



University of
Stavanger

FACULTY OF SCIENCE AND TECHNOLOGY

MASTER'S THESIS

Study programme/specialisation:

Master in Technology (Siv.ing)
City and Regional Planning

Spring semester, 2021

Open

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Supervisor(s): Ana Llopis Alvarez


Title of master's thesis: Urban Development in Sande

Credits: 30

Keywords: Urban Design
Development
Social Environment
Planning for People
Green Structure
Neighborhoods
Sola Municipality
Sande

Number of pages: 108.....

+ supplemental material/other: .6.....

Stavanger, 
15.06.2021

Urban Development in Sande

Daniel Bertelsen

Acknowledgements

This master's thesis is written at the faculty of Science and Technology at the University of Stavanger, and represent the ending of my 5-year integrated education in Master of City and Regional Planning. This master's thesis has been written in the spring of 2021.

The theme is chosen on background of my interest in design, and the area Sande was proposed by Sola Municipality. Further I wanted the planning to mainly focus on people, as I think this should be the core of urban planning.

I wish to appoint a special gratitude towards my supervisor Ana Llopis Alvarez for all the invested time and professional input throughout the whole semester. Thank you for good advice, motivating conversations and engagement over the thesis.

Further I would like to thank my friends and family for moral support throughout this journey.

A huge thank you to all my fellow students for all memorable experiences throughout the years. You have made my study period fun and exciting, and I cannot wait for all the future memories.

A special appreciation towards my fellow students Saba Athar Rasuli and Thea Hove Hauge for guidance and support through the master's thesis.

Thank you!

Stavanger, June 2021

Daniel Bertelsen

Abstract

As larger cities grow, the pressure on the lots within those cities increases and people eventually are driven to the surrounding cities. Because of this pressure, the population increases around the larger cities, and these nearby areas need new residential development. The thesis focus on development in Sande, located in Sola municipality, as the population is expected to increase in the municipality.

As the population increases, people are starting to live closer to each other in dense conditions. It is therefore important to plan such that this densification does not decrease the living conditions of the people. Green structures and spaces have been prioritized within this master's thesis, and not only the building structures. When planning a residential area, all factors need to be considered with the mindset of who is going to live within the area. The thesis aims on urban planning and design with a strong focus on the people, and their preferences.

The thesis starts with a literature review, presenting relevant literature regarding people-based planning principles. Multiple urban planners are listed in the theory to provide different principles, and further literature and participatory studies were included based on the planning stages life, spaces and buildings. It was further discovered that green structure, diversity, identity and classical architecture were desired by the people. The life, spaces and buildings stages were further used as a base for themes included in a spatial analysis as well as the development stage.

Development based the stages life, spaces and then buildings, required thorough analytical data. The analysis discovered important advantages and disadvantages within the specific research area in Sande. These key findings were further implemented within the framework of the literature in the concept development.

The concept development focus on all key finding from the literature and spatial analysis. The intention on the concept has been to facilitate for social life and lively streets, including a diversity of people. In the concept development, the key findings are used as a framework for different stages of the planning.

Lastly the proposal is presented with a 2D masterplan, in addition to illustrations from a digital 3D model. Here, further details are implemented to achieve a good social environment. The design is based on a larger coherent green structure, surrounded by attractive neighbourhoods in quarters supporting a wide diversity of people. In the design, life, spaces and buildings operate together to create lively spaces with a social environment connected with nature.

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01

Chapter 1 - Introduction



Illustration 1.0.0.1. The planning area.

1.1 Background

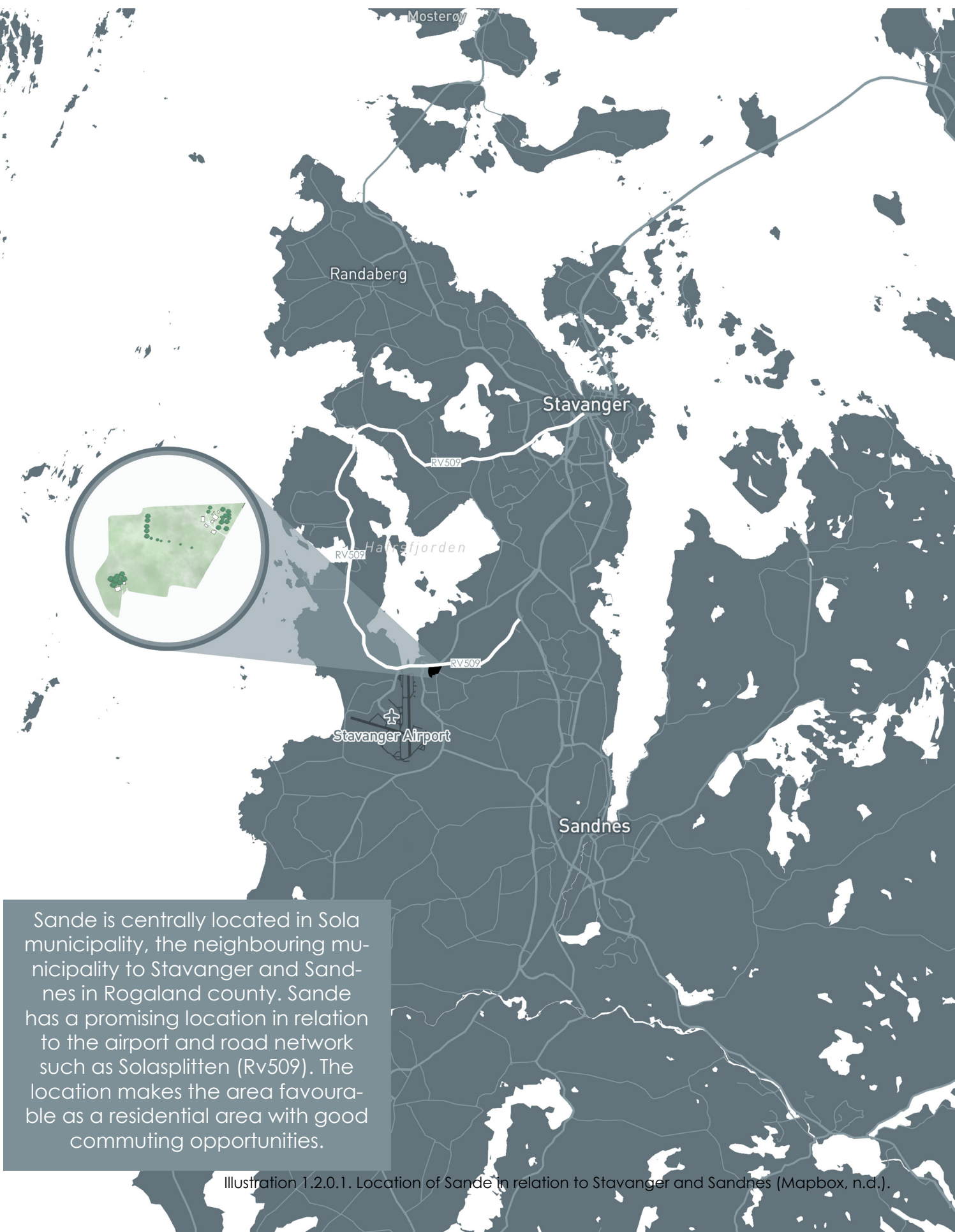
Rogaland is a county in the west, and is one of the largest counties in Norway (Statistisk sentralbyrå, 2020). Rogaland is expecting a population increase of a total of 12,5% until 2050. This is the third largest expected increase considering the other counties in Norway. The Stavanger region is today the third largest city region in Norway, only surpassed by the Oslo region and Bergen region (Stavanger Region, 2014). The Stavanger region contains around 9% of the total population in Norway.

Because of a large growth in the region, Stavanger municipality has a high density of people (Osnes, 2013, p. 6). This density limits the area within the municipality, and a strong agricultural protection in the region places pressure on the lots in Stavanger. This further drives people to other municipalities. Sola is one of the municipalities in the Stavanger region, located along the boarder of Stavanger. Because of the pressure on Stavanger, it is expected that sola will have a population increase of almost 23% until 2050.

Because of this population spread from Stavanger it is important to look at development in other municipalities within the region for future growth. Because Sola municipality is predicted to become more populated within the next years, this thesis will focus on residential development in Sola.

In today's situation, Sande does not have an approved area regulation. An area regulation is used by the municipality when the municipalities area part or the municipality finds it necessary to give more detailed clarifications of the usage of the specific area (Miljøverndepartementet, 2009). The purpose with an arearegulation is to be strengthening the municipal planning of wholesome building patterns and coherent structures. Area regulations thereby creates a more predictable framework for later private planning and construction. The thesis will not focus on making an area regulation, but rather create guidelines towards future development and propose a design solution.

1.2 Geographical Context



Sande is centrally located in Sola municipality, the neighbouring municipality to Stavanger and Sandnes in Rogaland county. Sande has a promising location in relation to the airport and road network such as Solasplitten (Rv509). The location makes the area favourable as a residential area with good commuting opportunities.

Illustration 1.2.0.1. Location of Sande in relation to Stavanger and Sandnes (Mapbox, n.d.).

1.3 Governmental Objectives

1.3.1 Sola Municipality Plan

Parking

Sande is located within a high value axis in relation to public transport. As seen in table 1.3.1.1, residential development in Sande can have one parking lot per accommodation unit (Sola kommune, 2020, pp.9-10). In addition, every accommodation unit can have up to 0,2 guest parking lots. For bikes, there is a minimum amount of parking lots for each unit. For Sande, it is stated that development should include minimum two parking lots for bikes for each accommodation unit. Parking spaces for both cars and bikes needs to facilitate 50% for electrical charging. For car parking, 5% needs to be facilitated for people with disabilities.

Greenspace

Public greenspaces should have safe access, with focus on traffic from the residential area, in addition to be shielded from traffic, noise, pollution and satisfactorily illuminated. A minimum of 50% of the greenspaces must be exposed to the sun at spring equinox at 15:00. Adjacent buildings against common greenspace must not be taller than that the ratio between average height and distance between buildings shall be 1:1,5. Minimum space between apartments has to be at least 18 meters, and the greenspaces should be somewhat coherent. To ensure growth of bushes and trees, at least 1/3 of the greenspaces must not be substantiated.

Objective	Area	Car		Bike	
		Parking lots	Electric charging	Parking lots	Electric charging
Residential	Alongside high value public transport axis	1,0 and 0,2 guest parking per accommodation unit	50%	Min. 2 per accommodation unit	50%

Table 1.3.1.1 Parking (Sola kommune, 2020b, p. 9).

Density

According to the municipality's thematic map 11.9.5 - public transport axis with influence area, Sande is within a 500meter radius from the high value public transport axis (Sola kommune, 2020b, p. 43). Therefore, unit per acres are set to be 6-12 for Sande, with a minimum %FAR equal to 70 and a maximum %FAR 160 (Sola kommune, 2020b, p. 18). This is the highest allowed density for urban projects in Sola municipality, showing the importance of the public transport axis.

Table 3.1.1.2 specify requirements for the minimum common outdoor living area m2 per. accommodation unit on terrain within the planning area. For Sande, 30m2 per. accommodation unit are the minimum requirements for the common greenspace (Sola kommune, 2020b, p. 24).

Areas where the noise rises above 55dB in use hight 2 meters, in addition to areas with a steeper terrain than 1:3 should not be added in the total area of the playgrounds and common greenspaces (Sola kommune, 2020b, p. 24).

Area	Requirements of m ² smallest common outdoor living area per accommodation unit on terrain.
Within a 500 meters radius from the high value public transport axis	30m ²

Table 3.1.1.2 Common outdoor living area (Sola kommune, 2020b, p. 24).

Type	Triggered by number of units	Covers up to number of units	Main age group	Minimum size area	Recommended max distance from units
Local playground (sand-playground)	6	25	Preschool children (0-6 years)	200m ²	100 meters
Area playground (quarter playground)	25	100	Kids, young and older (5-13 years)	2 acres	400 meters
Activity surface (ball field)	150	600	Everyone	2,5 acres Dimensioned for 40x60m field with associated safety zone	400 meters
Recreation area (central playfield)	600	1200	Everyone	6 acres	500 meters
Regional green structure				20 acres	500 meters

Table 1.3.1.3 Playgrounds (Sola kommune, 2020b, p. 25).

Guidelines for merging common play and outdoor living areas retrieved from Sola kommune (2020b, p.25):

Sand playgrounds and quarter playgrounds should be merged for up to 30 residential units where possible. The size should be a minimum of 2,2 acres, with a walking distance less than 300 meters.

Quarter playgrounds and ball fields should if possible be merged together for up to

175 homes. The common living area should be at least 4 acres with a walking distance less than 400 meters.

Ball fields and central playfields should be merged for up to 700 homes. The size must be at least 7,5 acres with a distance on less than 450 meters from the residential units.

Playgrounds and ball fields should be coordinated across zoning plans and existing playgrounds and ball fields.

1.4 Research Question

When developing an urban area, there are multiple factors which is important to consider such as the landscape, climate, green structure, road network etc. These factors need to be considered with the mindset of who are we planning for. Making a place attractive is not just about making a place beautiful, it is about making the functional place which is appealing for the people who will be using the area. As more people move towards the larger cities, and the growth of the human population, people are now living closer to each other. It is therefore important to plan such that this densification does not decrease the living conditions of the people. Green structures and assembly points should still be prioritized, and not only the building structures.

This thesis will be focusing on urban planning and design with a strong focus on the people, and their preferences. The research question will therefore be:

“How to develop a residential area in Sande with focus on the social environment”.

1.5 Sub-objectives

As the research question is regarding the potential people living within the planning area, or simply uses the area, it is interesting to look at what kind of people the planning should aim at. All people are different, and does not have the same needs. Therefore, finding out who could potentially benefit from this area, and how they would benefit from each other will be crucial to support the main research question. Further, the thesis will look at how to attract those people to use the streets and urban spaces, and create lively neighbourhoods. The sub-questions are as follows:

Who should the area focus on, and how can the area provide for these people?

