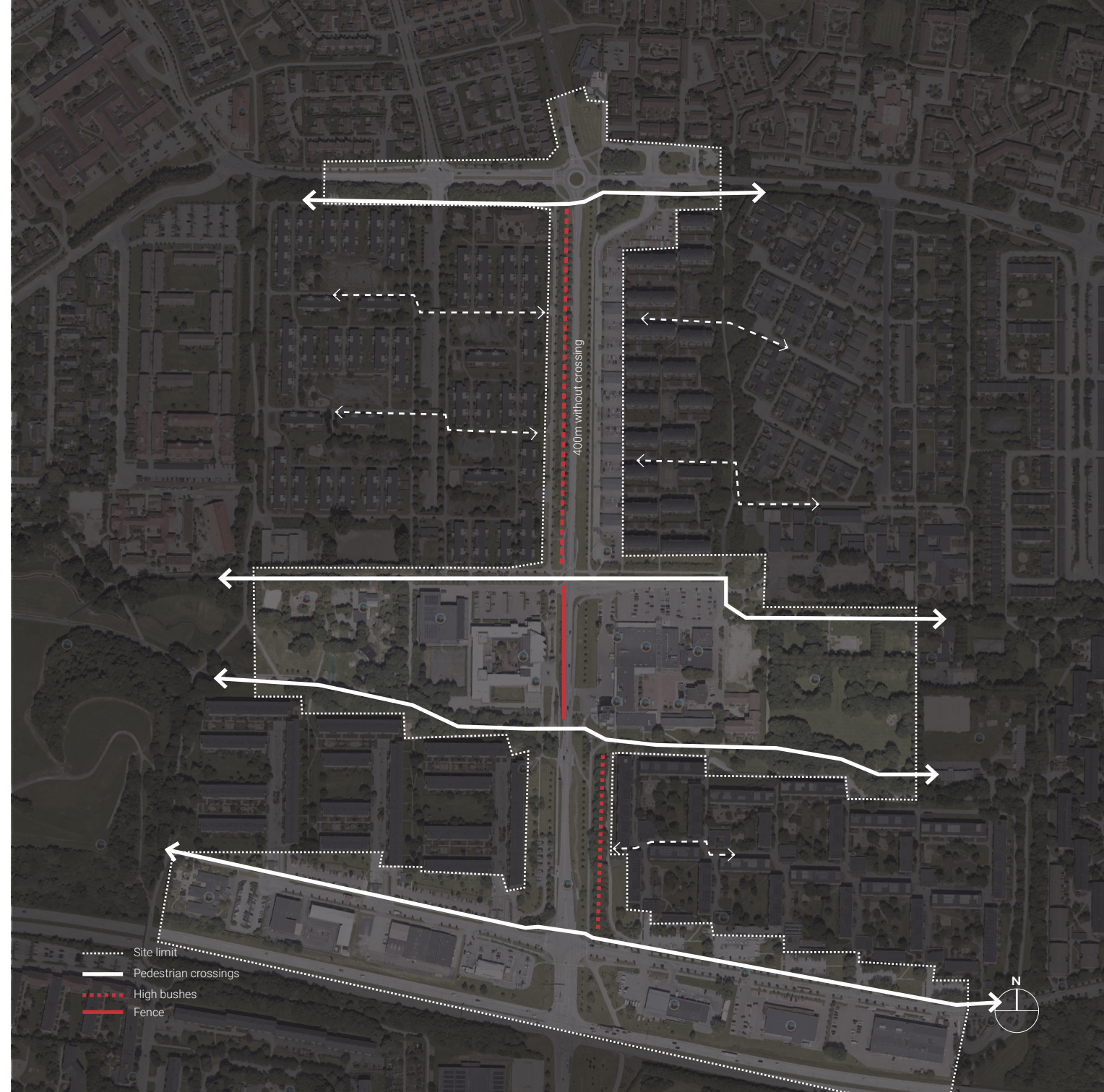


CAR PRIORITY

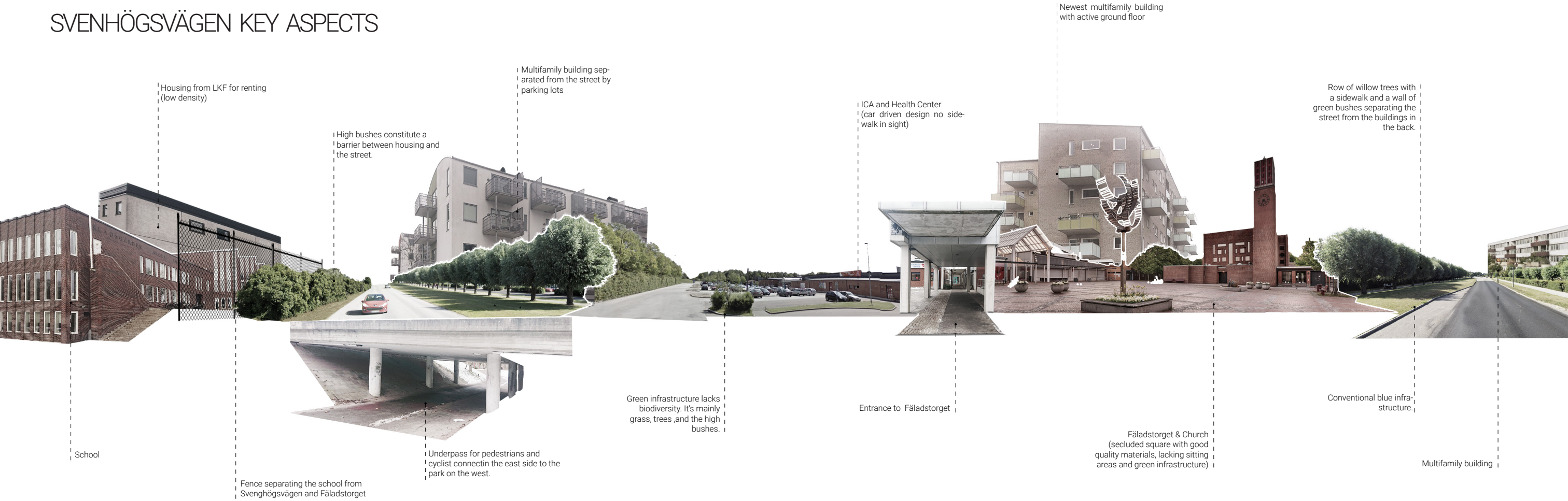
When looking closer into the street there are almost no crossings for pedestrians and cyclists even though the neighborhood, in general, has a good path network.

The street itself has a car-driven design and the presence of fences and large bushes with no interruption breaks the capillarity of the pedestrian network making it difficult for the inhabitants to cross between east and west.

There is also a lack of an interesting green and blue infrastructure and places to sit which reinforces the conclusion that the area itself is mostly used only for circulation rather than a place to stay.



SVENHÖGSVÄGEN KEY ASPECTS



Housing from LKF for renting (low density)

High bushes constitute a barrier between housing and the street.

Multifamily building separated from the street by parking lots

ICA and Health Center (car driven design no sidewalk in sight)

Newest multifamily building with active ground floor

Row of willow trees with a sidewalk and a wall of green bushes separating the street from the buildings in the back.

School

Fence separating the school from Svenhögsvägen and Fäladstorget

Underpass for pedestrians and cyclist connect in the east side to the park on the west.

Green infrastructure lacks biodiversity. It's mainly grass, trees, and the high bushes.

Entrance to Fäladstorget

Fäladstorget & Church (secluded square with good quality materials, lacking sitting areas and green infrastructure)

Conventional blue infrastructure.

Multifamily building

04 STRATEGIES

04.1 GOALS AND APPROACH

With a holistic approach, the project aims to propose solutions and interventions that support the new lifestyle that will surge according to future scenarios. These solutions, beyond promoting resource-efficiency, will also increase the quality of the public spaces and add social, economic and, environmental sustainability to the site.

Moreover, the design also aims to respond to the specific needs of the site and take into consideration the impact of the interventions at Norra Fälåden as a whole.

04. 2 STRATEGIES

DESIGN CIRCULAR

To promote a generative neighborhood that produces rather than only consumes through a system that involves different daily activities and basic resources such as water, energy, and food.

In this system, different structures and buildings would feed one another to keep resources as local as possible and promote resource efficiency.

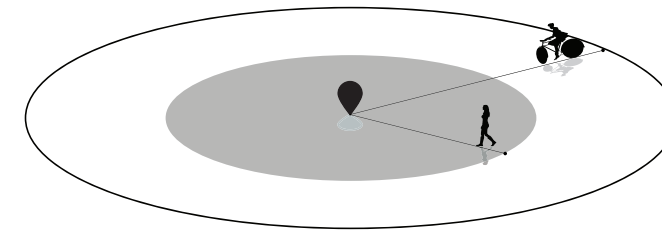


04. 2 STRATEGIES

5 MINUTES CITY

Provide an opportunity for people to live more locally by promoting a robust and more complete neighborhood by adding new functions and bringing important daily activities closer, such as recycling center, shopping, working, among others.

Promote local transportation and prioritize pedestrians and bicycle connections.



