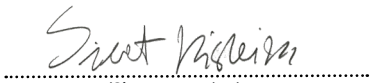
FACULTY OF SCIENCE AND TECHNOLOGY

MASTER'S THESIS

Study programme / specialisation; City and regional planning - 2 years masters degree	The spring semester, 2023 Open / ~~Confidential~~
Author: Sivert Risheim	 (Signature author)
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FROM HOSPITAL TO URBAN CENTRE: TRANSFORMING SUS VÅLAND

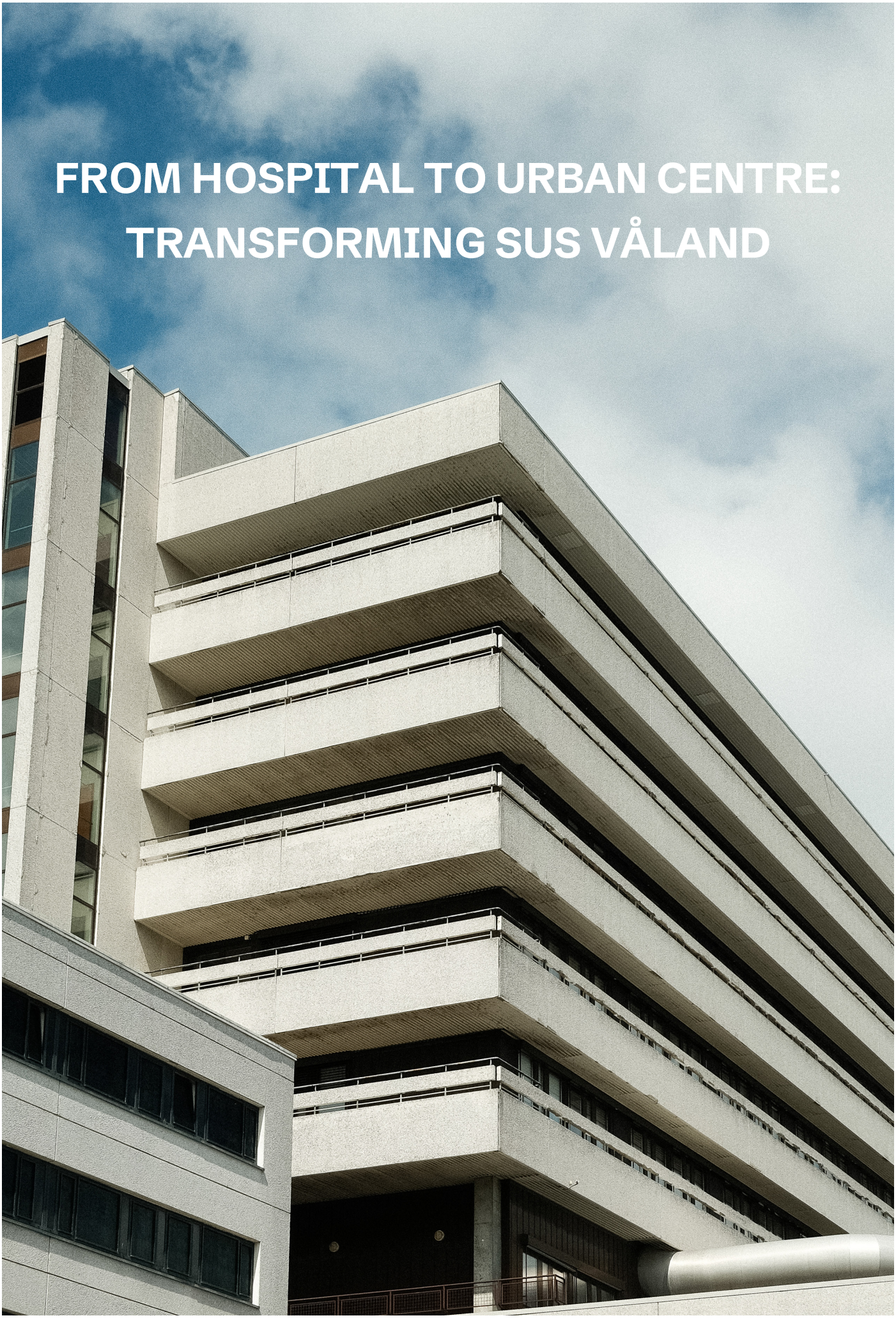

Figure 1.1: Front page

Preface

This master thesis represents the culmination of my two-year master's degree course in city and regional planning at the University of Stavanger, aswell as my five years of studying in this field. This journey has been filled with challenges, learning opportunities, and excitement. The primary goal of this process was to identify an engaging and significant theme that would contribute to the future development of Stavanger and the planning profession. I intentionally designed this thesis to focus on a topic that I find fascinating and enjoyable.

I would like to express my gratitude to my supervisor, Fabio Alberto Hernandez Palacio, for providing valuable feedback and assistance throughout the writing process of this thesis. His guidance has greatly contributed to its development.

I would also like to thank Arild Byrkjedal at Stavanger Development for engaging conversations regarding current processes and data access related to the development. These discussions have enhanced my understanding of practical aspects within urban planning.

I extend my thanks to my classmates, friends, and family for their crucial support during this journey. Their encouragement and assistance have been invaluable.

This thesis reflects the dedication and hard work invested in my pursuit of knowledge and my desire to contribute positively to the field of urban planning. As I conclude this chapter of my academic journey, I eagerly look forward to applying the insights and expertise gained from this research hoping to make meaningful contributions to urban planning in Stavanger and beyond.

14/6/2023

Abstract

The objective of this thesis is to explore the transformation of the Våland hospital as the hospital functions are set to move to Ullandhaug. The research question guiding this study is:

How can the current hospital area be transformed into a new vibrant and multifunctional area covering the demands of the 21st century?

The study employs comprehensive research methodology, including literature review, analysis of the physical properties of the area, and the creation of a design proposal. These methods were chosen to gather relevant information, identify challenges, and propose feasible solutions for the development of the Våland hospital grounds.

Through the analysis, several challenges were identified, including barrier effects, the presence of large existing building masses, and a lack of identity. Understanding these challenges is important for addressing the needs and opportunities of the area effectively.

The proposed design framework focuses on redifining the purpose of existing buildings based on their functional and aesthetic potential. It also includes a well-connected road network design, measures for improved connectivity and traffic management, the integration of green spaces, and the establishment of a historical quarter to enhance the area's identity

This master thesis serves as an inspirational starting point for future discussions, collaborations, and refinement of the development plans for the Våland hospital area. By addressing the research question and proposing a comprehensive design framework, this study contributes to the realization of a vibrant, connected, and identity-driven urban area that covers the demands of the 21st century.

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Introduction

Figure 1.2: Image of a public space in the hospital area

1.1 Background

The future of the hospital grounds at Våland

Stavanger University Hospital (SUS) is in the process of constructing a new hospital at Ullandhaug, replacing the old hospital at Våland. This is a process which will happen gradually in two different construction stages. The first stage will be completed in the first quarter of 2024 (Helse Stavanger, 2022), when the second stage will be finished is currently unknown. When the first part of the new hospital is finished all somatic departments and supporting functions will move from Våland to Ullandhaug. This leaves a large area of land and massive empty building masses at Våland. There will be dual operation of the hospitals as there will be a long moving process. It is mainly the somatic functions of the hospital that are set to move, the psychiatric functions will currently stay at Våland. It is very uncertain how lengthy this process will be and how long Stavanger will have its hospital function split into two different hospital areas. This means the process of transforming the area will most likely happen in multiple stages over a long period of time.

The hospital grounds at Våland is a highly complex urban area that may be a huge asset to the Stavanger region if developed correctly. The plot is centrally located and is a vital part of Stavanger's future urban development. The future of this plot of land and the existing hospital building masses after the current functions are gone has not yet been determined by the municipality. How the building masses can be re-used or altered is also an important unanswered question today since demolishing all buildings is not a viable solution from a climate standpoint.

The hospital at Våland is owned by Helse Stavanger which is responsible for the health services in the Stavanger region. The responsibility for health services in the county lies with Helse Vest, an organization operating under the Norwegian state. Stavanger Development is a company owned by the municipality with a purpose to develop areas on behalf of the municipality. Of the total hospital plot 70% of the area is owned by SUS and 30% is owned by Stavanger Municipality as shown in figure 1.3 (Stavanger Utvikling, personal communication, 20.3.2023). This will however most likely change in the future when SUS (Stavanger universitets sykehus) starts selling their property in order to finance the future hospital development at Ullandhaug. Stavanger municipality is currently working to create regulations and guidelines for hospital plot. It is highly uncertain how these regulations will dictate the re-use of buildings, area use, maximum density and maximum building height. This creates uncertainty for potential buyers of the area owned by Helse Stavanger.

Figure 1.3: Map showing the ownership of the hospital area

The future at Ullandhaug

The future hospital in progress at Ullandhaug will be split into two different construction stages. Step one will consist of 125 000 m2 distributed among 5 buildings, while step two will consist of 102 400 m2 (Helse Stavanger,2022). The total cost of step one will be approximately 113 million kroner. 70% of this consits of a loan from the Health and Care Ministry while the remaining 30% will come from Helse Vest as well as from SUS. The new hospital will have single rooms with bathrooms for all patients. There are a total of 640 patient rooms planned. The buildings will be placed around one large public space as seen in figure 1,4 with a public transport axis going through. All buildings will have their own entrances and are tied together with bridges on the second and third floors (Helse Stavanger, 2022) . Its location close to the university opens up for new cooperation opportunities between the university and the hospital.

Figure 1.4: Image of the new hospital at Ullandhaug (Helse Stavanger, N.D)

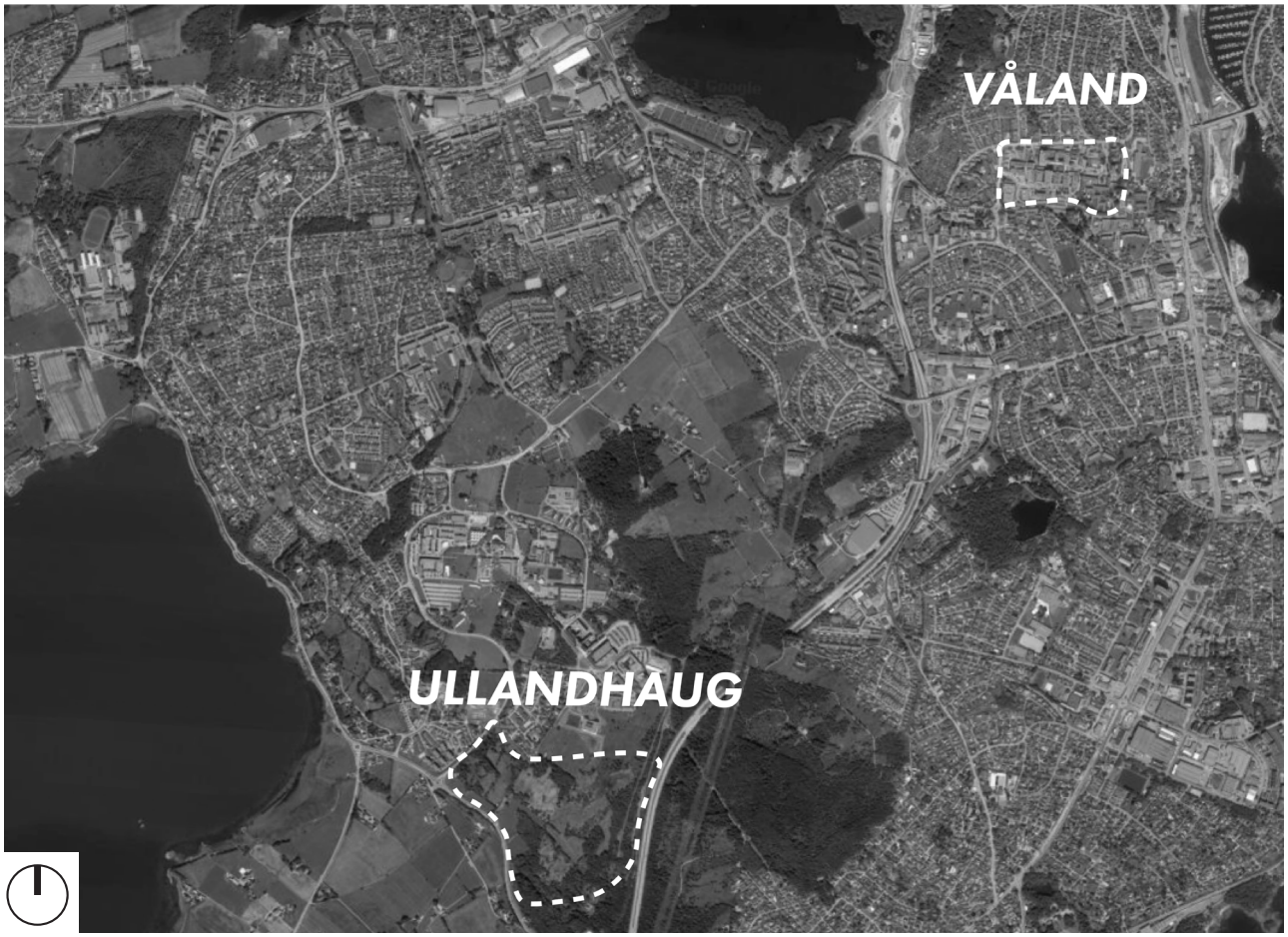


Figure 1.5: Map of the location of the new hospital at Ullandhaug (Based on map from: Google earth,2023)

Site visit

Figure 1.6: Pictures from site visit

1.2 Research question

When the hospital moves to Ullandhaug a huge opportunity rises to transform the hospital plot at Våland into a new function benefitting the rest of the Stavanger region. The hospital has been located at Våland since 1927 (Helse Stavanger, 2017) and has been a vital part of the city of Stavanger. This area is now the center of focus of urban planning in the Stavanger region. It is a plot with huge potential and many uncertainties within the areas potential future use. The area has many challenging aspects regarding potential re-use of the massive existing hospital buildings, question of identity as the hospital functions and potential future use of the area. This makes the area unique in the way that there are rare oppertunities for this scale of development with massve function changes and building masses. This is how the research question in this thesis came to be:

"How can the hospital at Våland be transformed into a new vibrant and multifunctional urban area covering the demands of the 21st century?"

The sub questions aim to understand how the area can be sucsessfully developed aswell as reveal the qualities and challenges of the existing hospital area at Våland:

"How can the new development be sustainable, crate well functioning public spaces and establish an identity?"

"What are the existing qualities and challanges of the hospital area?"

The purpose of this thesis is to present a vision of a potential future consisting of a design framework and a design proposal based on an analysis of the hospital area. The proposal will consider re-use of the building masses, establish a future identity and propose a well functioning urban environment. The aim of this thesis is to create a vision showing the potential of the area and how it can be developed as an inspiration for future planning and development.

1.3 Method

In order to answer the research question multiple different well thought out methods is important. These are vital in gathering all necessary information and deciding on different design choices based on this data. In this chapter the methods used in this thesis will be presented.

Case studies

A case study is a method of learning where cases in areas where similar challenges have successfully been resolved are reviewed. The definition is “an intensive analysis of an individual unit stressing developmental factors in a relation to the enviroment” (Merriam Webster, n.d) This is a way of looking at different solutions in a real world context and how they can be compared with the current study area. The case studies have been carefully picked in order to find cases that resemble SUS Våland. The case study method also provides inspiration for creative solutions to design challenges and inform decision-making. By drawing on the experiences of comparable projects, the case study method enables building further on various successful projects in a different context.

Site visits

To be able to understand the site, multiple site visits have been conducted. The first visit happened early in the process to be able to gain a visual understanding of the site in order to start the thought process. Further visits have been done in order to gain the impression of identity, visually observe the area from different perspectives and gain a sense of scale.

Literature analysis

The thesis builds upon existing literature and theories in order to support the research question and the design proposal. A literature study collects and reviews relevant literature in order to create a theoretical understanding to build upon. This will also give an important perspective which is important in order to understand future needs of the area.

Urban analysis

The proposal of the thesis builds upon an urban analysis of SUS Våland and nearby areas in order to gain fundamental knowledge about the area. An urban analysis focuses on the spatial aspects of the area as well as the social and economic aspects. (University of Louisville, n.d) A deep knowledge of the area is important to be able to understand the future needs, potential and challenges of the area.

Feasibility study

A feasibility study serves as the cornerstone of this thesis, with the purpose of looking at the existing qualities, challenges, and opportunities in order to unveil the potential future development in the area. This study comprehensively considers all relevant factors to establish a robust groundwork for future developments. Its objective is to highlight the areas potential needs and address them effectively presenting the optimal solution for the areas future.

Design process

The process of designing a proposal requires multiple steps in order to come up with a solution to a problem. Design is a multidisciplinary field that encompasses a range of methods and processes, each of which can be used to address different design challenges and objectives.

Visualisation

The document is presented through adobe InDesign, which is a layout and text program used in order to design the document. Further photoshop and illustrator have been used to process maps, illustrations and figures. Maps have been processed with Autodesk AutoCAD in order to achieve accurate measurements and angles. Digital 3D-models have been made with the use of Sketchup-Pro.

Physical model

A physical working model has been made of SUS and the surrounding areas in the scale 1:2000. This is done in order to visualize different volumes on the study area. To make this model the tools AutoCAD and a laser cutter have been used. The terrain is made of cardboard, with medium density fiberboard (MDF) representing the buildings. Foam has been used to construct the buildings within the study area, allowing for convenient modifications and experimentation.

The use of physical models allowed for the exploration of different scales and perspectives, providing a more realistic and detailed view of the plot. This helped identify design challenges and opportunities, as well as visualizing different volumes and heights in relation to the surrounding environment.

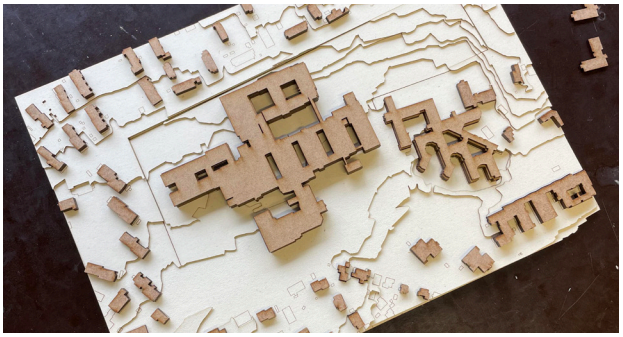


Figure 1.7: Picture of the physical model

Structure of the thesis

Research question:

How can the current hospital area at Våland be transformed into a new vibrant and multifunctional area covering the demands of the 21st century?

Litterature

Sub question 1:

How can a new development be sustainable, crate well functioning public spaces, and establish an identity?

- Litterature
- Case studies
- Design principles

Analysis

Sub question 2:

What are the existing qualities and challenges of the hospital area?

- Gathering existing data
- Urban analysis

Design proposal

Research question:

How can the current hospital area at Våland be transformed into a new urban area?

- Design framework
- Proposal

1.4 Delimitation

Scope of the thesis

Due to the immense scale and complexity of the hospital area, this thesis will primarily concentrate on the physical aspects of the site. This focus enables exploration of Design and spatial arrangement. Considering the available resources and the scale of the project, economical aspects will not be taken into account.

Stavanger

Stavanger university hospital is located in Stavanger which is the fourth largest city in Norway. This is also the administrative centre of Rogaland County wich is a region with a population of approximately 482 000 people and an area of 9,3771 square kilometers (Rogaland Fylkeskommune, 2022). The county's economy is heavily reliant on oil and gas production, fishing, and agriculture. Its proximity to the North Sea has made it a vital center for oil and gas exploration and production, with many international oil and gas companies having operations in the region. With a population of 144 147 people, Stavanger is a significant urban centre in Norway. Stavanger municipality covers an area of 241 square kilometers (Stavanger kommune, 2023e)

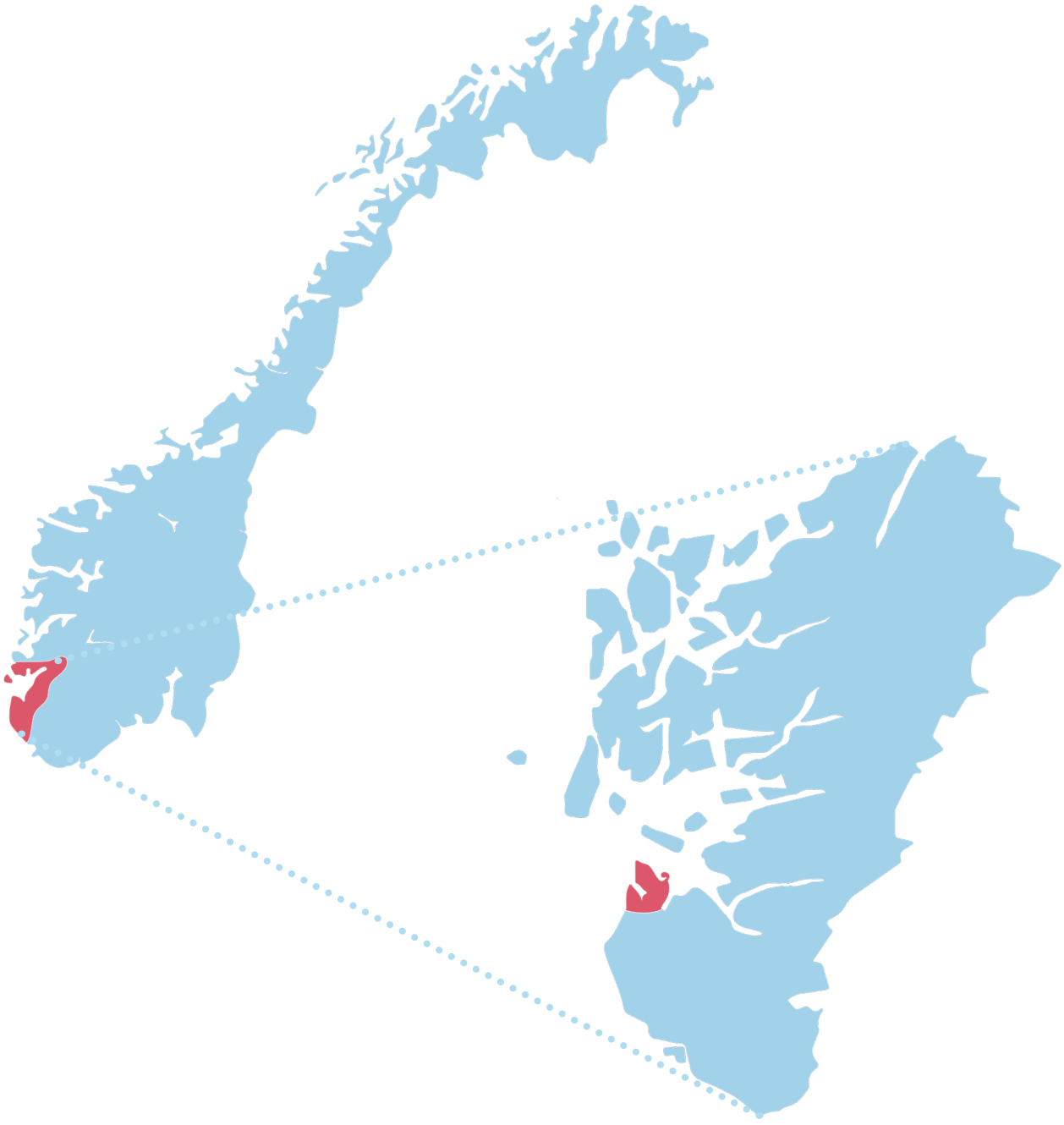


Figure 1.8 and 1.9: Maps showing the location of the study area

Stavanger unviersity hospital

The study area for this thesis is located within the grounds of the university Hospital as seen in figure 1.10, which is situated in the Våland city district in Stavanger municipality. Våland is mainly a residential area located in the central part of Stavanger. The hospital area is surrounded by mainly residential areas, parks, and road structures.

The hospital functions at Våland will gradually move over multiple years which will lead to the hospital buildings gradually becoming empty. It is mainly the Somatic functions of the hospital that are set to move while the psychiatric functions are set to stay in their current buildings. The apartments at the western side of the area are set to be sold to a private developer and are not a part of the municipalities masterplan. The limits of the study area in this thesis will be set to the somatic functions and the buildings belonging to these functions. The study area is 81 247m2 with buildings that have a footprint of approximately 24 233m2. This gives 29% plot utilization and a total utilization of the study area of 124%.

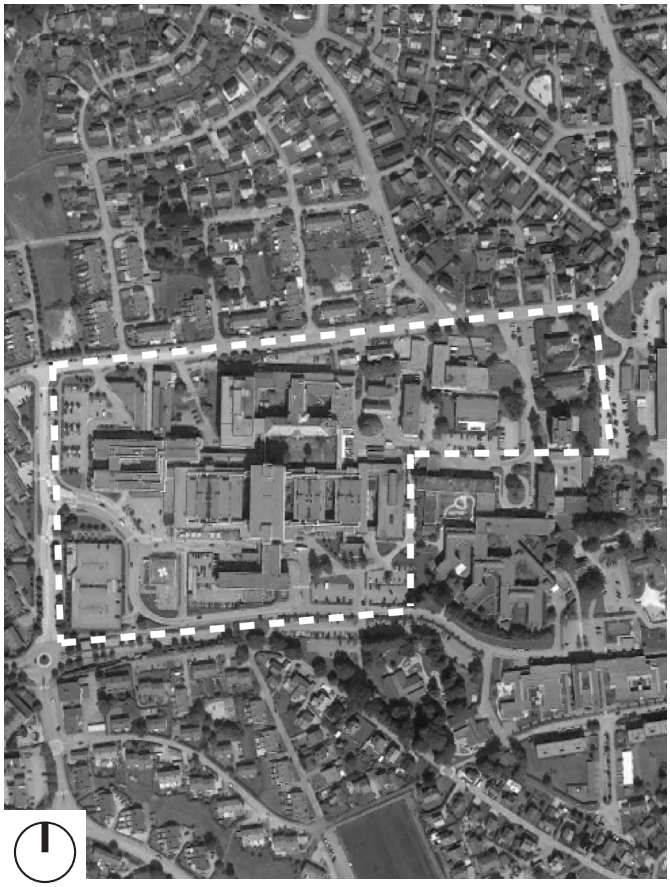


Figure 1.10: map showing location of the study area (Based on map from: Google earth,2021)

Figure 1.11: Map showing the location of the study area

1.5 Guidelines and regulations

National guidelines

Every fourth year the state proposes new goals and guidelines to urban planning and city development for region and municipal planning. These lay the foundation for future and existing urban development. The guidelines aims to make urban development more focused on climate, compact and vibrant cities, preservation of nature and culture as well as economic development. The plan proposes that the 17 FN sustainability goals should be fundamental in regional and municipal planning in order to increase sustainability over multiple fields (Regjeringen, 2019).

Regional guidelines

The region plan for Jæren and Søre Ryfylke is a long-term plan for housing, area and transport planning in the region. The plan aim to give directions for further regional development towards 2050. The main goal of the strategy is to have sustainable city and regional development. Their vision is: “A region which is sustainable and capable of change”. The plan contains 6 sub goals which is will be met in order to achieve the vision. The sub goals include different strategies that must be put in place in order to meet these goals (Rogaland fylkeskommune, 2020)

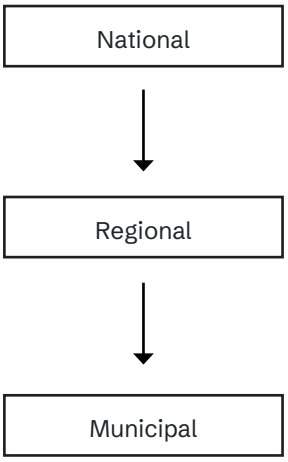


Figure 1.12: The hierarchy of plans

- *Promote everyday physical activity, good mobility, and improve the environment*
- *Benefit from our investments*

An easier everyday life

- *Strengthen value creation capacity and contribute to productivity growth*
- *Further develop a network of complementary business areas*
- *Provide attractive business areas for all companies - in the right place, at the right time, and price*
- *Take joint responsibility for the location of companies with special needs*

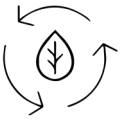
Competitiveness

- *Meet future housing needs*
- *Develop healthy and inclusive local communities*

Strong neighborhoods

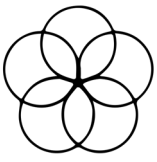
- *Further develop attractive town center environments*
- *Attract activity to the town center*
- *Ensure space for innovation in the retail industry*

Thriving city centers



- *Combat climate change and its consequences*
- *Reduce land use change*
- *Further develop regional green structure*
- *Strengthen and rehabilitate biodiversity*
- *Contribute to ensuring good ecological and chemical status of water environments.*

Sustainable natural recourses



- *Build and share knowledge*
- *Strengthen implementation capacity and ability to act*
- *Develop and participate in partnerships and networks.*

Regional cooperation

Figure 1.13: regional goals (Rogaland fylkeskommune, 2020)

Municipal guidelines

The current municipal plan was agreed upon on September 14, 2020, and outlines the focus the municipality will have for the next 14 years (2020-2034). The plan consists of two parts: the society part and the area part. The society part explains the direction and goals the municipality aims to achieve, while the area part outlines the locations and methods for future city development within the municipality.