How to achieve living streets and urban spaces?

1.6 Methodology

In order to answer the research question, this thesis will include a theory part (chapter 2) and a spatial analysis (chapter 2). These chapters will further set the framework for the development concept and proposal.

A literature review is a review of different papers and research, and relevant literature is essential for all kinds of research projects and different disciplines (Snyder, 2019, p. 334). The theory will mainly focus on qualitative data collected by different studies and known urban planners. In this part of the thesis, only secondary data which already has been collected will be presented. The literature review is further divided into the sub-chapters: life, spaces and buildings, a principle from

Jan Gehl (2010). These chapters will have a main focus on different aspects which is important to consider when planning for people, and further determine which aspects is important to map out in the analysis, as well as being a framework for the concept development.

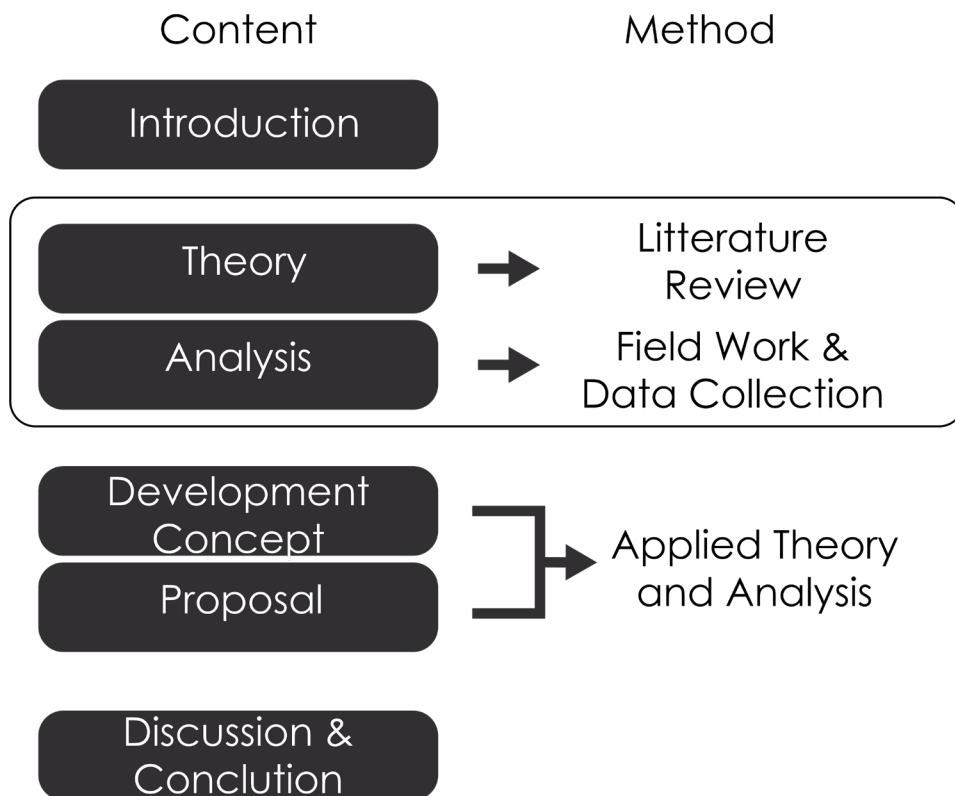


Illustration 1.6.0.1: Structure of the thesis

A spatial analysis is chosen as one of the main methods to uncover the existing conditions in Sande and the specific planning area. The analysis will gather secondary and primary data of the area, and include qualitative and quantitative data. Qualitative method bases of the gathering of data usually in the form of text, unlike quantitative which gather data in the form of numbers and statistics (Grønmo, 2020). The main goal of the spatial analysis is to gain more knowledge about Sande and to better get an understanding of how to further urbanise the area. Chapters are formed based on knowledge from the findings in the theory, as factors which is important to map out. The chapters are:

- Landscape
- Infrastructure
- Social infrastructure
- Blue-green structure
- Architecture and identity

The chapters are supported by the theory as seen in illustration 1.6.0.2. The analysis will work together with the theory to make a concept for a design proposal which will focus on the people that will be using the area.

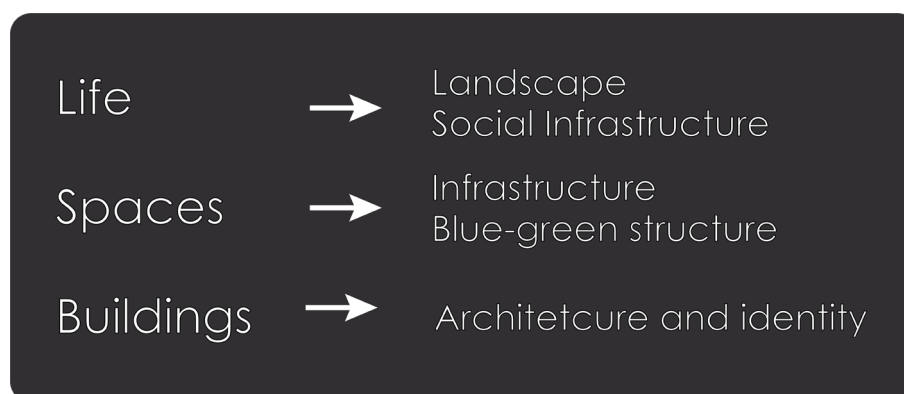


Illustration 1.6.0.2: Analysis based on theory

02

Chapter 02- Theory



Illustration 2.0.0.1. Green structure within the planning area.

2.1 Introduction

Urban planning is a social endeavour, creating a place for the people (Mason & Harland, 2016, p. 5). An important factor to consider when planning is the landscape because it focusses on how the place and people interact and belong together, and how each has shaped the other. Jan Gehl, a danish architect and urban designer, summarised the landscape-led approach as first life, then spaces, then buildings. His idea was that planning should first focus on the people and how they live. Furthermore, Gehl describes that one should focus on the spaces and places that support the way people live, and lastly sort out the location of buildings. This way of planning will be further discussed, and the theory will be based on these three factors as the concept is based on the social aspects of planning and relates to the research question.

Before Jan Gehls idea is presented in depth, the theory will first dive into the most basics of urban planning. Kevin Lynch, a known urban planner, are presented with his five dimensions of performance that relates to city quality, which are based on the joint effect of the place and society which occupies it (Lynch, 1981, s. 111; Patil & Patil, 2016, s. 1172). The five dimensions are: vitality, sense, fit, access and control, from the book "A Theory of Good City Form". They prefer primarily to the spatial form of the city, giving general statements of humans and the nature. Having general characteristics makes them connect to goals and values of any culture, as well as any settlement form which are relevant. The dimensions of performance are important aspects of city planning, and essential to understand before going more in depth.

Life

Spaces

Buildings

2.2 Dimensions of Performance

2.2.1 Vitality

Habitats should be able to support the health and biological well-functioning of the different species, as well as their survival (Lynch, 1981, pp. 118-131). Vitality concerns the degree to which the settlement supports these vital functions. Multiple aspects of health depend primarily on the social structure rather than the environmental structure. Kevin Lynch mentions three principals under the dimension vitality, of which are sustenance, safety and consonance.

Sustenance:	Availability of elements to sustain life.
Safety:	Physiological, social and physical safety.
Consonance:	Degree of fit between the environment and human requirements.

Illustration 2.2.1.1. Vitality (Lynch, 1981, p. 118).

2.2.2 Sense

The simplest form of sense is identity, which is the extent to which a person can differentiate a place in relation to other places (Lynch, 1981, pp. 118-143). Sense focus on the degree a place can be identified, both clearly perceived and mentally differentiated. In addition, the harmony between the environment and human capabilities, and cultural constructs. Identity is further discussed in theory part "2.5.1 Genius Loci", where the term ingenious loci is presented.

2.2.3 Fit

The fit of the place is referred to how well the spatial and temporal pattern match with the customary behaviour of the users (Lynch, 1981, pp. 118-150). Places are customary to fit the ways of behaviour, but behaviour also changes to fit the given place. The dimension addresses the degree forms and capacity of spaces, equipment and channels in an area match with the quantity and pattern of actions that people customarily participate in, or wish to participate in. The fit between human pattern and behaviour and a place focus on characteristics such as improving accessibility and adaptability.

2.2.4 Access

Humans are social animals, and the most basic access are access to other people (Lynch, 1981, pp. 118-189). Next in importance is access to daily tasks such as going to work and buy food. In addition, access to important services such as medical, financial, educational, religious, and recreational must be included on an equal footing. Access is also required to certain material resources such as energy and other goods. People also has the need of access to places, such as symbolic places and natural environments. Lasty Lynch talks about how humans want access to information. Importantly, access focus on the quantity and diversity of the elements which can be reached in the given place.

Humans are territorial animals, and space along with the behaviour associated

2.3.5 Control

with the space must in some degree be regulated and controlled (Lynch, 1981, pp. 118–211). In this context, it means one particular form of space control: the legally defined ownership of an area. Further, Lynch discuss five spatial rights: The right to be in a place, right of use and action, right of appropriation, right of modification and right of disposition. The control is referred to the degree to which the access and use of activities and spaces are being controlled and regulated by the people that use, work and reside in them. Further, he mentions other dimensions under control; congruence, responsibility and certainty, whereas the congruence refers to when extent to which the actual users and inhabitants of a space have control over the space. The responsibility explains how those who have control over an area should have the motives, power and information to do so, in addition to having a commitment to the place. The dimension certainty explains how people should feel secure and understand the control system.

2.3 Life

Starting with life, means starting with the people (Mason & Harland, 2016, s. 7). This further implies to have a clear vision for the community that will be living in each development. An important question to ask is, what will people hope for in their future homes, and what is it that they would value and appreciate the most? The better balanced the community, the better it will integrate with the surrounding area. All people have the ability to sense whether a place is welcoming or exclusive.

After getting a clear vision, it's important to explore how the different qualities of each site shape the way it will be used and function (Mason & Harland, 2016, s. 7). For instance, a peripheral piece of land could become pivotal due to the way the sun moved across the site, which gives the area evening light. This can further be used to make important social purposes, and improve the way of living for the people. Mapping out these factors is important before planning the location of buildings.

2.3.1 Diversity

People are one of the key elements to which attracts other people (Jacobs, 1961, p. 109). The activity generated by people such as errands, or people aiming for drink or food itself is an attraction to other people. Places are often designed based on the premise that people seek the sight of emptiness, usually in order to find quiet and peace. However, people naturally seek activity and other people. Jane Jacobs argues that successful streets have people appearing the streets at different times throughout the day. She strongly advocates diversity in her book "The Death and Life of Great American Cities".

One of the key strategies to achieve active streets throughout the day is to have a diversity of people living in the neighbourhood. Here, different people have different needs and contribute to activity at different times. For instance, an adult may create activity to and from work, specifically around 8:00 and 16:00. In addition, an adult may go grocery shopping on the way home. If it is a family with kids, additional activities throughout the day are added, as kids tend to attend activities outside of school in the evening. A teenager can create activity as they go to school, in addition to late night parties. All different people then create different types of activities in different periods of time, and can be used by city planners to contribute to a steady flow of people in the streets.

2.3.2 Jan Gehls 12 Quality Criteria

Jan Gehl is a well-known Danish architect and urban planner, who is the author of several books and research articles. In the book "cities for people" (2010), he developed three dimensions and 12 quality criteria that will contribute to achieving attractive urban spaces.

The human dimension is described by Jan Gehl (2010) to be a necessary planning dimension which places the people in focus during the planning. Four objectives are further concretized that are central to the human dimension; a living city, a safe city, a sustainable city; and a healthy city. Jan Gehls 12 quality criteria is a key tool for working towards these ideals.

Gehl (2010), stated that protection is the most fundamental, which needs to be considered first. If the protection is not secured, there is no meaning to focus on the other quality criteria, as the protection is crucial for the people living in and using an area. Under protection Gehl mention safety against traffic and accidents, crime and violence and unpleasant sensory effects. In good urban spaces, people can move around freely without being in danger of any kind.

Comfort comes next in line, and has the second most important criteria (Gehl, 2010). These criteria are also fundamental for people. In addition, urban spaces need to feel inviting towards these activities in an urban space. The comfort relates to the possibility to walk, stand, stay, sit, see, talk, hear, and be active, as shown in illustration 2.3.2.1.

Lastly, pleasure is taken into consideration, as the least essential criteria (Gehl, 2010). Here, human scale, the possibility to enjoy the weather and aesthetic qualities are reflected as part of the 12 quality criteria. In good urban spaces, the existing qualities of the area are being utilized.

The criteria will be divided within each main chapter, life, space and buildings. Regarding life, the sub-chapters within each dimensions are highlighted in illustration 2.3.2.1. For life, uncomfortable sensory effect such as wind and noise are important aspects.