5 minutes walk
5 minutes cycling

04.2 STRATEGIES

DESIGN FOR LONG TERM THINKING AND RESILIENCE

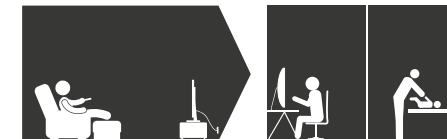
Our generation is the first one to feel Climate Change and the last one to be able to do something effective about it.

Design with long-term thinking is to include future generations in the planning process, consider the impacts of the transformations and also give opportunity for changes to happen when the time comes. These changes can either be positive or negative and that is the reason that, as part of long-term thinking, resilience is a significant aspect that promotes recovery, flexibility, and adaptability of the city.

Considering the advancement of technology the buildings could be easily assembled and disassembled. Flexible buildings can be easily adapted to the need of their users and fulfill different functions over time.



FLEXIBLE BUILDINGS

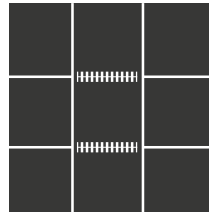


FLEXIBLE FUNCTIONS

04.2 RESPOND TO THE SITE

STRENGTHEN THE CONNECTIONS

The neighborhood has several activities and urban services that are appreciated by the population. New connections and an enhanced network will increase accessibility between these activities and facilitate the movement within the neighborhood.



INCORPORATE GREEN AND BLUE

Promote biodiversity and interesting streetscape with increased diversity of vegetation and the introduction of alternative urban drainage within the streetscape.



WILLOW TREE IDENTITY

Work with the willow trees and not despite or against them by embracing its presence and turning it into an identity for the area.



CREATE MEETING PLACES

Defining key places and promote places to stay.



STREET LIFE

Activate the ground floor with different public functions and services



05 PROPOSAL

05.1 MASTERPLAN



GUNNESBO

SANKT HANS PARK

STANGBY

Svenshögsvägen

BRUNSHÖG

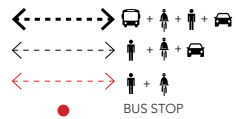
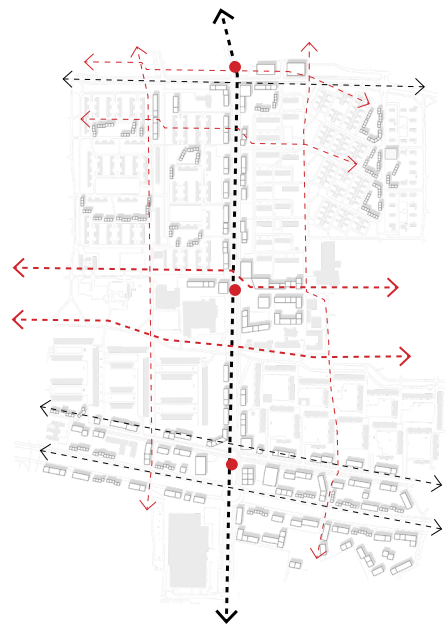
CITY CENTER

200m 100m 0

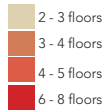


05.2 OVERVIEW MASTERPLAN

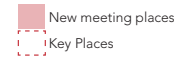
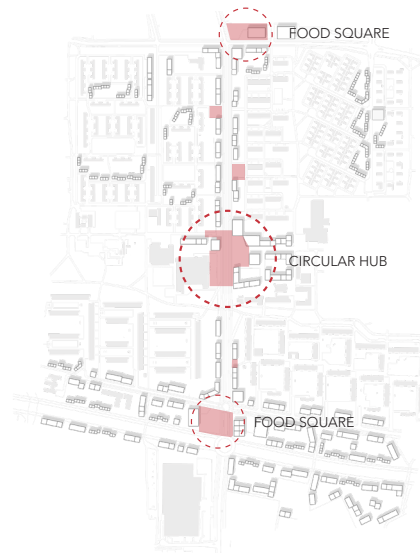
CONNECTIONS



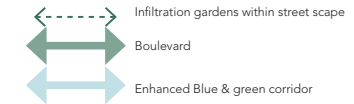
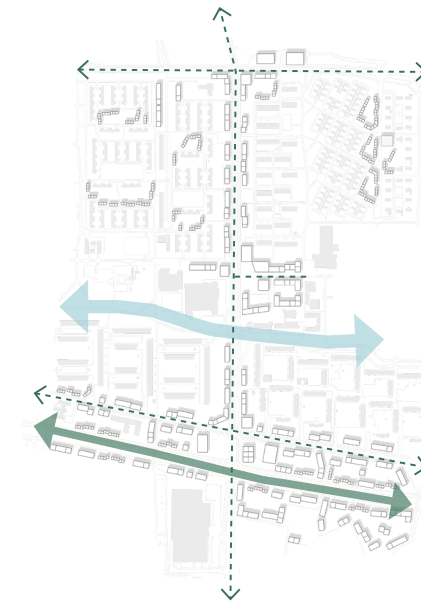
DENSITY



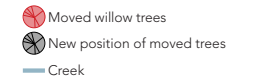
MEETING PLACES



GREEN & BLUE



WILLOW TREES

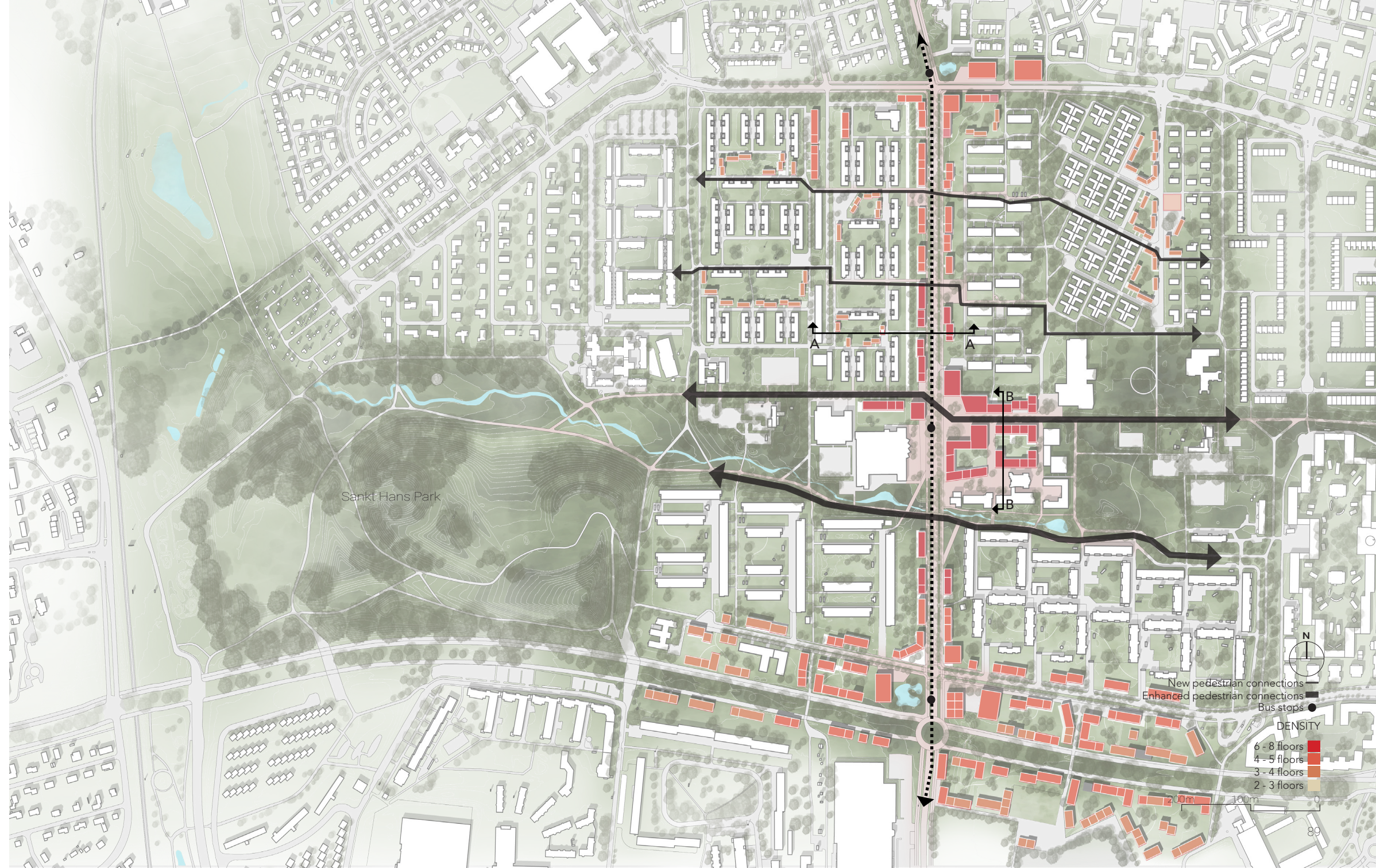


05.3 INFRASTRUCTURE

Svenshögsvägen is transformed into a street with a dedicated bus lane to reduce traffic jams during rush hour and becomes a lively street with a new design that prioritizes pedestrians.

More pedestrian crossings increase the walkability from east to west and the Boulevard (predicted by the municipality) increases the connectivity of Norra Fälåden to the south of the city.










Higher density around key places and bus station such as the Circular Hub and the Food Squares











05.4 FUNCTIONS & USES

The introduction of new functions promotes a more complete neighborhood in which the inhabitants can prioritize live more locally.