The municipal society part has been divided into three main goals (Stavanger kommune, 2020):

- A strong city center with a diverse business life. Stavanger has the role of a region center and the municipality will therefore work to strengthen the trade in the entire region in order to strengthen Stavanger (Stavanger kommune, 2020).

- Good everyday life. everyone should have a good life where they live. The municipality will focus on developing strong local environments (Stavanger kommune, 2020).

- Green aim, The municipality aims at becoming more environmentally friendly. Stavanger should be a leader in creating a more sustainable society and a greener climate. They will also focus on caring for the nature and cultural environments in the municipality (Stavanger kommune, 2020).

Stavanger municipality focuses its future urban planning on reducing travel time for its inhabitants. They aim at having most peoples everyday needs be covered within walking, cycling or inner city public transport distance of their homes. This will reduce the city's collected transport needs and reduce total emissions.

The study area is currently regulated for hospital functions as seen in figure 1.14. This will however only be temporary as the municipality is working on a new regulation of the area. The surrounding areas are mostly regulated for housing with some green areas and other functions. Some areas around Våland has its own regulation with belonging guidelines and is regulated as such.

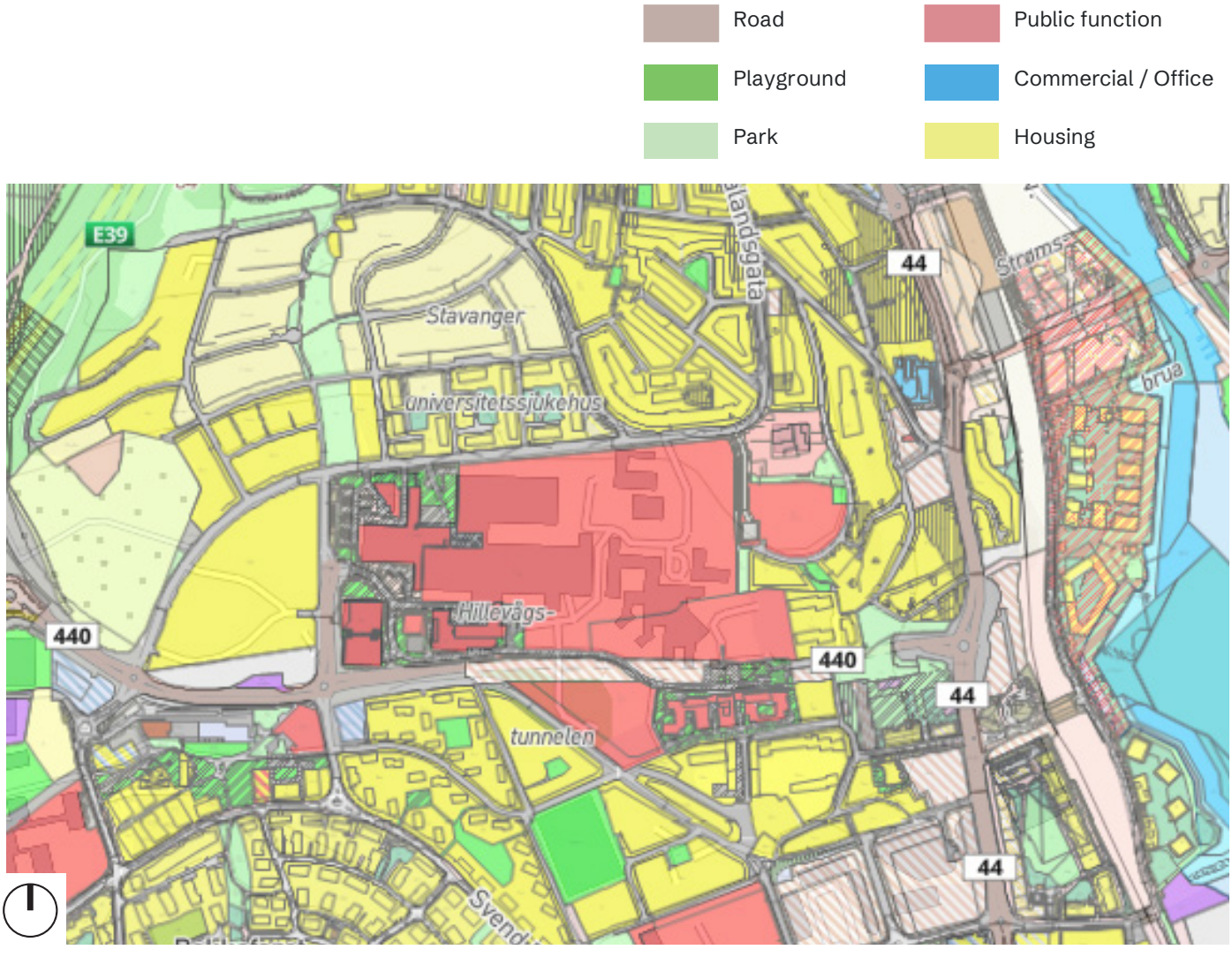


Figure 1.14: The current regulation of the hospital and the surrounding areas (Kommunekart, n.d)

City zones

Stavanger municipality has divided the city into four different urban development zones. The zones represents different strategies, structures, and development goals. The aim of this is to set long term goals for the future development of the city. The different zones also has different requirements and regulations.

- A – The central zone
- B – The primary development axis
- C – The secondary development axis
- D – The outer city

The project area is located within the bound of city-zone A as seen in figure 1.15. This is the most central zone and according to the municipal plan this is where 80% of new developments should happened in the future. This sets regulations for area utilization, parking spaces and building height (Stavanger kommune, 2020).

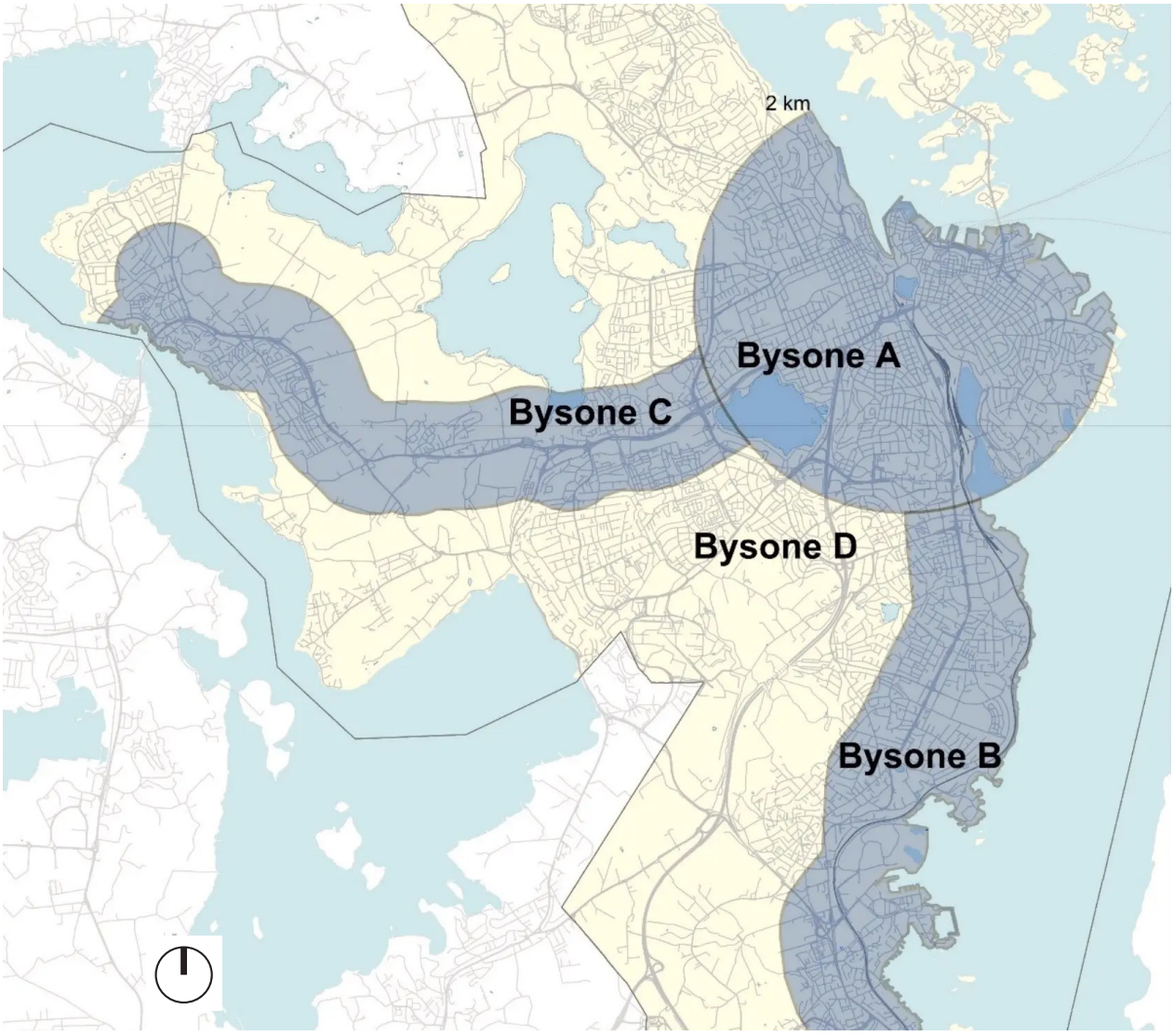


Figure 1.15: The different city zones in Stavanger (Stavanger kommune, 2023)

Development requirements

Buildings

- Requirements for density in city zone A
  - Minimum residential density 75% FAR
  - Maximum residential density 150% FAR
  - Minimum density for other purposes 120% FAR
  - Maximum density for other purposes 240% FAR
- Buildings above 8 floors can be considered in areas within city zone A and B, area use higher than regulated can be allowed for high-rise buildings.
- Housing should minimally be 40 m2 BRA
- Minimum 80% of housing should be larger than 55 m2 and have 2 rooms.
- Private and common areas should be larger than 55 m2
- Regional functions should be placed within city-zone A
- Industry and storage purposes should not be placed within zone A
- Universal design should be taken into account in the proposed plan

Outdoor areas

- "Kvartalslek" minimum 1,5 hectare area with good sun and noise conditions which should have at least 5 different activity elements for children.
- For all plans with 4 or more apartments there should be a minimum of 30 m2 public space. For central city areas the requirement is 16 m2
- All living areas should have a private outdoor area
- The public areas should be outside of yellow decibel zone (55-64 dB)

Parking

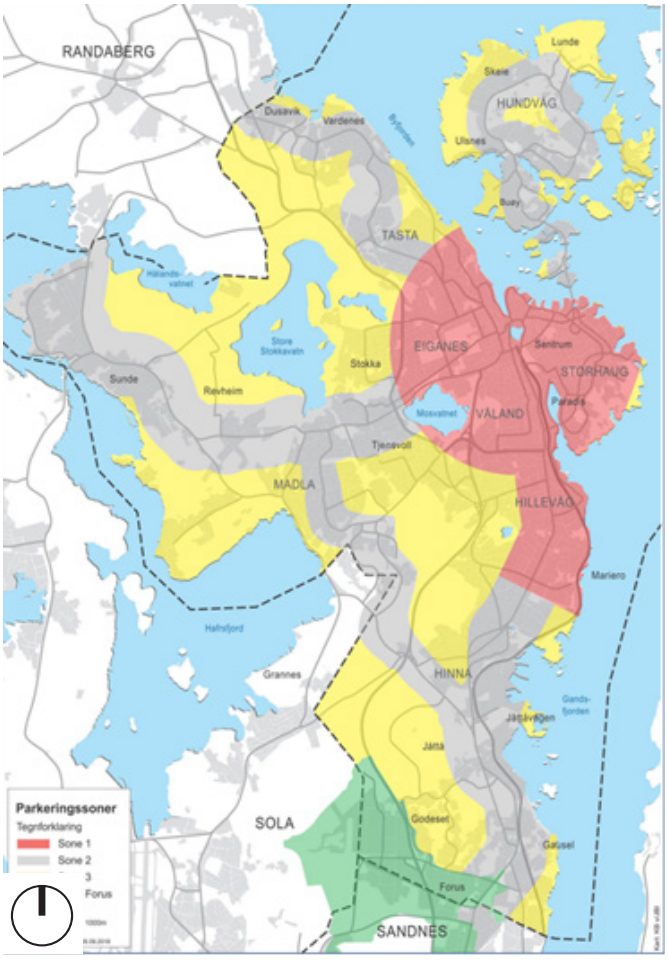
The study area is located in parking zone 1 as seen in figure 1.16

- Requirements parking spaces for cars:
  - 0,5 spaces for each apartment
  - 0,2 guest spaces for each apartment
  - Minimum 0,5 maximum 05 for each

100 m2 of plot use.

- Each apartment should have space to park 3 bikes
- When more than 10 parking spaces 5% should be handicap parking spaces.
- Each parking space should be 2,5 x 5m
- Handicap parking should be 4,5 x 6m

(Stavanger kommune, 2020)



Zone 1

Zone 2

Zone 3

Zone Forus

Figure 1.16: Maps showing parking zones in Stavanger (Stavanger kommune, 2023)

SUS planning program

Stavanger has published a planning program which will be used as the fundament for future regulation of the area. The planning program acts as a formal start to the planning process of SUS Våland. In the planning program Stavanger municipality has set one main goal, and three sub goals with various sub sections. These have been made in order to steer the planning process in a wanted direction and create goals for the future planning process to come. The municipalities main goal for the hospital area is to "transform the area from a city in the city to a part of the city" (Stavanger kommune, 2023c). By this they mean that currently the area acts as its own entity and is disconnected from the surrounding areas. The municipality goal is to blend the area with the existing surrounding areas and infrastructure in order to make it a part of the city (Stavanger kommune, 2023c). The three sub goals are:

- A climate and environmentally friendly district
  - Complete the development with circular principals
  - Strengthen the biodiversity and blue green values
  - Focus on active mobility
  - Facilitate for short distance everyday life
  - Facilitate for environmentally friendly energy use
- An accessible district
  - Improve the interaction with the surrounding environment
  - Establish new and strengthen existing connections in the area
- A district with its own identity
  - Preserve local qualities and historical features
  - Preserve buildings and other structures that are important for the cultural environment and identity of place
  - Facilitate the reuse of existing buildings
  - Ensure that new building structures and outdoor areas prioritize aesthetic qualities and blend in with sur roundings

(Stavanger kommune, 2023c)

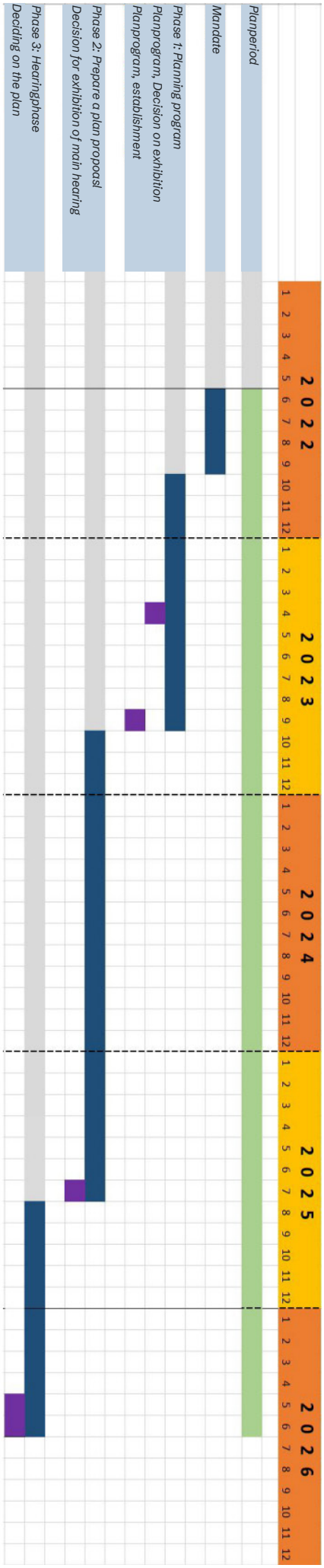


Figure 1.17: The current schedule for the planning of the new development at the hospital

Surrounding plans in process

Bekkefaret

A new area plan is currently beeing developed for Bekkefaret by Stavanger municipality. The area currently consists of two kindergartens and a high rise apartment building as seen in figure 1.18. Since the kindergartens currently situated in the area will soon be merged and moved with the new kindergarten at Teknikken the area will need to be repurposed (Stavanger utvikling, ND).

Figure 1.18: Image of Bekkefaret

Teknikken

There are currently plans for Teknikken which is located at the western side of thestudy area. Teknikken is a plot near the hospital where an old vocational school used to stand. The building is now demolished and the plot is being transformed into a kindergarten and housing. The kindergarten is buildt and completed while the municipality is still processing detail plans for the new housing area as seen in figure 1.19 (Stavanger utvikling, ND).

During the autumn of 2021 there was a competition for a concept of the new housing areas. Helen & Hard won the competition and will be the contractor for the new housing area. They also designed the new kindergarten in the teknikken area.

Figure 1.19: Render showing the potential future at Teknikken (Stavanger utvikling, 2021)

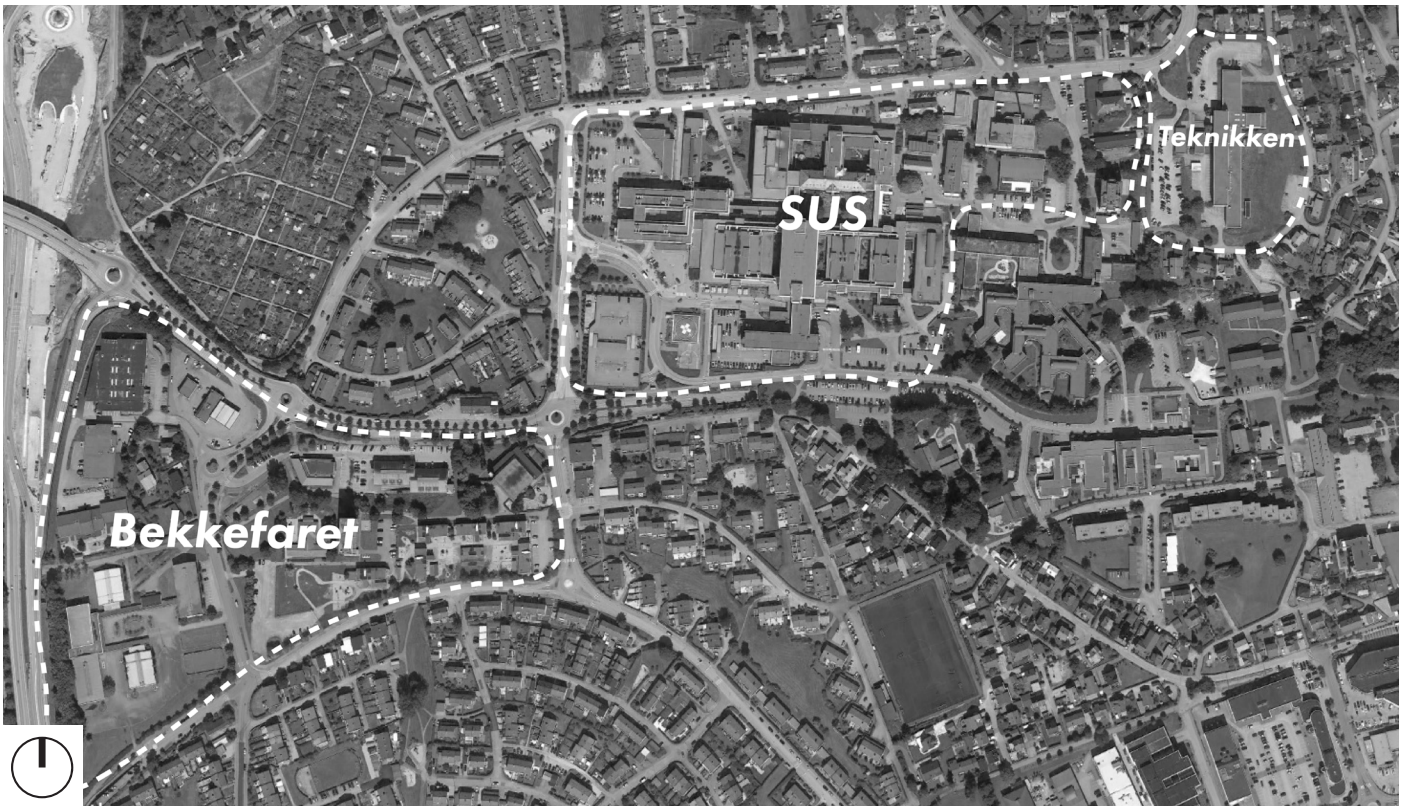


Figure 1.20: Location of Teknikken and Bekkefaret related to SUS (Based on map from: Google earth,2021)

Areaplan Hillevåg

Stavanger municipality is currently in the progress of creating and area plan for the city district of Hillevåg. This plan aims to create guidelines for future development in Hillevåg. These guidelines will include the placement of housing, green areas and shopping. Aswell as how attractive urban areas and spaces should be created. The plan will be sendt to public hearing autumn 2023 (Stavanger kommune, 2023d)

Figure 1.21: Render of the potential future at Hillevåg (Mitthillevaag, n.d)

Areaplan Paradis

The future area plan for Paradis will create a climate neutral city district area with 500 housing units and 79.000 m2 for economic activity and three new public parks. The municipality has presented three different alternatives for a future plan currently on public hearing. (Stavanger Kommune, 2023b)

Figure 1.22: Render of the potential future at Paradis (Stavanger kommune, 2023)

Figure 1.23: Map showing the location of Hillevåg and Paradis in relation to the study area (Based on map from: Google earth,2021)

Literature

The literature section of this master thesis provides an overview of the existing theoretical and empirical knowledge related to the field. The literature review aims to identify the key concepts and research of urban design related to the research question. By examining the relevant literature, this section provides an analysis of the current state of knowledge in the field and lays the foundation to be able to answer the research question.

2.1 Sustainable development

Sustainability is defined as “meeting the needs of the present without compromising the ability of future generations to meet their own needs” (UN, 1987) This definition affirms that we only have one planet and we need to take care of it in order to allow for future generation to live as comfortably as the previous generation. The term sustainability has 34different dimensions. Climate,environment, economic and social relations. It is in the context of these 4 dimensions decided if something is sustainable.

The UN has set 17 sustainability goals as to achieve within 2030 seen on figure 2.1. These goals call for all countries to work together in order to solve various global issues. The sustainable development goals provide a framework for solving pressing challenges like climate change, poverty, inequality and economic development. Each of the sustainability goals has specific targets and indicators which are used to measure progress and efforts. FN urges all countries to adopt these goals in order to create a more sustainable and fair world (FN, 2023).

Norway is committed to becoming a zero emission society within 2050 in order to meet the Paris agreement. The Paris agreement is an international agreement which aims to limit global warming to below 2 degrees Celsius compared to pre-industrial levels. The agreement was adopted in 2015 during the UNFCC (United nations framework convention on climate change). It aims to combat the threat of climate change and how it will have an impact on global societies. The Paris agreement has been signed by 196 countries including Norway (SNL, 2022).

In order to achieve the goal of this agreement Norway has set goals for reducing emissions and has committed to reduce these emissions by 50% within 2030, and become a zero-emission society by 2050 (Miljøstatus, ND). This means all sectors of society will have to reduce their emissions.

The municipality of Stavanger has agreed on a climate plan adressing the biggest sustainability challanges the city faces and the strategies to face them.The city aims to reduce pollution by 80% within 2030 compared to 2015 emissions and be a fossile free municipality within 2040. In aiddition the aim to ensure safe consumption of fish and seafood from all sea areas by 2030, clean air for all residents, and preserve the habitat and biodiversity of plant and animal life.

To achieve this the muncupality will focus on improving sustainable transportation options, implement emission-free heating solutions, address seabed pollution, support cleaner wood stoves, protect natural areas, and promote environmental initiatives during planning and construction (Stavanger kommune, 2018)

Figure 2.1: UN sustainability goals (NTNU, n.d)

2.2 Re-use and rehabilitation of buildings

Traditionally the building industry has been based on the assumption that you demolish all old buildings and replace them with new buildings and new materials. Re-use and transformation is not something new, but it has usually been the exception in the building industry. It has been limited to re-using the materials by crushing them and using them as filling. The real estate sector in Norway produces 40% of all CO2 emissions, 40% of the energy use and 40% of the waste (Tekna, 2019). In Norway the building industry contributes to 14,7 million tons of CO2 emissions. 50% of a buildings emissions during it lifespan happens during transport and production of the materials required for the building. From the yearly emissions from the real estate sector 70% of the emissions come from new buildings and processes around these (Byggalliansen, ND)

Future built is a co-operation program which showcases different building projects that acts as role models. The goal of the program is to showcase that it is possible to create climate neutral buildings and areas. It was established in 2010 and consist of the municipalities surrounding Oslo municipality. A circular building recognized by Future built is a building where recourse utilization is at its highest, and consists of at least 50% re-used components (Futurebuildt. ND).

According to a study performed by SINTEF there is generally a low degree of re-using buildings in Norway. Only 1-1,4% of buildings are upgraded. The reduction in emissions when rehabilitating a building is found in re-using existing materials and not generating more waste. The study finds that rehabilitating a building in Norway generally produced 1/3 of the emissions equivalent to building a new one. When evaluating rehabilitation of a building, the identity and its historical values should be considered. Decisions can't be taken based on only reduced emissions. Other factors such as environmental consequences and social aspects must be included in the decision. Complete lifecycle analysis is important in order to make decisions when evaluating buildings (Sørland, Klungerbo 2021).

There are also challenges to re-using existing building masses. A rehabilitated building does not necessarily cover the same needs as a new building would. This can lead to a desire for even more buildings to cover the need. In cases where density can be increased by building a new building it will be more beneficial than to rehabilitate an old less efficient building. Increasing density is overall more sustainable in the long run because of the emissions coming from the transport sector. It can be difficult to get existing buildings to have the same energy effectiveness as new buildings. Even though a rehabilitation process can have less emission during the construction phase, the total emission of a new building can be less because of increased energy effectiveness. The demands in today's market can be hard to achieve when rehabilitating a building. It varies greatly if it is cheaper to rehabilitate than to build new buildings buildings depending on the varying conditions. Rehabilitation projects will have a higher degree of uncertainty than new buildings. In addition adapting existing buildings to new demands and uses is more demanding and difficult than demolishing and creating a brand new structure on a blank slate (Sørland, Klungerbo 2021).

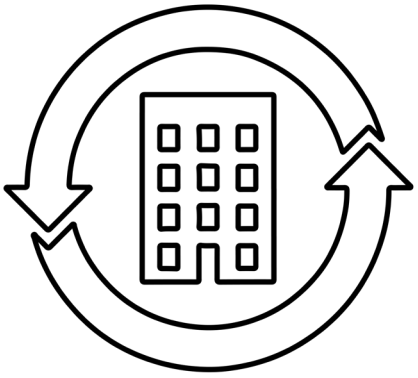


Figure 2.2: Re-use icon

2.3 The meaning of identity in urban regeneration

A sense of place and identity is not only coming from the physical aspects of the space but also the social aspects. The identity of a place is defined by the activities and elements in the environment surrounding it (Ujanga, Zakariya, 2015). Often older urban spaces have more established identities than new spaces because over time residents and people using the space has connected it with certain factors and uses. This is often not the case when establishing a new identity in a new area or with new buildings. When creating a new area an identity can either be implemented or appropriated. When implementing an identity a developer attempts to give a place identity. When appropriating an identity the inhabitants themselves establishes the identity of place (Skrede, Andersen, 2019).

2.4 Urban densification

Urban densification is an important strategy in order to achieve sustainable cities as urban sprawl can lead to social and economic problems. Densification refers to increasing the population density of urban areas and has multiple advantages. Densification helps reduce the overall land use in and around cities. By promoting denser environments cities can reduce the amount of land used and preserve natural habitats and open spaces. Urban densification can help support more sustainable ways of transportation. Denser cities promote walking, cycling and public modes of transportation. This will reduce greenhouse gas emissions and lead to a more sustainable city. It will also generally lead to a more healthy lifestyle (Hernandez-Palacio, 2018).

"Densification can support sustainable urban development by promoting compact and efficient urban form, reducing the ecological footprint of cities, supporting active and sustainable mobility, enhancing social interactions, and promoting economic vitality" (Hernandez-Palacio, 2018.P, 29).

Densification also however has its challenges. Increased housing prices and social acceptability are issues which need to be addressed with increasing density. Increased density also often leads to decreased availability of open green spaces per inhabitant and increasing exposure to pollution and noise (Hernandez-Palacio, 2018).