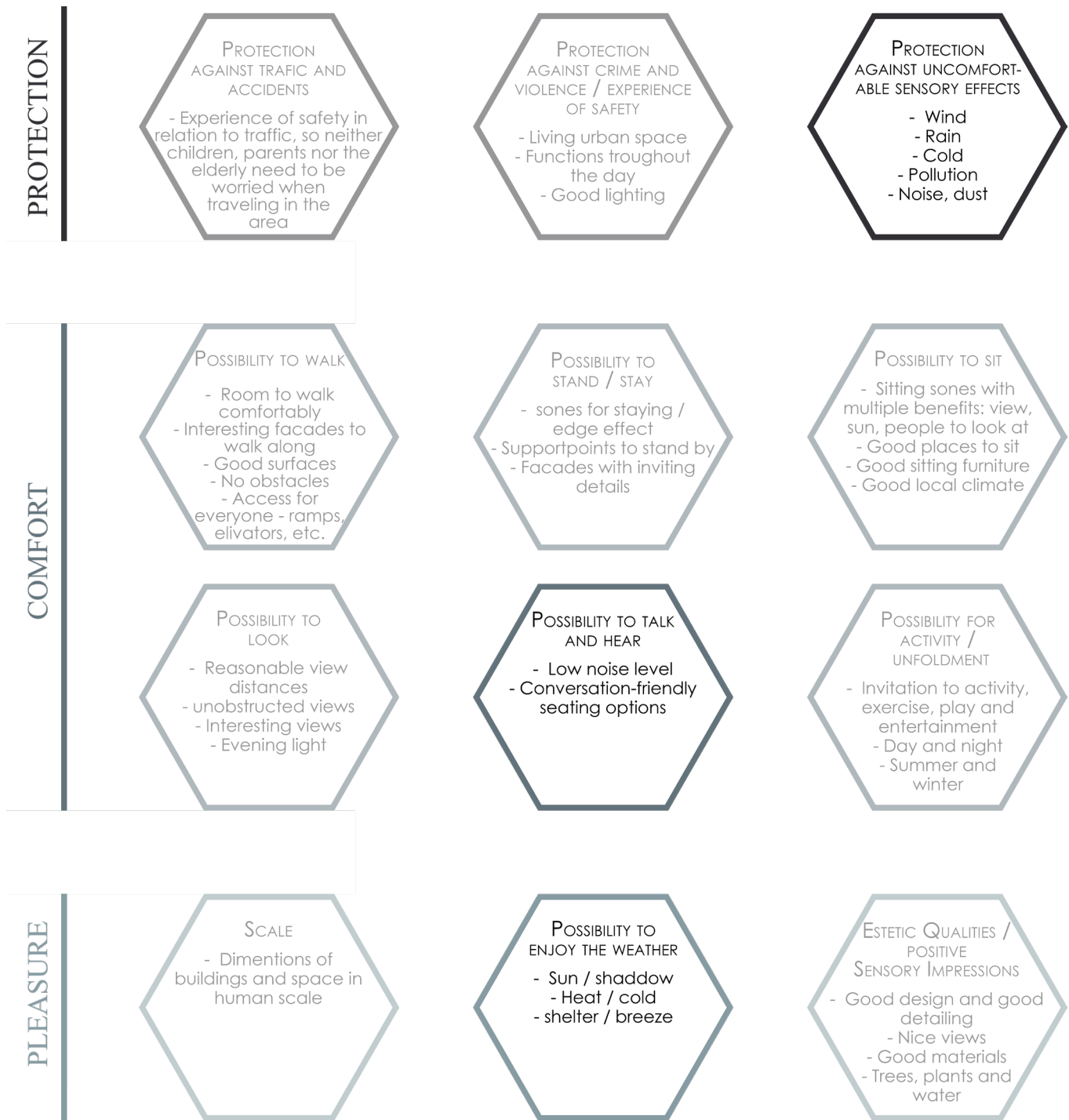


Illustration 2.3.2.1: Jan Gehls 12 quality criteria regarding life (Gehl, 2010).

2.4 Spaces

In many cases it seems easier to conceptualise the different spaces when it is defined in relation to the surrounding buildings (Mason & Harland, 2016, s. 8–9). However, this approach only defines shapes instead of making places. When sorting out buildings first, everything has to fit around them, which leads to a design that is based on the fitting. This leads the design of public spaces to be reduced to resolving the technical issues, and functionality.

2.4.1 Jan Gehls 12 Quality Criteria

The criteria of Jan Gehl which relates to space is highlighted in illustration 2.4.1.1. Here, protection against traffic and crime are important within the protection dimension. Further, spaces need to consider possibility to walk, look, sit, and activity, and lastly provide aesthetic qualities. More information about Jan Gehl and the dimensions and criteria is provided in chapter “2.3.2 Jan Gehls 12 Quality Criteria”.

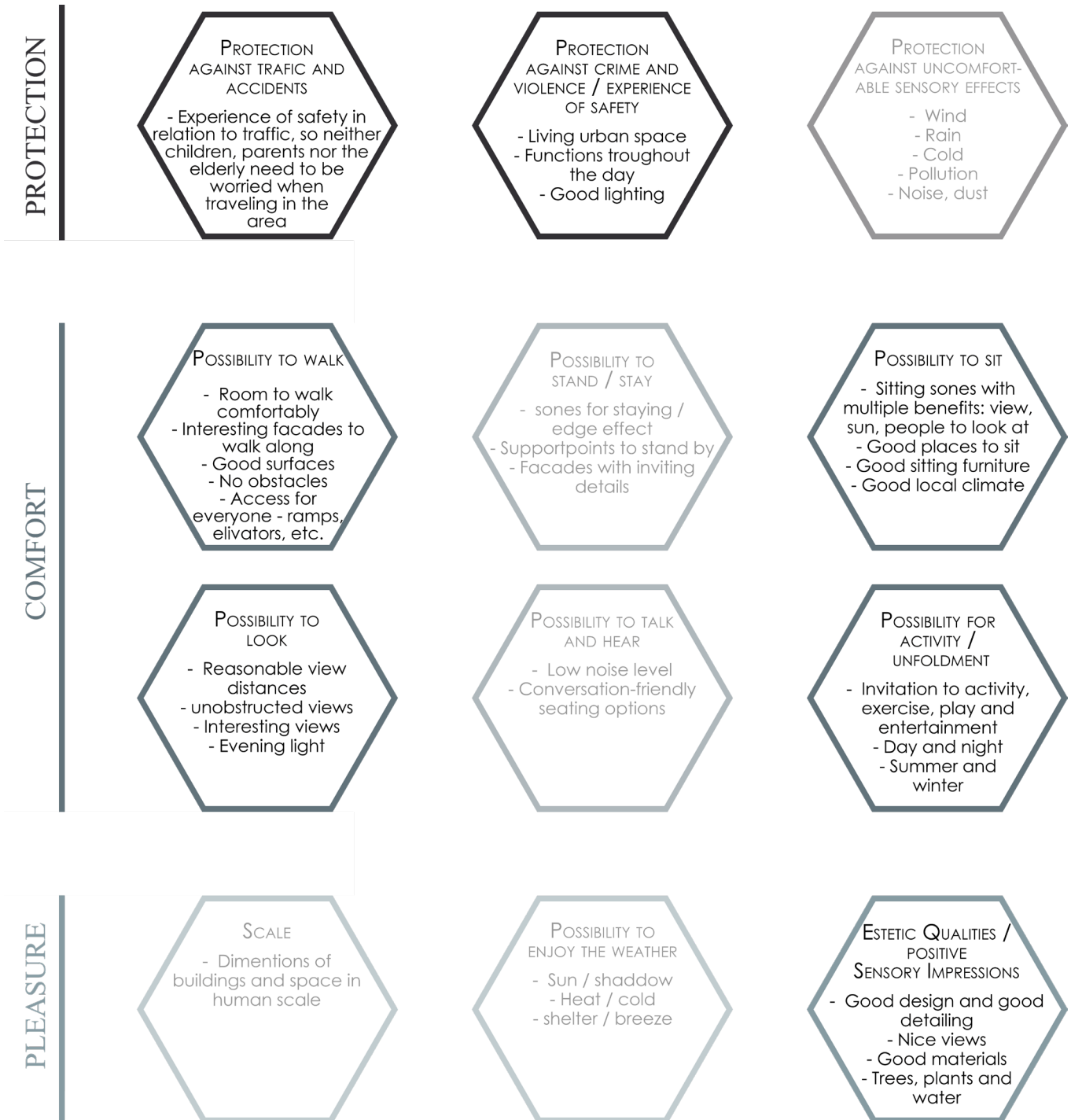


Illustration 2.4.1.1: Jan Gehls 12 quality criteria regarding space (Gehl, 2010).

2.4.2 Green structure

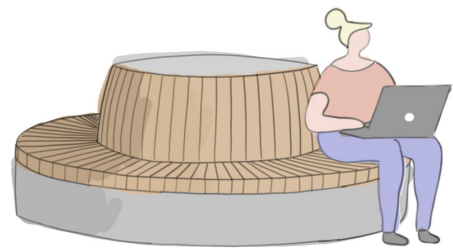
A study from Sweden included a survey to find out what makes a good local environment (Steffner, 2009, s. 50–119). Participants were shown different environments, which they would give their first reaction to. The study had few coherent responses, except for blue-green spaces, as the study found out that blue-green structure had a huge impact on people's reaction. In relation to other structures, blue-green structures had a higher impact, making people feel happy, stimulated, harmonious, safe and relaxed.

Biodiversity underlies many ecosystem services which is demanded by humans, this includes effects on health and their well-being (Adams et al., 2005, s. 714–724) (Apfelbeck et al., 2020, s. 1–2). Humans and their cultures are enhanced through maintaining sustainable mosaics, which includes wildlife communities. However, in the current situation fewer plants and animals occur in residential areas, which makes humans separated from nature. To achieve densification of wildlife, the wildlife conservation has to be directly implemented in the urban planning and design process. Green structure such as backyards, residential gardens, business parks or vacant lots in urban areas can provide important habitat for a number of species. Urban densification however results in a reduction of these green structures, which can further endanger species that are closely associated with urban areas. Larger green lawns are severely restricting wildlife density. To enhance the habitat value, one could plant trees, shrubs, vines and herbaceous vegetation, in addition to provide a source of freshwater.

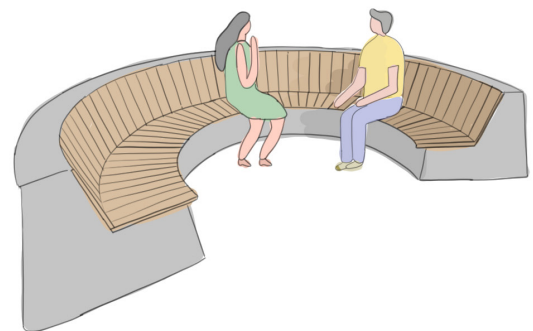
2.4.3 Seating

Offering people various seating elements gives people social comfort (Project for Public Spaces, 2008). Different seating in different places strengthen their choice to sit wherever they prefer. Important choices can be to sit in the sun or in the shadow, with or without others, close to an activity or in a calm area. Doing so, seating areas can function as a catalyst for social activities, where social comfort can help facilitate spontaneous social interactions and activities. Illustration 2.4.3.1 shows how different seating function in the public with people which has different needs. In the illustration there are three different seating options, introverted seating, introverted seating, and optional seating. Optional seating can in the public space function as an important tool for creating social and active streets.

Introverted seating



Extroverted seating



Optional seating

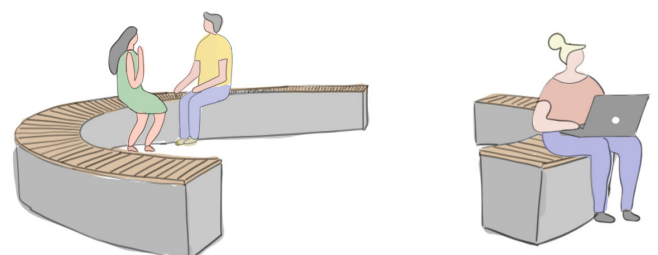


Illustration 2.4.3.1: Different seating

2.4.4 Community Gardens



Illustration 2.4.4.1: Community gardens - (Egli et al., 2016, p. 351).

“Community gardens contribute to community wellbeing by influencing the nutritional and social environment”.

(Egli et al., 2016, p. 348)

Community gardens are pieces of land which is used as semi-private gardens for the specific purpose of growing fruits, vegetables and herbs for self-consumption (Egli et al., 2016, s. 348–349). Illustration 2.4.4.1 shows different themes which is based on different data and articles found on community gardens. Here, the main themes are shown as larger branches, which represent positive outcomes.

These outcomes are divided into the main categories, health and social. As for the health aspect, profits are healthy body weights, physical activity and food security. Profits based on the social are ownership and pride, urban beautification and community cohesion. The minor themes can be seen as smaller branches on illustration 2.4.4.1.

2.5 Buildings

The architecture is essential in the urban space and the commercial value (Mason & Harland, 2016, s. 10). However, the shapes and layout should be determined by the landscape, and the design of the buildings should be led by the needs of the people who will live there, which is mapped out in the first planning stage, life. Location of buildings should be suggested by the site itself, to protect the tranquillity of the site from sources for noise, and how to improve wind flow patterns. By using Jan Gehl's landscape-led approach, the right balance between spaces and buildings are found to create added value to the landscape.

2.5.1 Identity - Genius Loci

The term *genius loci* was introduced by Christian Norberg-Schulz, meaning the spirit of a place (Møystad, 2017). He argued that the people's identity is based on the identity of the place. Place identity is a versatile concept upon the relation between human and environment (Peng et al., 2020, pp. 1–4). The social constructivist theory of place identity focus on individuals' subjective perceptions of geographical space, which provides valuable insights for studies such as spatial planning and urban design. The concept, place identity, was initially introduced by Harold M. Proshansky. He defined place identity as "those dimensions of self that define the individual's personal identity in relation to the physical environment by means of a complex pattern of conscious and unconscious ideas, feelings, values, goals, preferences, skills, and behavioral tendencies relevant to a specific environment". Elements as components of place identity has by studies been referred to by almost every aspect of a place, which means that place identity can be anything that makes a specific place identifiable within the spatial system.

2.5.2 Styles

People tend to prefer styles that fit their knowledge structure, and a study from the *Journal of Environmental Psychology* shows that the public often tend to dislike modern or atypical styles (Stamps & Nasar, 1997, pp. 27–30). Illustration 2.5.2.1. shows the different features which the study found to show the biggest difference in preference. The most popular styles found was houses which appeared to have pointed roofs, simple footprints, and windows which is centred in their respective building structure. The more unpopular design features were flat, shed, mixed or round roofs, more complex footprints and off-centre windows related to their building structure, either relatively small or large.

A more recent study from the Norwegian University of Life Sciences (NMBU) has shown that urban areas characterized by classical architecture was better received by the public (NMBU & Grande, 2020). The study used VR technology to show the public different urban areas in a 360-degree rotation, which they rated based on their own feelings. Here, the main finding was that most people prefer classical architecture characterized by symmetry, ornaments, natural materials over modern architecture.