Existing Functions

-  Recreation for kids
-  Sports
-  Health center
-  School
-  Food store
-  Food store
-  Church
-  Elderly home
-  Health Center

New Functions

-  Restaurant
-  Fresh vegetables
-  Coworking
-  Charging stations
-  Parking
-  Recycling
-  3D printing
-  Workshops



05.5 GREEN AND BLUE

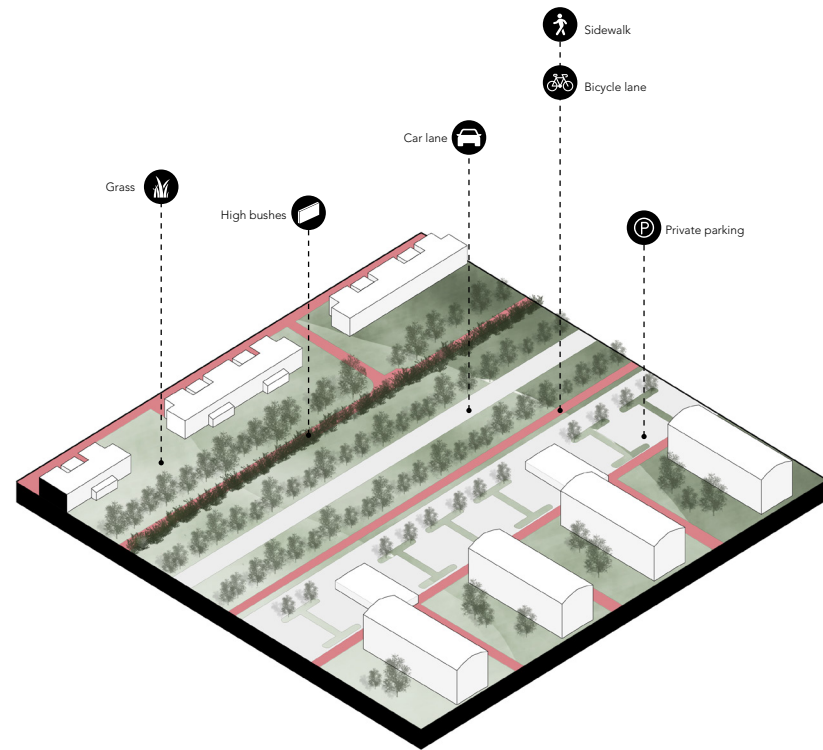
Several different studies were done for the proposal aiming to have a minimum impact on the willow tree rows. The final proposal resulted in moving only part of one of the rows located on the north of Svenshögsvägen. Some of the trees were then reallocated to key places within the site so they can grow untrimmed and become a landscape mark for these areas.

Other trees were moved into semi-private courtyards and schoolyards so they can become living tree structures to enhance local identity and create a playful environment for the children living on the site.

To enhance the existing green corridor that connects east to west of Norra Fälåden, the proposal used the existing topography to extend the existing creek into the east. Part of the removed willow trees was also placed alongside the extended creek since they can grow very well with the presence of water.

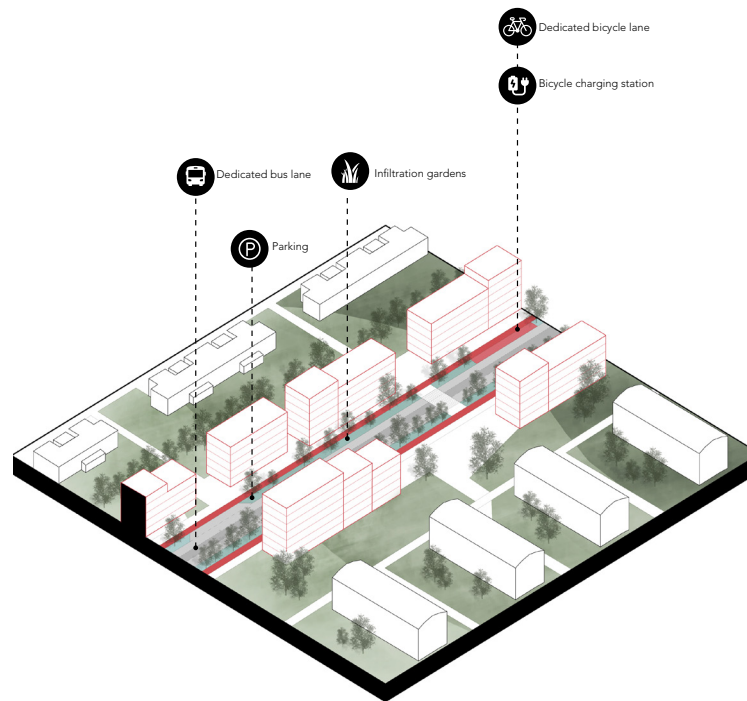


05.6 SVENSHÖGSVÄGEN'S STREET PROFILE



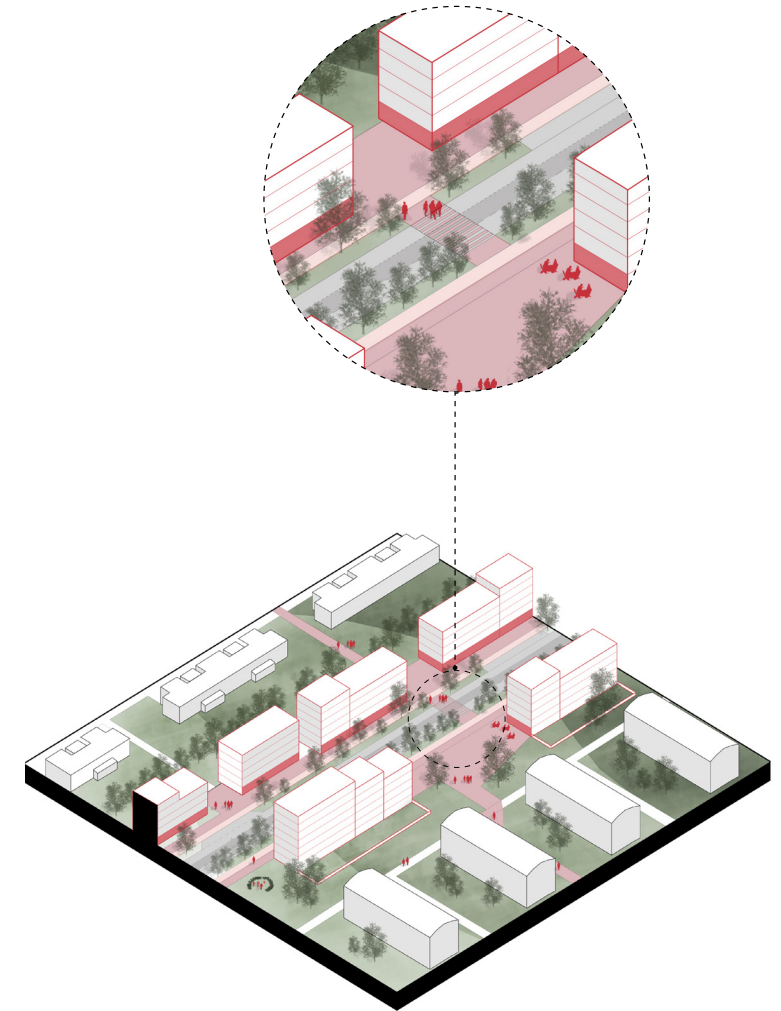
EXISTING PROFILE

Poor green infrastructure
 Conventional drainage
 No crossings
 Bushes imposing barrier
 Tree rows



NEW PROFILE

Dedicated bus lane to relieve traffic jams
 Street parking for car and bicycles
 Infiltration gardens



NEW PROFILE

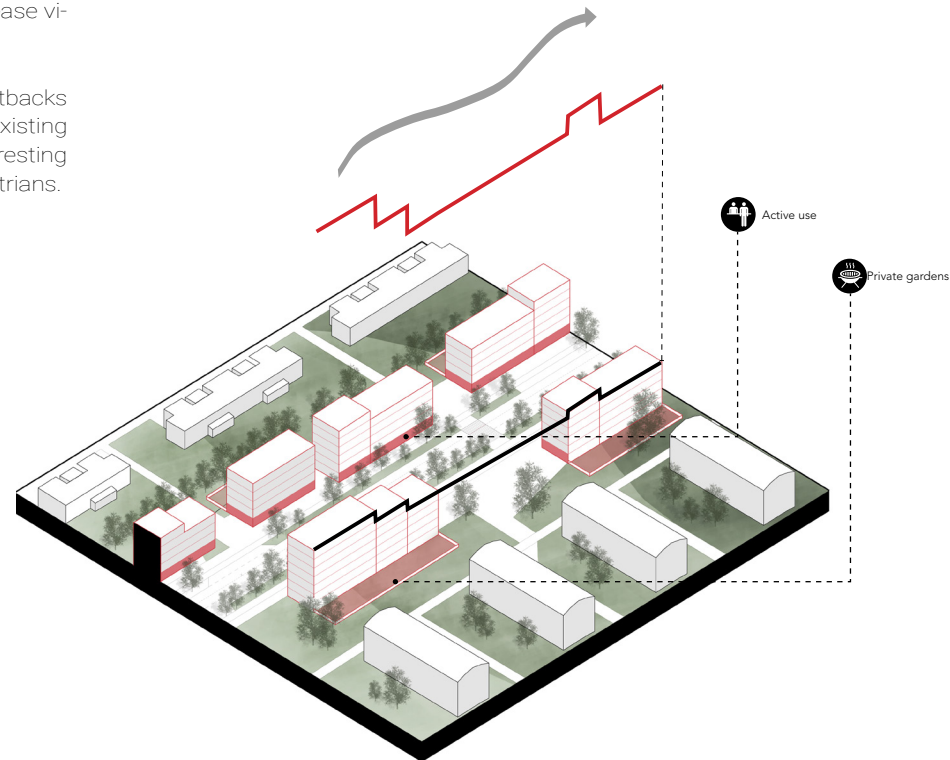
Meeting places
 Opened gardens

05.7 BLOCK TYPOLOGY

BUILDINGS ALONGSIDE THE STREET

Active ground floor at key places to promote street life and private gardens to increase visual connectivity