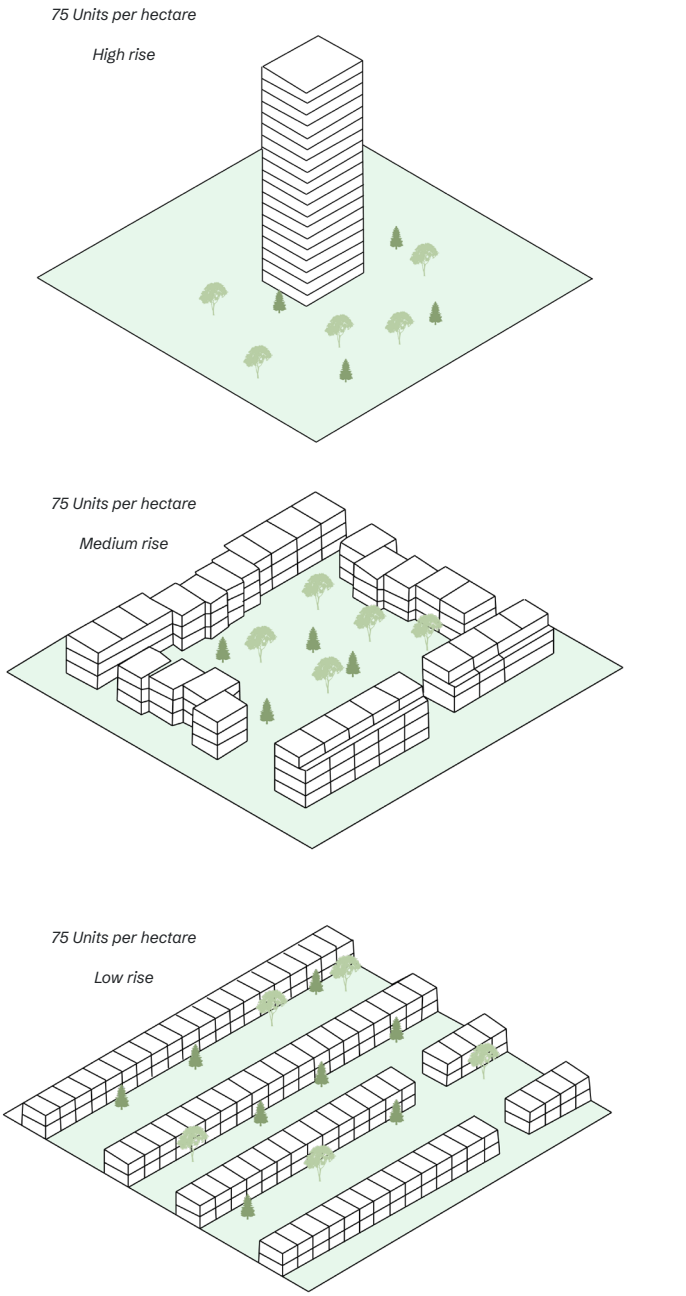


Figure 2.3: Illustration showing different forms urban density can take (based on figure from: Mehmet Topcu, 2014)

2.5 Urban design

The advantages of the courtyard typology

In the book soft city David Sim advocated for enclosed city blocks designed for people. The advantages of enclosed city block structures are huge, with very few disadvantages. Enclosed city block structures are clusters of buildings arranged around a central open courtyard as seen on figure 2.4. This creates an urban space with clear definitions of public and private space which creates a sense of community within the block and provides the residents with a shared urban space. The design is effective in creating more walkable cities since it encourages walking and cycling instead of using the car. The urban spaces manages to create a car free environment with car access to all the buildings on the outside of the courtyard. In addition David Sim argues that courtyards also improves the microclimate by creating sheltered space and allows for a high density while keeping the human scale (Sim, 2019. P18).

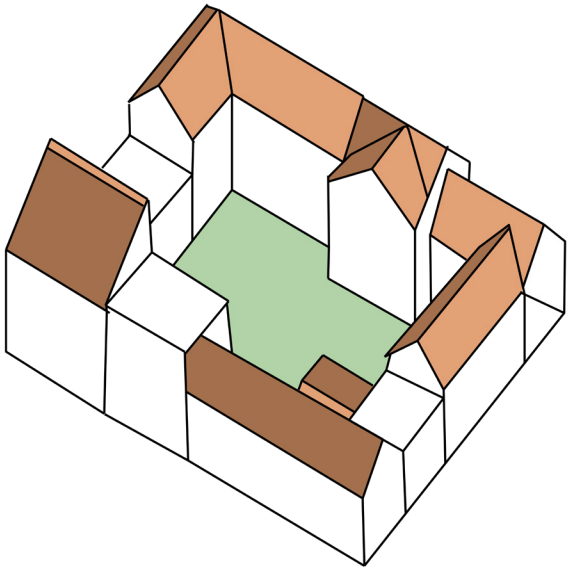


Figure 2.4: the courtyard typology

Active first floors

One major advantage of the courtyard design is the large ground floors they create. These ground floors are highly adaptable and allow for a variety activities on ground level. According to David Sim active first floors activates the streetscape and creates an engaging environment. Active first floors also have the capability of expanding to the sidewalk which establishes a more active pedestrian environment and takes use of often unused public space (Sim, 2019. P54).

Figure 2.5: Active first floors in Vienna (Urban design group, 2020)

Street design

Streets take up more than 80% of public space in cities and is the base which cities are built on. Road networks designed for people and not just cars, increases safety for pedestrians and encourages walking (CNU, ND). A denser network allows for higher walkability and reduces land use. According to Jan Gehl “if the movement of traffic is reduced from 60 to 6 kilometers per hour, the number of people on the street will appear to be ten times greater”(Gehl, 2011) This is why it is important to promote walkability and cycling because cities become more active. “Slow traffic leads to lively cities”(Gehl 2011).

Figure 2.6: Prioritization of traffic (Kommunal og modrniseringsdepartementet, 2016)

Urban space network

Urban spaces an idea handbook is a publication from the Norwegian government acting as a resource for planners, architects and landscape architects for designing public spaces (Kommunal og distriksdepartementet, 2016). The book contains guidelines and strategies for creating attractive and functional spaces in a Norwegian context. The book proposes five different criteria's in order to create a well functioning network of public urban spaces.

Usability

The book emphasizes on creating urban spaces that are user friendly and accessible. These spaces should be universally designed and be accessible for everyone. Urban spaces needs to be planned for use all year around. This can be done by adapting the space for different use during different periods. Shelter for harsher weather can be ensured by good placement and dimensions of the urban space and the urban furniture. Urban spaces should be usable during all times of day and feel safe. This can be achieved with good lighting and good maintenance. Benches can be used for creating new meeting places and also rest stops for elderly. This is a simple tool of improving the urban landscape (Kommunal og distriksdepartementet, 2016 p 24-29).

Closeness

The network of urbans spaces should be adapted to the principles of the 10 minute city. Attractive paths and roads often leads to people wanting to walk further, while barriers and bland environments reduces cycling and walking. A local area should have access to various different types of urban spaces with different functions (Kommunal og distriksdepartementet, 2016 p 30-34).

Connectivity

Mobility is an important part of the functionality of the public urban space. Sidewalks needs to be wide and pleasant to use and be able to house activities. Children should be able to use the infrastructure without being in danger and there should be dedicated zones for walking and cycling. It is also important with good lighting during all times of day so that the spaces feel safe (Kommunal og distriksdepartementet, 2016 p 36-39).

Quality

The urban space should be made to last and use quality material which stand the test of time. Facades should be interesting and the environment should trigger different senses. Cultural heritage areas can tell interesting stories and contribute to a feeling of identity in the urban setting. Art can also be used in order to make an urban space more attractive (Kommunal og distriksdepartementet, 2016 p 40-44).

Urban green structure

Green structure in cities contribute to increased biodiversity and opens up for recreational activities. It is important that the green structure is planned with a larger green network in mind tying multiple green areas together. Urban farming can have many positive effects on the neighborhood and establish identity. It also has advantages for biodiversity. Green structure also have the ability to combat surface water and other climate issues that may be present in the area (Kommunal og distriksdepartementet, 2016 p 45-49).

Conclusion

When creating an urban space there should be a good relation between the building and the urban floor. The first floor should have an active façade with good material use and architecture. Green elements should be used in order to deal with rainwater and support biological diversity. All urban spaces should be connected and be catered towards the pedestrian. If there are any elements like a view or a cultural monument, these can be used as a way of creating an identity for the urban space (Kommunal og distriksdepartementet, 2016).

Nine criteria for livable urban dense cities

The book Soft City is a book on people-friendly architecture and city planning by David Sim. The book explores how urban design affects and potentially improves people life's. The book emphasizes the importance of designing cities that prioritize the well-being of people and support a variety of different functions. David Sim proposes Nine criteria to create livable urban dense cities (Sim, 2019).

Diversity of built form

Diverse built form creates a more adaptable and inclusive city. Buildings should vary in height, typology, shape, dimensions and special conditions. This allows for a more dynamic and responsive city that can better accommodate the evolving needs of its residents (Sim, 2019 p 214-215).

Diversity of outdoor space

Outdoor public space should be designed to fit a various range of users and activities. These spaces consist of a mix of public, private or shared spaces. These spaces should be in close proximity of another and consist of different typologies. Streets are also public spaces and can support outdoor life in multiple different ways (Sim, 2019 p 216-217).

Flexibility

Flexibility is a highly important factor in urban design. This is because in a city the needs of the inhabitants gradually change over time. David Sim argues that urban design and plans should incorporate adaptable structures, modular buildings and flexible spaces that can be repurposed in order to accommodate to changing needs (Sim, 2019 p 218-219).

Human scale

Urban environments needs to be designed at a human scale in order to meet the needs of its inhabitants. This means that buildings, streets and public space are sized appropriately to the needs of people. this involves prioritizing walkability, public transportation, and mixed-use development to create a more livable and sustainable city catered towards people living in it (Sim, 2019 p 220-2021).

Walkability

Walkability is an important component in order to make a dense city livable. Built cities should have is easiest way of transport be walking. This includes designing streetscapes that prioritize pedestrian safety, creating public spaces that encourage walking, and promoting mixed-use development that allows people to access their daily needs on foot (Sim, 2019 p 222-223).

Sense of control and identity

Sim argues that the importance of identity in the urban context. Residents should have a voice in shaping the built urban environment. Edge zones around private property are important for expressing identity. Urban design should reflect the cultural and historical heritage of the city. There should be a clear distinction between public and private. It is important that public areas are inviting for people to spend time there (Sim, 2019 p 224-225).

A pleasant micro climate

A pleasant micro climate is important in order to create spaces where people would want to spend time. It is important to designing buildings, streets, and public spaces that let in natural light, air flow, and shade as well as protect from the wind and rain. Parks and green roofs can be used to reduce heat and make the city more sustainable and attractive (Sim, 2019 226-227).

Smaller carbon footprint

The built forms should use less recourses in construction and operation in order to reduce the carbon footprint of the built mass. The overall carbon footprint should be reduced by by creating infrastructure that promotes public transport, cycling, and walking and mixed-use development that allows people to access their daily needs without relying on cars (Sim, 2019 p 228-229).

Greater biodiversity

Urban environments should prioritize green structure. Vegetation in urban environments has overarching advantages such as mitigating pollution, protecting against elements, better microclimate, improved drainage and greater biodiversity. This can be implemented by having multiple smaller green spaces, greenery along spaces and edges, green walls and soft landscape where possible. This creates a more sustainable and resilient urban environment that can adapt to the impacts of climate change (Sim, 2019 p 230-231).

Figure 2.8: The nine criteria for livable dense urban cities (Sim, 2019)

Case Studies

This section aims to explore different examples of successful urban transformation projects in similar cases as the one at Våland. The purpose of this section is to identify key principles and best practices that can be applied to the hospital area at Våland. Through the examination of case studies from around the world, this section aims to identify common themes and successful strategies that can be adapted to study area. By analyzing these case studies in the context of the research question, one can gain insight into how different cities have approached similar challenges and learn from their methods.

3.1 Amtssygehuset - Aarhus, Denmark

Amtssygehuset is an old hospital area in Aarhus, Denmark. The hospital has moved to a different location and the area is to be transformed and repurposed. As with the hospital in Stavanger it is located central in the city of Aarhus and is in close vicinity to the railway and multiple green areas. The proposed plans for the new development suggests keeping the old hisotircal brick buildings and removing the newer administration buildings in order to keep the indetity of the area. New proposed buildings should be in red brick in high architectural quality in order to fit in with the existing buildings masses and respect the older hospital buildings as seen in figure 3.2. The new development features multiple green public spaces and the proposal ties the area well into the surrounding existing infrastructure by introducing two new main axis as seen in figure 3.1 (Aarhus Kommune, 2021).

The new plan proposes having low building heights of maximum 5-6 floors. This is to keep the presence of the existing historical buildings which are 1-5 floors. The development is made with numerous different types of housing in order to accomodate for a multitude of different economical and social aspects. The municipality proposes implementing temporary use of the buildings swiftly after the functions leave. This allows testing new solution on a smaller scale before implementation. In this way experience can be gathered on what may be the future solution and functions of the area (Aarhus Kommune, 2021).

Figure 3.1: Masterplan of the proposed new development (Aarhus kommune, 2021)

Figure 3.2: Render of potential development at Amtssygehuset in Aarhus (Aarhus kommune, 2021)

3.2 Carsberg byen - Copenhagen, Denmark

The Carlsberg city district in Copenhagen is an earlier industrial area which has been transformed into a new city district. The area is dominated by old factory buildings that has been restored in combination with newer high rise buildings as seen in figure 3.3. This development has been successful in mixing low rise buildings with high rise buildings in order to create a varied environment with a high density. Close knit streets with the pedestrian in focus in combination with evenly scattered public space keeps the human scale in the area and avoids the larger buildings feeling overwhelming. Most of the buildings are mixed use with active first floors in which is vital to keep the area active during all times of day and avoiding a sleeping city (Carlsbergbyen, n.d). Mixed use also promotes less driving as most people's needs are located within a close vicinity.

Figure 3.3: Picture of Carlsbergbyen in Copenhagen (byggeindustrien, 2021)

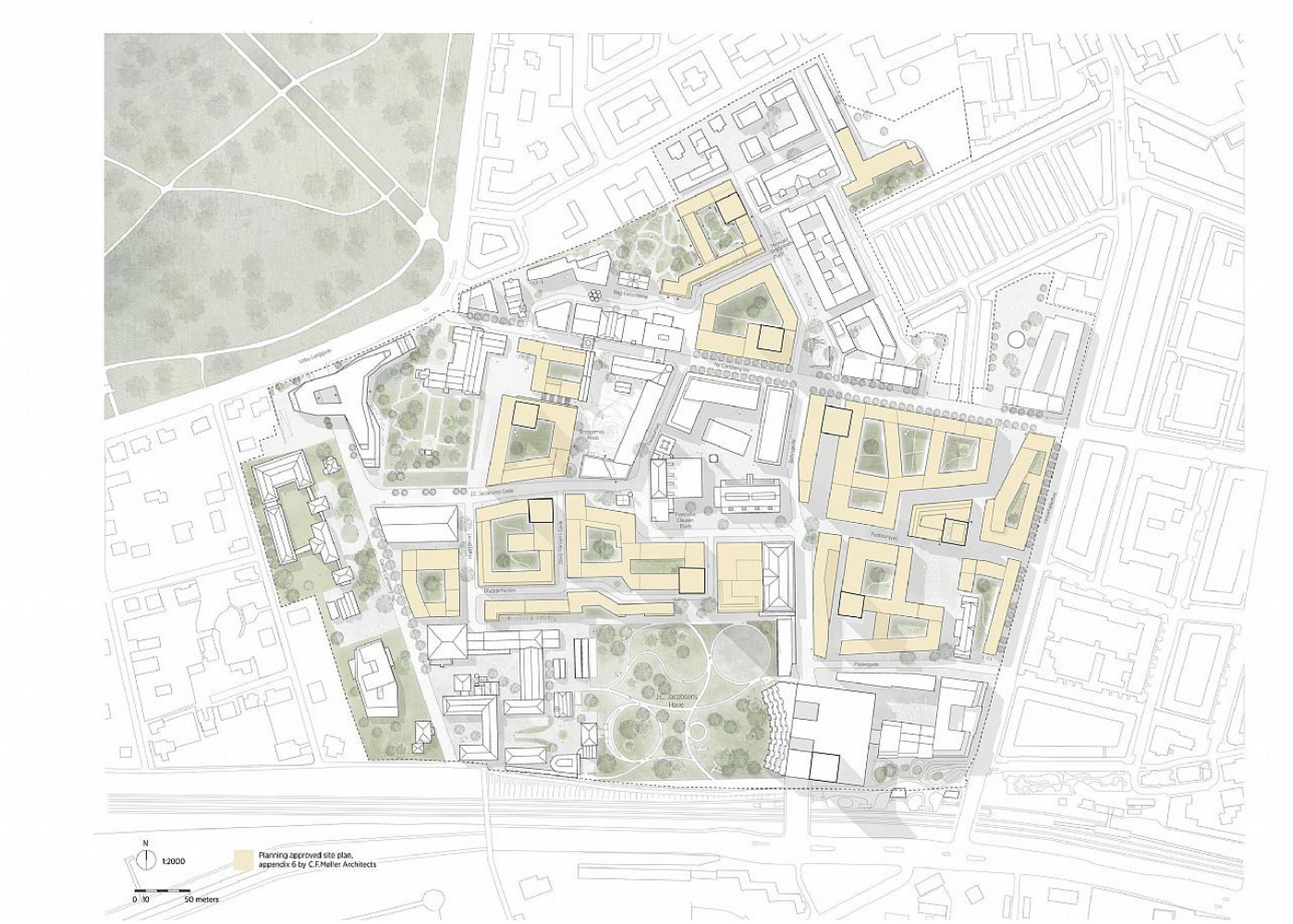


Figure 3.4: Carlsberbyen masterplan (CF møller architects, n.d)

3.3 Drammen Hospital – Drammen, Norway

Drammen hospital is set to move to Barakerøya in 2024/2025. The property which today makes Drammen hospital will be repurposed for new functions. The municipality is currently in the works of creating a regulation plan for the area. (Drammen Kommune, 2023). Four different architectural firms have created feasibility studies for the area in order to be able to propose a design for the new development. These are concepts meant to guide the municipality deciding on how to regulate the area. The Drammen hospital plot have many similarities to the current hospital area at Våland. The plot is located close to the city center and has large hospital structures which will need to be repurposed and transformed. Like most of the buildings at Våland, Drammen hospital mostly consists of high rise concrete buildings in relatively poor condition with low quality architecture as seen in figure 3.6.

All the proposals conclude with either repurposing or transforming the main hospital building as seen in figure 3.5. This is a sustainable solution to keep the areas identity intact. They also propose different solutions in order to tie in the hospital area with the surrounding road network and infrastructure. All the proposal are a mix of low and high rise buildings. Keeping the same height as the existing hospital is done in order to keep the silhouette unchanged and maximize the potential. The plans also suggest step by step development and temporary use of the area in order to have functioning buildings while other areas are being developed. This will enable the development to start sooner at a lower initial cost and allow the process to stretch over a longer period of time (Drammen Kommune, 2023).

Figure 3.5: sketch of the potential development in Drammen (Nordic & Norconsult, 2019)

Figure 3.6: Image of the main hosptial building in Drammen (Wikipedia, 2020)

Figure 3.7: Masterplan of the potential development in Drammen (Nordic & Norconsult, 2019)

3.4 What can be learned from these cases ?

The developments of Amtssygehuset, the Carlsberg City District , and Drammen Hospital provide important learning for the future development at SUS Våland.

Mix of high and low rise

Carlsbergbyen in Copenhagen displays a successful mix of high-rise and low-rise buildings. This mix leads to a diverse buildt enviroment where the human scale is inteact because of the scarse high rise buildings. This creates an enviroment where one can get the advantages of both high rise and low rise buildings.

Preserving an identity

By integrating historical buildings and respecting architectural styles, new developments can seamlessly blend with the existing context, establishing a sense of continuity and cultural significance as shown in the case studies. Amtssygehuset propose retaining historical brick housing while removing newer administration buildings, while the Carlsberg City District and Drammen hospital sucsessfully integrate older buildings. The Drammen development shows how older buildings with low quality architecture can sucsesfully be inegrated and transformed with newer buildings.

Prioritize pedestrians

Carlsberg City District's focus on pedestrian-oriented streets and evenly scattered public spaces. Drammen Hospital's relocation plan also emphasizes the need for safe and comfortable pedestrian pathways and green spaces. By designing streets and public spaces with pedestrians in mind, these developments enhance the overall livability and accessibility of the area.

Integration with the surroundings

Integration with existing infrastructure is another vital lesson. Amtssygehuset and Drammen hospital tied the new developments into the surrounding infrastructure by introducing new main axes and ensuring seamless connectivity with the transportation network. This integration enhances accessibility and connectivity, making it easier for residents and visitors to navigate the city districts.

Temporary use

Implementing a step by step development and temporary use strategy is evident in Drammen Hospital and amstssygehuset. By repurposing the main hospital buildings step by step and allowing temporary uses of the area, the development process can be more flexible and cost effective. This approach enables functional buildings to be in place while other areas are being developed while ensuring a smooth transition and maximizing the potential of the site.

Mixed use

Carlsbergbyen in Copenhagen shows the success of mixed-use development. By combining residential, commercial, and cultural functions, the development creates a vibrant and balanced urban environment. Active ground floors with retail and community spaces creates an active street life and reduces dependancy on cars. The diverse mix of functions leads to social interaction and a stronger sense of community.

Analysis

The purpose of this analysis is to explore the plot at Våland in order to create an informed design proposal. Through this analysis, knowledge is gathered on the opportunities and challenges presented by the area and will inform recommendations for future development of the plot and its buildings.

4.1 Location

Stavanger unviersity hospital is located in the center of the Stavanger region. To the north of the study area is the city district of Våland which consists mainly of housing, schools and small local stores. The district is known for the landmark Vålandstårnet located on a small hill. Våland consist mainly of low rise wooden housing that is a part of “Trehusbyen” in Stavanger. To the south the study area borders with the distrcit of Bekkefaret which also mostly consist of housing, with some larger apartments buildings and a local church. To the west the area borders Våland Colony garden which a part of the Våland city district. Further west is Mosvannet which is a larger recreational area consisting of a small lake with a surrounding forest. To the east the area borders Hillevåg as seen in figure 4.2.

The study area is delimited by Amauer Hansens vei, Fylkeslege Ebbelsgate, and FV440, enclosing the primary somatic functions of the hospital. This is also the area which consists of the building that have functions which will be moved to Ullandhaug leaving the plot and buildings empty.

Figure 4.1: Aerial photo of Stavanger university hospital (Helse Stavanger, n.d)

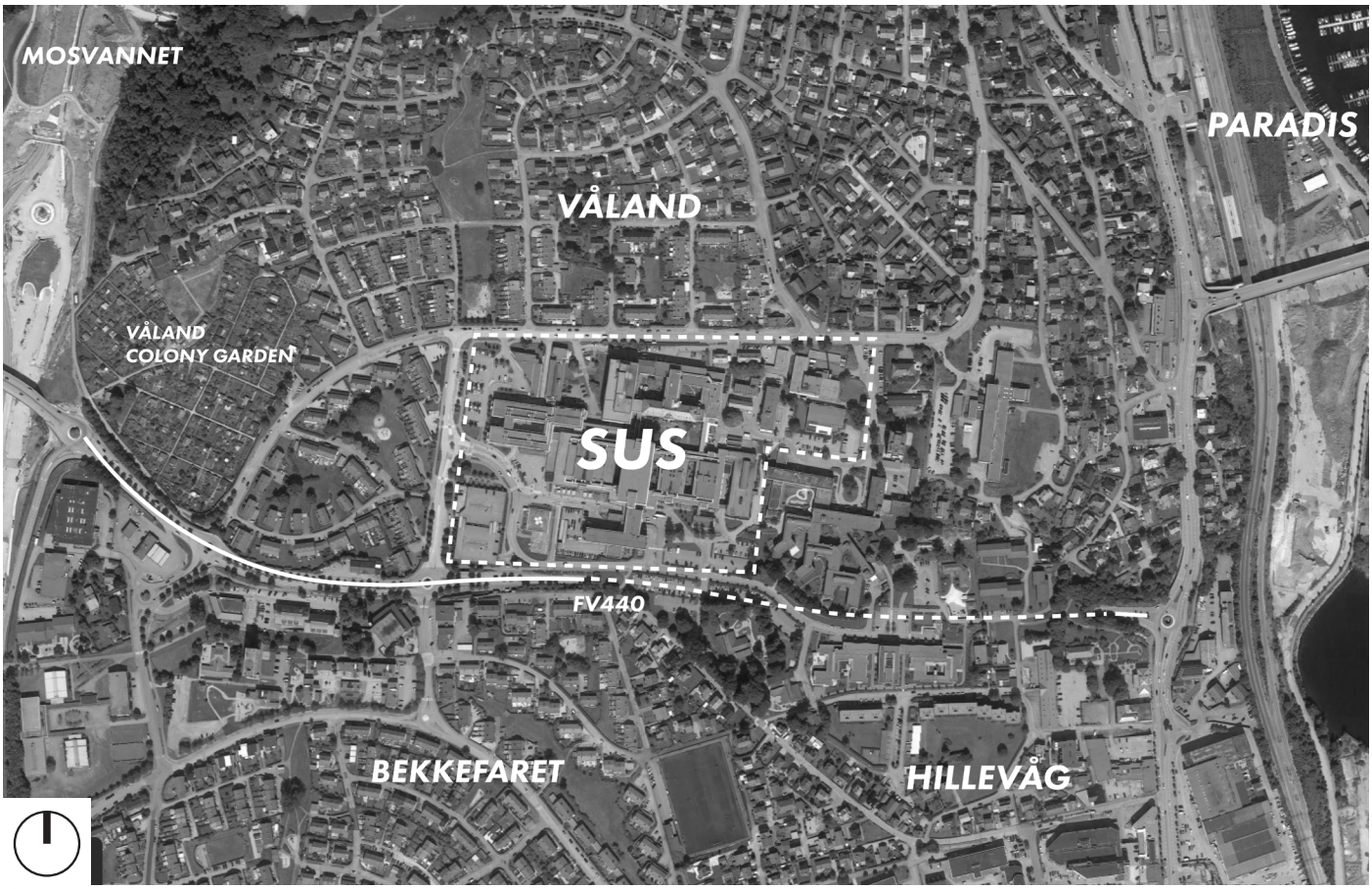


Figure 4.2: Map showing the location of the study area and surrounding areas (Based on map from: Google earth,2021)

4.2 Historical development

The first hospital in Stavanger was built in 1272 and was until 1700 the only hospital in Stavanger. The old county hospital was put to use in 1842 and had four patient rooms. In 1897 Stavanger hospital was built at Kannik. In 1923 the county council decided on building a new hospital south of Våland. Four years later Rogaland hospital was opened in 1927 at Våland costing 1.58 million kroner (Helse Stavanger, n.d). This was a hospital meant for the city's population and surrounding districts with buildings were the first of the buildings present at today's current hospital. In 1960 Stavanger hospital and Rogaland hospital got merged and all hospital functions were located at Våland. In 2001 all ownership of hospitals was reformed and the ownership of the hospital and all its functions got transferred to the state. The county municipalities enterprise for the hospital was named Helse Stavanger (SML, 2022). Over the years there has been multiple expansions to the hospital adding more functions and space for patients.

Figure 4.3: Image of the hospital taken in 1961 (Stavanger byarkiv, 2019)

Figure 4.4: Image of the hospital area taken in 1951

Historical timeline

1937

10 Years after the establishment of the hospital. The area mostly consisted of farm land and the first hospital buildings still present today.

1960

Stavanger is expanding and more housing is present in the area. The administrationbuilding is present and the eastern expansion is beeing buildt.

1973

The pshyciatric department and internatbygget is buildt.

1999

The hospital area is starting to look recognisable as more infrastructure is present. 11 buildings were added during this period (KAP arkitekter, 2023).

2007

The hospital is nearing its current state. as the patietnhotel is buildt and MOBA is under construction.

2022

The emergency room is completed. and the area is as it is today.

Figure 4.5: Aerial photos of the hospital area (Norge i bilder, n.d)

4.3 Landscape

The Landscape in the area is generally affected by a slope stretching from the north-west down to the south-east side of the area. This creates a shallow slope stretching through the entire hospital plot. The hospital grounds are flat to accomadate for buildings and the surrounding elevation is altered accordingly. This is to keep the buildings and parking areas at a flat and even level.

The height at Ullandhaug and the height at the Våland tower surrounds a valley creating the borders of a landscape room. At the floor of this landscape room is the road Fv440. The room can be observed from different levels in the landscape with the two distinct landmarks tying the room together (Stavanger Kommune, 2023c).