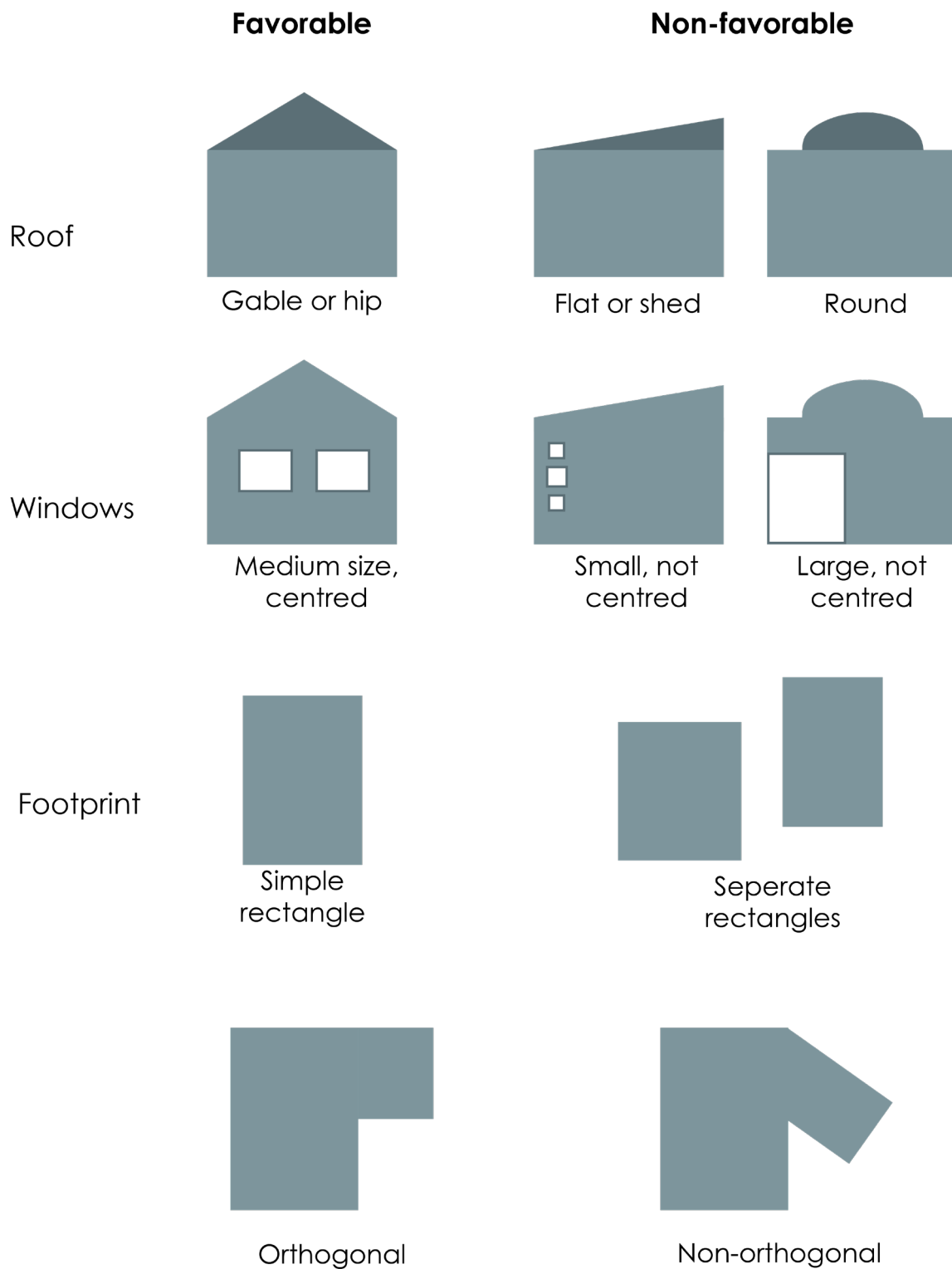


Illustration 2.5.2.1: Architectural styles, favorable vs non-favorable (Stamps & Nasar, 1997, p.28).

2.5.3 Jan Gehls 12 Quality Criteria

The criteria of Jan Gehl (2010) which relates to buildings is highlighted in illustration 2.5.3.1. Here, protection against uncomfortable sensory effects is added. Additionally, the buildings facades take part in the possibility to walk and stand, and aesthetic qualities and positive sensory impressions. Further, buildings have an important role regarding the views and to shelter placed from noise. Lastly, buildings should be developed considering the human scale.

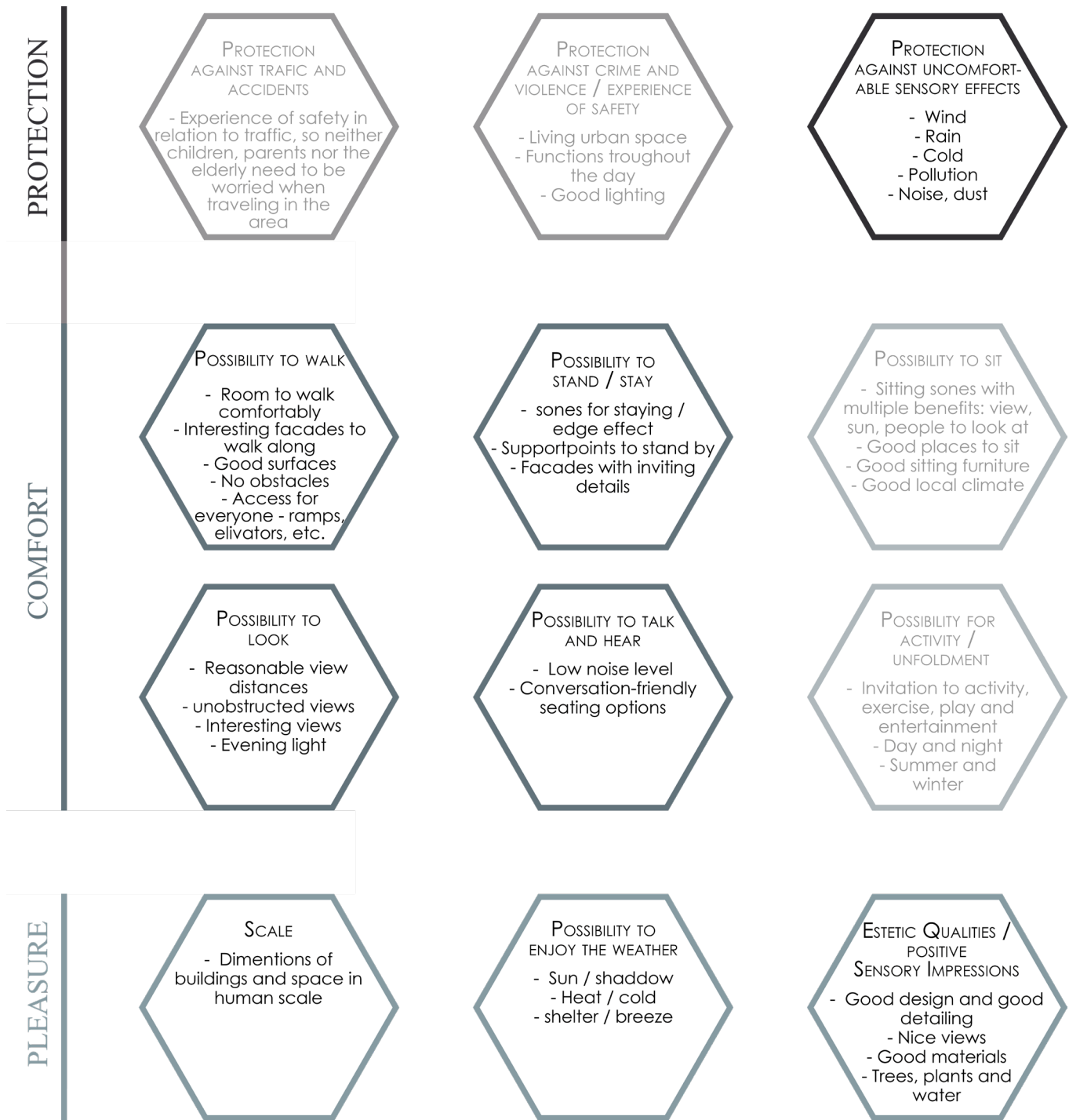


Illustration 2.5.3.1. Jan Gehls 12 quality criteria regarding buildings (Gehl, 2010).

03

Chapter 03 - Analysis



Illustration 3.0.0.1. Green pedestrian path.

3.1 Research Area

This chapter shows the planning area through photographs taken from the area. The location of the photographs is shown in illustration 3.1.0.1 through numbers from 1 to 8. These numbers are shown on the top right on each picture. The photographs' main purpose is to give the reader to gain a complete picture of all the different

aspects of the area, and get a better understanding of the scale. This chapter is chosen as the first chapter in the analysis, to give the reader this understanding beforehand. The planning area has a total size of 80 000m², which in comparison is equivalent to around 11 football fields (Footballhistory, n.d.).



Illustration 3.1.0.1: Map over research area, with numbers referring to photographs

1



Illustration 3.1.0.2: Grass field

2



Illustration 3.1.0.3: Pederstrian bridge

3



Illustration 3.1.0.4: Trees, located in the middle of the planning area.

4



Illustration 3.1.0.5: Trees, located in the center of the area.

5



Illustration 3.1.0.6: Apartments located in the south.

6



Illustration 3.1.0.7: Bus stop north within the planning area.

7



Illustration 3.1.0.8: Vegetation in the north-east.

7



Illustration 3.1.0.9: Vegetation in the north-east.

8



Illustration 3.1.0.10: Walking trail on the small-scale hill the south-east.

8



Illustration 3.1.0.11: view from top-point in the small-scale hill in the south-east.

3.2 Landscape

3.2.1 Terrain

The area is characterized by a plain wide and open landscape with few height differences and elevations towards north. The steepest terrain is found in the west, as shown in illustration 3.2.1.1, where the landscape rises towards a small-scale hill. Here the area rises to 17 meters above sea level. Most of the area consist of cultivated agricultural landscape, with slightly any human interference. The project area consist of large amounts of loose material, mainly thick moraines (Norges geologiske undersøkelse, n.d.). The west side hill is categorised as a bare mountain, with

less than 50% loose material. In the south, outside of the main research area, both in the southwest and southeast, there are two small-scale hills which are rising up towards 25 meters above sea level.

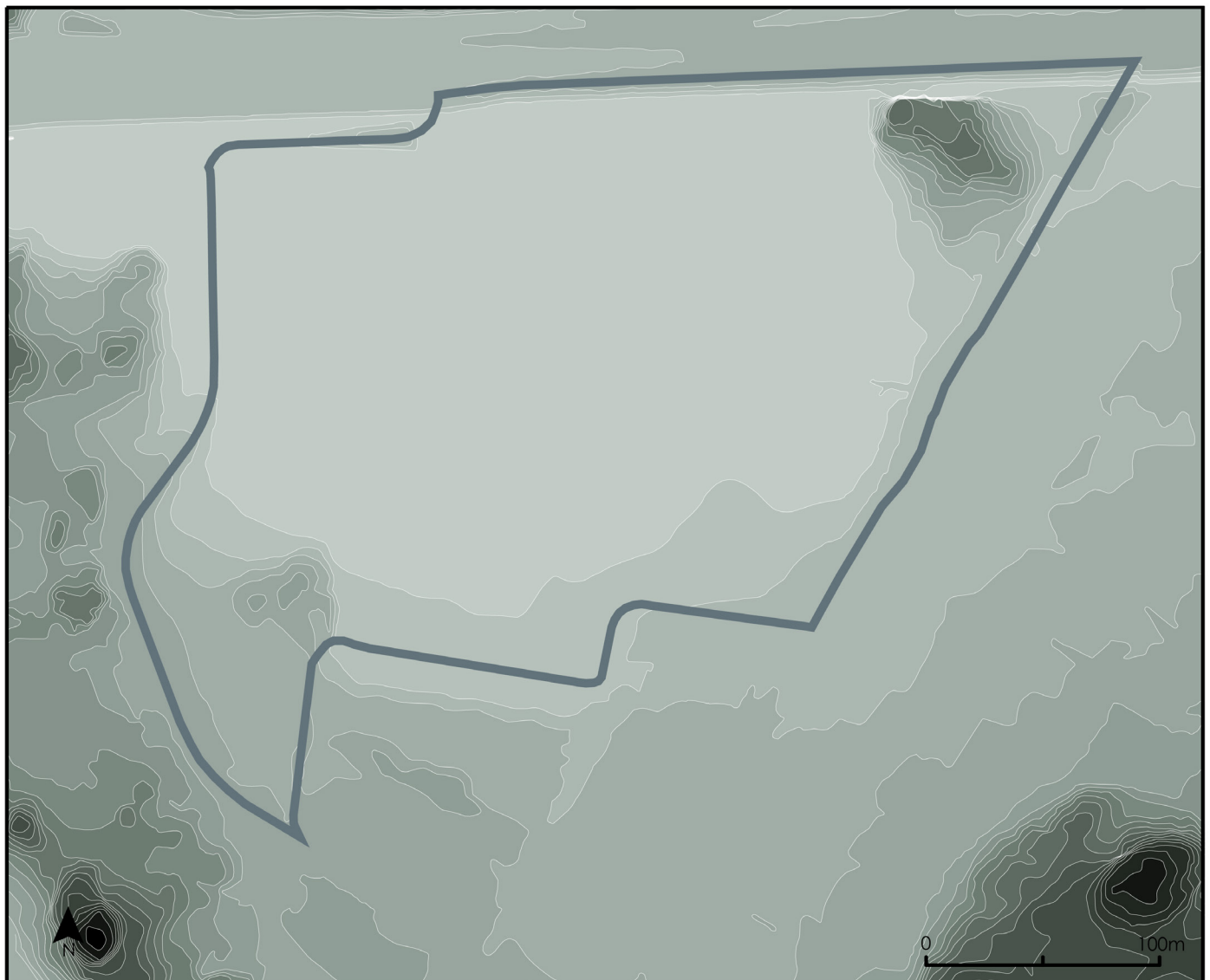


Illustration 3.2.1.1: Terrain with the outline of the area.