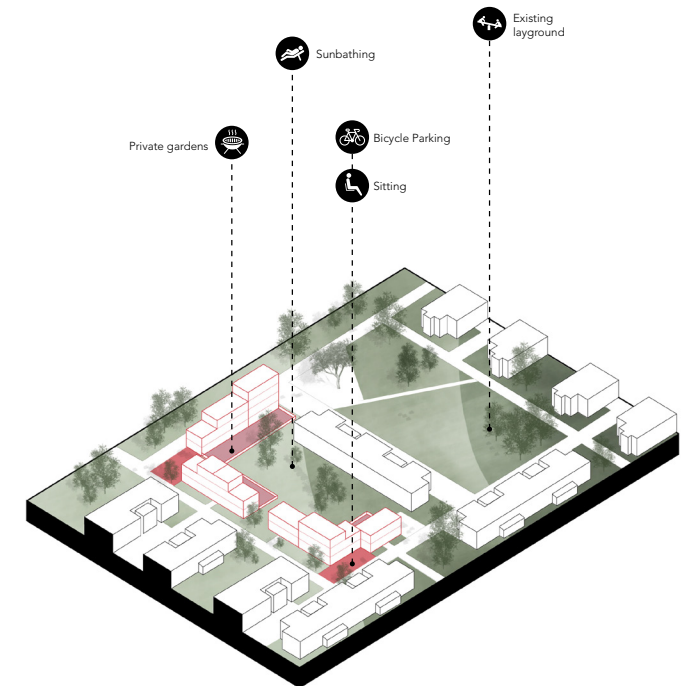
Different heights and distances for setbacks and will break the perspective of the existing row trees and promote a more interesting and instigating atmosphere for pedestrians.



BUILDINGS WITHIN COURTYARDS

Private gardens on the ground floor will increase visual connectivity for local residents.

The existing condominiums have several large opened areas with grass. They lack biodiversity but they create an interesting atmosphere when a person walks by. In order to keep this interesting aspect of the neighborhood, the new buildings will be placed on only a few of these areas and they will still form a semi-private courtyard.

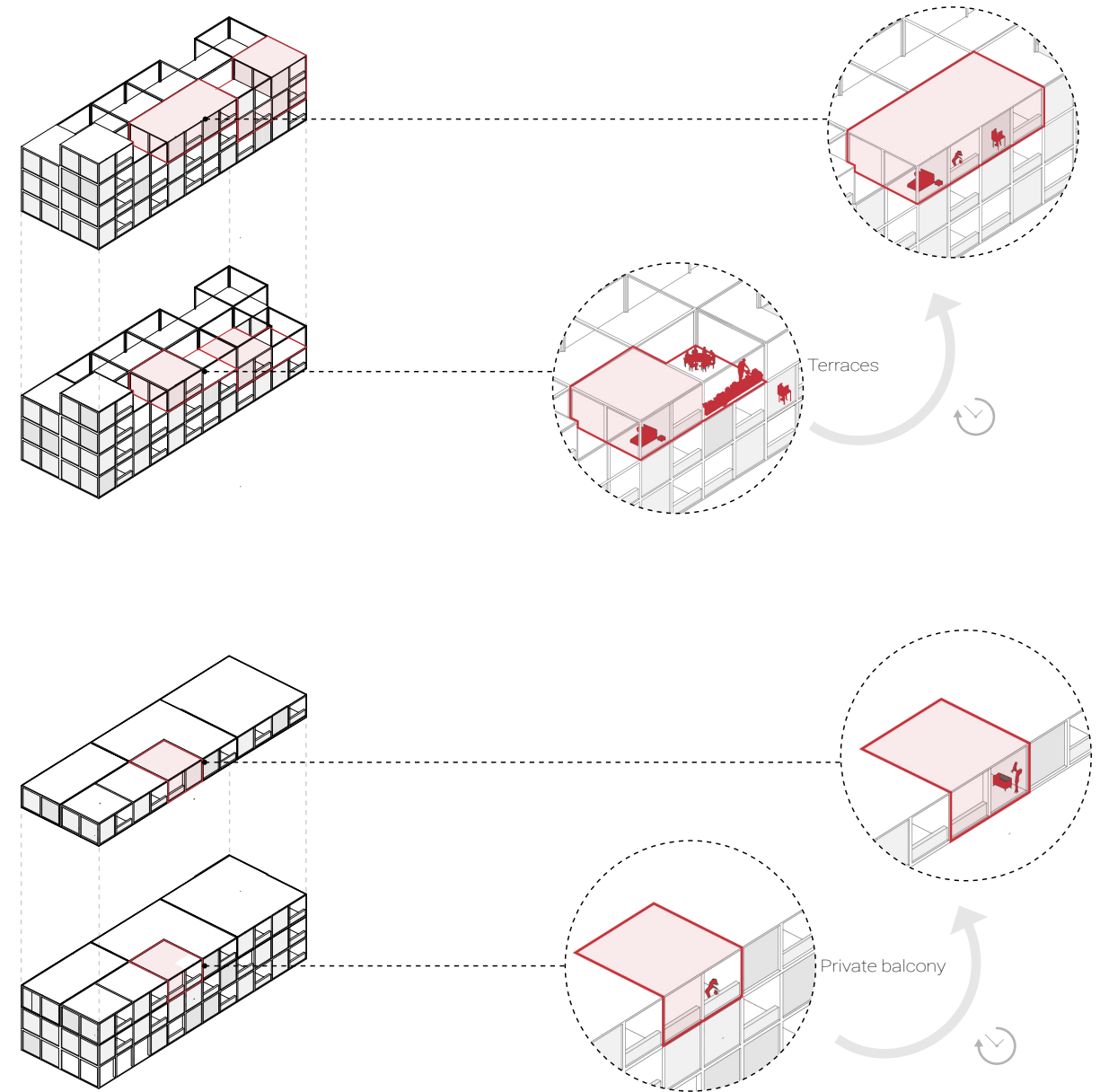
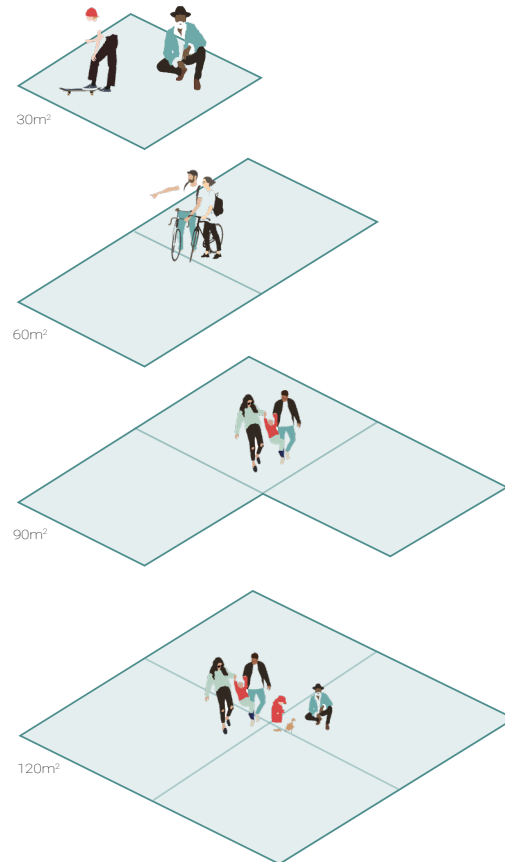


05.8 FLEXIBLE HOUSING

Flexible housing promotes diversity in the size of apartments so it can accommodate different lifestyles and also flexibility of choice by attending to different needs of the users in different stages of life.