Figure 4.6: Overlooking the hospital area

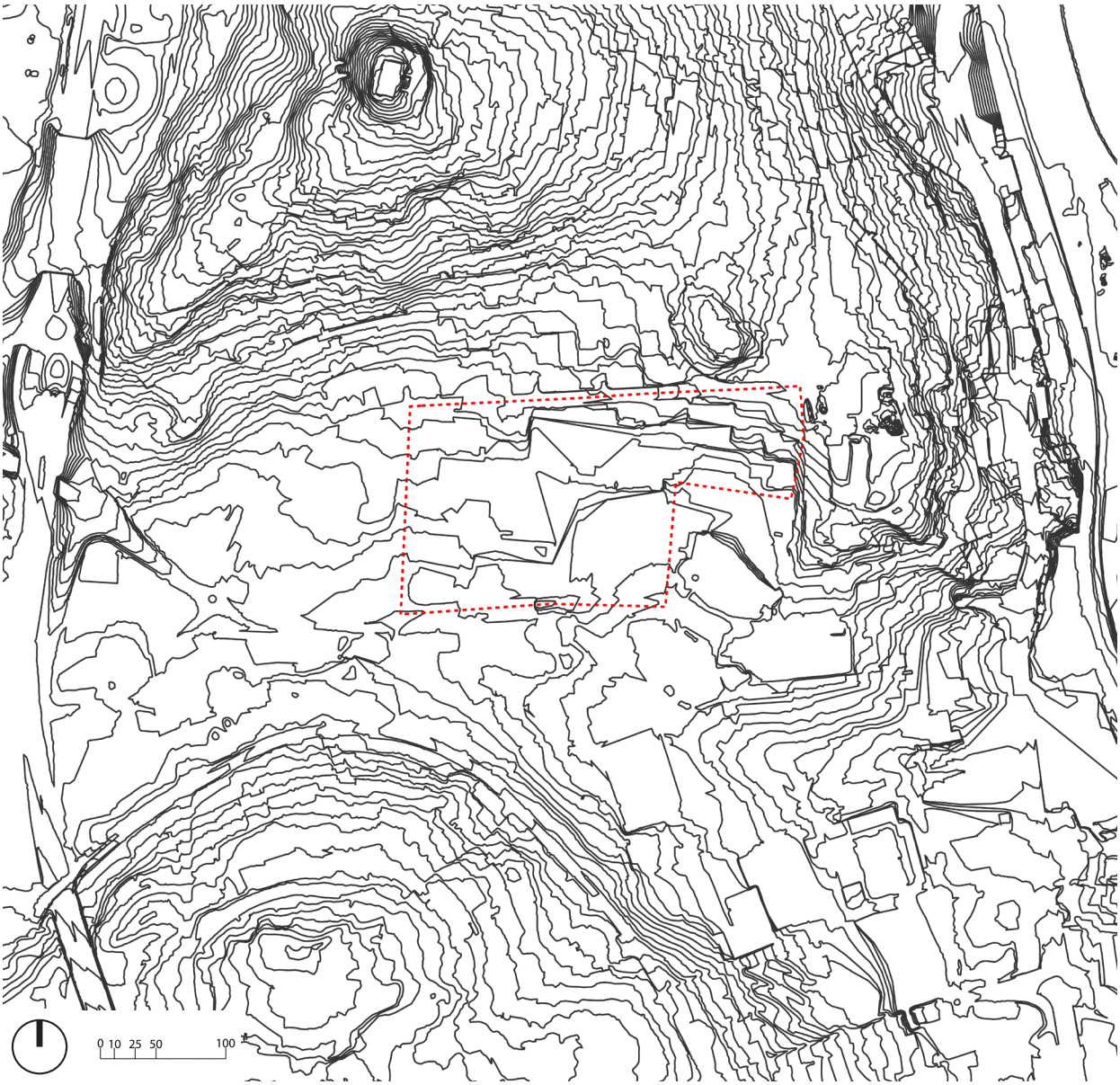


Figure 4.7: Map showing the topography around the study area

4.4 Climate

The climate in Stavanger is characterized by the coastal climate in western Norway. The area has mild temperatures, moderate precipitation and wind through the year. The temperatures vary from around 1 degree average up to 15 degrees average. The area sees about 1000mm yearly precipitation with the wettest month being October. Stavanger has during the last 13 months had 186 days with rainfall (YR,n.d). A multitude of areas in Stavanger is also likely to harbor small microclimates appearing in urban spaces where wind and rain from the coast are diverted. It is important to take windcorridors and microclimate into consideration when planning the area.

Surface water

Stavanger municipality has conducted an analysis wich looks at the potential of damaging surface water in the Stavanger region (Skybruddsplan). Våland hospital is situated in an area where buildings may be affected in the future because of climate change. The area is situated at the bottom of the runoff of the larger green areas beneath the Våland tower. This leads to some of the water running towards the hospital buildings and along the facades. This water ends up stationary in the center of the hospital area as drainage during extreme rain isnt sufficiant (Stavanger kommune, 2022).

The analysis recommends that when the current hospital moves to ullandhaug the new development should establish a continues floodway integrated in the plan. This should not lead the water into the existing tunel. They reccomend leading the floodway along Fridtjof Nansens vei, this should then further lead to the football field for flood prevention (Stavanger kommune, 2022).

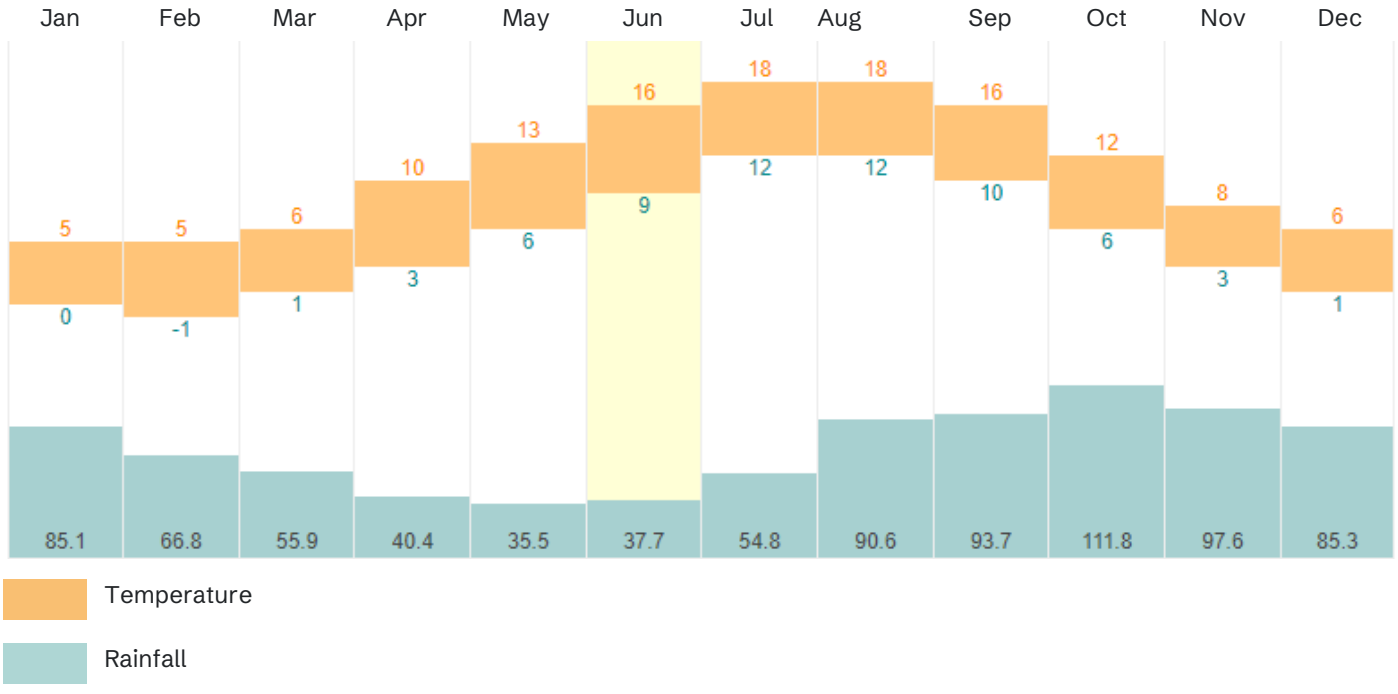


Figure 4.8: Average temperature and rainfall in Stavanger (Timanddate, 2023)

4.5 Noise analysis

There is significant noise pollution at the edges of the area coming from the surrounding roads with the most significant noise coming from fv440 as seen in figure 4.10. There are sound walls, large buildings structures and vegetation which may dampen some noise coming from the roads as seen in figure 4.9. The requirements for an urban space in a new development is lower than 70dB as an average during the day and night. If rooms next to the road are made for longer stays or is a quiet place of an outdoor area this requirement is 55dB (Regjeringen, 2021)

There are often noise from helicopters related to the hospital function. According to the sociocultural analysis performed by Asplan Viak there seem to be an acceptance towards noise coming rom the hopsital area. Some did however complain about traffic during night hours and noise coming from helicopters (Asplan Viak, 2022) .

Figure 4.9: Picture of Fv440

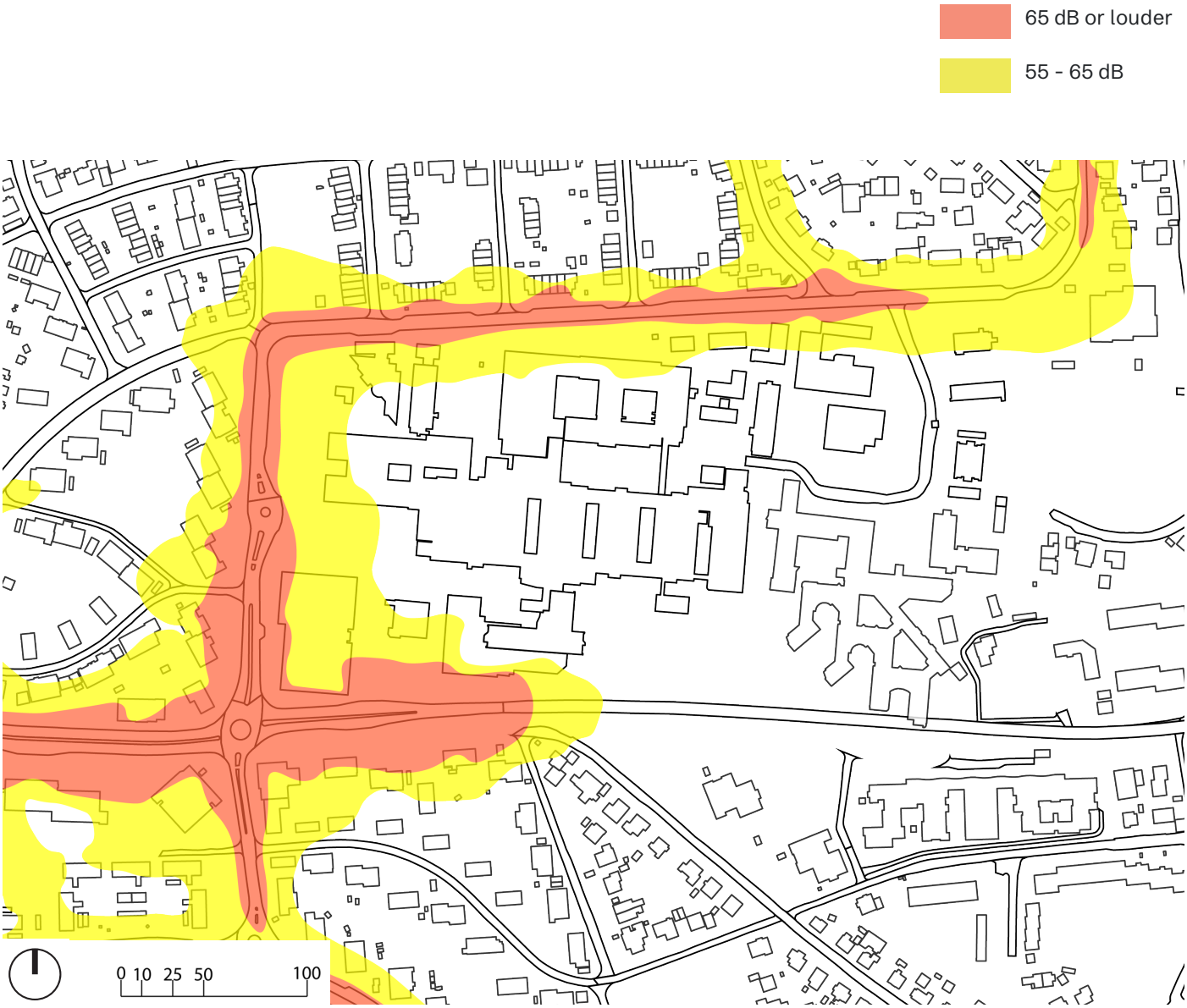


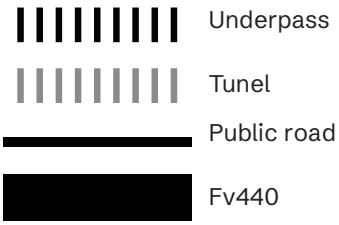
Figure 4.10: Noise analysis (Based on data from: Statens vegvesen n.d)

4.7 Road network

The roads surrounding the hospital mostly consists of well-functioning grid networks. These networks are ended by the hospital area which acts as a large disrupting cell. The hospital area itself has few roads and paths since it mostly consist of large building blocks with low walkability. The area is mainly designed for cars with easily accessible roads from the E39 and large parking areas. A Toll ring has been set up after the roundabout in order to deter driving which may lower the total amount of traffic. There are also paths for bikes and pedestrians surrounding the area but no intuitive paths leading through the hospital plot. The high scale and amount of building mass in the area create a barrier for pedestrians and cyclists.

The roads surrounding the hospital is affected by traffic related to the hospital functions. Speed limits surrounding the area are at 40kmt while FV440 is 50kmt . The area is affected by FV440 which is one of the main roads leading to E39 from the city center with a yearly traffic of 12023 cars (Statens Vegvesen, n.d). This is a heavily trafficked road which is also an important part of the public transport system. FV440 creates a barrier effect between Bekkefaret and Våland, since the only way to cross it for cyclists and pedestrians is an underpass seen in figure 4.13.

Figure 4.11: Picture of the underpass on the south side of the study area



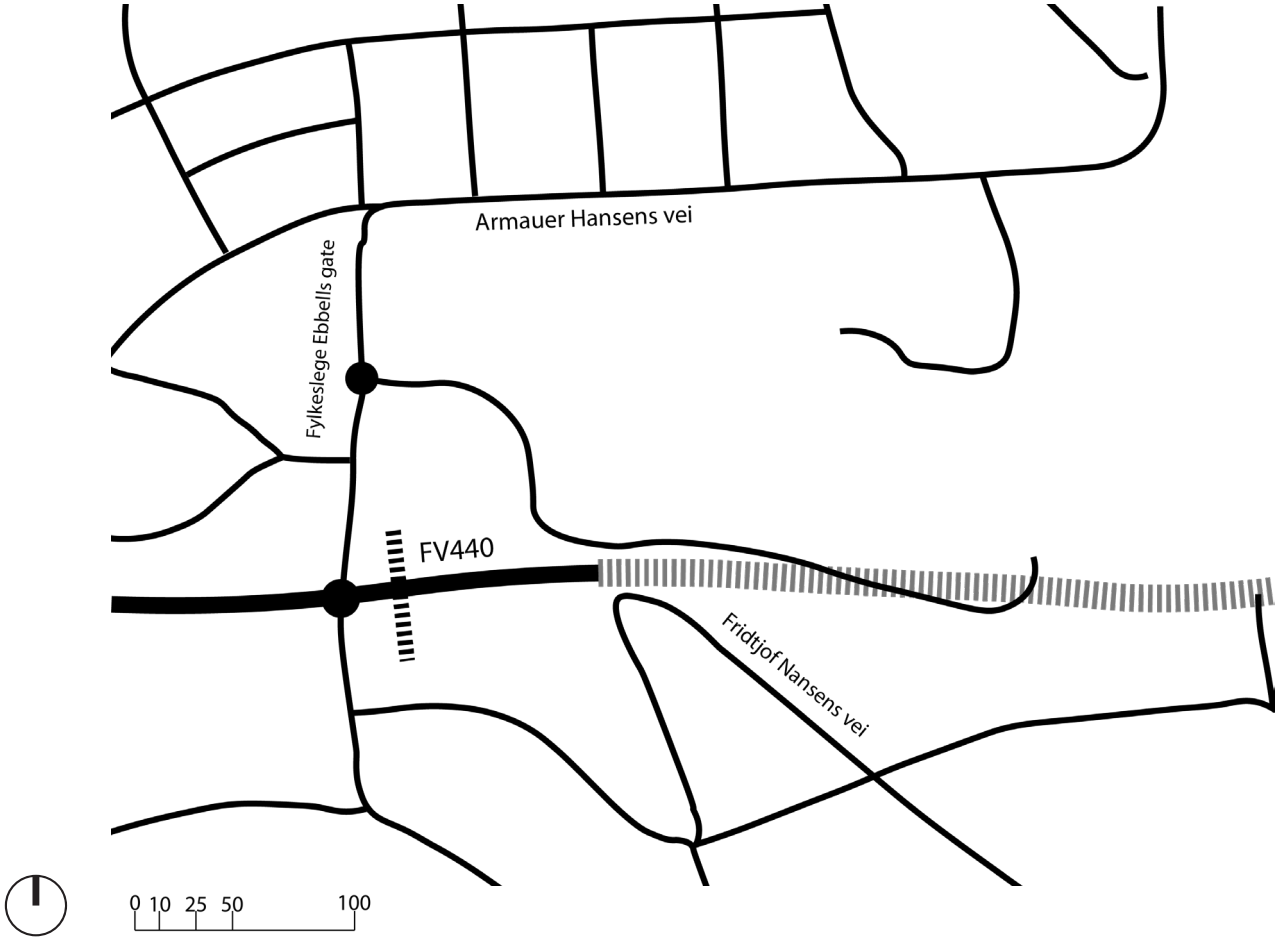


Figure 4.12: Map of the road network

4.6 Public transport

There are multiple bus stops located in the area tying it in with the rest of the citys public transport system as seen in figure 4.12. There are two routes where buses stops by the area. These routes have a high frequency and covers the areas transport needs sufficiently for its current function. The buses that stops by the northern section is route number 11. The routes that goes by the southern route are route 4, X31,X60, NW192 and VY190. In addition the local busroute to the airport (FB40) stops by the study area taking the southern route (Kolumbus, n.d) . The study area in close vicinity with the local Railway which goes from Stavanger through Sandnes and the southern railway ending in Oslo. This connects the area well with the rest of the region.

The area has sufficient city bike stations for the hospitals current functions. This makes sure the area is accesible by the city bike network present in the Stavanger region provided by Kolumbus.

Figure 4.13: Picture of bus stop along Fv440

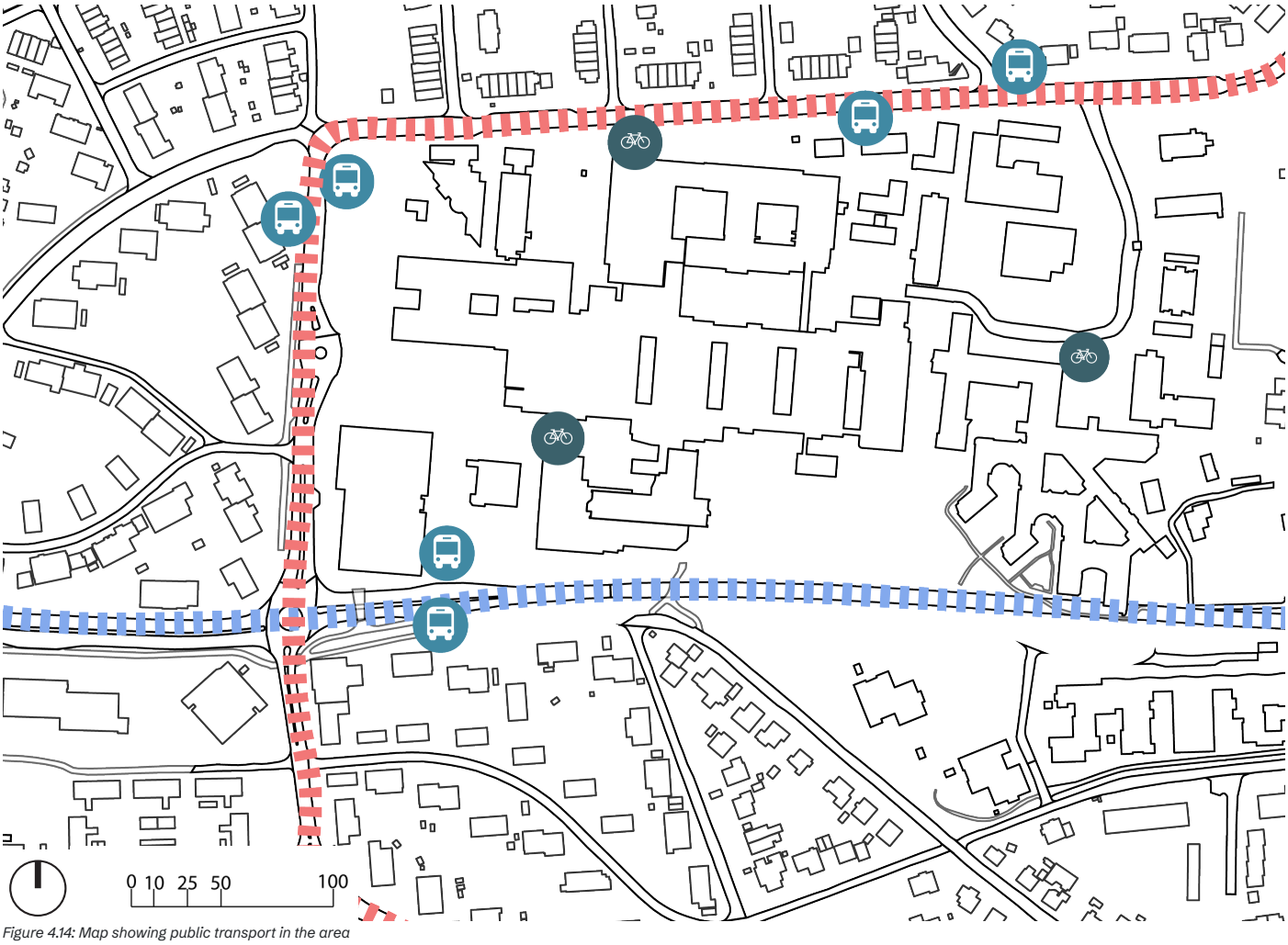


Figure 4.14: Map showing public transport in the area

4.8 Functions

The area is generally characterized by its biggest functions beeing the hospital and surrounding housing. Most of the functions in the area supports current hospital functions and its users. There are some mixed functions on street level in the south side of the area but the main impression is still that there is a low mix of functions as seen in figure 4.16.

According to the sociocultural analysis performed by Asplan Viak many of the inhabitants around the study area indicate that there is a lack of meeting places in the form cafes and shops. This is expressed by inhabitants of all ages and backgrounds. In addition the analysis states that many of the inhabitants a place that feels more city like with a variety of functions. South-west of the area is the shopping center Kilden located and according to the sociocultural analysis this is a center may of the people in the study area are using today for their shopping (Asplan Viak, 2022). This indicates that the area could benefit from more functions in the form of a local district center. There are sufficient kindergartens in the area which covers the current needs.

Figure 4.15: Picture of Bekkefaret church

Figure 4.16: Map showing the functions in the area

4.9 Green structure

The overall impression of the hopsital plot varies greatly depending on the season. During summer the area appears green with scattered green structure and trees all over the area. However during winter the area appears gray as the green elements fade and the gray facades make a bigger impression. The green areas which exists on the hospital plot are varied with different functions. Many of these are created for the patients and hospital staff to have shorter breakes. This means that the areas generally are made for shorter stays with few active functions or activities. There are sufficient trees and grass along sidewalks and path-ways giving the area a genreally green impression during spring and summer.

Figure 4.17: Picture showing green structure at the hospital

Vålandsparken in the north side of the area consists of a large green park area as well as a forest area on the north side as seen in figure 4.18. This green area leads further to the large green area surrounding Mosvannet which leads further to other green areas in Stavanger conencting to the implemented green network. At the western side of the area there is a small green corridor leading from Bekkefaret church to Mosvannet

Despite having some green areas and a overall green expression there are no larger connected green areas in the hospital area. The gray facades of the hospital area and lack of larger green spaces leads to the area acting as a barrier between the existing larger green infrastructure in Stavanger (Stavanger kommune, 2023).

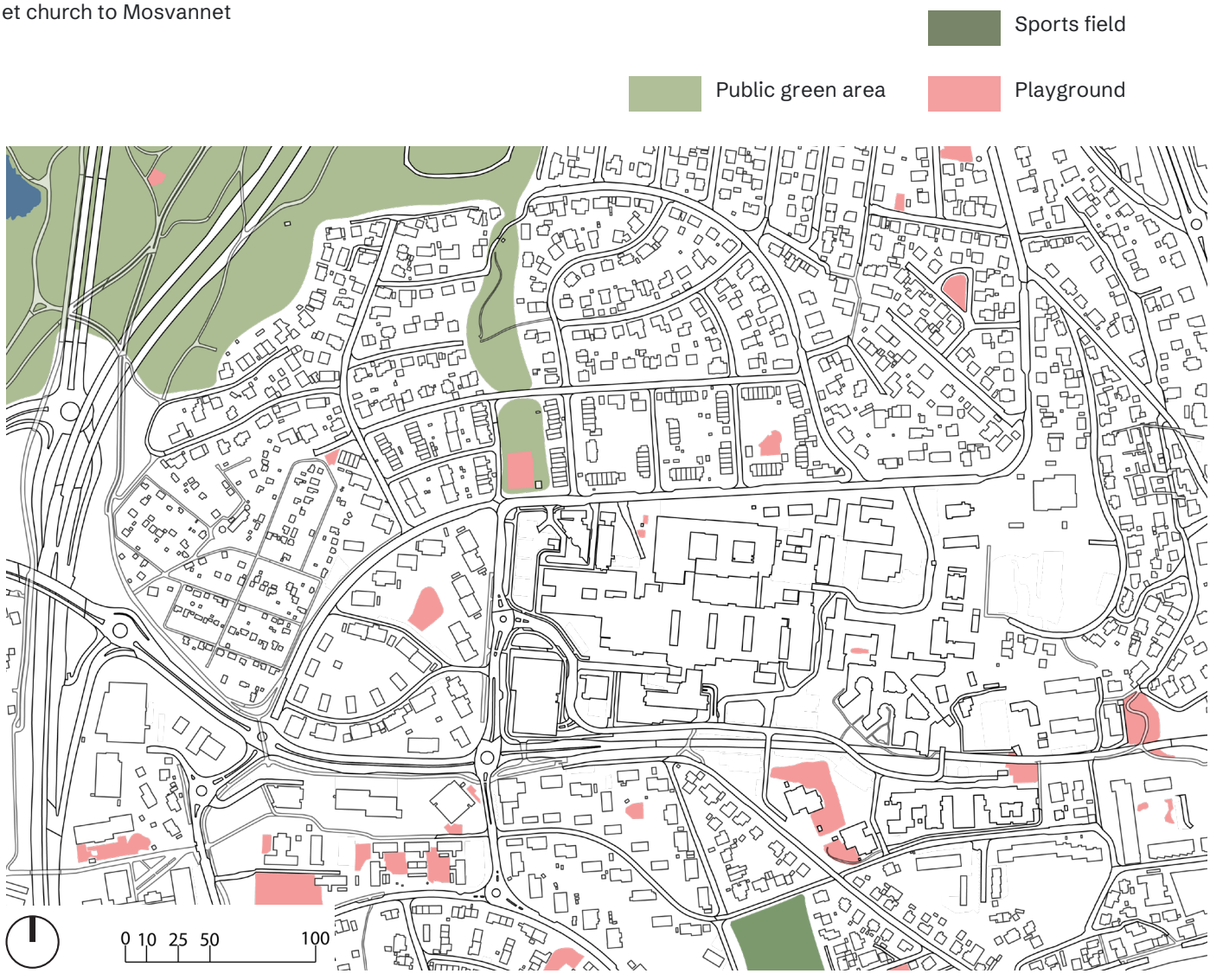


Figure 4.18: Map showing playgrounds, sport fields and public parks

4.10 Identity

The areas identity mostly originates from the its functions and history of being a hospital. Inhabitants in Stavanger and the surrounding region has a relation to the area as a hospital function which establishes an identity. The architecture of the hospital buildings is very little coherent and mostly reflects an increasingly need for space the hospital has had since its beginning. This leads to a little coherent area where it is hard to find an identity other than its current function. When most/all the hospital functions move the area is left with a weak sense of identity since this was connected to its function, however a new potential point of identity are the older hospital buildings as they display the origin of the hospital. Few people in Stavanger are currently aware of these buildings as they are mostly covered by newer buildings and extensions of the hospital.

Figure 4.19: Picture of the old entrance to the hospital area

4.11 Architecture

The general architectural quality of the area is low and show signs of the hospitals emerging need for space over the years. The buildings were built during varying time periods which is reflected by the architectural expression and material choice seen in figure 4.22. This leads to a blend of vastly different and contrasting architectural styles. In addition the materials choice mostly consits of gray concrete and white facade panels giving the area a greige look especially during the winter months in Stavanger. There is little exitement and play found in the facades which makes the buildings appear like large blank spaces. This is also true for the newer buildings, where blank facade panels have been used to create a similar empty expression.

The older buildings are also gray in color beeing made of concrete and have a symetrical classic expression. Østbygget (old) has some facade decoration and arches leading to a more appealing facade. Østbygget is built in new classisism while the two other buildings are built in historicism. The administration building is buildt in a functionalistic architectural style.

The large concrete hospital facades create a stark contrast to the surrounding low-rise wooden housing, with their imposing presence and solid construction standing out against the delicate aesthetics of the surrounding wooden buildings. This contrast contributes to affirming the hospitals barrier effect.