3.2.2 Local Climate

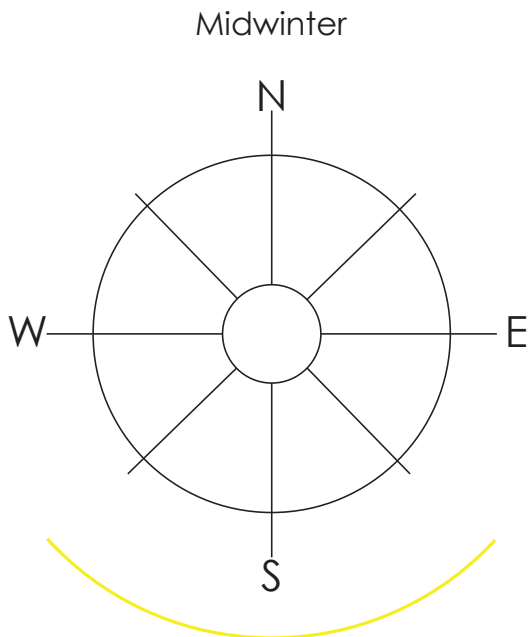


Illustration 3.2.2.1: Sun conditions midwinter (Suncurves AS, 2020)

Sun

As the area has a somewhat flat surface with some slope towards north, it is an ideal area for development considering sun exposure. Illustration 3.2.2.1 and 3.2.2.2 shows the movement of the sun throughout the day in midsummer and midwinter, as the area is more exposed for sunlight in the summertime. The sun rises in the east, and goes down in the west. In midsummer, the sun is in the east around 13:50, and for midwinter at 12:40 (Suncurves AS, 2020).

Wind

The wind rose is calculated from the Meteorological Institute, which shows the average wind exposure in Sola from 2007-2006 (Arkitektkontoret Stav AS, 2019, p. 14). The data is collected at station Sola 44560, and shows data throughout the whole day, in every month. The wind rose shows that the strongest wind come from north-west and south-east. The wind rose illustrates three colours, white, yellow and green.

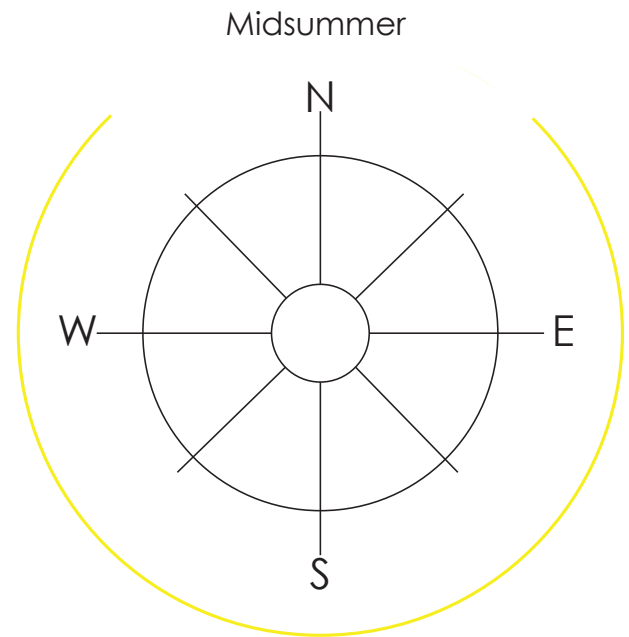


Illustration 3.2.2.2: Sun conditions midsummer (Suncurves AS, 2020).

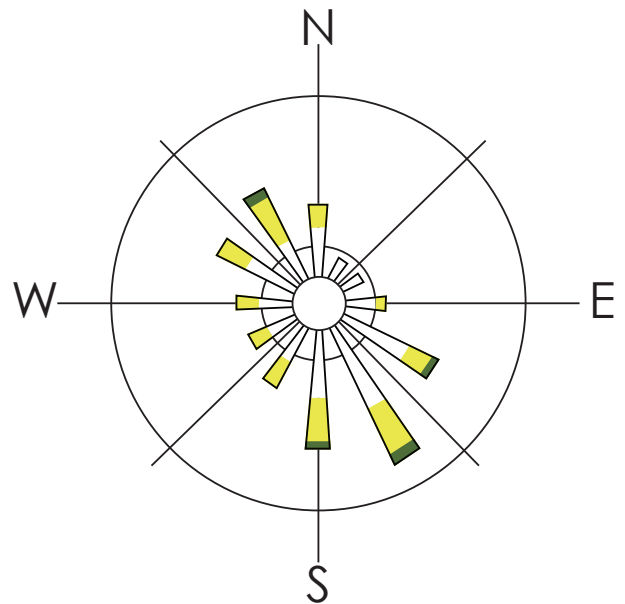


Illustration 3.2.2.3: wind conditions (Arkitektkontoret Stav AS, 2019, p. 14).

White represent wind in between 0,3 – 5,2 m/s. Yellow represent wind with a velocity between 5,3 – 10,2 m/s. Green correspond to the wind velocity between 10,3 – 15,2 m/s.

3.3 Infrastructure

3.3.1 Road Network

Solasplitten is the main road in the area, and are in direct contact with the analysis area. The road is called Rv509 as the road is a highway, and the road connects the area to all of Sola in the north, seen in illustration 3.3.3.1. In addition, road Rv509 connects through sola and further to Stavanger city centre. In the east side, the highway connects to E39, which is an important road as it connect Norway to Europe. This road therefore creates easy access through car between the analysis area and the surroundings.

The road Sandesletta is connected to Solasplitten which is a highway. Sandesletta is a secondary road, and is important for the area as it connects up to Solasplitten as well as access roads to the residential. This also counts for Åsenvegen, which leads up to the research area and connects to Sandesletta. Other roads that are in direct contact with the analysis area are access roads, which connects the roads and the buildings.

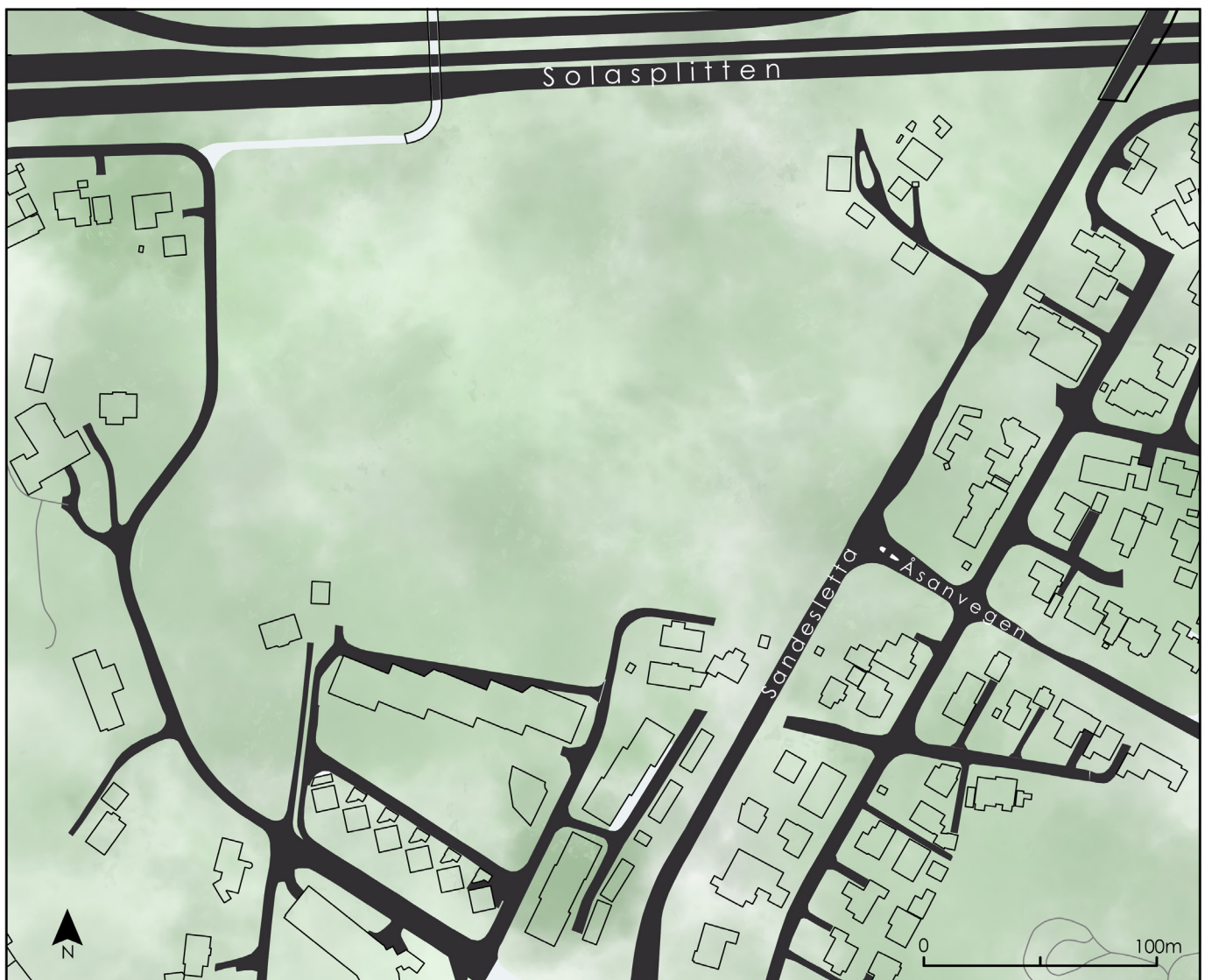


Illustration 3.3.1.1: Road network

3.3.2 Noise Pollution

The maps show noise pollution in the research area in relation to the framework in T-1442, referring to the table 1, criteria for zoning. This table maps out the different variables for dB which is considered to be yellow or red zones. The red zone is closest to the noise source, and represent an area which is not suitable for noise sensitive functions (Regjeringen, 2016). The yellow zone represents an assessment zone, where noise sensitive functions need to be further considered.

Road traffic

Illustration 3.3.2.1 show the different zones in relation to noise pollution by road traffic (Kartverket & Polarinstitutt, n.d.). In T-1442, yellow zone represents higher noise than 55dB (Regjeringen, 2016). The red zone represents all traffic noise over 65dB. In the north, there is placed a noise barrier in the form of a fence which is reducing the noise considerably.

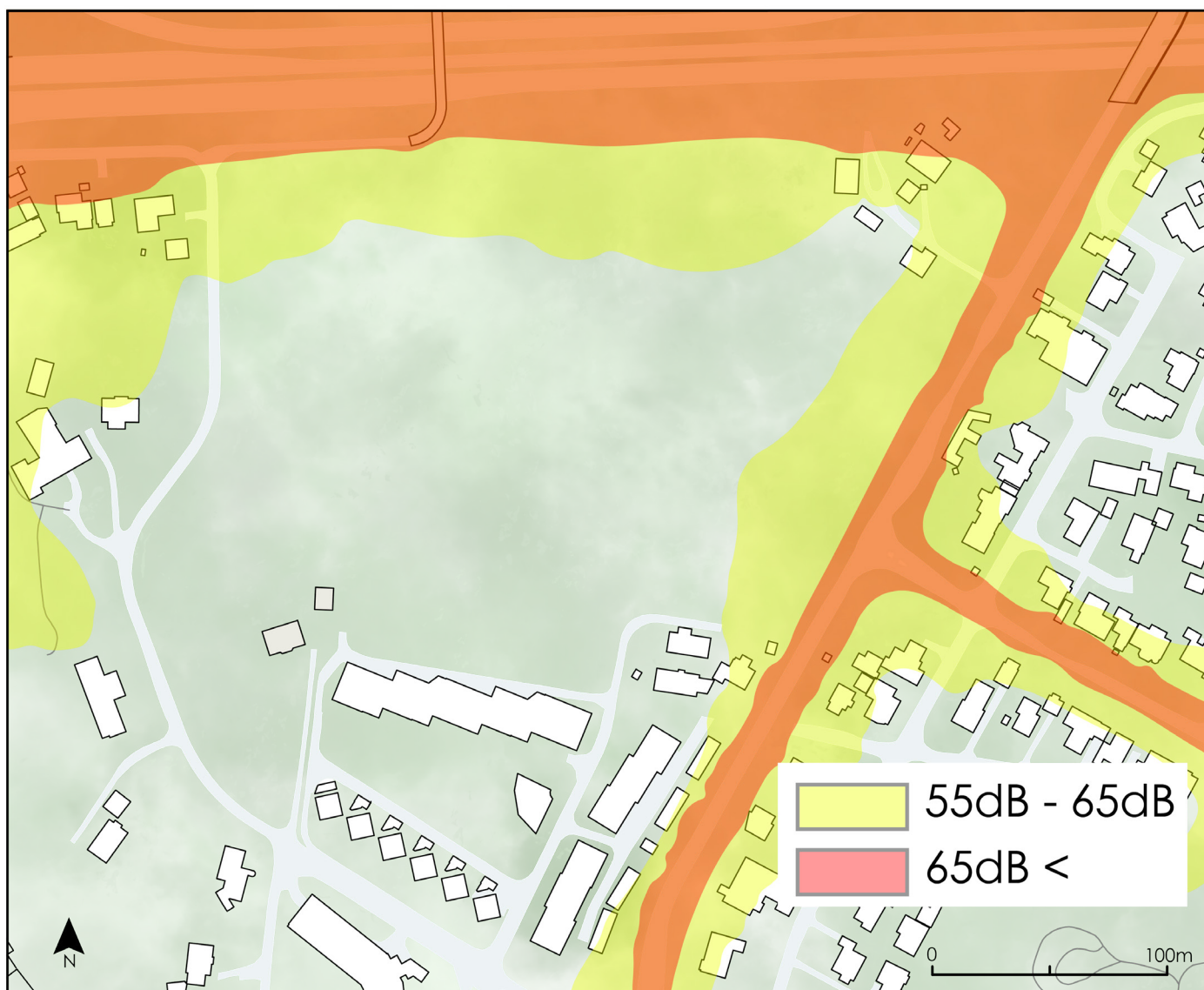


Illustration 3.3.2.1: Noise from road (Kartverket & Polarinstitutt, n.d.).