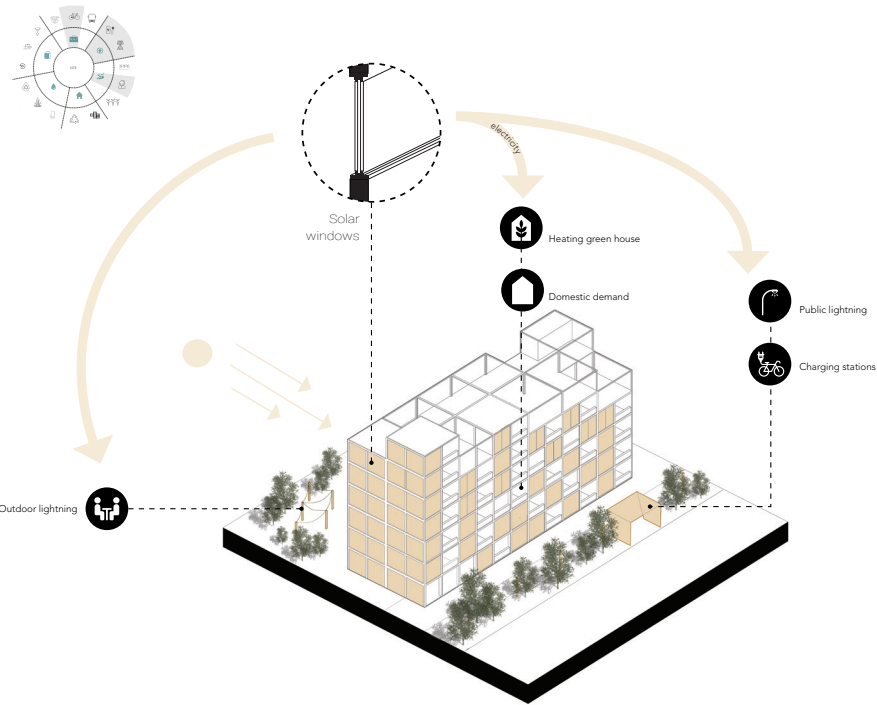
On the flexible housing, every apartment has a large balcony that initially can be used as a private garden and eventually, can be closed with panels to create an additional room.

On the top floor, the apartment has large terraces that can initially be used as a garden and also be transformed into extra rooms creating the opportunity to double the size of the apartment. For instance: An apartment of 72m² can have a terrace and be transformed into a 108m² when necessary.