Figure 4.20: Image showing the current architecture

Figure 4.21: Image showing a mix of different architectural styles

4.12 Urban morphology and volumes

The hospital area stands out as a large grey area among the rest of the surrounding urban environment cosisting mostly of wooden housing seen in figure 4.23. There are few connections with the surrounding environment since the area ends all existing roads and path structures. There are also seemingly no pathways leading through the hospital property. The area has been built in multiple steps where the hospital current needs have been in focus. This results in a complex building morphology which is little coherent wich allows for few well functioning public spaces.

The hospital buildings have a massive volume in comparison the surrounding building structures which creates a stark contrast between the study area and the surrounding environment. The buildings in the area are tall and dense with a high degree of utilization and are placed tightly together. The floorplans are generally deep to cater to the hospital functions, and the buildings are located densely together. Many of the buildings appear to be in seemingly bad condition and require transformations in order to be re-used. Some of the buildings also lack elevators, escape routes, and are plagued with deep floor plans with poor lighting.

Figure 4.22: Image showing the neighboring wooden housing

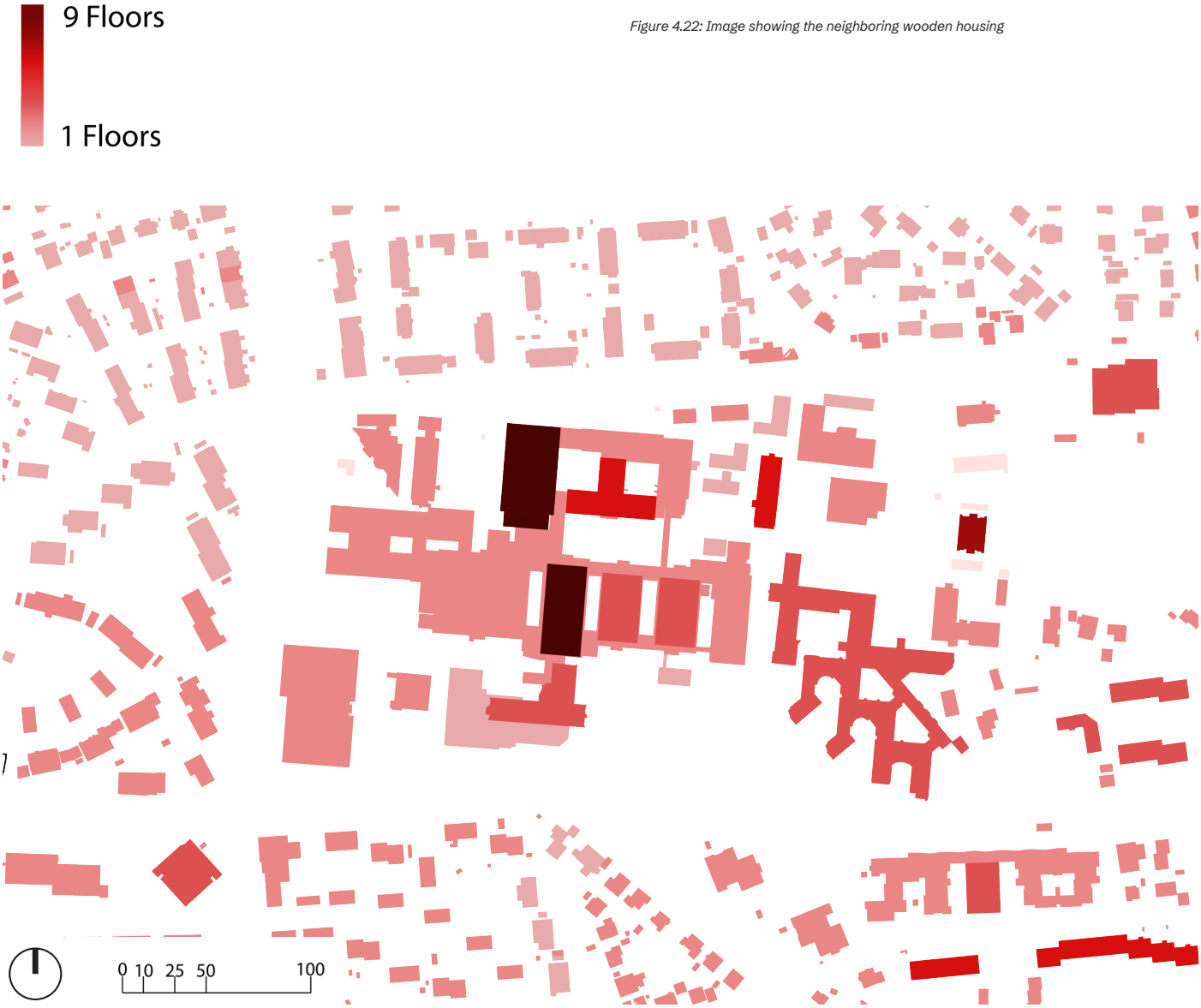
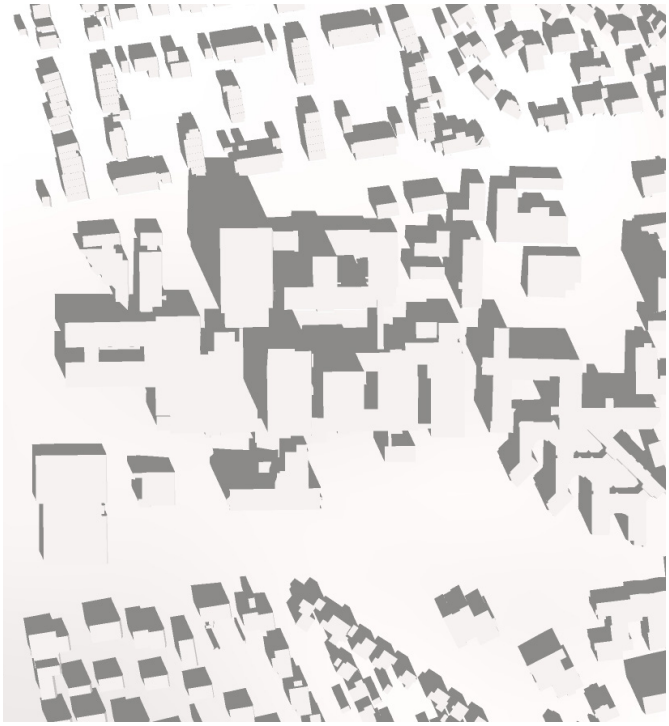


Figure 4.23: Map of the building heights in the area (Based on data from: Norconsult, 2022)

4.13 Shade Analysis

Large existing building masses cast shadows over central portions of the central area. The shadows are caused entirely by built mass and not terrain variations. This makes certain parts of the area less attractive because they are shaded during most hours of the day. However most of the south sides of the buildings are mostly covered in dayligght.



15. march 12:00

15. June 12:00

15. march 15:00

15. June 15:00

Figure 4.24: Sun diagram shows sun and shade during different times of the year

4.14 Protected buildings

A total of three buildings on the hospital grounds are protected cultural monuments accodring to the current cultural herritage plan in Stavanger (Stavanger kommune, 2011) . These buildings are Østbygget as seen in figure 4.25 and two smaller buildings, Portbygget and Vaskeriet. These buildings are all a part of the first hospital (Amtsygehuset) which was built in 1927. In addition the Administrasjonsbygget is not classified as a protected building but has features and history that makes considered worth protecting.

There are no registered cultural environments present in the study area however “Trehusbyen” which is the largest collection of wooden housing in Europe borders the study area. This contains 8000 houses in the central parts of the city center and mostly consist of buildings built before the second world war (Stavanger Kommune, 2022) . The wooden housing in “Trehusbyen” has to adhere to certain regulations and guidelines in order to keep its historical identity.

Figure 4.25: Image showing Østbygget the old section (Stavanger kommune, 2023)

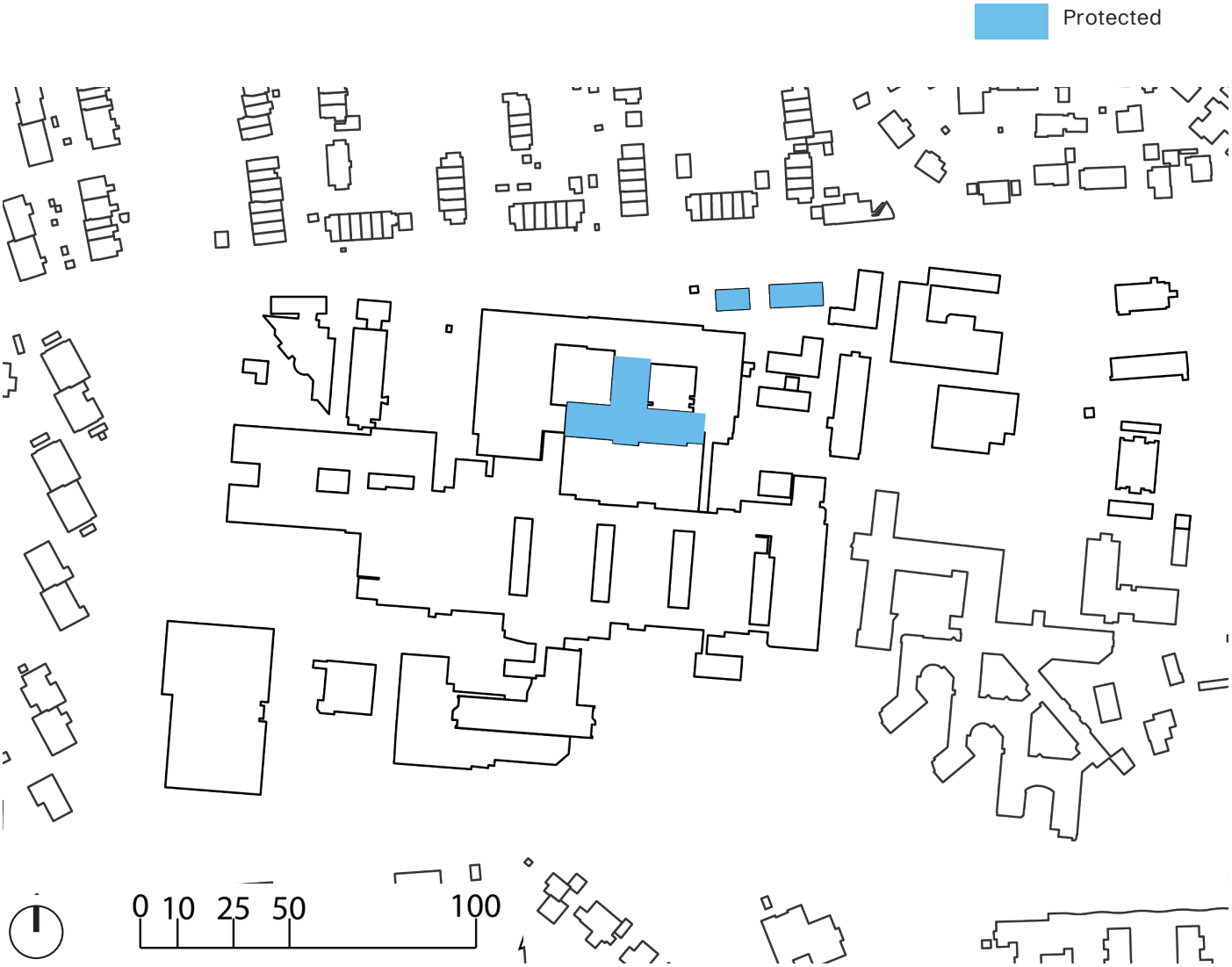


Figure 4.26: Map of the protected buildings (Based on data from Stavanger kommune, 2011)

4.15 Building re-use

The area consist of 40 buildings constructed between 1927 and the most recent in 2012. The buildings vary greatly in size, condition and architectural qualities.

By request from Stavanger municipality, Stavanger development and Helse Vest, an evaluation of the potential re-use of all buildings at the hospital grounds has been conducted. This report was done by Norconsult and finished October 2022. The analysis was conducted to assess the feasibility of repurposing or transforming the existing buildings at the hospital site. The report only takes technical aspects into account and not future possible use of the different buildings. This means that architecture, aesthetics and building protections are not evaluated.

The analysis by Norconsult is based on floor plans and visual observations. It is done at a general level in order to be able to do a rough analysis of all 40 buildings. The analysis is made to be used as a guide in evaluation each separate building further and in order to create a masterplan for the area. The evaluation of each building is based on 6 different criteria's. These are ,ceiling height, access to daylight, vertical access, construction principles, effective utilization, access to wet rooms.

The analysis also estimates the Co2 emissions by demolishing the existing building to build a new one and the savings by re-using the existing building structures.

In the analysis the buildings are ranked from low to high depending on how many of the 6 set criteria's they meet. This is only an indication on how suitable the buildings are to be re-used and not a recommendation on what they should be used for. The hardest use to meet is housing. Housing have strict rules on apartment size, lighting, escape routes and views. Offices are less strict but still have requirements of lighting and escape routes. Commercial purposes have the lowest requirements and has uses that can be adapted to a broad range of building types (Norconsult, 2022).

The following is an evaluation of each building in the study area based on the analysis done by Norconsult. The evaluation will be done based on Norconsults criteria's and emission calculations in combination with an evaluation of possible density, function and architecture. Only buildings located in the study area will be further explored and analyzed.

Figure 4.27: Image showing existing building mass in comparison to the surroundings

1	Østbygget (old)	9	Sydbygget III	17	Modulbygg A and B
2	Østbygget (new)	10	Hematoonkologibygget	18	Magnettomograf
3	Portbygget	11	Internatbygget	19	Apotekbygg
4	Vaskeribygget	12	Varmesentralen	20	Pasienthotellet
5	Vestbygget	13	Administrasjonsbygget	21	Maurtua
6	MOBA	14	Mikrobiologisk	22	NLA
7	Sydbygget	15	Forskningens hus	23	Stavanger legevakt
8	Sydbygget II	16	Ambulansesentralen	24	Hjertelaget

Figure 4.28: Location of the hospital buildings (Based on data from: Norconsult, 2022)

Østbygget The old part section - 1927

Østbygget was built in 1927 and is the oldest building in the hospital area. The building is currently used for various purposes such as laboratories, patient rooms and offices (Norconsult, 2022). It is built in a classic style of architecture and consits mostly of granite and concrete. Currently it is almost fully enclosed by neighboring buildings that were built as additions to the hospital as it demanded more space. This leads to the building not beeing accessible by the public. Since this is the first hospital building it is a protected monument and has potential to be further used as a place of identity for the area. The building has a small garden in front which also was part of the original hospital. The belonging garden still exists but is surrounded by neighboring buildings.

According to Norconsults analysis the building has a floorplan that is easily adaptable and materials that still have a long lifespan. The limiting factor in this building, according to Norconsult, is the fact that it only has one elevator which limits its potential for apartments (Norconsult, 2022).

The building is protected as it is the first hospital building in the area. It has high potential density and good quality architecture. It also scores high on Norconsults evaluation. This leads to a building with a high degree of re-usability.

Figure 4.29: Østbygget the old section (Helse Stavanger, n.d)

Tonn Co2 Building new	*1229*
Tonn Co2 Re-use	*638*

Table 1

Østbygget the new section - 1986

The new section of Østbygget consists of several additions to the original hospital building. The buildings are used for polyclinic and treatment rooms. The additional buildings surround the original building and enclose it making it hidden from the all sides of the hospital. According to the analysis the buildings have poor construction quality, limited vertical access and the it is 20m deep which lead to poor natural lighting conditions (Norconsult, 2022). The additional buildings also have poor architectural qualities which draws attention and hides away the old section of Østbygget. In addition to blocking access to the original building, these factors makes it difficult to re-use for other purposes.

Figure 4.30: Østbygget the new section

Tonn Co2 Building new	*1236*
Tonn Co2 Re-use	*642*

Table 2

Portbygget - 1927

The building consist of two floors and a cellar and is today used by the trade union and safety representatives, while the cellar is used for storage (Norconsult, 2022). The building is part of the original hospital built in 1927 and has similar architectural qualities. This building is protected along with the other hospital buildings from 1927.

Figure 4.31: Portbygget

Tonn Co2 Building new	*117*
Tonn Co2 Re-use	*59*

Table 3

Vaskeribygget - 1927

The building has one floor, cellar and an attic. It is a concrete building and has according to Norconsult recently had its facade rehabilitated (Norconsult, 2022). It was constructed in 1927 as a part of the original hospital with the belonging architecture. It has good access from the street level but limited universal access to the attic. Currently, the building serves educational purposes and has a the same level of protection as the main hospital building (Norconsult, 2022).

Figure 4.32: Vaskeribygget

Tonn Co2 Building new	*156*
Tonn Co2 Re-use	*62*

Table 4

Vestbygget - 1978

The building has 8 floors and has according to Norconsult a high degree of flexibility because of its construction. It has 9 elevators and two staircases creating good vertical communication making it easier to adapt to other purposes. It is however deep at 27 m making the deeper sections recieve little daytlight. Norconsult states that the building potentially can house up to 90 apartments, and can be adapted to offices or similar purposes (Norconsult, 2022). The general architectural quality of the building is poor with a façade mostly consisting concrete with little expression. These factors in combination with a potentially high density leads to a building which is important to re-use.

Figure 4.33: Vestbygget

Tonn Co2 Building new	*5 510*
Tonn Co2 Re-use	*2803*

Table 5

MOBA - 2008

MOBA was built in 2008 and consist of 3 floors. The building has an emergency department of the hospital, an isolation department, emergency medical communication center and storage in the cellar. This building has no columns making it easy to adapt it for other purposes. It also has big windows leading to good natural lighting conditions and is very accessible. Its existing rooms with belonging bathrooms are easily adaptable to be used for dorms or a care home for elderly (Norconsult, 2022). These factors also makes it viable for temporary use for different functions during a potential construction phase. The MOBA building is a quite new building with a facade consisting of white panels giving it a more modern look.

Figure 4.34: MOBA

Tonn Co2 Building new	*3 299*
Tonn Co2 Re-use	*1 618*

Table 6

Sydbygget - 1981

Sydbygget was constructed in 1981 and consists of 9 floors. Norconsult evaluated the building to have a high grade of flexibility since it has a rhythmic axis system, sufficient elevators and stairs. It is however a very deep building at 27m which leads to poor natural light conditions in the inner sections of the building so these areas will have to be used for purposes which do not require natural light (Norconsult, 2022). The general architectural quality of the building is poor with a facade mostly consisting concrete. Norconsult approximates that the building could house 80 apartments, 2000m² office space and 6800m² for other purposes where the lighting conditions are bad. These factor lead to the building being highly viable to be re-used for other purposes.

Figure 4.35: Sydbygget

Tonn Co2 Building new	*5 336*
Tonn Co2 Re-use	*2 549*

Table 7

Sydbygget (II) - 1981

The southern building consists of 3 floors. It consist of operation rooms, mixed functions and storage with wardrobes. According to Norconsult the building has a rhythmic axis system giving it a high degree of flexibility with tall floors (Norconsult, 2022). The building has a concrete facade and is 50m deep making it lack daylight in the inner sections. There is also only one elevator and two staircases. These factors makes it hard to repurpose the building for other uses other than industrial or storage functions.

Figure 4.36: Sydbygget (II)

Tonn Co2 Building new	*2 832*
Tonn Co2 Re-use	*1 147*

Table 8

Sydbygget (III) - 1981

The building consist of 3 floors and contains the maternity ward, gastro laboratories, treatment rooms and offices. It has a high floor height and has good vertical communication. Because of its rhythmic axis system it is rated as flexible according to the analysis done by Norconsult (Norconsult, 2022). It consist of a concrete facade. The buildings a small atriums in the middle sections which create some outdoor space. This however leads to a lack of light in the inner sections of the buildings as well as in the atrium spaces. The building could be converted to 250 office spaces according to Norconsult (Norconsult, 2022). These factors gives the building a high degree of re-usability.

Figure 4.37: Sydbygget (III)

Tonn Co2 Building new	*2 639*
Tonn Co2 Re-use	*1 070*

Table 9

Hematoonkologibygget - 1996

The building consist of three floors that contains patient rooms, offices and treatment rooms. It is rated as having a high degree of flexibility because of its rhythmic axis system. It also has a high floor height with good vertical access (Norconsult, 2022). These factors indicate that the building is highly re-usable.

Figure 4.38: Hematoonkologibygget

Tonn Co2 Building new	*2 074*
Tonn Co2 Re-use	*11 110*

Table 10

Internatbygget - 1970

The building consist of 9 floors and was previously used as housing for nurses working at the hospital. Today it consists of offices and belonging common areas. According to Norconsult the building can be to adapted for between 40 and 35 apartments and has good vertical communication (Norconsult, 2022). These factors lead to a building which can be re-used. The facade is however poor as it mostly consist of facade panels and would have to be reworked.

Figure 4.39: Internatbygget

Tonn Co2 Building new	*1253*
Tonn Co2 Re-use	*659*

Table 11

Varmesentralen - 1978

The building consist of technical functions and has two floors. It has a high floor height and a carrying facade (Norconsult, 2022). The building was built for a specific purpose and has a low achievable density. The building can be re-used to house commercial functions.

Figure 4.40: Varmesentralen

Tonn Co2 Building new	*683*
Tonn Co2 Re-use	*272*

Table 12

Administrasjonsbygget - 1940

The adiministration building, also called “Søsterhjemmet” (the nurse home) is the first addition to the original hospital. The building consists of 5 floors and is used as an administrational building. There are today 60 offices in the building with relatively low floor height which is it too low to adapt to the new building standard for offices. It may however be possible to re-use for apartments. It also has two staircases giving it good vertical communication. Norconsult rates the building as being highly flexible and possible to re-use (Norconsult, 2022). The building is from 1940 and is buildt in a functionalistic style drawn by the local architet Gustav Helland (Stavanger kommune, 2023a). This leads to a facade and expression which is vital to maintain.

Figure 4.41: Administrasjonsbygget

Tonn Co2 Building new	*1 030*
Tonn Co2 Re-use	*551*

Table 13

Mikrobiologisk - 1961

The building consists of two floors and is used for multiple laboratories. It has carrying facades and a structural wall in the middle of the building dividing it. Norconsult states that the building generally consist of low quality materials from the 60s, and would have to be severely upgraded in order to meet today’s standard (Norconsult, 2022). The building also consist of only two floors and has a low density. Because of its specific function and general quality this building is not recommended to re-purpose.

Figure 4.42: Mikrobiologisk

Tonn Co2 Building new	*111*
Tonn Co2 Re-use	*63*

Table 14

Forskningens hus - 1950

This is a concrete building consisting of two floors. It is today used as offices but It was originally built as a house with multiple different apartments (Norconsult, 2022). This makes it possible to revert the building back to its original purpose.

Figure 4.43: Forskingens hus

Tonn Co2 Building new	*353*
Tonn Co2 Re-use	*189*

Table 15

Ambulansesentralen - 1982

The building consists of two floors and is mainly used as a garage and living quarters for the ambulance workers. The building is poorly isolated and lacks daylight (Norconsult, 2022). This building height will not allow for a high degree of density which leads to the building not being reccommended for re-use.

Figure 4.44: Ambulansesentralen

Tonn Co2 Building new	*175*
Tonn Co2 Re-use	*70*

Table 16

Modulbygg A and B - 2001

These are temporary buildings which is currently being used for offices and workspaces belonging to the hospital (Norconsult, 2022). There is no purpose in re-using these buildings since they are only set up and made to be used temporary.

Tonn Co2 Building new	*0*
Tonn Co2 Re-use	*17*

Table 17

Magnettomograf - 1986

The buildings is almost completely submerged in the ground and is used for MR. It is made of concrete with led plates in order to be completely isolated (Norconsult, 2022). There is no view from this building since it is mostly submerged. The specific use of this building leads to it not being recommended for re-use.

Tonn Co2 Building new	*170*
Tonn Co2 Re-use	*68*

Table 18

Figure 4.45: Modulbygg A and B

Apotekbygget - 1999

This was originally built as a pharmacy but as the pharmacy moved to a new building it is now currently used as offices. It has its carrying construction in the facades and has no beams on the inside. This makes it easy to repurpose the inside but hard to modulate the shape of the building. It only has one entrance and poor vertical communication so large renovations will have to be made if it were to be repurposed (Norconsult, 2022). The building only consist of two floors which leads to a low density. This building is not recommended to re-purpose.

Figure 4.46: Apotekbygget

Tonn Co2 Building new	*130*
Tonn Co2 Re-use	*52*

Table 19

Pasienthotellet- 2004

The building consist of 4 floors plus two floors with parking underground. It is used as a patient hotel and acts as the main entrance to the hospital. The building houses 138 hotel rooms and 282 parking areas. The building has a carrying façade and will most likely appeal to today's standards since it was built in 2004. It is however oriented towards the north and only has one staircase and elevator making it hard to re-use for housing purposes while getting the required sunlight. It can however be used as office spaces or commercial spaces (Norconsult, 2022). Re-purposing the taller parts of the building will be beneficial since they can be easily used for other purposes. The other parts of the building mainly consist of parking area.

Figure 4.47: Pasienthotellet

Tonn Co2 Building new	*3 711*
Tonn Co2 Re-use	*1 713*

Table 20

Maurtua - 1976

The building was originally built as a kindergarten to be used for the children of workers at the hospital. It is a wooden building that currently is used for offices. The building is from 1975 and will most likely need substantial upgrades (Norconsult, 2022). In addition it only consist of two floors giving it a low density. This makes the building not recommended to re-purpose for other uses.

Figure 4.48: Maurtua

Tonn Co2 Building new	*208*
Tonn Co2 Re-use	*111*

Table 21

Hjertelaget - 1973/1999

The building contains a sports-hall, wardrobes, test rooms and offices. Norconsult states that if it is to be re-used for other purposes than a sports-hall significant transformation will have to be done (Norconsult, 2022). This leads to a building not recommended for re-use.

Figure 4.49: Hjertelaget

Tonn Co2 Building new	*479*
Tonn Co2 Re-use	*191*

Table 22

NLA - 1994

The building consists of two floors and is used by the hospitals helicopter. It has a landing pad on the roof and the building mostly consist of hangar, living quarters and offices (Norconsult, 2022). It is partially built into the ground. The building will be hard to re-use for other purposes because it is specifically built to be used by helicopters.

Figure 4.50: NLA

Tonn Co2 Building new	*260*
Tonn Co2 Re-use	*104*

Table 23

Stavanger Legevakt 1997/2018

The building is used as the emergency room for the hospital. Parts of the building was built in 1997 while a new addition was added in 2018. Norconsult states that the building has generally high material quality since it is quite new (Norconsult, 2022). The building will however be difficult to r-use since it is built for a highly specific purpose. In order to re-purpose this building significant transformation would have to be done.

Figure 4.51: Stavanger Legevakt

Tonn Co2 Building new	*497*
Tonn Co2 Re-use	*199*

Table 24

Building re-use conclusion

The potential for re-using buildings in the area is heavily influenced by their specific construction and their function as part of the hospital. This area contains a variety of buildings that were constructed in different time periods, with varying architectural qualities, degrees of flexibility, and limitations. Most of the buildings in the area consist of low quality architecture and will need to have facades and other elements reworked.

Not eligable for re-use

The buildings with a highly specific function as NLA, Stavanger legevakt, Hjertelaget,Magnettomograf and Ambulansesentralen, have poor architectural qualities, and are limited in their potential for re-use because of thei rhighly specific function.

Maurtua, Modulbygg A andB, Apotekbygget and Forskningens hus are buildings which would require large transformation in order to be re-purposed and are very low density buildings. Re-using these would make it hard to achieve the desired density for the new developmetn

The new section of Østbygget, Mikrobiologisk, Sydbygget (III) and Sydbygget (II) are larger building masses with generally low qualities. Re-using these buildings would make it impossible to establish a well functioning road network and removing the existing barrier effect in the area.

Despite its important function in the area, the building housing Varmesentralen has poor qualities. However, it is feasible to remove the building while retaining its role as a renewable heating source.

Eligable for re-use

Vestbygget, Sydbygget and Hematoonkologibygget are larger buildings in the area and among the buildings that would require the most co2 to re-build if demolished. In addition these buildings have features which makes it possible to re-use and modulate for new functions.

The oldest buildings, Østbygget, Portbygget and Vaskeribygget are protected monuments with higher quality architecture that can be repurposed as a place of identity for the area. In addition Administrasjonsbygget has architectural features which are important to retain in the area.

The newer buildings, such as MOBA and Pasienthotellet are easily adaptable and consist of newer materials. MOBA has the qualities of a future retirement home and the patient hotel have a layout which makes it possible to transfrom its function to offices. This makes them possible to re-use. The parking garage below Paseitnhotellet will be removed in order to make room for new infrastructure.