Air traffic

The map in illustration 3.3.2.2 demonstrates the appearance of noise from Sola Airport, and the correlated air traffic (Kartverket & Polarinstittutt, n.d.). From T-1442, yellow zone represents a noise higher than 52dB, and for the red zone higher than 62dB (Regjeringen, 2016). The most important

source of noise from the airport is generated during departure and landing (Avinor, n.d.). Because this is close to the ground, high structures could potentially reduce the disturbance from the airport. In the red zone, private gardens should be placed on the east side. Most of the area is within the yellow zone, and will have a decreased disturbance.

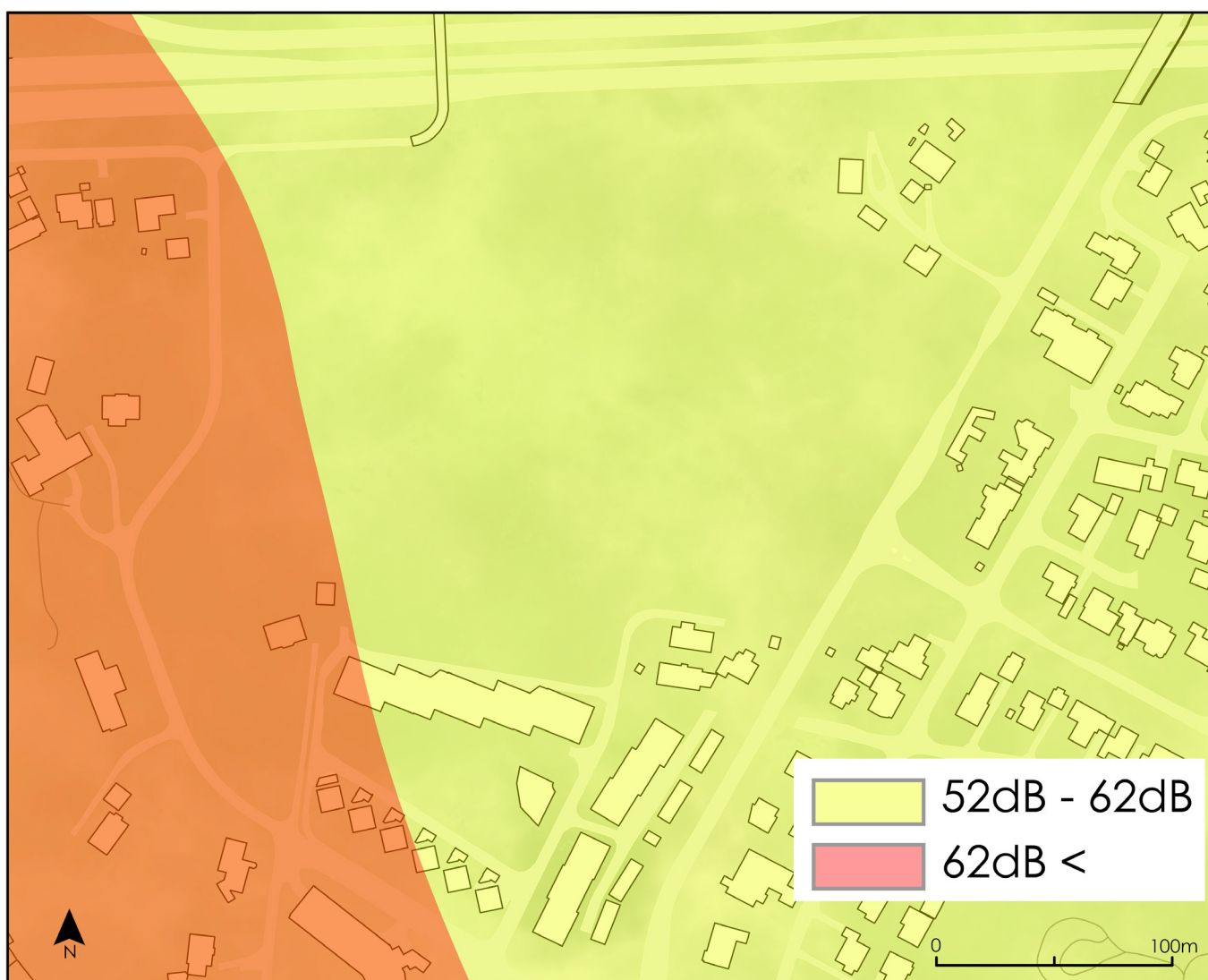


Illustration 3.3.2.2: Noise from air traffic (Kartverket & Polarinstittutt, n.d.).

3.3.3 Average Annual Daily Traffic

Solasplitten is the most trafficked road in the area, with an annual average daily traffic on 19 300 at the most within the area (Statens vegvesen, 2020). Crossing the road is done by bridges to avoid conflicts with the many drivers.

The northern road with AADT equal to 2 100 leads away from the main road and to 100 leads away from the main road and to

the road in the north with a total AADT on 8300 (Statens vegvesen, 2020). The other road connected to Solasplitten is leading traffic to the road. Sandesletta has a AADT equal to 7742, then is reduced in the south to 5082. Åsenvegen has a AADT on 4592.

The rest of the roads have no registrations as they are little trafficked and are mostly access roads (Statens vegvesen, 2020).



Illustration 3.3.3.1: AADT (Statens vegvesen, 2020).

3.3.4 Public Transport



Illustration 3.3.4.1 Bus routes (Kolumbus AS, n.d.).

X50: Stavanger – SUS – E39 – Sola – Skadberg

7: Stavanger – Madlakrossen – UiS – Sola – Skadberg

58: Sola – Tjelta – Kleppekrossen – Horpestad – Bryne

(Kolumbus AS, n.d.)



Table 3.3.4.2 Sola Ungdomsskole bus stop.

Within the analysis area, it is located two bus stops which is shown in the illustration 3.3.4.1 (Kolumbus AS, n.d.). The two bus stops are Sola Ungdomsskole, which lies in the north (see illustration 3.3.4.2), and Sandevegen in the south. Trough Sola Ungdomsskole, two bus routes pass by, x50 and 7. As seen in illustration 3.3.4.1, x50 connects the area with Stavanger city centre and Skadberg. In addition, the bus travel trough important sites such as the University of Stavanger and Stavanger University Hospital. Route 7 has the same stops in the end and connects the area with the University, however this route passes trough Madla instead and not the university hospital. Route x50 only travels

from 14:00 – 17:00 with approximately four departures each hour. Route 7 usually have two departures each hour, with some additional departures from 07-08 as this is a demanding hour. The bus does not travel at night.

Route 58 are the only bus passing through Sandevegen (Kolumbus AS, n.d.). The route to Bryne does not pass trough this stop as the route stop at Solakrossen. However, the bus route has one departure from Klepp Station to Sandevegen on weekdays. This route therefore has little to no impact on the area.

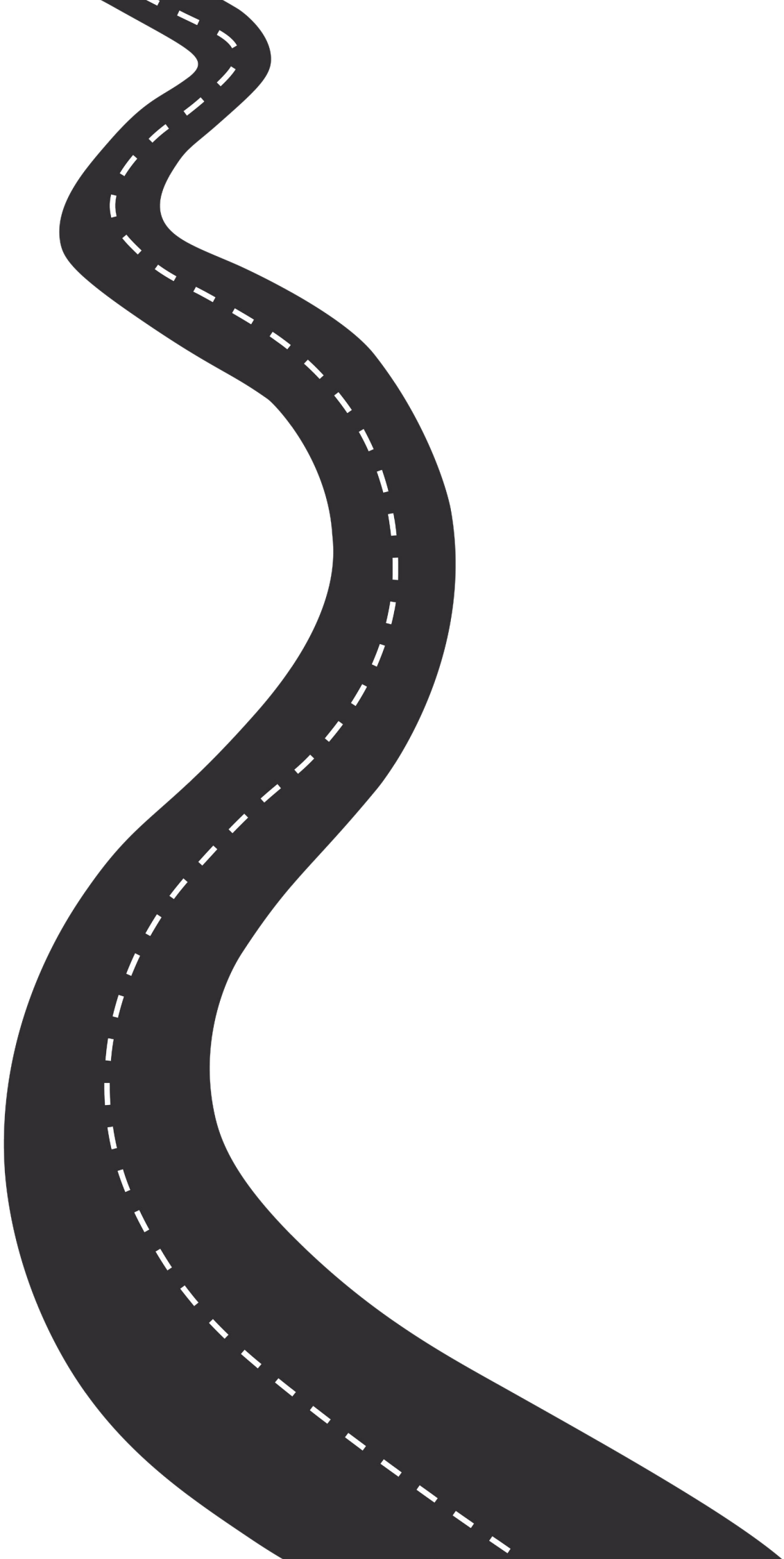
3.3.5 Walking and Cycling

Especially in the east side of the analysis area, there are multiple walkways and sidewalks for pedestrians and cyclists. Because of the lack of pathways for pedestrians and cyclists, multiple of the car roads within the area will be used by the pedestrians and cyclists. This can for instance be seen in the illustration 3.3.5.1 on the west, where there are two unconnected pedestrian paths, and the road needs to be used to commute between the two.

The two most important paths are those leading above Solasplitten through bridges, making connection to the other side. Further connections to these two should be an important aspect when developing the area. If new development causes more pressure on the existing traffic, pedestrians and cyclist should not use the access car roads as paths. New walkways and sidewalks would then need to be implemented, with a focus on the westside.



Table 3.3.5.1 Pedestrian paths



3.4 Social Infrastructure

3.4.1 Education

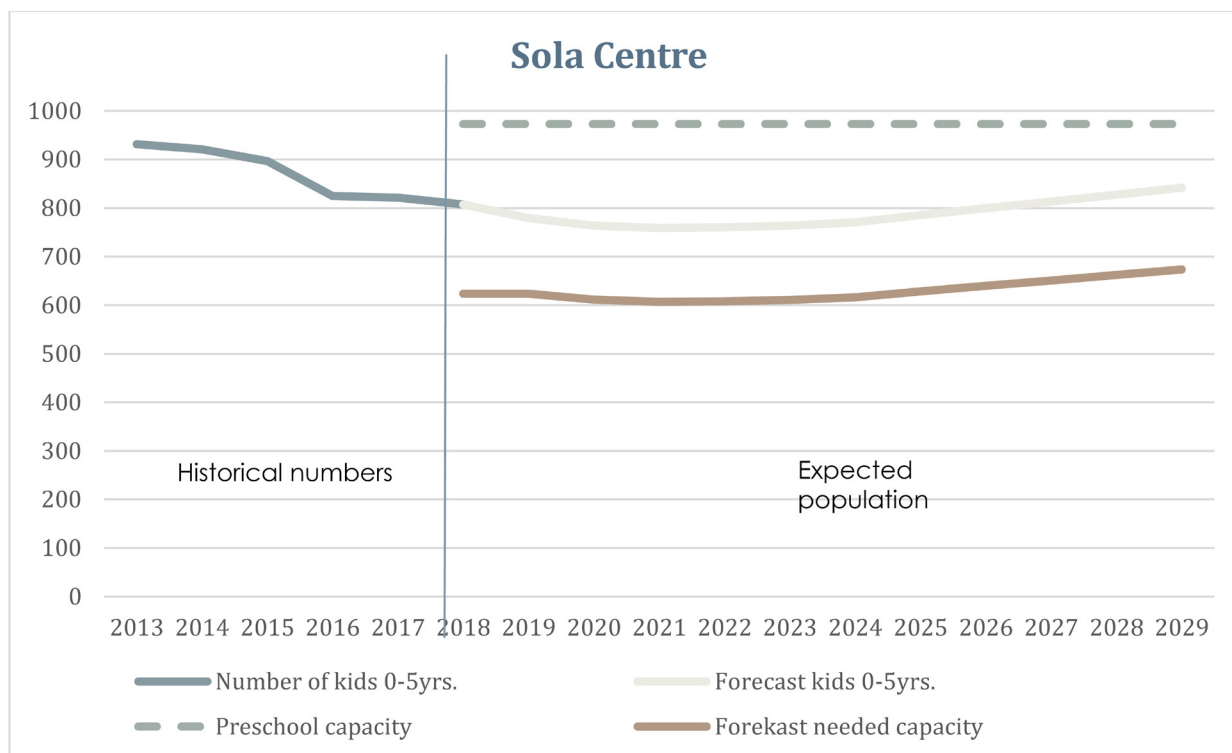


Table 3.4.1.1 Capacity within the municipality regarding preschools (Stavanger kommune, 2019b, p 8).