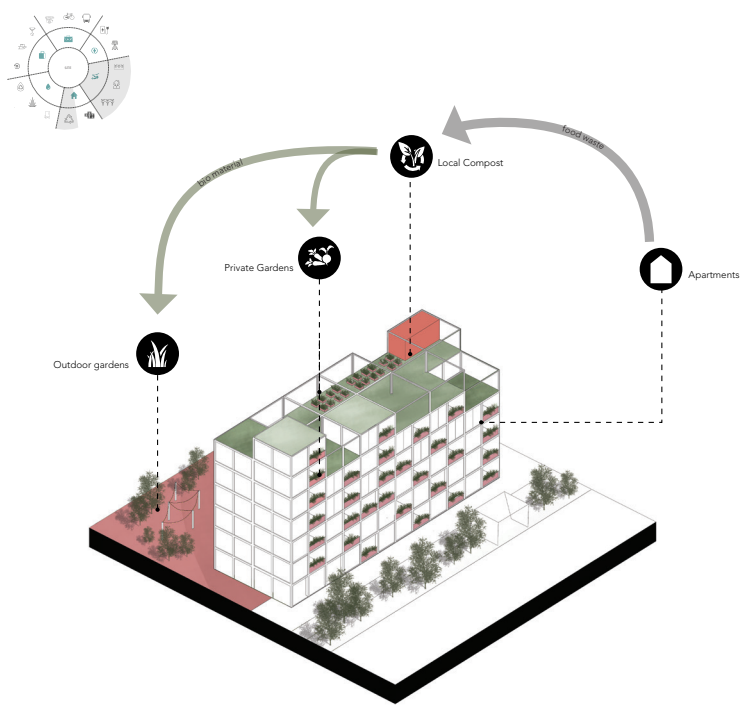


05.9 GENERATIVE HOUSING

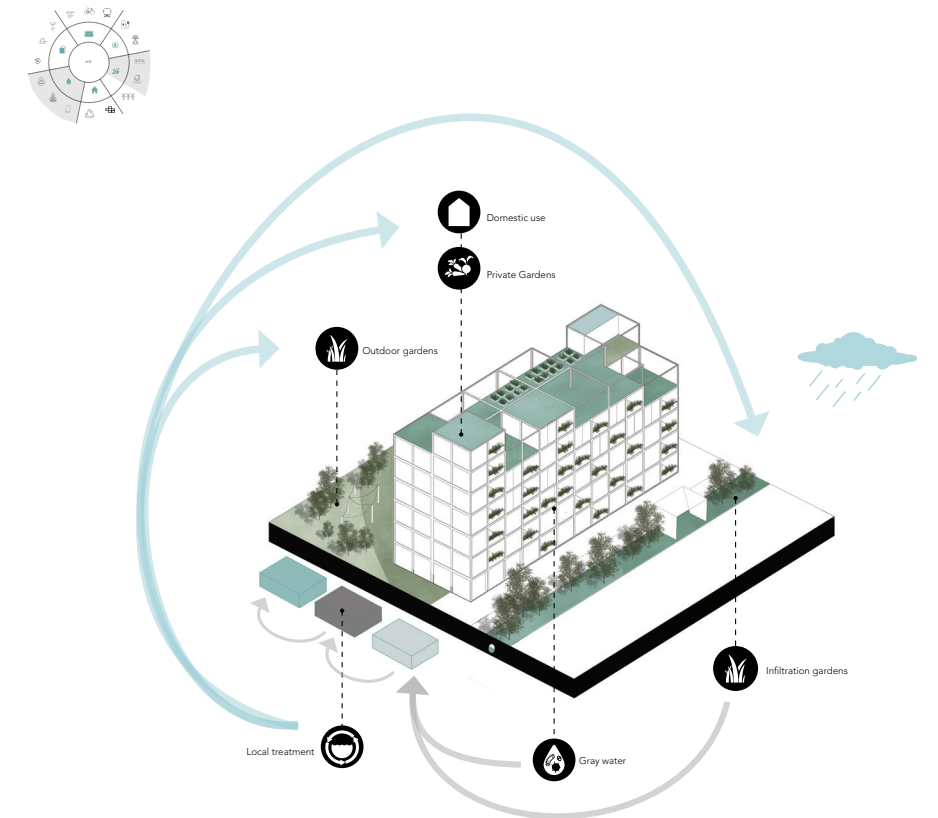
ENERGY



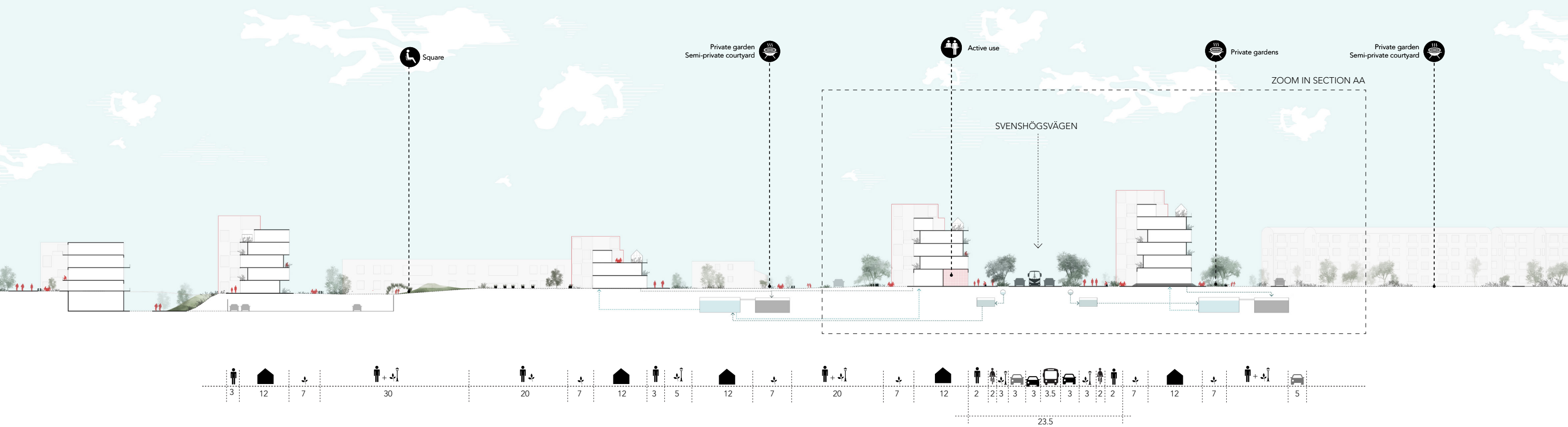
FOOD



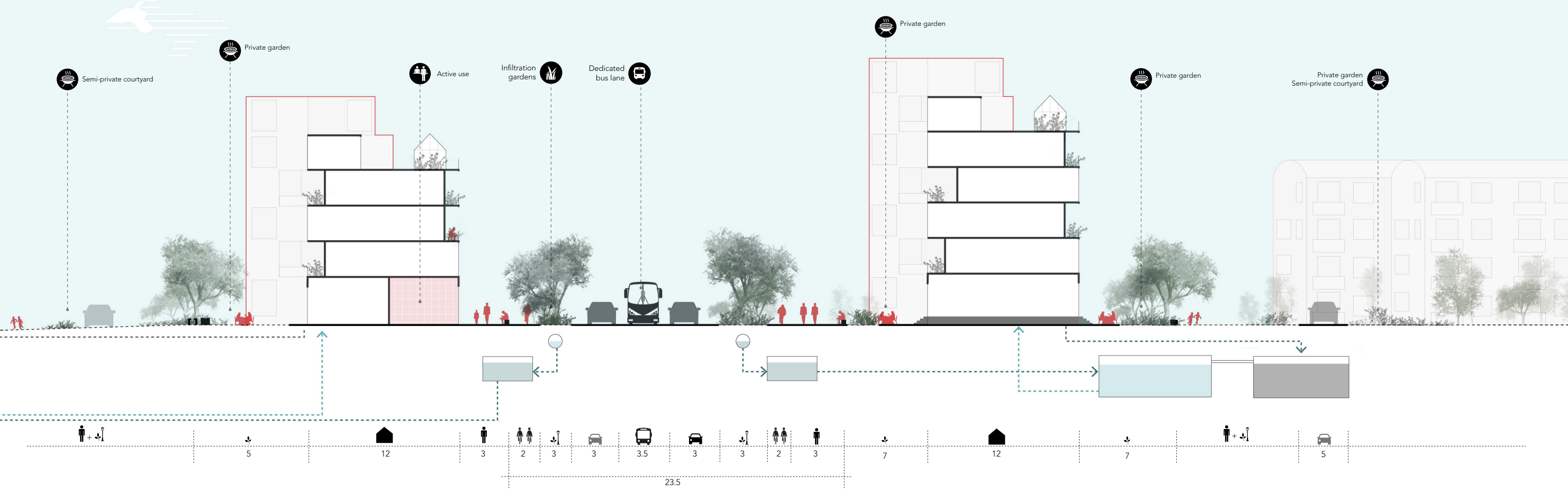
WATER



05.10 SECTION AA



ZOOM IN SECTION AA



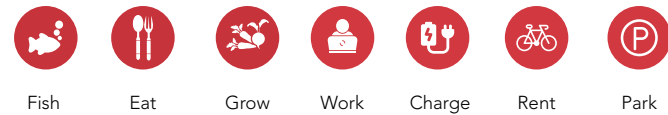
05. 11 FOOD SQUARES

Demand for food is a critical issue that we will face in the future. The Food Squares are a system that aims to supply the future demand for food, promote resilience, and also social, economical, and environmental sustainability by creating a meeting place with biodiversity and sharing possibilities.

The system is composed of three structures that will feed one another resource-wise:

Aquaponic Greenhouse
External pond
E-Parking Garage

The systems are located strategically within 5min walk from multifamily housing, 5minutes of cycling from the single-family and row houses, and also at the entrances of Svenshögsvägen so visitors can park their car on the E-Parking Garage and walk towards the main square.



Fish

Eat

Grow

Work

Charge

Rent

Park

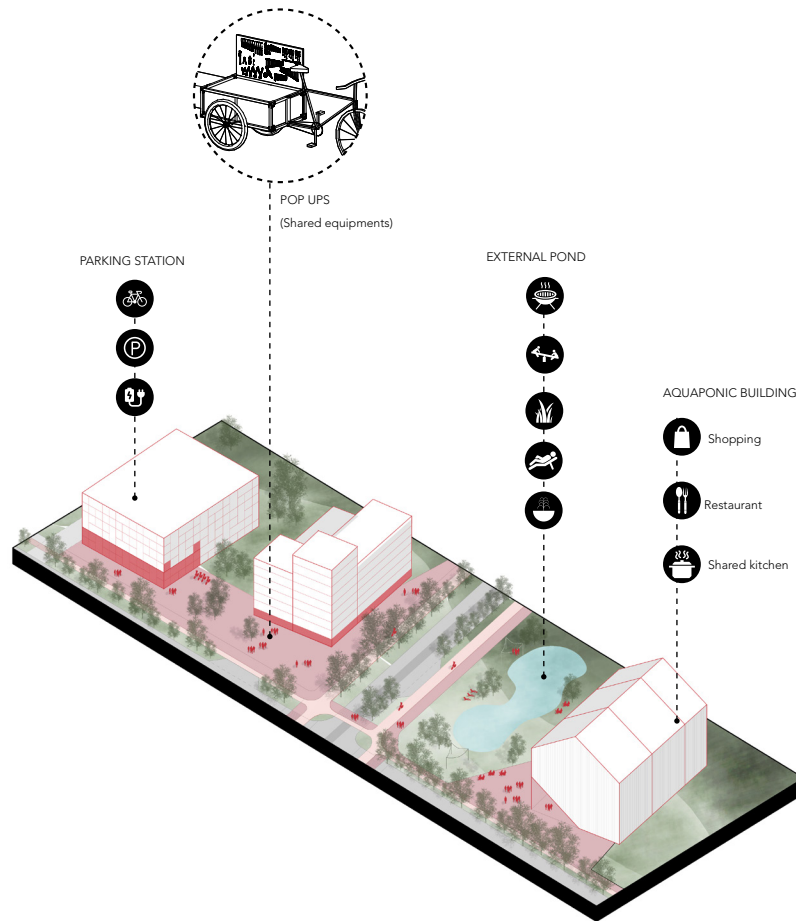


Norra Fälåden
Radius of 500m
5 minutes walk

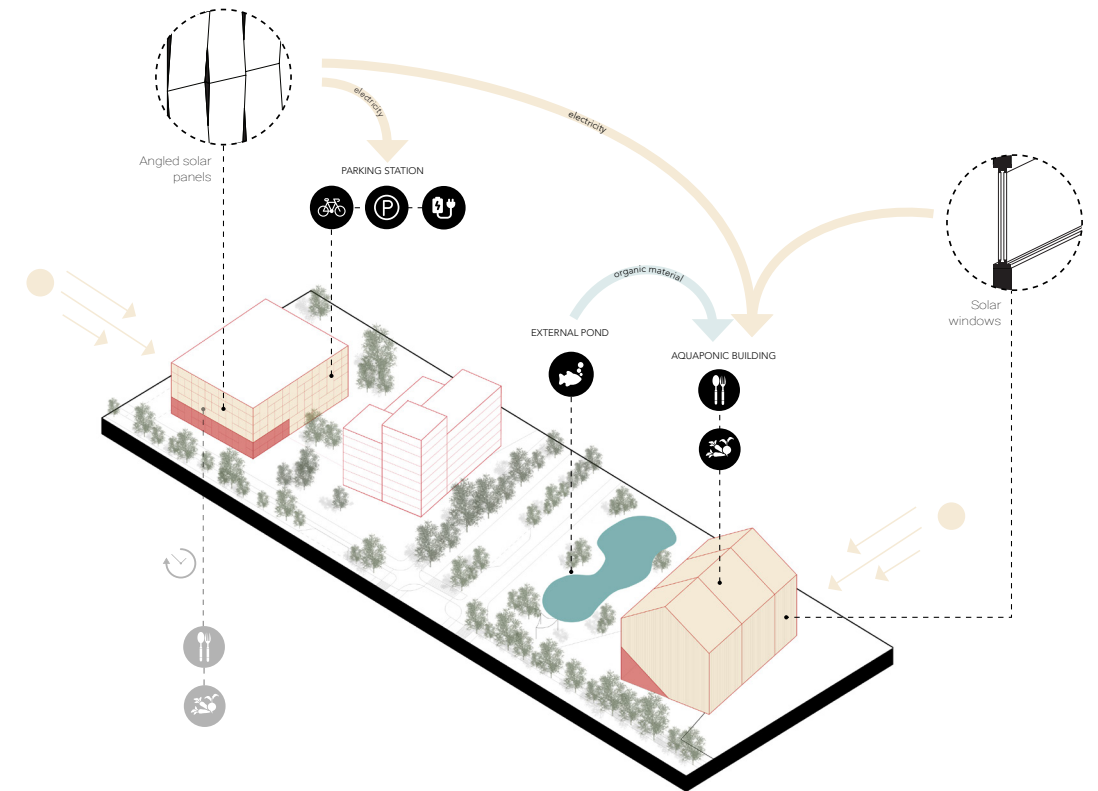


05.11 FOOD SQUARE

- **Aquaponic Green House**
Beyond vertical farming, that greenhouse has restaurants and food stores to sell the fresh vegetables grown locally.
- **External Pond**
The natural external pond with lush vegetation creates a better condition for the fishes to grow, promotes biodiversity to the area, and adds quality to the public space.
- **E-Parking Garage**
It is a transportation sharing center with an E-bike station in which the population can rent cargos, strollers and repair their own bicycles.
If necessary, with time, the building can be converted into another aquaponic housing since the solar panels in the facade can feed the energy demand of its new function.

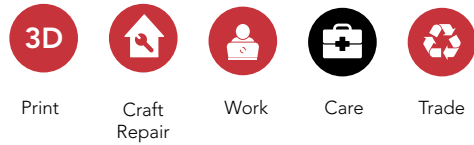


TECHNICAL FLOW



05.12 CIRCULAR HUB

Considering that in the future scenario people will have a new relationship with companies and a new way of shopping the Circular Hub consists of two new functions in which the consumer can:



Trade center is a place to:

- return non-circular products that still are on the market
- return rented products to the companies
- repair products

Fab lab is a place to:

- print parts or products with bio-materials
- craft furniture or products in workshops that are opened to the public
- a place for research and experimentation of new technologies
- education center for repair and craft workshops, and also for students of local schools.