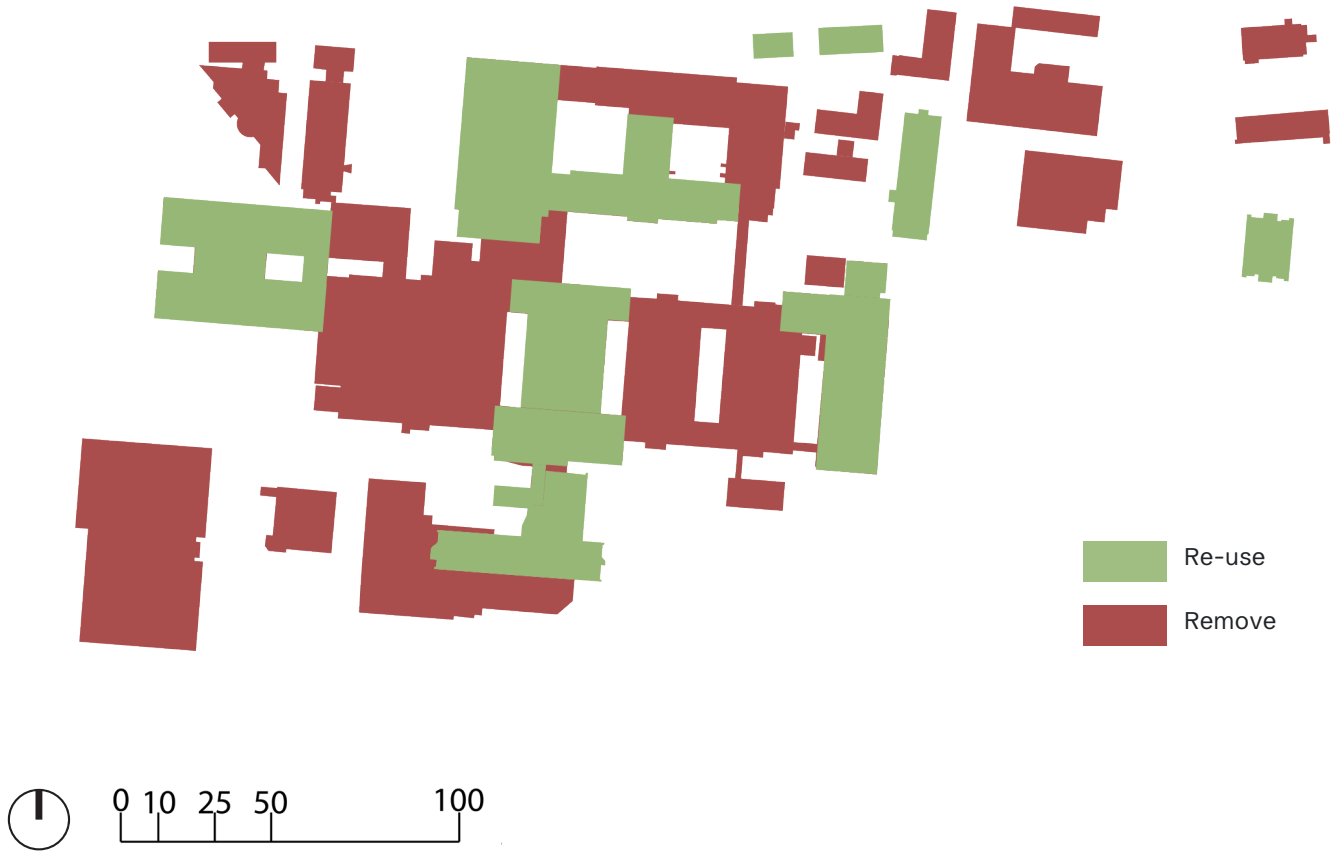


Figure 4.52: Map showing what buildings is recommended to re-use and which to be removed

4.16 Sociocultural Analysis

A sociocultural site analysis has been done on the areas surrounding the hospital area at Våland by Asplan Viak on behalf of Stavanger Development. They have gathered information from people living around the area and others who may have interest in the future development. Expectations, how people use the area, identity in the hospital area and bordering areas has been analyzed (Asplan Viak, 2022). The analysis aims at answering the question: What is the most relevant considerations and issues for urban development at the hospital plot?

This has been further divided into three different research questions:

- How is the area used, and what is desired for the future?
- What is desired by potential actors, and what future ideals for development exists?
- What is the sense of identity and delamination of the area?

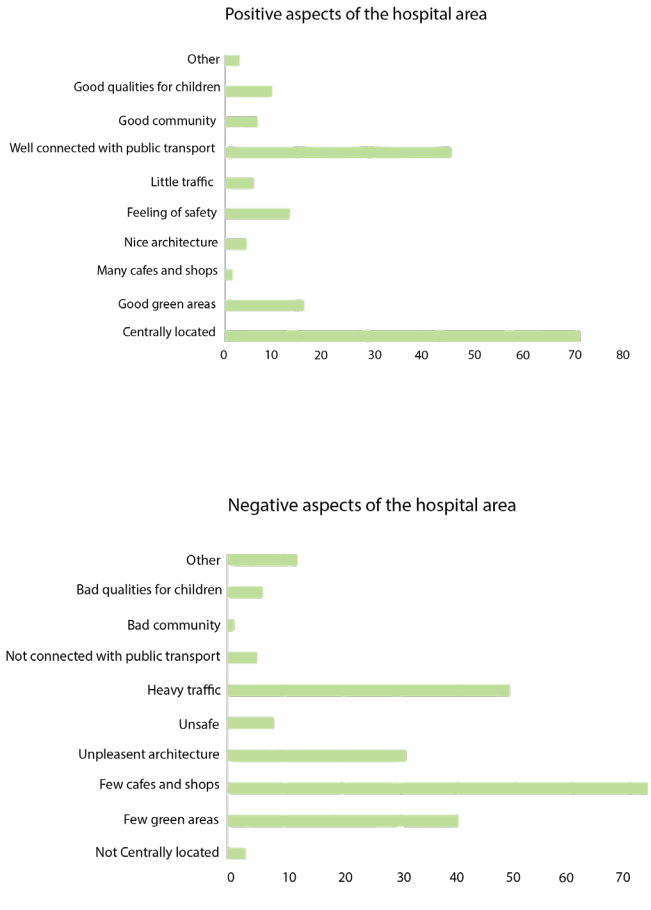


Figure 4.53: Graphs showing the results of the survey performed by Asplan Viak (Asplan Viak, 2022

How is the area used, and what is desired for the future?

According to the analysis the area is mostly dominated by the functions of the hospital and the surrounding housing. There is little interaction between the inhabitants of the surrounding areas and the hospital area or its buildings. The Distribution of different types of housing Is skewed towards single family housing. There are few apartments and there has generally been built very little housing in the area the last 15 years.

The green areas surrounding the hospital are often used for recreational activities and there is a general opinion of a good coverage of public transport and a central location.

In addition the inhabitants voice a need for more retail stores and more active ground floors. There was also a need for more social meeting places both inside and outside near where people live (Asplan Viak, 2022).

What is desired by potential actors, and what future ideals for development exists?

According to the analysis there are few points of conflict among the different actors in the area. They have few contradictory opinions and they are mostly interested in creating new green areas, more meeting places, introducing a mix of different functions and improve the overall aesthetic of the area (Asplan Viak, 2022).

What is the sense of identity and delamination of the area?

The hospital area is located between different neighborhoods that rarely interact with another. According to Asplan Viak an important step in the development of this area will be to define an identity for the plot. In addition will the new development have the potential of tying the surrounding neighborhoods together. The volumes at the hospital area should be reduced and more public meeting places introduced to create identity and belonging in the area. The gathered data also indicates that more green areas should be introduced (Asplan Viak, 2022).

In addition there is no mention of re-use of any of the buildings with exception of the oldest hospital buildings. According to Asplan Viak this could be because a lack of knowledge or that this is more of a professional discussion. It is however interesting that this issue is something the local population isn't concerned about.

4.17 Conclusion

The analysis presents various qualities and challenges the hospital area at Våland has today. The analysis shows the current status and potential rehabilitation of the hospital buildings, the areas central location, and the challenges the area faces today both geographically and sociocultural. The main challenges uncovered in the analysis are the barrier and contrasting effect the existing hospital building create against current infrastructure, the barrier effect established by FV440, a lack of social meeting places and the areas identity attached to the hospital functions. These factors are important to address when transforming the area. The design proposal will be based on the findings in this analysis.

S

- Centrally located
- Sufficient surrounding infrastructure
- Large green areas and public spaces nearby

W

- Massive existing building masses
- No infrastructure on the hospital plot
- Few surrounding functions
- Lack of identity

O

- Re-usable and adaptable building masses
- Nearby green structure network
- Existing tunel structure
- Good surrounding road network

T

- Fv440 creates a barrier effect
- Re-use of old hospital buildings
- Uncertainty of the future development process and regulations

Vision

5.1 Vision
5.2 Urban design framework

5.1 Vision

In order to create a clear design proposal it is important to establish a vision of the future development. The vision and strategy will be based on the findings in the analysis and the literature section. The aim of this project is to create a new urban development that blends qualities of the old hospital with new modern urban design. This will establish an identity, be a highly sustainable project and create a development which merges the old hospital plot with the surrounding areas.

“FROM A FUNCTION TO A PLACE”

Figure 5.1: From a function to a place icon

The vision of “From a Function to a Place” recognizes that the current hospital area is primarily defined by its functional role, which has shaped its social, visual, and functional aspects, with surrounding infrastructure dedicated to supporting this function. The goal is to transform the area into a vibrant urban place within the city, moving away from its singular purpose. This transformation will aim toseamlessly integrate the area with its surrounding environment.

Central to this vision is the reclamation of the hospital plot’s historical and cultural significance, while ensuring its seamless integration into the urban landscape. The focus is on establishing a strong sense of identity and inclusivity, creating a versatile space that caters to the diverse needs and aspirations of the community. Taking a holistic approach, the vision promotes social interaction, well-being, and a thriving urban environment. Sustainability is a key consideration, emphasizing the reuse of existing building masses and aligning with the citys broader sustainability goals.

To realise this vision the following chapters will present a design framework and a proposal, outlining the necessary steps and considerations for implementation.

5.2 Urban design framework

The urban design framework consist of guidelines which forms the physical and functional aspects of the proposal. This provides a framework from which further design decisions are taken in order to achieve the proposed vision of the area. The following design framework is flexible and adaptable allowing for change as the area develops over time accommodating for unforeseen future needs.

- Create multifunctional environments
- Design for resilience and sustainability
- Create livable environments
- Enhance mobility and accessibility

Create multifunctional environments

The transformed area should have a mix of different functions in order to promote reduced travel times and activity during all times of the day. A high mix of functions allows the area to be adaptive for the future and cater towards more people. The different buildings should also have different types of apartments and offices to promote social and economical sustainability.

Design for resilience and sustainability

When designing an urban environment it is important to design an area that will stand the test of time and lay the foundation for future needs. A good well-functioning street network and buildings which are solid which will cover future needs is necessary. During a time where sustainability is highly important it is vital to focus on the longevity of the build mass. This is why it is important to take care of the existing build mass that can be re-used for other purposes and remove the buildings that no longer are able to serve their purpose. New future development at the hospital area will need to be designed around the re-usable buildings currently situated in the area in order to create a coherent area.

Well functioning urban space

Well-functioning urbans spaces are highly important in new urban areas. The new urban spaces should be intimate and shelter from the harsh weather that can be present in the Stavanger region. These public spaces should also act as meeting places for the local community with active first floor creating a lively enviroment. Green areas are important as they improve the quality of life in urban cities and provied green pockets providing break from the city. The green areas should be evenly scattered around the proposed area and connect with the city's larger network of green areas.

A part of the city

Connecting the area with the surrounding infrastructure is one of the main goals from the municipality regarding the development of the hospital area. This is important in order to remove the current barrier effect the hospital have today. These connections in combination with a tight knit street network will increase the overall mobility and accessibility of the area. The transformed area should also connect with the existing green network in order to become a part of the larger city. Bus stops and city bike stations should be spread out evenly thorough the area to increase the general accessibility to the areas new development.

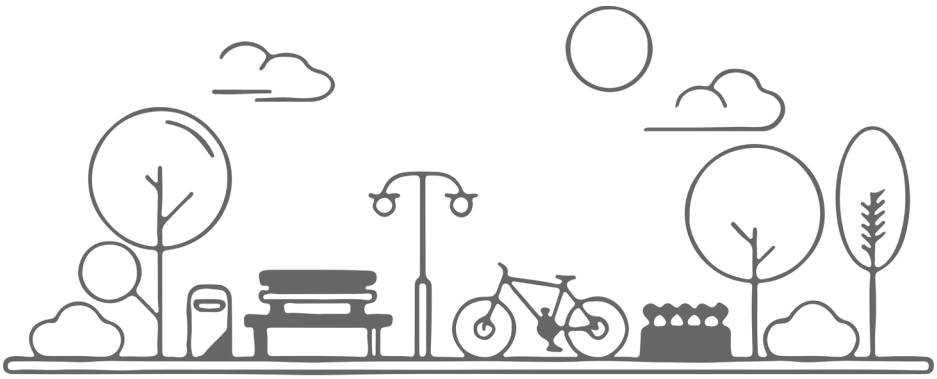


Figure 5.2: Design framework icon

Materials and architecture

The material use of the buildt enviroment has a huge impact on the visual expression and the identity of the area. The proposed materials for the buildings are concrete, wood and brick. The concrete will be used in order to blend with the existing protected concrete buildings from 1927. Wood is used as it is a highly sustainable material as well as a way of continuing the expression of the characteristic wooden housing areas in Stavanger. Brick is used as a way of introducing a more complex expression and to give the new development a new identity while expressing some color and contrast. There is generally few red brick buildings in Stavanger so this will ensure the area has its own unique identity. This will also connect this area to the older red brick hospital in the city center of Stavanger.

The architecture used in the project will consit of a blend of modern and classic architecture using the best qualities of both styles as seen in figure 5.4,5.5 and 5.6. This blend will place emphasis on classic proportions with modern large windows bringing in daylight. This will preserve the identity of the older buildings while bringing in a new element blending in with the newer hospital buildings while acting as a breath of fresh air in the area.

Some buildings should have slanted roofs in order to keep the human scale in the area and avoid towering large structures. In addition they will effectively shed water and snow while bringing a classic estetic to the area.

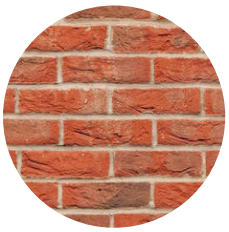


Figure 5.3: Brick (Unsplash,n.d)

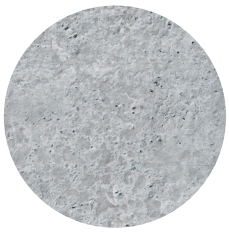


Figure 5.4: Concrete (Istockphoto,n.d)

Figure 5.5: Glass (Freepik,n.d)

Figure 5.6: Wood (needpix,n.d)

Figure 5.7: Mix of classic and modern architecture (Architectsjournal, 2022)

Figure 5.8: Mix of classic and modern architecture (Archdaily, 2020)

Figure 5.9: Mix of classic and modern architecture (MAD, n.d)

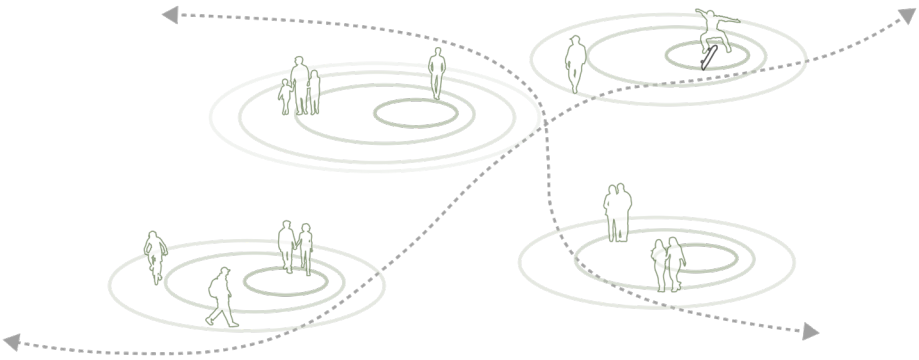
Design proposal

The design proposal consits of a suggestion to how the hospital area at Våland can be transformed when the hospital functions move to Ullandhaug. This development will transform the area into an urban local city distrcit. The new development opens for more workplaces, housing, office spaces and cultural functions in a central location in Stavanger. The new development is highlighted and its placements is based on the findings in the analysis, current guidelines and regulations with knowledge from the litterature section.

6.1 The layers of the proposal

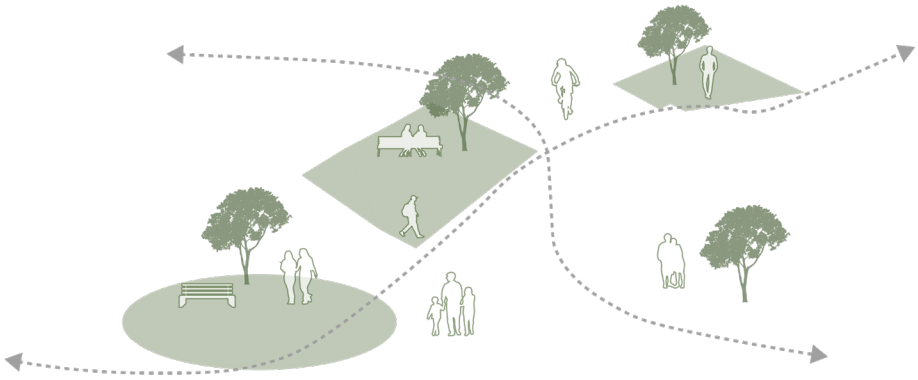
Urban Life

- A part of the city
- Streets designed for people



Urban space

- Well functioning urban enviroment
- Inviting public spaces
- A greener enviroment



Buildings

- A mix of new and old
- Multifunctional enviroments
- Building re-use and alteration
- A dense enviroment

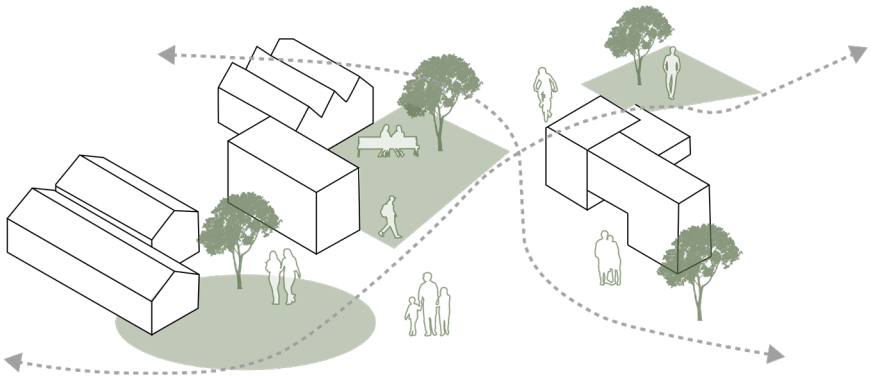


Figure 6.0: Ilustration showing the layers of the plan (Inspired by Aarhus Kommune, 2021)

Figure 6.1: Masterplan

Figure 6.2: Masterplan in 3d

6.2 Urban life

A part of the city

One of the main challenges in the current area is its lack of connections with the surrounding environment, the new development aims to establish strong ties with the surrounding enviroment by introducing a tightly-knit road network. This approach will significantly enhance mobility and connectivity with the surrounding infrastructure as seen in figure 6.4.The area will be divided into smaller plots, incerasing diversity and mitigating the obstructive impact of larger building blocks. This design promotes intuitive movement for pedestrians and cyclists throughout the area as seen in figure 6.3. By fostering improved connections to the surrounding infrastructure, mobility between the area and its neighboring areas will be greatly improved. This integration will seamlessly merge the new development with the surroundings, positioning it as an integral part of the city. The enhanced connectivity will enable efficient and intuitive movement throughout the new development and facilitating seamless travel from point A to point B.

Figure 6.3: Illustration showing mobility between buildings

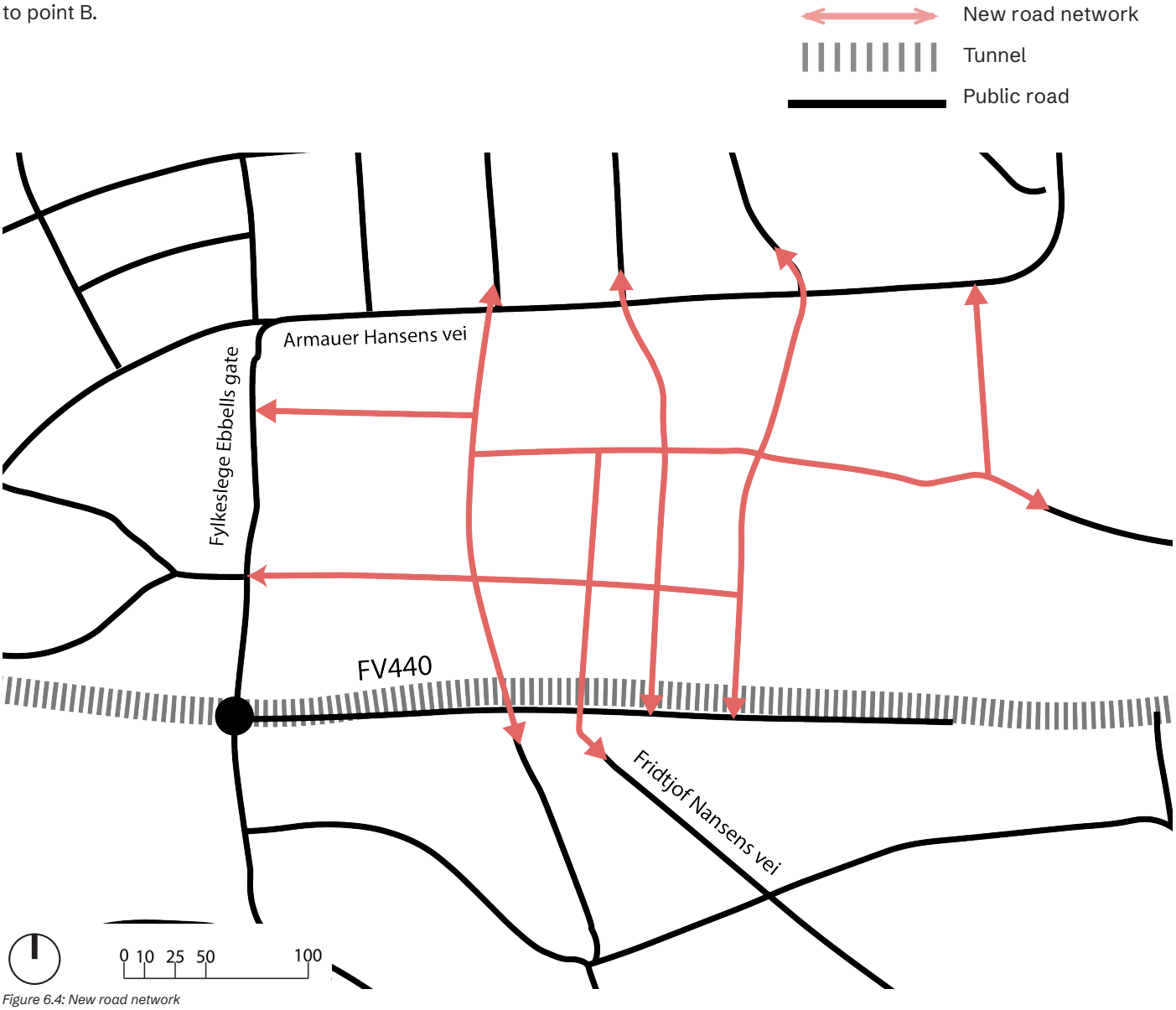


Figure 6.4: New road network

FV440 Tunnel extension

In the proposed design the tunnel which FV440 goes through is extended as shown in figure 6.5 in order to remove the existing barrier between Bekkefaret and the study area. The road creates a barrier by forcing pedestrians and cyclists in a underpass in order to cross. In addition the road leads to noise and dust pollution of the area. The extension of the tunnel will lead traffic going to the area to the north through Amauer Hansens vei.

By extending the tunnel, a significant amount of additional space will be opened up, presenting an opportunity to introduce and enhance green infrastructure and promote walkability within the area. The extension of the tunnel will allow for the proposed buildings to be pushed further south, taking advantage of the space made available by FV440. This strategic placement of buildings not only maximizes land use but also helps create a more harmonious urban enviroment and ensures better integration between the new development and the surrouding urban enviroment.

The exsisting bus stops along FV440 will be underground and available via stairs and elevator. There will be an opening the roof of the tunnel to allow for natural light. This will increase the feeling of safety by adding natural light and willa act as ventilation. The opening in the roof will also dampen the concentration of noise that may appear in tunels. In addition future electrification of vehicles will reduce noise and air pollution further at the ends of the tunel further.

Public transport

Sufficient city bike stations will be added in the area to ensure ample micromobility options. Bus stops has been added alon the central boulevard of the new development in order to tie the area in with the public transport system. The current bus stops along FV440 will remain in their original locations, except they will be relocated underground, as illustrated in figure 6.5. This will maintain good connections to the city's public transport network.

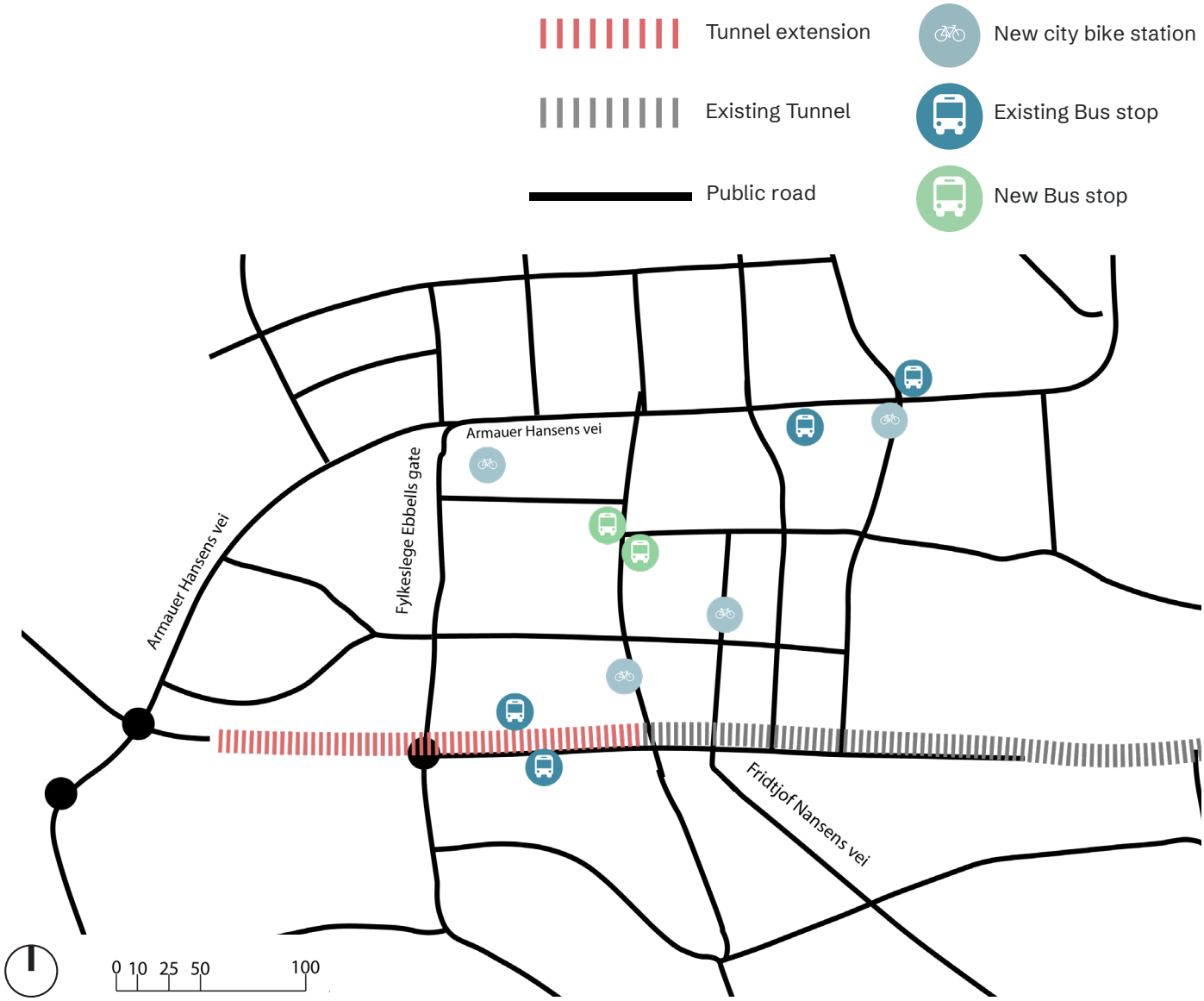


Figure 6.5: New public transport locations and extension of tunnel

Streets designed for people

A new outer ring is proposed in order to eliminate unnecessary driving through the area and concentrate car traffic into a designated section, functioning as the main street for vehicles entering and exiting the area. This measure effectively prevents unnecessary traffic within the local street network and significantly improves traffic flow.

The drivable streets will have a width of 10-12 meters, allowing ample space for emergency and maintenance vehicles. These vehicles require a street width of minimum 3,5 meters (Statens vegvesen, 2022). 10-12 meters also accommodates for a wide sidewalk, providing sufficient room for various activities and enhancing pedestrian experience. To create a separation between pedestrians and vehicles, sidewalks will be sheltered from the streets through the use of trees and other green structures as seen in figure 6.7. This not only forms a barrier between pedestrians and cars but also provides shelter from noise. Furthermore, the incorporation of green structures promotes biological diversity and contributes positively to surface water management.