Preschools

In the annual report per. 15/12/18, Sola had a capacity of a total availability of 1991 children (Sola kommune, 2019a). This date, there were 1823 preschool children in Sola municipality, which concludes with a space capacity on 168. It is important to note that there is a transit affect, where children from the surrounding municipalities can go to preschools in Sola as well and cover that spare capacity. However, it is stated that every child has the right to go to preschool in their own municipality, which gives them the priority if capacity appears to be restricted.

Sande is within Sola centre preschool district, which has a capacity on 973 children (Sola kommune, 2019b, pp. 7–14). In 2019, 624 of these spots were taken, which leaves 349 spare spots left available to cover missing capacity for Tananger and Sola north. As seen in figure 3.4.1.1, there will be a need for a capacity on 674 in 2029, which leaves 299 spots for free disposition.

Sola centre district has 13 preschools, where the distribution of communal and private is shown in figure 3.4.1.2 (Sola kommune, 2019b, p. 17). Four of the preschools are communal which covers 257 children, while nine is private which covers 367 children.

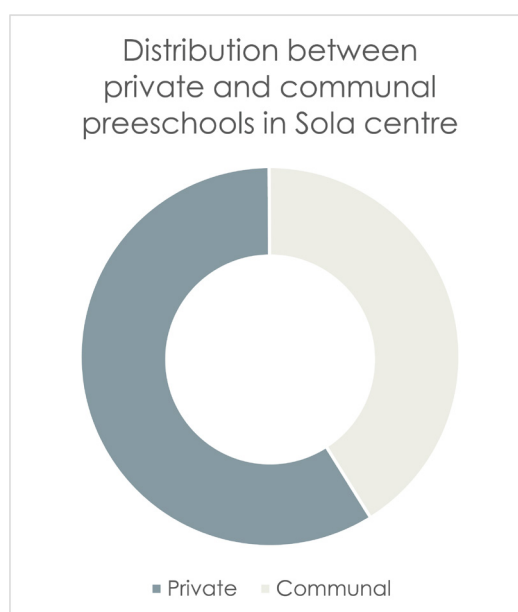


Table 3.4.1.1 Distribution between private and communal preschools (Sola kommune, 2019b, p. 17).

Primary and secondary school

There are currently nine primary schools in Sola municipality, all spread out to cover all of Sola. However, the majority of the primary schools are located close to Sola centre, as this area are more accessible in regard to everyday travel. As the analysis area are close to Sola centre, it is also close to most of the different primary schools, which makes the area attractive for families.

In Sola there is today two secondary schools, Sola secondary school and Tananger secondary school, where Sola secondary school is only few meters from the analysis area. In addition, there will be a third secondary school in Sola municipality, which will be ready fall 2021 (Sola kommune, 2020).

Stadium, Sola Hallen, fitness center is within a short distance. In addition, Sola Arena will be finalized within 2021, which is located right outside of the analysis area (Stavanger aftenblad, 2021). Other utilities for activity are also found close to the centre of sola such as a cultural center, restaurants and cafes. These utilities are important to create commuting within the area and activities throughout the day.

3.4.2 Daily Chores and activities

The analysis area is close to Sola centre, which makes the area attractive considering daily chores. For residential within the area, grocery stores and other necessary utilities are in close proximity. Sola centre is about 800 meters away from the analysis area, which equivalent to a ten-minute walk. Having daily chores this close makes it more convenient for existing and future residents to do these chores throughout the day, without having to plan in advance. These chores can easily be done for instance within the travel from and to work, which reduces the travel distance and time.

In sola centre, there are located multiple businesses, which creates workplaces for the people in the area, and can be an important factor for new residents. Other activities which is more unnecessary can be found somewhat in close proximity to the analysis area. Sport utilities such as Sola

3.5 Blue-green Structure

3.5.1 Blue-green elements



Illustration 3.5.1.1 Blue-green elements in Sande

Within the area, it is located a stone fence, which follows the pattern of the trees located in the centre of the area, shown in illustration 3.5.1.1. There is a row with large stones, which frames parts of the arable fields. This fence is partially overgrown with moss and high grass. It is uncertain how old this stone fence is; however, it is not a protected element.

There are three areas with large trees, as shown in illustration 3.5.1.1. These are all larger trees, which takes several years to grow. Because of this, these trees should be remained in a further development in the area if possible. As known from chapter "2.4.2 Green Structure" in the theory, green elements such as trees has a high value in relation to the aesthetics and people's perception of an area.



Illustration 3.5.1.2 Stone fence

In the current situation, there is no blue elements within the analysis area. Most of the area are categorized as cultivated land, with some bushes and high grass.

Outside of the main planning area, there is a larger green area in the south east. From Chapter 3.1.1, it is known that this are formed as a small-scale hill which can be used for hiking. In addition, this green area has a bike track which can be used to leisure. West of the planning area, there is found more cultivated land, which cannot be used for outdoor activities.

3.5.2 Ecological Diversity

Within the research area, there has been observed starling birds while feeding, most recent in March 2021 (Kartverket & Polarinstitutt, n.d.). This bird is near endangered, and is listed in the Norwegian red list. Starling birds has also been observed in different locations west for the analysis area. In addition, other species has been observed all around the area, especially birds, flowers and moss, which is enlisted as critically endangered.

3.6 Architecture and Identity

3.6.1 Architecture



Illustration 3.6.1.1: Modern houses in the south.

Within the planning area, there are few buildings. Those located within the planning area has a classical architecture, more in line with the favourable architecture seen in the theory part “2.5.2 Styles”. Illustration 3.6.1.2 shows a photograph of one of those buildings located in the north of the planning area.

Outside of the planning area, within the reaserch area there is a mixture of building types. Most of the buildings has the same classical style as within the planning



Illustration 3.6.1.2: Classical house in the north.

area, where they have styles found in the favourable architecture. Some, as seen in illustration 3.6.1.1 are more recent, and has a more modern look. These has more atypical styles which is known from the theory might be more non-favourable by the people. The photograph on illustration 3.6.1.1 is taken in the south of the analysis area. However, the majority of the surrounding buildings are larger detached houses for larger families, with classical architecture with known structures and styles.

3.6.2 Identity

In today's situation the identity has clearly not been the main focus, as the area has been used for agriculture, and has had other purposes. There are few elements located within the planning area in Sande. Here its previously found from the analysis some larger classical buildings, trees, stone fence and a large grassland. The identity known from the theory chapter "2.2.2 Sense" as the degree elements has to differentiate themselves from other elements. The elements work together to strengthen the sense of identity. The green field therefore does not give the area much identity as there is located multiple green fields west of the planning area, in addition to multiple locations in Sola. The high trees seen and the stone fence however does differentiate themselves from the surroundings.

The surroundings have the identity to basic neighbourhoods, with mostly larger detached houses in a classical architectural style. In addition, because there is located some modern architecture to the surroundings, this classical basic neighbourhood identity is weakened. Further development should strengthen one or the other style, to make a cohesive style which will strengthen the identity. From the theory, it is known that classical style is preferred by most people, and is therefore recommended in further planning. Further, the planning area can obtain other elements which is not found in the surroundings which will give the planning area its own identity.

3.7 Summary

This chapter works like a summary of all the key findings from the analysis. All key findings are listed in the table below. The table includes the chapters of where all the key findings are discussed in the analysis. In addition, the table includes notes regarding what further development needs to consider in regard to those specific findings. This table then works as a summary for the analysis, as well as an introduction towards the development concept.

Analysis subject	Key finding	Further development
3.2.1 Terrain	Flat terrain with a steep slope in the north-east.	New structures should be focused on the existing flat terrain. The steep slope would need to be flattened if necessary.
3.2.2 Local Climate	Good sun conditions, where the sun rises in the east and goes down in the west (summertime).	To maintain the existing sun conditions, new development should consider lower buildings where the morning and evening sun are most exposed. This would prevent reducing the sun conditions elsewhere in the planning area, giving every resident a fair share of the sun exposure.

3.2.2 Local Climate	Strongest wind come from north-west and south-east.	Taller buildings should be located in the north-west to reduce the win exposure in the area. In the south-east however, due to the sun exposure, buildings should have a lower height.
3.3.1 Road Network	The area is well connected to the surroundings through Sandesletta.	Because the area is well connected to the surroundings, new development could be attractive to additional people, which will increase the diversity in the area. Further development should take this into account.
3.3.2 Noise Pollution	The area is exposed by noise pollution both from roads and air traffic.	Further development needs to consider multiple different noise cancelling and reducing elements.
3.3.3 Average Annual Daily Traffic	Sandesletta is a trafficked road with high AADT.	Adding new roads in the area connected through Sandesletta should avoid making a T-junction.
3.3.4 Public Transport	The area is in close proximity to a bus stop, and is well connected by means of bus transportation.	As the area gives potential residents the possibility to commute by public transport, the area is attractive also to people without a personal car or other means of transport. This can give the strength of diversity to the area, and new development should take advantage of this opportunity.

3.3.5 Walking and Cycling	Multiple pedestrian pathways in the east but few within the planning area.	New development needs to add safe pedestrian pathways to accommodate for the new structures. Pedestrians will need more accessibility and permeability within the area, in relation to today's situation.
3.4.1 Education	Nearby educational institutes have the capacity for a new settlement in Sande.	Preschools, primary school and secondary schools in close reach has additional capacity. New development therefore does not need to include eighter of those institutes, and should implement some family residential units to achieve diversity.
3.4.2 Daily Chores and Activities.	The area is in close proximity to Sola centre, which accommodates for multiple different functions.	The new development does not need to include any important functions as Sande is close to Sola centre provide with these necessary and optional functions.
3.5.1 Blue-green Elements	Multiple green elements within the planning area.	The existing green elements should be connected to make a larger coherent green structure for the new residents.

3.5.1 Blue-green Elements	No water source within the area.	New development should include water elements to enhance the existing and additional green structure. This water source should be freshwater as this supports the biological habitats within the area.
3.5.2 Biological Diversity	Some threatened species are observed in the area.	The existing green structure should be passed on in the new structure to best avoid a decrease in the numbers of species located within the area.
3.6.1 Architecture	Most of the surrounding buildings are large classical detached houses.	As the surrounding already accommodate for significant number of large family houses, new development needs to accommodate for other types of residents.
3.6.2 Identity	The area has few elements besides some trees and the stone fence which gives identity	New structures should incorporate elements which is complimentary to the existing identity, which is green structures. The trees and stone fence should be incorporated in the final proposal. In addition, strengthen Sandes inherent identity with classical architecture.

Table 3.7.0.1 Summary of the spatial analysis.

04

Chapter 04 - Concept Development



Illustration 4.0.0.1 Final proposal

4.1 Life

4.1.1 Influencing Factors

Illustration 4.1.1.1 shows important elements which has an impact on the area in relation to further development. These factors are important to map out before spaces and buildings are placed, which is further discussed in the theory part "2.2 Life". The map shows the noise zone from road traffic, sun conditions as the wind directions.

Sensory Effect - Noise

The noise north-east are mapped out in the analysis part "3.3.2 Noise Pollution", and represent the noise above 65dB, which is the red zone. Further development should be taking this into account, as playgrounds and other recreational elements should not

be placed in this zone. To further decrease the effect on the yellow zone seen in illustration 3.3.2.1 from chapter "3.3.2 Noise Pollution " larger building masses or other elements could be placed to reduce the noise.

Noise from the airport can be seen in illustration 3.3.2.2 in part "3.3.2 Noise Pollution". This is a factor of importance, that needs to be kept in mind when placing buildings. Air traffic is not consistent such as the road traffic, however, it is recommended to have some sort of noise barrier to cancel out as much as possible of the air traffic which occur on land.