Norra Fälåden
5 minutes walk
5 minutes bike



05.12 CIRCULAR HUB

CHALLENGES : DEMOLITIONS

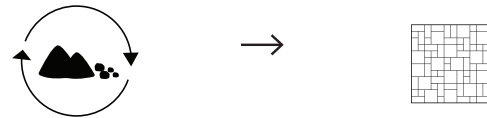
The area around Fäladstorget is very car-driven designed and due to the presence of an ICA, a great portion of the surface was reserved for parking lots. The buildings, besides the church, have the backside turned to the street and do not bring any quality or promote street life.

Fäladstorget, the square in front of the Church, is very secluded and even though it does not have many qualities, it does have good quality materials.

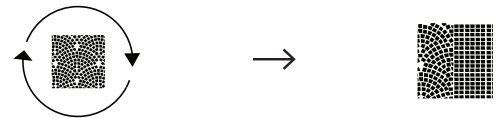
The challenge within this area was to decide if demolitions should be made to be able to better the quality of the public space. Demolitions can be very unsustainable, if materials are not recycled a lot of waste can be produced. To tackle this issue, after several studies, the final proposal demanded that only a few buildings and parking lots would need to be demolished and several materials can be recycled:



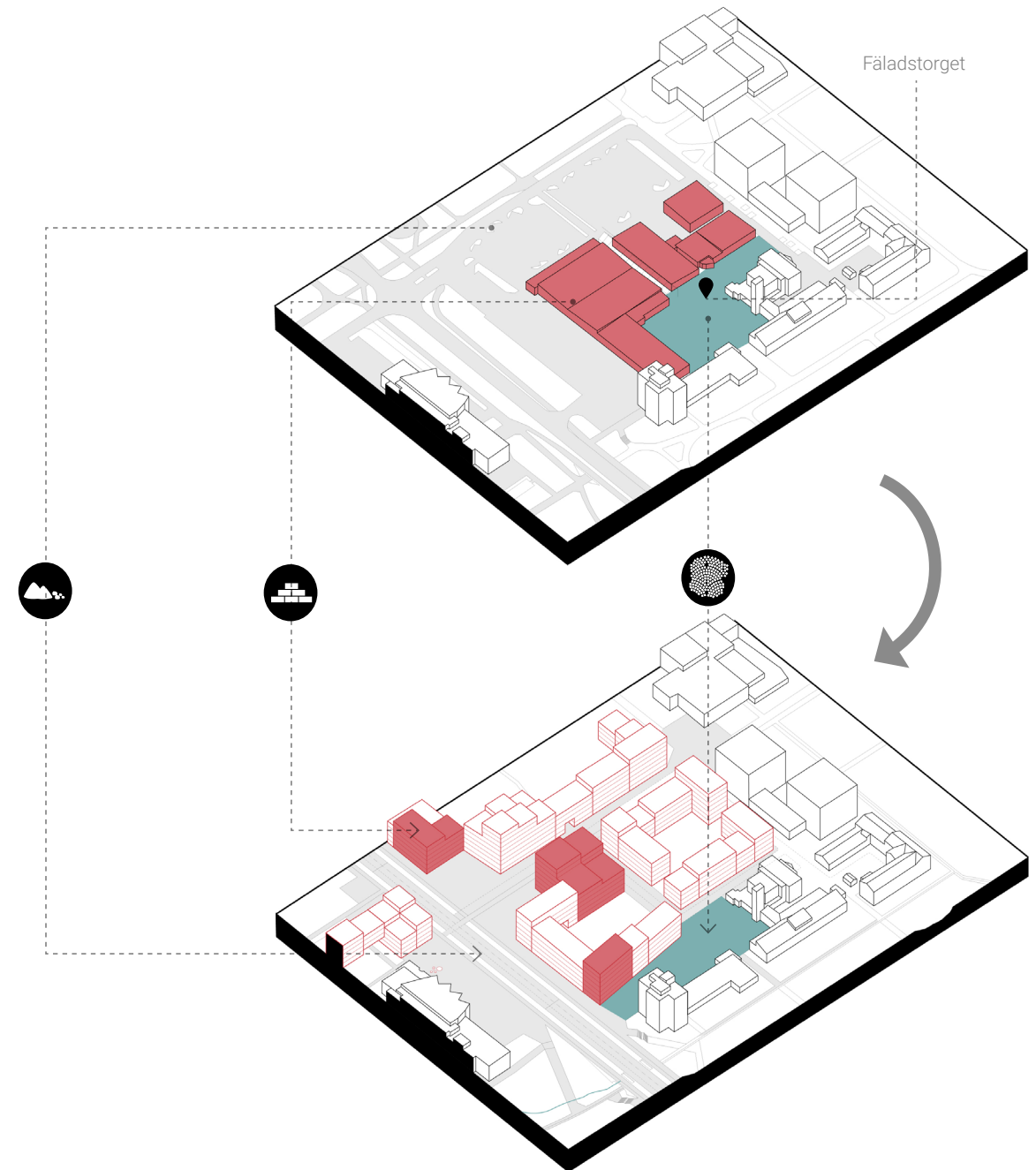
The bricks from the buildings will be reused as facade panels for the new buildings



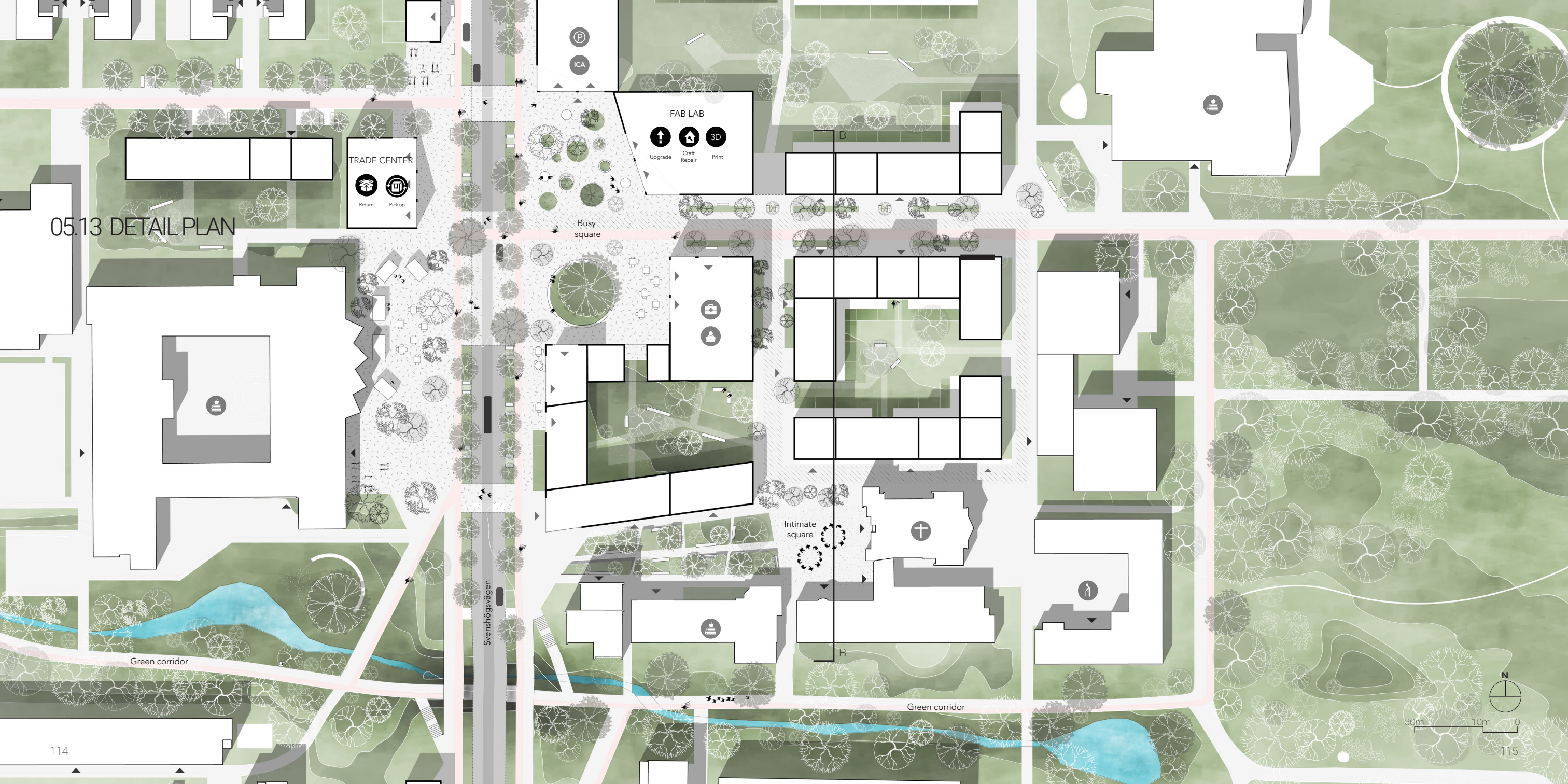
Asphalt can be recycled into pavement of different colours for the new square and sidewalks.