Within the area, the inner streets will feature sections of cobblestone to naturally reduce vehicle speeds. To ensure universal accessibility for wheelchair users, sections of these cobblestone roads will be paved with asphalt.

Speed limits will be set to 40 kph for the outer ring and 30 kph for the inner roads, prioritizing pedestrian safety and minimizing noise pollution. Lower speed limits also facilitate easier and safer pedestrian crossings, reducing potential dangers in the streets.

To create car-free environments that prioritize pedestrians, designated pedestrian-only streets will be introduced as seen in figure 6.8. These streets will provide clear pathways for cyclists and spacious areas for street activity. With a width of 10-12 meters, the streets will also accommodate emergency and delivery vehicles when necessary. In addition, smaller paths within courtyard structures will have a width of 8 meters, creating a more intimate environment within these spaces promoting a moblie and flexible area.

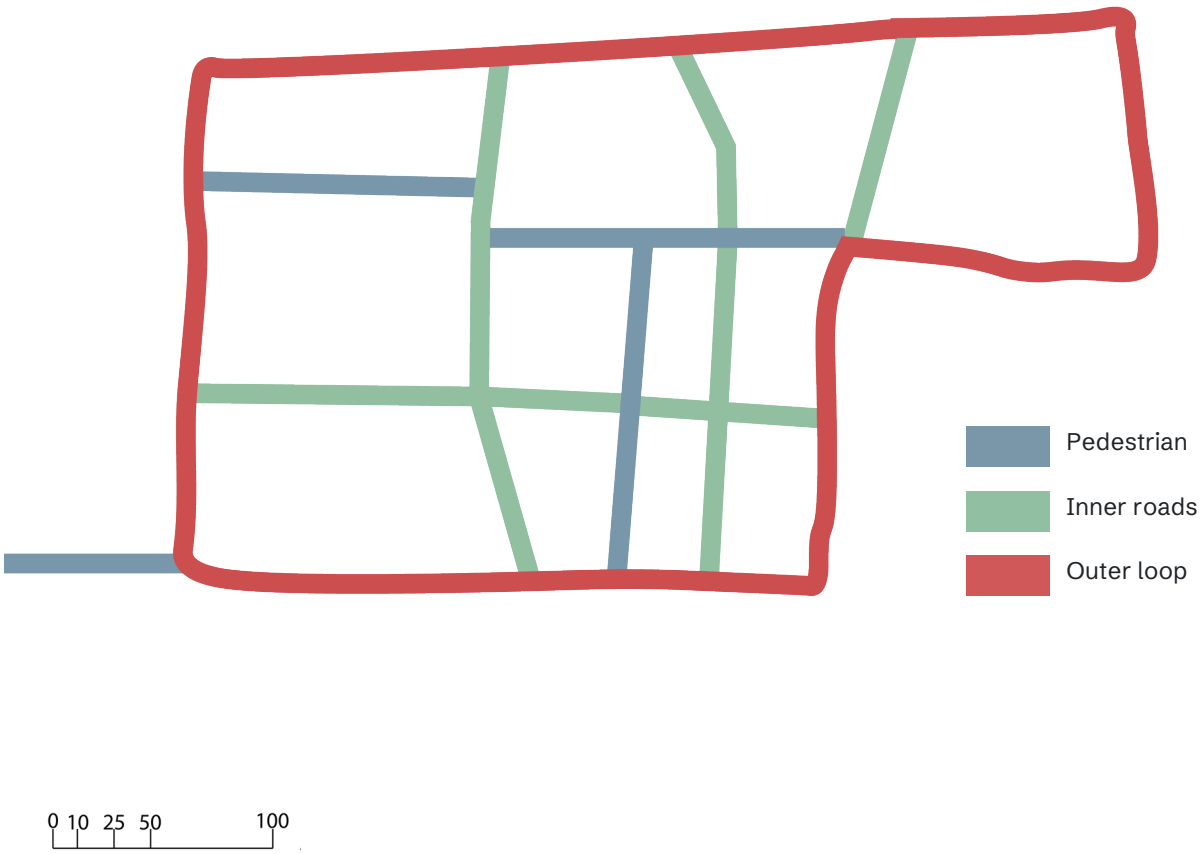
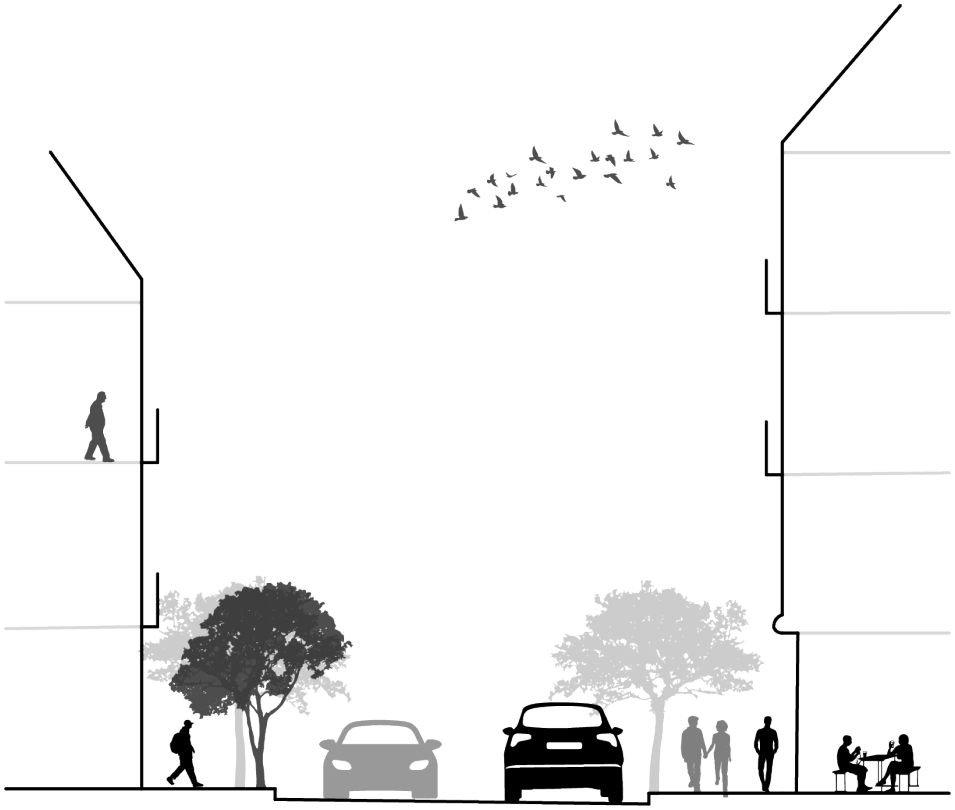
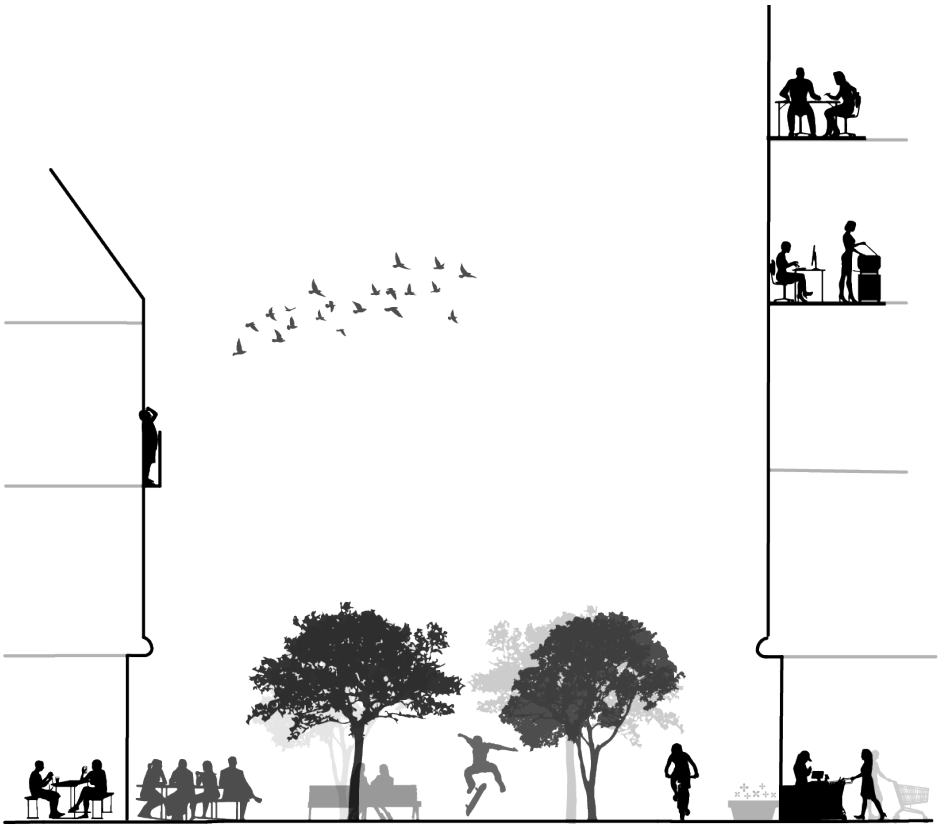


Figure 6.6: Proposed street network



1m 5m

Figure 6.7: 12-meter drivable road



1m 5m

Figure 6.8: 12-meter pedestrians street

Figure 6.9: Render of a drivable street

Figure 6.10: Render of a pedestrian street

6.3 Urban space

Well functoning urban enviroment

The proposed typologies aim to create intimate public spaces in relation to the building masses. These typologies establish a clear difference between private and public spaces, shelter from harsh weather and achieves higher density than traditional tower structures. In addition courtyard typologies will provide a sufficient density in comparison to the building masses present in todays area. These typologies require lower building height in order to achieve the same density as typical high rise towers wile providing other benifits.

The total height of the buildings will be adapted to the surrounding building heights in order to be lower towards the low-rise housing at Våland, and increasingly become higher towards teh taller existing hospital at the center as seen in figure 6.11. This creates a softer transition between the existing low rise wooden housing and the new development. This means the area will consists of a mix of high and low rise buildings. which leads to a varied silhouette with a high density will retaining the human scale. Building height will not exeed the height of the existing hospital buildigns.

This is done in order to keep the presence of the hospital building and to keep the shiluette of the area unchanged. Building heights has also been lowered towards the original hospital buildins from 1927 to enhance their presence.

The new buildings proposed for the area will be between 4-6 floors depending on where they are located and their surrounding enviroment. With an average floor of 3 meters the buildings will be aproximately 12-18 meters.

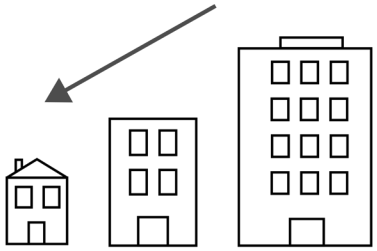


Figure 6.11: Transition to surrounding building heights

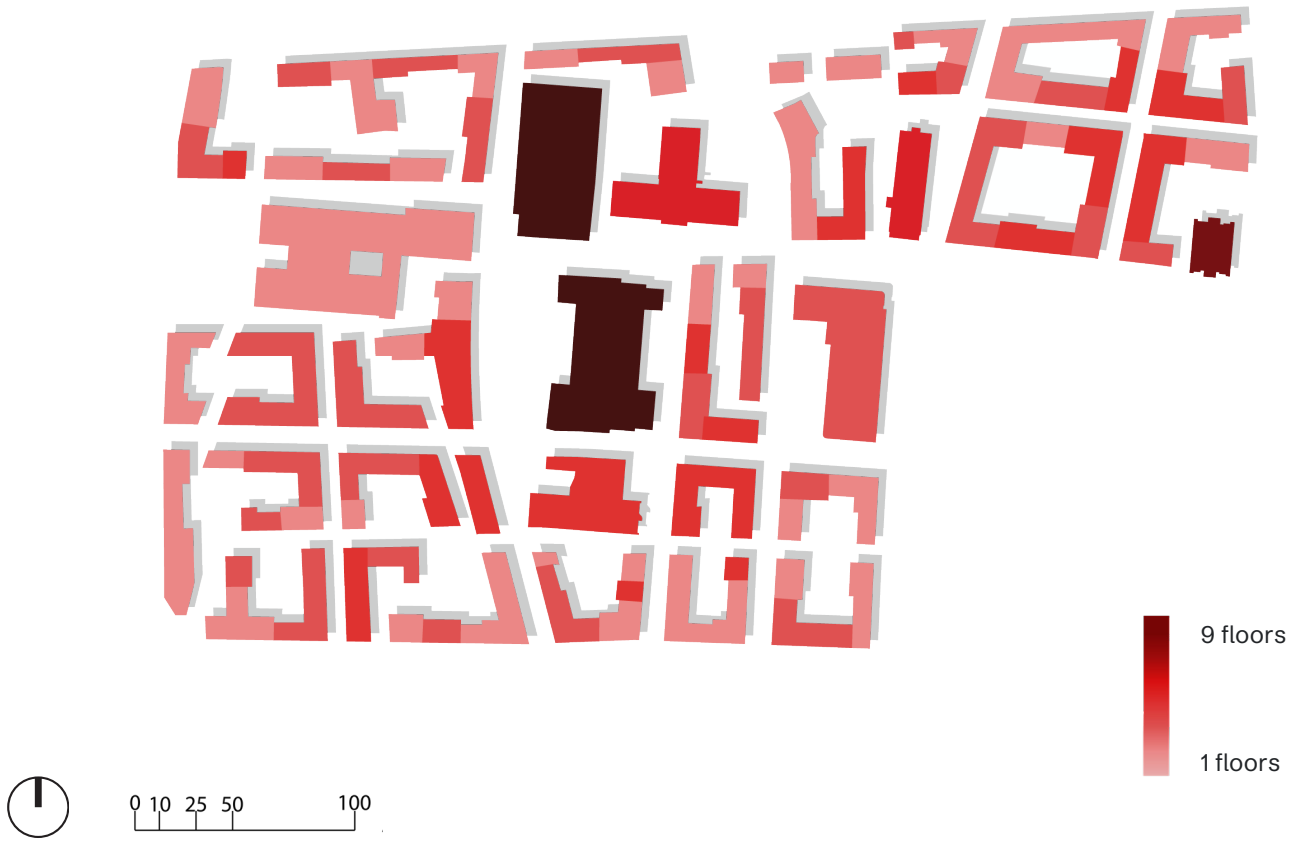


Figure 6.12: Map showing proposed building heights

Inviting public spaces

The new area will have a clear difference between public and private areas with the use of the courtyard structure. The new public urban spaces are smaller intimate areas which appear more inviting and sheltered. Smaller urban spaces give the illusion of more people present and will be activated by have various functions at street level. The urban spaces are all connected to create a well functioning urban network as seen in figure 6.14. There is a mix of green areas and squares wich allows for different activities. Public spaces has been introduced around the preserved hospital buildings in order to create identity and open up the buildings for the public.

Nolli map

A Nolli map seen in in figure 6.13 shows which buildings and spaces are private and which are public. This shows a balance to the area by having a mix many open spaces for the public but also having some private areas in the courtyard structures.

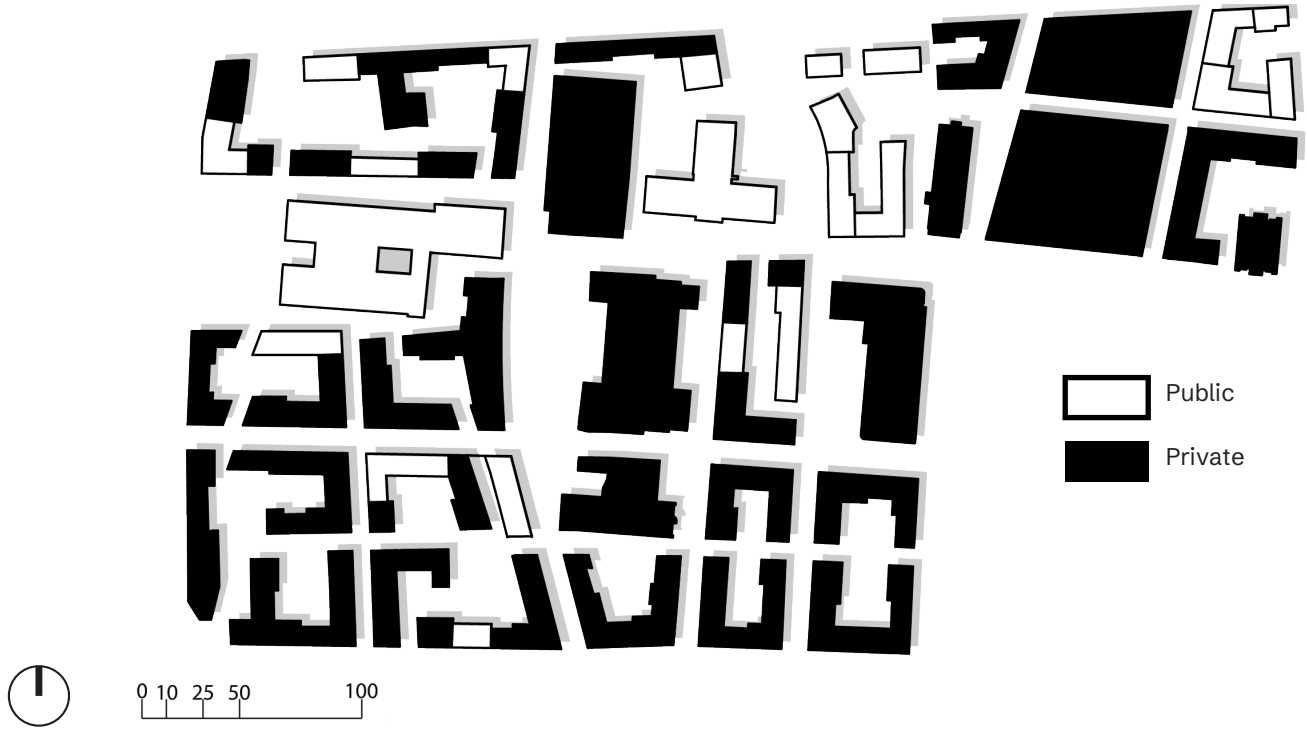


Figure 6.13: Nolli map

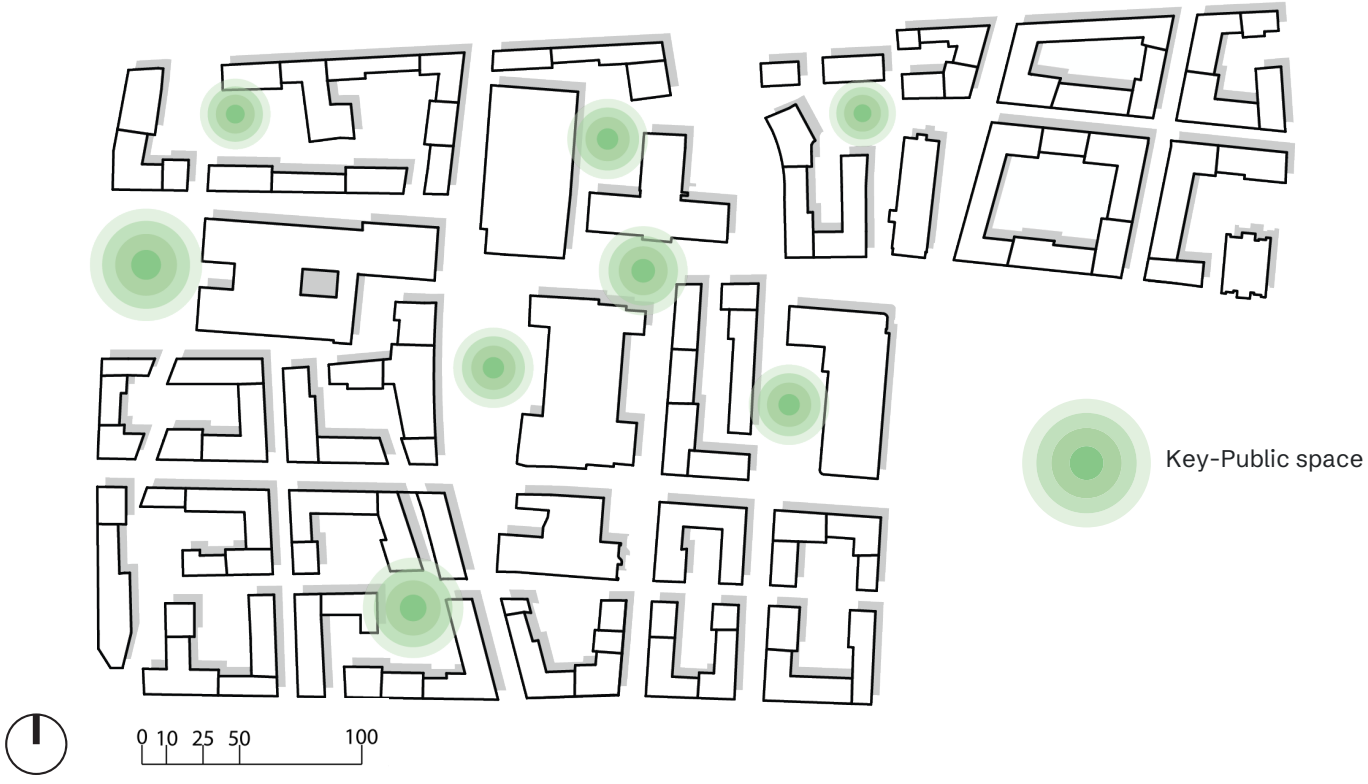


Figure 6.14: Map showing key public space

A-a

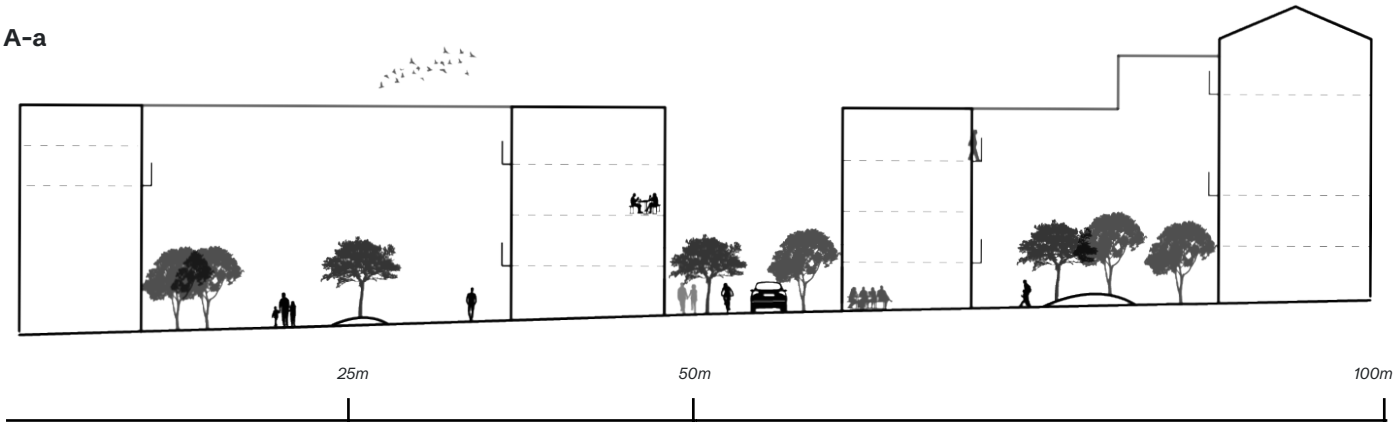


Figure 6.15: Section A-a

B-b

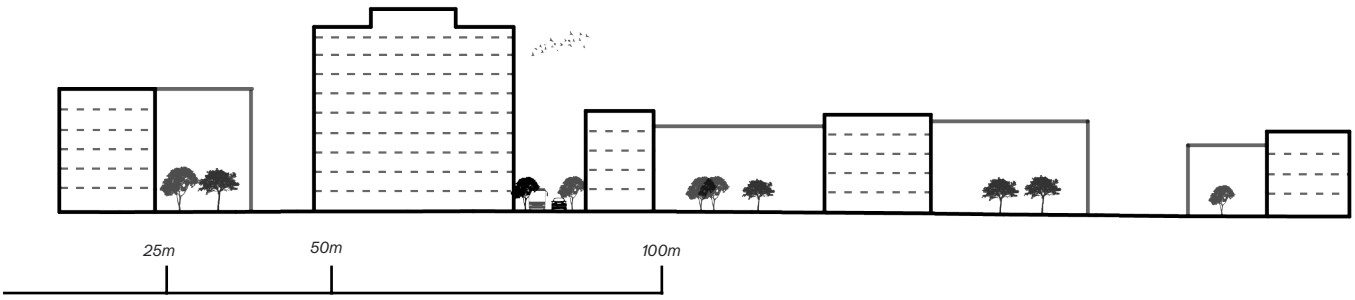


Figure 6.16: Section B-b

C-c

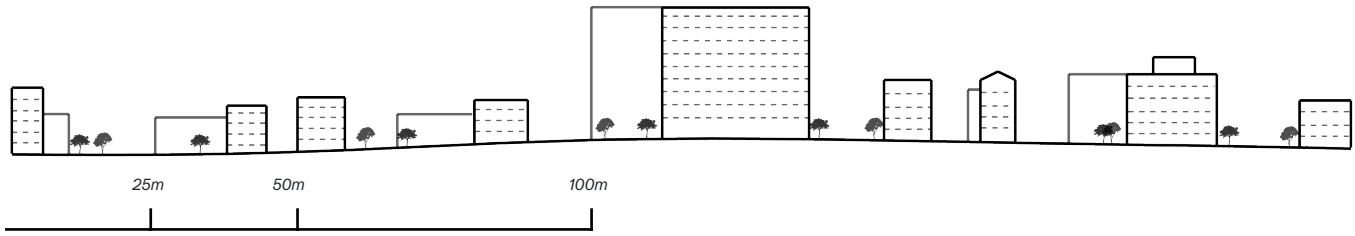


Figure 6.16: Section C-c

Figure 6.17: Map showing location of the different sections

Figure 6.18: Render of public space

Figure 6.19: Render of public space

A greener enviroment

A multitude of larger green areas has been introduced and spread out over the entire area as shown of figure 6.20. This leads to a stronger presence of a greener enviroment and acts as places for recreation. The larger green areas are made for longer stays and tie together to form a network of green spaces.

An expanded green area has been incorporated in front of Østbygget, extending along the pedestrian street. This restoration revives the former green space that existed when the original building was constructed, as sown in Figure 4.4.

A green boulevard is introduced stretching from the north to the south of the area creating a stronger green connection between the new development and the existing green network of Stavanger. This boulevard will further lead towards Mosvannet and acts as a green corridor.

A green axis has been introduced stretching from the existing park in the north and down through the boulevard street down to the south seen in figure 6.20. There is also an axis connecting the green corridor at Våland church with the new boulevard as shown on figure 4.4. This axis will function as a way of tying this area in with the rest of the green structure network in Stavanger. Green public spaces and other green structure has been added along this axis to strengthen the presence of greenery.
Trees and smaller green plants will be used in order to reduce the sound coming from cars, create a barrier between pedestrians and the street and function as a solution for possible surface water and other harsh weather. Added greenery also has the benifit of increasing the local biodiversity and keeping the precence of animal and instrinct in the urban enviroment.

Figure 6.20: Proposed green structure

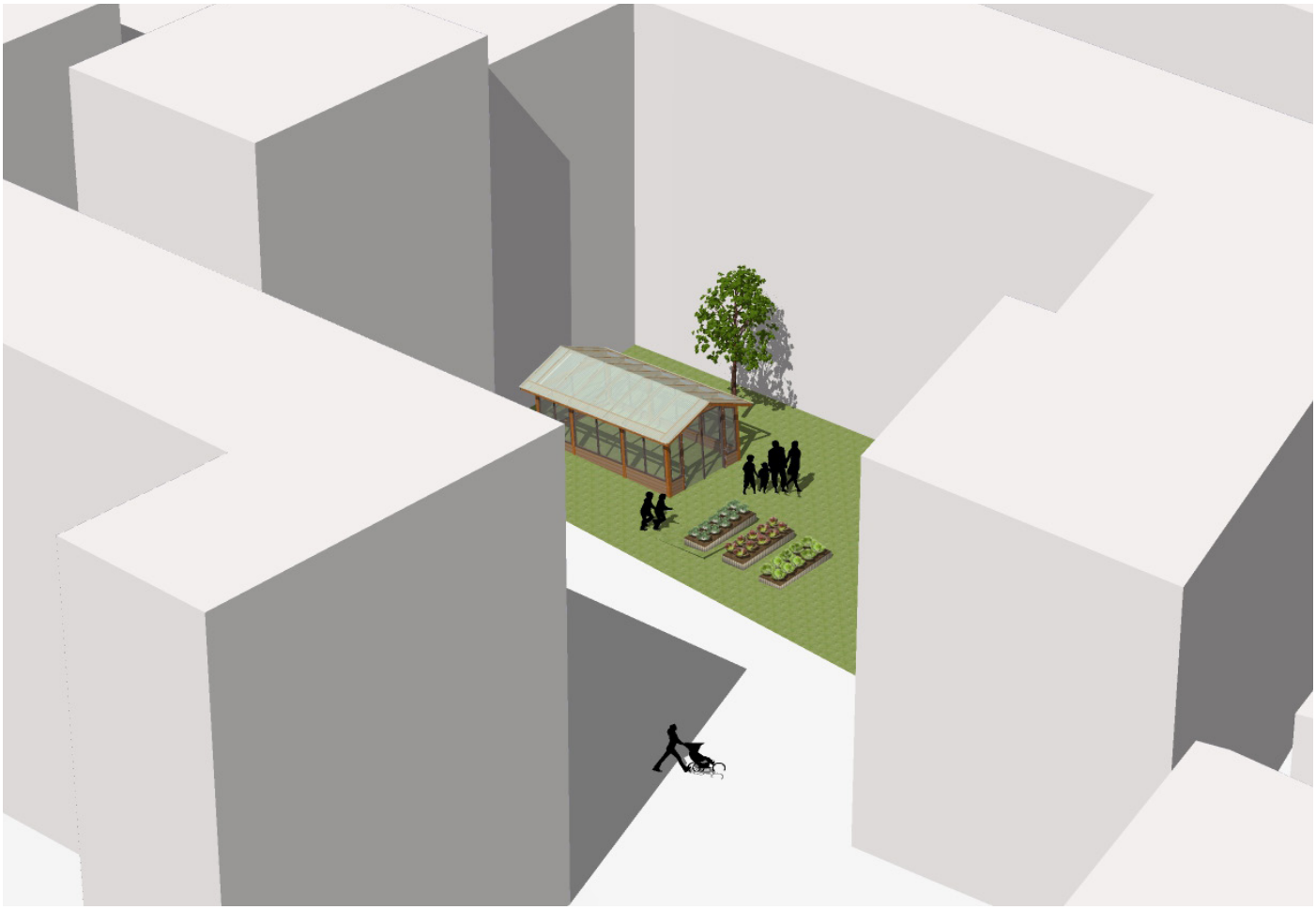


Figure 6.21: Render showing shared gardens and greenhouse

Surface water

Stormwater is managed in green areas using SuDS (Sustainable drainwage systems) or NBS (Natura based solutions). The establishment of the area can enable the adaptation of these spaces to receive stormwater from nearby areas as well (Regjeringen, 2015). Water that is not drained in the area of the new development will be guided along Fridtjof Nansens vei an further lead to the football field for sufficient drainage of extreme weather. A Green axis wil be established leading towards Fridjof Nansens through larger green areas in order to resolve the issue of new surface water and runof water from new and existing green areas. Figure 6.21 shows how this has been resolve-de by Asplan Viak in Deichmansgata Oslo

Figure 6.22: Possible solution to surface water in Deichmansgata Oslo (AsplaViak, n.d)

6.4 Buildings

Multifunctional enviroments

The proposed area will consist of a mix of various different functions in order to create a lively urban area. A mix of functions ensures that there is activity in the area during all times of day. This also reduces travel significantly since people living in the area have multiple functions which covers their needs in a close vicinity promoting the 10 minute city concept.

Office functions has been located along the main center street in order to be closer to public transport and shelter the housing towards the potential increased noise. The housing units has been located in structures with inner courtyards creating a sheltered enviroment. Sections of the area has been set to public functions as it is difficult to forse future needs for the area and the municipality.

Because of the timespan of the future develpment new building has been labeled public functions in order to set aside building mass for potential future needs. This ensures enough space in the area for important public infrastructure which will cover potential future needs.

Urban district center

A new urban center is proposed in order to cover the needs of the areas users aswell as surrounding areas. This urban center will have commercial functions aswell as cafes and cultural functions. This will lead to less people having to travel further into the city center for meeting places and dayli needs. The proposed area will gather people in and around the area creating a point of identity. These functions are proposed for the area with the background of the findings in the sociocultural analysis by Asplan Viak.

Buildt for everyone

The new housing development aims to provide inclusive and affordable housing across all social levels. By integrating mixed-income housing, offering subsidized units, and promoting efficiency in design and construction, ensuring accessibility and affordability. The goal is to establish a diverse and cohesive community where everyone can afford a house.

Active first floors

As uncovered in the analysis there is a lack of cafes and stores in the area. This will be solved by adding active first floors in all the building which will have active funtions. This will lead to a more active street level and overall area. and offer the inhabitants a range of functions within close range. The aim is for this area to function as a district center providing funtions for the study area and the surrounding areas.

Figure 6.23: Proposed functions

A mix of new and old

The presence of the historical buildings from 1927 is weak in the current state of the area. In order to increase this presence public open urban spaces around the older buildings has been introduced. This allows for the public to see the architecture and restores the presence of the older buildings. They should also have cultural functions which will be open/semi-open to the public. This ensures a relation to the buildings and their historical value is displayed.

A historical quarter is proposed as a way of tying the historical hospital buildings together and to improve their presence. This quarter consits of an urban greenspace surrounding by the older historical buildings. This creates a space that is surrounded by older buildings and establishes the long lost identity of the old hospital area.

To establish a new identity in the area brick is used in order to create a new identity with the poroposed buildings. This material will add a subtle contrast to bordering areas and establish a new identity of the new development.

Sightlines has been established towards the Østbygget in order to strengthen its identity and visual presence. This leads to it beeing easier to see and potentially acting as a landmark in the area.

Figure 6.24: Map showing the re-used hospital structures

Building re-use and alteration

The facades of the existing buildings will mostly be kept as they are today. The exepction is MOBA, Pasienthotellet and internatbygget. These will have their facades reworked in order to match the architectural expression of the rest of the area. The reason for this is that these buildings express little identity and create a harsh contrast to the rest of the buildt enviroment.

Vestbygget and Hematoonologibygget has had their building footprint altered in order to allow for a higher grade of mobility in the area as seen in figure 6.25. This allows for a stronger road network and increase mobility around the building masses. This can be done because of the structural properties of the buildings. The alternation only removes a small portion of the buildings and is vital in order to remove the barrier effects the current buildings create.

Østbygget, Portbygget and Vaskeriet

The historical and protected buildings from 1927 will be re-purposed for cultural functions. This is done in order to allow access for the public to these buildings. Their facades will stay the same as they are protected and important to the identity of the area.

Vestbygget, Sydbygget, Hematoonologibygget and Pasienthotellet

These are the tallest buildings in the area and make up the shiluette of the skyline of the hospital. The facade will be kept as it is as it expresses the previous use of these buildings. Because of their deep structure the buildings will be re-purposed for offices with active first floors. The deeper sections of the building can be used for different office functions that does not require sunlight. The roof space of these buildings will be used for solar panels because of their large surface space. This will increase the sustainability of the area and potentialy reduce electricity prices. In addition to water heating provided by varmesentralen this will create highly sustainable office buildings.

MOBA and Vestbygget

These buildings will be re-purposed as retirement homes as this can be done with little modificaion. MOBA can house aproximately 82 patient rooms according to a study done by KAP architects. (KAP arkitekter, 2023).

Administrasjonsbygget and internatbygget

These buildings will be transformed into new hosuing as they have sufficient sunlight. Facades and windows will have to be adapted in order to cater to regulations and standards.

Varmesentralen

This building will have its entire building re-constructed but the function of the building will stay the same. The water heating function will be moved to the cellar of the building in order to retain its important function of heating the area. By doing this the area above can be used for other purposes such as housing and comercial space.

Figure 6.25: Map showing modification of the hospital buildings

Parking

Parking in the area will be reduced to a minimum in order to incentivise more people to use public transport, walking and cycling. This generally leads to more people using their local areas and creates a more vibrant city. Since the area is located closely to a train station and multiple bus stops the need for a car is reduced. In addition there are bike paths leading to the city center for easy access. All the existing parking areas in the area has been removed and replaced with green structure and new buildings. Underground parking and temporary street parking is proposed to covers the minimal requirement of 0,5 cars per houshold. This reduces empty asphalt surfaces and area dedicated to parking.

In addition Parking for temporary visits in the area will be available within the courtyard structures. This allows for increased space in the streets by having minimal street parking and increases the feeling of security for the car owners.

A sustainable development

To embrace sustainability and use renewable energy sources, solar panels is proposed to be integrated into the roofs of the new development. This addition will enable the gathering of sustainable energy, reducing reliance on traditional power sources and contributing to a greener and more environmentally friendly energy supply.

Building upon the existing ground heat system, which uses the water from Gandsfjorden, adjustments will be made to efficiently provide heating and cooling for the proposed buildings. This system, already in place, offers an efficient and sustainable method of temperature control. By adapting the existing system, it becomes a seamless and cost-effective solution for meeting the heating and cooling needs of the future buildings within the area.

An essential consideration for reducing carbon emissions is the decision to repurpose selected existing buildings instead of demolishing them. By avoiding demolition, a significant amount of CO2 is prevented from entering the atmosphere. This conscious choice is instrumental in mitigating emissions from one of the most polluting industries globally, showcasing a commitment to environmental responsibility and sustainability.

A strong emphasis will be placed on the reuse of materials from buildings reccomended for removal. Rather than discarding these materials, they will be used in the construction of the new proposed buildings. This practice of material reuse not only minimizes waste but also reduces the demand for new resources, promoting a more circular and sustainable approach to the construction sector.

Sun and shade analysis

Sun and shadows analysis shows what areas are covered in shadow during different times of the year. By having a lower scale on the newer buildings more sunlight is available in the courtyard structures and the public space. This approach creates inviting spaces and enhances the overall atmosphere.

15. march 12:00

15. June 12:00

15. march 15:00

15. June 15:00

Figure 6.26: Shade analysis

A dense enviroment

The depth of the new buildings has on average been set between 7 and 12 meters. This is done in order to allow for natural light to fill the buildings through windows. The floors height for the proposed buildings has been set to 3m which accomodates for the requirement of 2,4 meters for apartments made for longer stays (Direktoratet for byggkvalitet, n.d). First floors will on average have a larger floor height to acomodate for buissnies and other commercial purposes which can reach up to 5m in height.

The total density of the area has been increased in comparison to the density of the old hospital. This has been achieved by introducing low rise typologies keeps the human scale while having a high density. In this way high density has been achieved while still retaining the human scale and impression of the area with mix of private and public space. The total footprint of the buildings are 42% of the total area with a FAR (Utilization) of 213%. This density will ensure sufficient housing and working spaces for the future and promote all the benifits of a denser enviroment. Because of the low building heights and the large amount of available public space the area will give an impression of a less dense area.

Dimentions

	Area	Building footprint	Building footprint %	Average floor height	FAR%
New development	95000m2	40642m2	42%	5,1	213%
Old hospital	95000m2	24672m2	25%	4,8	106%

Table 25

6.5 Detailed proposal

Historical quarter

A historical quarter is proposed in order to establish an identity around the older buildings at the hospital area. This will preserve and celebrate the historical heritage of the area while integrating it into the newer development. By assessing the historical buildings and structures a plan to maintain the unique character and charm of the historical quarter should be established.

Community garden and greenhouse

To promote activity, engagement and a sense of community, a community garden and greenhouse is proposed. This space will serve as a point for the users of the area to actively participate in gardening creating a sense of ownership to the area. This will also act as a large active green area promoting a more sustainable way of living. The greenhouse will enable year-round gardening, allowing for a larger range of plants and activities related to gardening.

Local marketplace

In order to establish new commercial fucntions and a sense of place, the proposal incorporates the establishment of a small local marketplace. This marketplace will serve as a vibrant hub where local farmers and produces can sell their products. The marketplace will provide economic opportunities, increase social interaction and increase the presence of the local farmers of the region.

District center

The district center is envisioned as an area serving as a central gatheringpoint for users of the area. This will be located in front of Østbygget serving as a center of idenityt for the area. A pedestrian street will lead up to the center with a range of commercial spaces, including shops, cafes, restaurants, and shops.

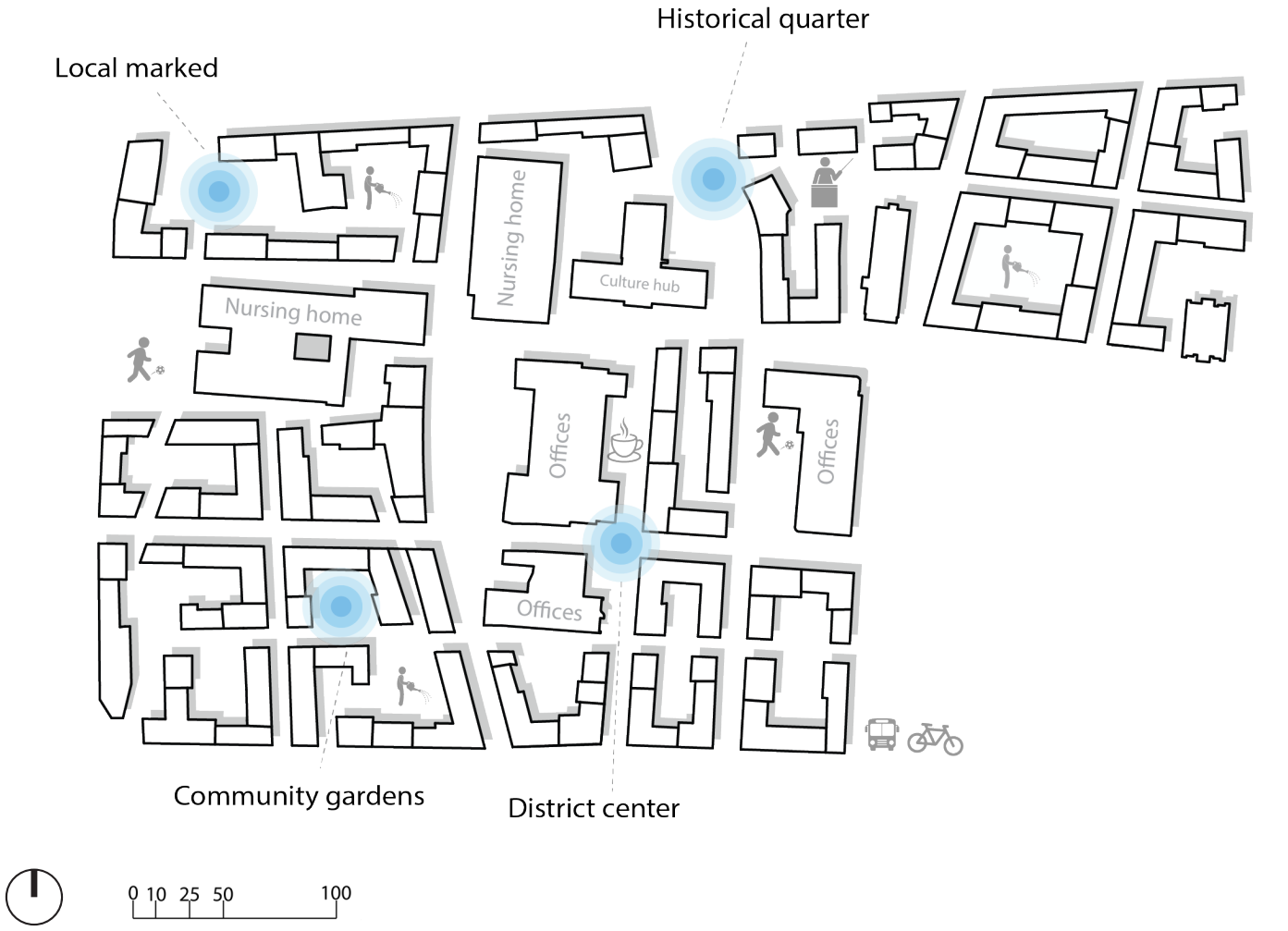


Figure 6.27: Detailed proposal

How it may look

The pictures shown are meant as inspiration on how the area potentialy can be developed in the future.

Local markedplace

Figure 6.29

Art gallery

Figure 6.31

Inner courtyard

Figure 6.33

Community garden

Figure 6.28

Shopping street

Figure 6.30

Public plaza

Figure 6.32

Figure 6.34: How it may look

6.6 Step by step development

This thesis propose developing the hospital area in multiple different steps. This is in order to keep the area active during a possibly long construction phase because the hospitals functions will gradually move away from the area. This will open up for temporary use in the remaining buildings during the construction phase and will allow the transformation of the area to start sooner. By doing this the hospital wont appear abandoned and under construction for a long period of time which could lead to unwanted consequences.

Some of the proposed development can be started sooner than others. Establishing a ring around the area utilizing existing roads should be prioritized first. This will make the area more accessible during the construction phase for the builders and establish a connection to the surrounding enviroment. The proposed green structure can quickly be established by using the existing green structure in the area. By doing this the area is tied up to the existing green structure network. Buildings which are beeing re-used and plots where there are smaller buildings should be prioritized as they require less demolition and quicker establishes a hte new area. The largest demolision projects should be prioritized last.

The nortern areas of the new development are prioritised in order to establish the area around the proposed retirement homes as quickly as possible. The extension of the tunel will be prioritised last as this is a development that will take a long time planning and executing.

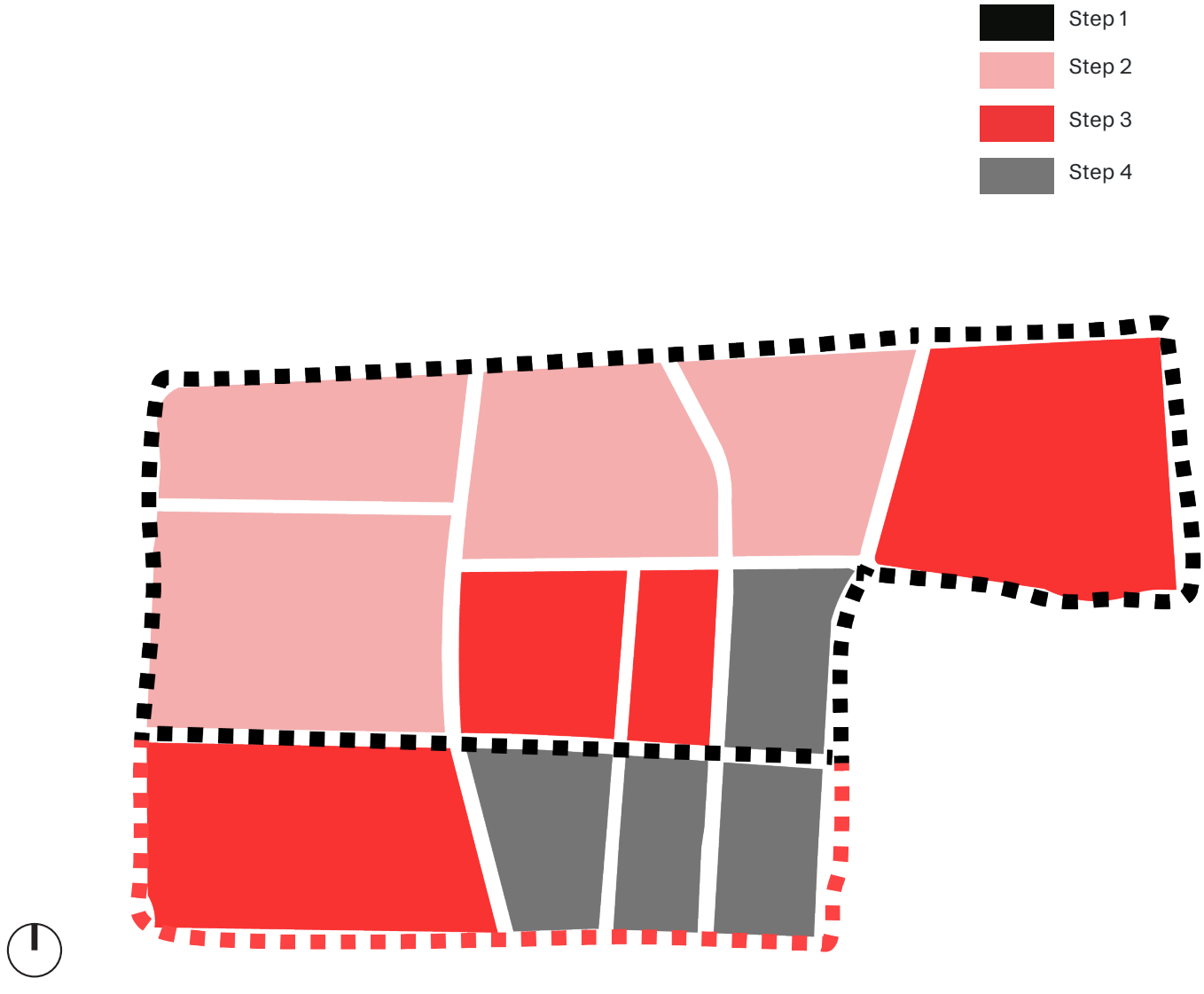


Figure 6.35: Proposed step by step development

Temporary use

During the planning and construction phases after the hospital moves to Ullandhaug, it is important to temporarily repurpose the buildings for other functions. The analysis revealed that several buildings can be transformed for new temporary uses.

According to a report by Norconsult, MOBA and Vestbyg-get can be converted into care homes, either temporarily or permanently, with minimal changes (Norkonsult, 2022). Additionally, the existing buildings can be repurposed for activities such as pop-up shops, art exhibitions, cultural events, and cafes. This ensures ongoing activity in the area and provides artists and creative individuals an opportu-nity to experiment. It also aids in the planning process and facilitates the establishment of successful new functions and installations.

Temporary use of the buildings helps to maintain a lively atmosphere and allows artists and creatives to explore and test new ideas. It ensures that the area remains active during the transitional phase. This temporary utilization brings fresh energy to the area and contributes to an understanding of what works well. It also benefits local businesses, creating opportunities for markets, concerts and festivals.

Temporary use enables learning about the citys pref-erences and needs, which can inform future permanent development plans. By listening to the community and experimenting with different ideas, a unique area can be created that reflects the interests of its residents.

Figure 6.36

Temporary public houses In Fornebu, Norway

Figure 6.37

Temporary public park in Stavanger, Norway

Figure 6.38

Street art in Kristiansand, Norway

Figure 6.39

Performing arts in Florence, Italy

Discussion & Conclusion

7.1 Conclusion

The aim of this thesis has been to transform the hospital plot at Våland. SUS was chosen as the area for a multitude of reasons. The transformation of the area is one of the most important current developments in Stavanger. The area has massive building masses which needs to be re-pruposed or demolished and the area is extremly attractive to inverstors. In addition the area has not yet been regulated by the municipality and has a huge interest by the public which made it a natural choice of a study area.

This lead to the following research question:

How can the current hospital area be transformed into a new vibrant and multifunctional covering the demands of the 21st century?

To address the research question, a variety of methods have been employed, including extensive literature research, analysis of the physical properties of the area, and the development of a design proposal. These methodologies have collectively informed and guided the creation of a proposed design that attempts to answers the research question.

The analysis has revealed current lacking elements in the area, serving as a foundation for identifying and addressing these challanges. The main challanges found in the analysis was the barrier effects present in the area, the large existing building masses and the lack of identity in the area.

A key aspect of the thesis is the exploration of how the existing building masses can be transformed and repurposed for future use. By analyzing the functional, and aesthetic potential of these buildings, the proposal seeks to adapt the buildings and in order to contribute to the sustainability aspect of developing an area.

By understanding these needs and based on findings in the litterature section, the proposed design proposal aims to create a vibrant and inclusive urban area connects and caters to the surrounding area. A clear vision of and design framework aim to enhance the livability and quality of life for the users of the area by transforming the are “from a function to a place”

The desing proposal implements a tight knit road network promoting increased mobility and improving the connection with the surrounding enviroment. The Fv440 tunel has been extended to remove its barreir effect and improve the connection between Våland and Bekkefaret. An outer ring is introduced in orer to keep car traffic within the area slower and more predictable. Roads are dimentioned with the pedestrian in focus and are therefor have wider sidewalks with green structure seperating the sidewalk form the road. A courtyard structures has been introduced as a way of creating smaller public spaces which feel more intimate and shelter better from the weather. in addition the courtyard structure allow for Low rise buildings while achieving a high density. New green connections and public space has been created in order to tie the area in with the existing larger green network in Stavanger. Mixed use enviroments has been proposed in order to create a dynamic and vibrant urban area.

Furthermore, the thesis has emphasized the importance of establishing an identity for the Hospital area. This is done by creating a historical quarter and establishing public space around the hospital buildings. In addition most of the facades of the older buildings are kept as a way of perserving identity.

This thesis is not intended as a final solution, but rather as an inspiration for further development and regulation of the Hospital area. The proposed design, vision, and framework presented in this thesis serve as a starting point for future discussions, collaborations, and refinement of the area’s development plans.

Overall, this thesis has shed light on the needs, potential, and possibilities for the Hospital area. By offering a comprehensive analysis and design proposal, the thesis aims to contribute to the realization of a vibrant, connected, and identity-driven urban area.

7.2 Discussion

The primary objective of this master thesis was to develop a comprehensive design proposal for the hospital area, with a particular focus on exploring the re-use of the existing building masses and emphasizing the identity aspect of the area. The intention was to delve deep into these themes and provide a thorough analysis of the hospital plot at Våland in order to provide a vision for the new development of the area. During the start of this thesis it was quickly realized that to take on all aspects of the site would be too timeconsuming for the time at hand. This is why it was decide to focus mainly on the fysical aspects of the area.

Time-span

Considering the long timespan of the future development at Våland, predicting the future fysical needs of the area proves challenging due to the substantial uncertainties involved. Anticipating future demands is a complex task, particularly in the context of a long-term development characterized by various unknown factors. This is why area has been set aside for possible future public function s. It is essential to recognize that there can be multiple solutions to address the issue at hand, and the presented proposal is just one among many possible options.

Building re-use

The evaluation of the existing building masses has been completed with limited access to data. The available information have primarily consisted of a structural analysis performed by Norconsult, which highlights the potential for re-use. Unfortunately, this analysis does not offer detailed insights into the condition or quality of the materials used in the buildings and their life span. Consequently, a comprehensive evaluation of the material qualities within the hospital buildings would be highly beneficial in determining whether re-use or demolition is more suitable.

In addition there is a significant degree of variability and uncertainty regarding which buildings the hospital intends to continue using and which ones are scheduled for relocation to Ullandhaug. The timing of these building movements and the overall duration of the project are uncertain. These factors have presented challenges in selecting the study area and deciding which buildings to demolish or retain. A step-by-step development approach and temporary use has been made in order to cater to the gradual movement of the hospital.

The buildings that were selected for re-use in this thesis are the buildings that are the most fit for re-use and will provide a sufficient density, reduced emissions and function. There are other buildings in the area which potentially can be re-used depending on the goal of the new development.

The sustanability aspect

The future development at Våland relies heavily on the re-use and re-purposing of the existing hospital buildings as shown in this thesis. Emphasizing the importance of this approach is essential, as demolishing the largest building and constructing new buildings of a similar scale would lead to significant pollution.

Economi aspect

As mentioned in the delamination section the economical aspect of the development is not taken into account in this thesis because of the lack of data, time and knowledge. This would potenitaly affect what buildings would be benifitial to re-purpose, function of the different buildings and potential density.

it is important to acknowledge that implementing underground parking in the area can be a costly approach. Despite the financial considerations, it offers significant benefits to the overall functionality of the area. By utilizing underground parking, a substantial amount of above-ground space becomes available for various purposes, such as buildings, green areas, or other purposes.

The density of the proposed area

The question arises whether the proposed area's density is excessively high for Stavanger, a city known for its low-rise wooden housing. However, maintaining a higher density is crucial to minimize travel times, accommodate future housing and office requirements, and prevent urban sprawl. To mitigate the perceived density, a courtyard structure is employed, incorporating frequent open green spaces and lower building heights. This design approach creates a balance between density and a more open and inviting environment.

FV440 Tunnel extension

By extending the current tunnel, a more cohesive and seamless transition can be achieved between the hospital area and Bekkefaret with minimal drawbacks. The proposed extension will have little impact on traffic flow since the existing roads in the adjacent roundabout can accommodate it. The majority of traffic on FV440 is directed towards Strømsbrua and the city center, remaining unaffected by the tunnel extension. As the hospital's function evolves, traffic patterns are expected to change, reducing the necessity for rapid car access. Consequently, the need for quick car access will diminish, aligning with the changing requirements of the hospital area.

There are potential drawbacks to this approach, such as the economic aspect and the implementation of underground bus stops. By designing the underground bus stops with careful consideration for ventilation and access to daylight, they can actually become enhancing features of the area. Proper ventilation systems and strategic placement of openings can ensure a comfortable and well-lit environment for commuters. In addition they have the potential of sheltering better for the harsh weather often common in Stavanger. With thoughtful design and attention to detail, the underground bus stops can contribute positively to the overall experience and functionality of the site.

Conclusion

the primary goal of this thesis was to present a design proposal based on a thorough analysis of the hospital area at Våland. Despite the limitations and uncertainties encountered throughout the project,the proposal has been successful in shedding light on the potential future development of the area. The author believes the strategies and proposed design suggested in this thesis has established a well functioning design framwork and proposal which will be valuable to the future of the development of this area.

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8.2 Figures

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The figures and pictures presented in this document, unless credited, have been produced by the author.

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