Cobblestones can be reused and fit into new shapes



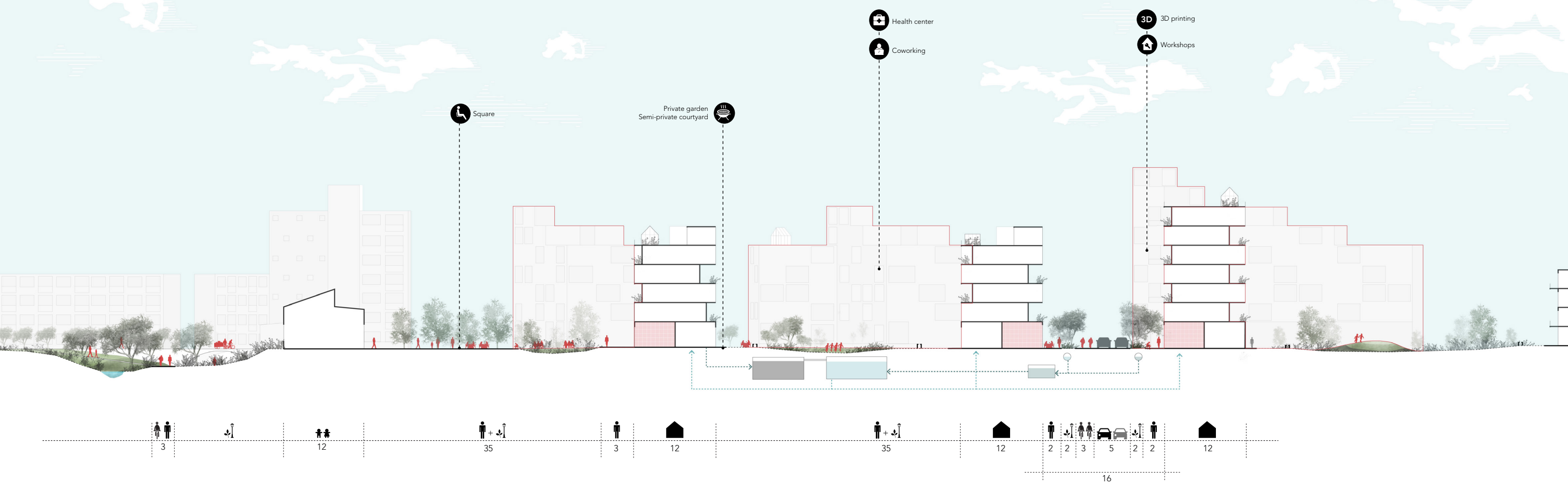
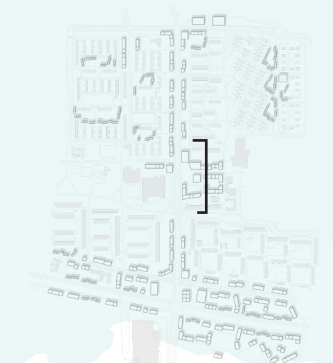
05.13 DETAIL PLAN





Perspective of the Circular Hub's busy square. Willow Tree creates a landmark. Fab Lab and ICA conform the space. Sitting areas provide support for life to happen.

05.14 SECTION BB






Right To Repair

Perspective of the Circular Hub's intimate square. New garden enhances the perspective and opens up the existing church to Svenshögsvägen. Active groundfloor and sitting areas brings life to the site.

05.15 PHASING

The design proposal aimed to have a minimal impact on the site, however, the changes would still need to be done strategically and for many years

Phase 1 (from today until 2035):

Build the new Svenshövsvägen along with the Circular Hub and the Food squares to create new connections and introduce the public nodes to Norra Fäladen. Start densifying around the new Fäladstorget first and then the areas around the Food Squares

Phase 2 (from 2035 to 2050)

The municipality of Lund will turn the Northern Ring into a Boulevard. Densify alongside the boulevard with a higher density as it gets closer to the city center.

Phase 3 (from 2050 onward)

Densify with the lower density building in the existing condominiums.



Today in Lund	60m ²	2,5 people	24m ² / person	8 770 people
Future	60m ²	3 people	20m ² / person	10 350 people
	60m ²	4 people	15m ² /person	13 500 people

06 LIFESTYLE STORIES

JESPER & EVA

Jesper and Eva are a mature couple with very good jobs. They live with their son in their own house with a big garden on the north of Norra Fäladen. They have very good jobs and frequently go shopping for new furniture and other things for the house, especially now that they can afford it. They usually drive to work on their electric car since they need to visit clients quite often and are called into their offices at unusual hours of the day.

On a Friday, they go shopping and as they usually do, they go to the Circular Hub. Since Jesper was on his way to work, they drove to and parked their car on the Parking Station¹, since there are barely any parking spots closer to Fäladstorget. Then they walk to the square and spend some time looking at the shopping windows along the street.

When at the Circular Hub they separate. Jesper goes to the Trade Center² to leave a rented blender, the company that he rented from often comes to take back their rented products. In the meantime, Eva goes to a lo-

cal store³ to buy an upgrade to change the color of her earplugs. After that, Eva decides to take an emergent online meeting with a client on the Coworking⁴ in the area. She will also have lunch later at the restaurant on groundfloor. Jesper walks back to the car and drives to work. He is relieved that it got fully charged and doesn't feel guilty of forgetting to charge last night.

Their son Isak is in the school⁵ during this time. A few days ago his class started building a tunnel from a living tree in the school yard⁶, they are hoping to finish before winter. After lunch, he usually spends his time taking care of bunnies⁷ and other animals on the Sankt Hans Park, the school lets them walk there by themselves since the new underpass is safer than crossing the busy street. Sometimes, they also enjoy playing in the shallow creek along the way, especially when it rains.



HELEN

Helen is a retired nurse, she rents an apartment¹ at Fäladstorget that recently got a room opened and transformed into a larger balcony. She was sad about her granddaughter leaving but she is happy to get an extra open space.

As every Wednesday, today goes to the park² for her routine walk and today she almost forgot she had a routine appointment at the health center³, so this time she had to rush back. Fortunately, she got there in time. She enjoys living closer to the health center, to an ICA, and also the Church and still be able to live in a smaller apartment with a big garden without needing to be in one of those big and expensive houses.

After the appointment, she went to her daily Fika with her friends from the elderly home in the intimate square⁴, right in front of the church. But of course, not before going to ICA⁵ to buy some goodies and also very quickly getting her favorite coffee mug at home.



LIAM & ALICE

Liam and Alice are a young couple. They do not have any kids yet, but in the future they will, so they are living in an apartment¹ on the top floor because they already know that in the next years they will transform part of their terrace in a nursery.

Alice loves to cook and grow her vegetables, but she doesn't have professional green fingers so she can't grow enough food for them to be self-sustainable. And to be fair, she also would need a lot more terraces to do so.

So twice per week, she goes to the Food Square² to buy fresh vegetables. Today tough bough extra food for an anniversary dinner and she had to rent a cargo bike from the Parking Station³ next to the LiDL⁴.

It is very practical for her that the trolleys are so close to the food store and to the bus station⁵ as well because she brought everything home and she returned the cargo bike on her way to work since the bus stop is right in front of the station.

Liam on the other hand likes to build furniture for the house as a hobby. They can't afford expensive tools and he also can't rent big ones because they take too much effort to bring up to the apartment and Alice has said she doesn't enjoy all the wood dust that stays in the apartment after.

So today, Liam has a day off from work and after he finishes his carpentry teaching class that he gives to the school students at the FAB LAB⁶, he decided to spend some extra time in the workshops to build Alice her coffee table.

The table turned out to be heavier than he expected. He thought his electric bike wasn't gonna be able to handle the weight, but he left it on the charging station⁷ on the street and it charged long enough for him to bring it home with no problems.

He is surprising Alice on their anniversary and wants to give to her an anniversary present. Hopefully, she will enjoy it.



JHONNY

Jhonny is an exchange student, he is one of the many students living in the neighborhood and he shares everything he can, after all, he doesn't earn a big income from his scholarship.

His room¹ is very simple, with only a few basic pieces of furniture and he wants to have at least some decoration to feel more comfortable in it. So last week he found some open-source 3D printing files for lamps, candle holders, and even a modern nightstand that can be assembled.

Since yesterday he finished his assignment earlier he booked one of the printers on the Fab Lab² for today. He got lucky that he found one available at the last minute, usually, they are busy for several days.

He took his bicycle and went to the Fab Lab, but on the way, he decided to stop in a local store to buy biomaterial to use on the printer. He rather uses the biomaterial because if the objects break or when he leaves he can just throw it in the composter in his building. After printing his decoration he went to meet his colleagues for group work at the Coworking³ and after they were done they decided to relax and drink a few beers at the restaurant⁴ by the pond.



07 REFLECTIONS

06 REFLECTIONS

Circular Economy is a relatively new concept that currently, the literature is lacking the discussion on how it would be implemented in urban contexts and how the implementation of the concept would affect people's lives in the future.

Based on the prospection of future scenarios for Sweden, this project was an attempt to understand the impacts of Circular Economy on daily life and how urban design can take part in it.

After completing this project, it is clear that, for now, that much is still on prospects and ideas, the role of urban design is to give opportunity for the new activities predicted by CE that will happen locally both on small and on larger scales, while using these as a vector to create a better and flexible urban environment where people with different lifestyles can thrive.



Perspective of the green and blue corridor meeting Svenshögsvägen in the background. Willow Trees mark the area, extended creek provides resilience and willow structures create an interesting and instigating environment for kids to play.

08

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