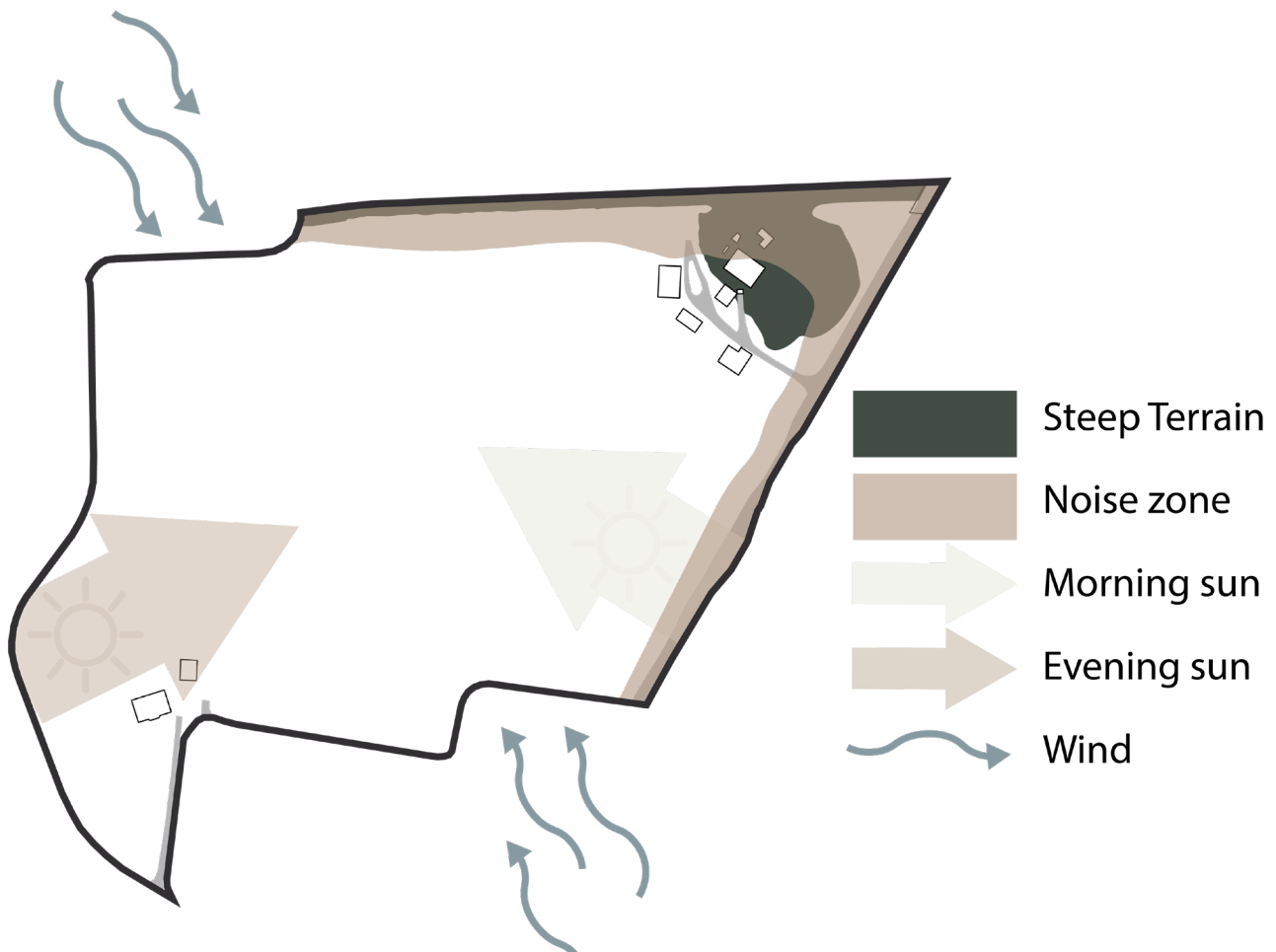


Illustration 4.1.1.1 Influencing factors.

Sensory Effect - Sun

In illustration 4.1.1.1, the daylight and evening sun are represented by two arrows with different colours. Day sun is not shown in the illustration, as it exposes the whole area with sun. From the analysis part "3.2 Landscape", the sun and terrain are analysed, showing that there are currently not many elements creating shadow in the area. Therefore, the new development is the most critical related to casting shadow. To keep the good sun conditions in the area, structures in the south-east and south-west should not exceed a height to where the sun exposure in the rest of the area reduced significantly.

Sensory Effect - Wind

From the analysis, chapter "3.2.2 Local Climate", it is known that the wind strikes the area from north-west and south-east. Wind is from the theory known as a troublesome sensory effect, and is bothersome for people using the outdoor spaces. New building masses or other elements should therefore attempt to reduce the exposure of the wind to make the outdoor areas more attractive for the people.

Landscape

The illustration 4.1.1.1 shows where the landscape contains a steep terrain. Here, further development needs to be considered, as buildings for instance could end up with at least one side underground. In this marked area, it is concluded that no structure can be developed without excavation.

Diversity

From the theory part "2.2 life", it is shown that the planning needs to consider what people will be using the area, and who will live within the area. From the analysis part "3.4.1 Education", it is evident that there is available capacity at the surrounding preschools, primary schools, and secondary schools. From part "3.3.4 public transport", it was found that the area has well coverage in relation to public transport through bus transportation. Additionally, sole centre provides a range of different activities and necessities in a close proximity.

All these factors makes the area attractive for a wide range of people in different stages in life. From the theory part "2.3.1 Diversity", it is believed that people gain from living in neighbourhoods with a wide diversity, through lively streets. Therefore, the area should not target one specific group of people, rather a wide range of different people.

4.2 Spaces

4.2.1 First stage

Illustration 4.2.1.1 shows elements which is of importance in relation to the development of spaces in the area. These elements are necessary to map out before the buildings, which was found out in the theory part "2.3 Spaces". The map illustrates an assembly point, based on the bus stop, the existing green structure and road connections in the form of arrows pointing towards the area.

without a car or other mode of transport. This bus stop creates a natural assembly point for the future residents. Further development should take advantage of this area, and use it as a larger green space, where people can meet and use differently.

Assembly point - Activity Field

In the analysis, part "3.3.4 Public Transport" it was found a bus stop within the development area. This bus stop creates great opportunities for future residents, and connects the area to several locations towards Stavanger. The bus stop makes the area more attractive for students and young adults, in addition to elderly or others

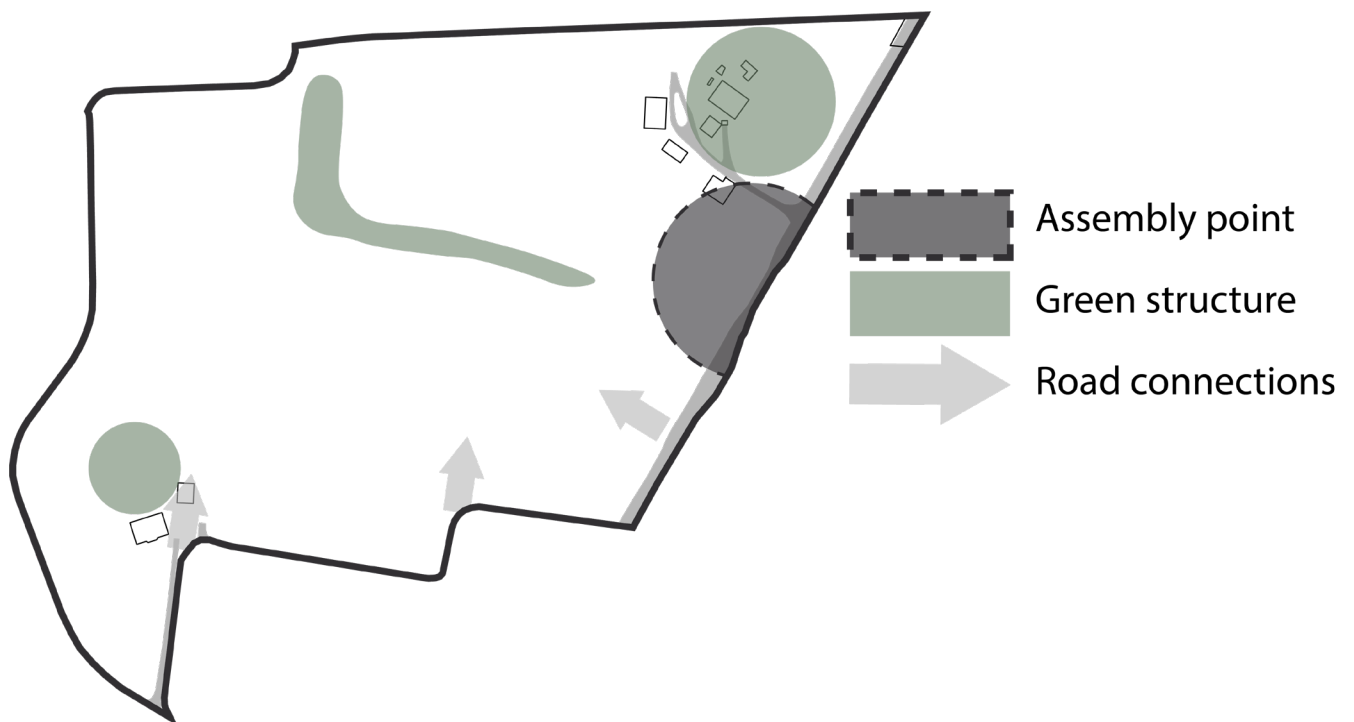


Illustration 4.2.1.1 Elements of importance regarding spaces.

Green structure

The analysis part “3.5 Blue-green Structure” found three green structures of value, which consists of a number of trees. As trees takes a long time to grow, these should be incorporated into the masterplan. Trees, as found from the theory cast natural shadow for inhabitants, in addition to enhance the habitat value, more discussed in the theory “2.3.2 Green Structure”. New green structure should be implemented to support the existing green structure, to become larger coherent structures.

Connections

Today, there is few roads within the development area, and new development demands a new road structure that should be built from the existing roads. The arrows represent roads outside of the area, which leads towards the area in a dead end. In a development, new roads should connect to these outside roads, to create a good flow in the traffic. Connecting new roads to the existing will create good mobility in Sande, for existing and future residents. The existing roads is shown in illustration 3.3.1.1, found in the “3.3.1 Road Network” chapter.

4.2.2 Second Stage

Connectios

Further design based on the first stage suggest connecting the new roads to the existing to enhance the permeability within the area. As seen in the map in illustration 4.2.2.1, these new roads are presented trough arrows, showing the connections to the existing roads leading towards the area. These new roads then further lead towards new connections. The new road structure based on the connections continue the existing grid structure elsewhere in the area, creating a practical and permeable solution.

As Sandesletta is a road with a higher AADT than 300, this road should not contain X-junctions (Statens vegvesen, n.d.). One of the new roads connects in the existing T-junction, and it is therefore recommended to create a roundabout, where X-junctions are most fitted for roads with a lower AADT than 300.

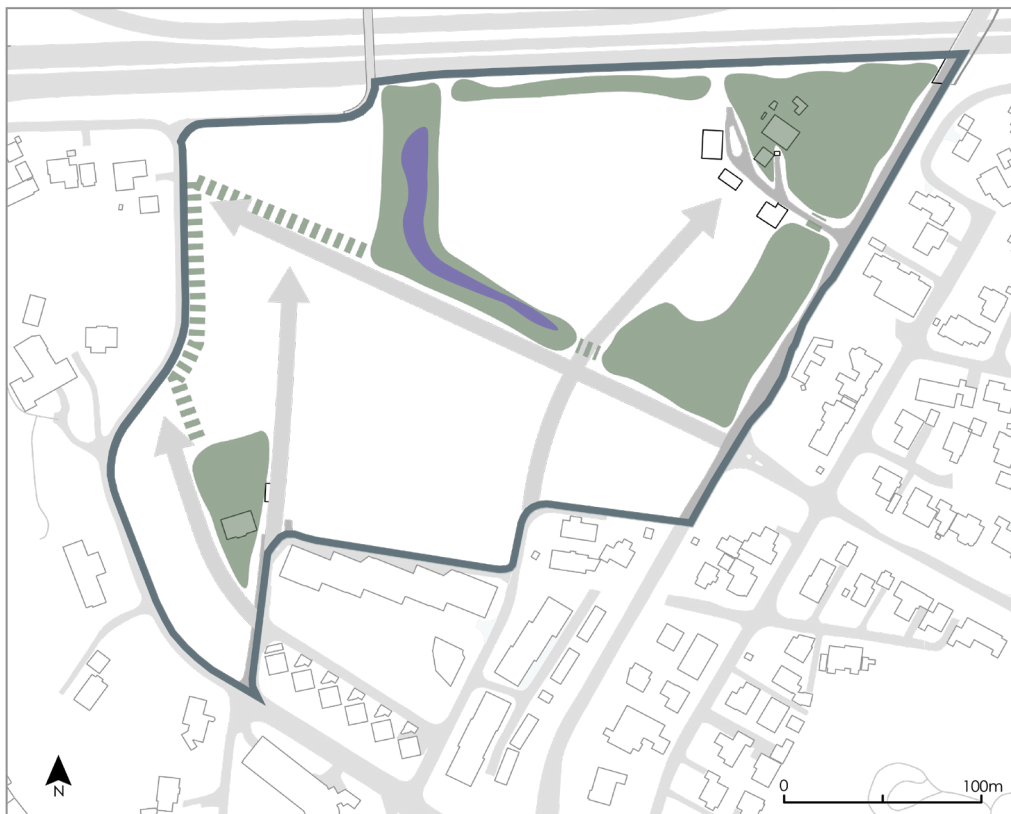


Illustration 4.2.2.1 Spaces second stage

Blue-green structure

The new recommended green structure is based on the existing structure, to form a larger coherent structure. They are shown in illustration 4.2.2.1 as green spots. In this proposal, all former trees have been preserved within larger green areas. The assembly point based on the bus stop is now shown as a large green structure. The new structure of the assembly point is naturally based on the surrounding old and new road structure, creating room for new housing in the north-west of the quarter. The assembly point is shaped to create a connection between the green structure in north-east and the chain of trees. Along with the green areas, there is an additional green path, leading towards other green structures in the west, connecting the focus area to the surrounding areas. This path also connects the last green area in the south-west. In the north, there is placed a green structure as the terrain is too steep for any construction.

Additionally, a blue structure is implemented within one of the green structures, located along the existing trees and stone fence. The combination of green and blue structures is found to create happy, stimulated, safe and relaxed environments for people (Steffner, 2009, s. 50–119). Further, the blue structure should be a source of freshwater, as this enhances the habitat value (Adams et al., 2005, s. 714–724) (Apfelbeck et al., 2020, s. 1–2).

4.2.3 Third Stage

Connections

Illustration 4.2.3.1 shows the complete road structure in the proposal. New added roads complete the grid structure, and make new connections within the area, enhancing the permeability. This makes it more efficient for the residents and visitors to travel within the area. These new roads also secure access to all new residential units. The road network is more compact in the south, as smaller buildings will be placed within these spaces. As larger buildings masses will be placed in the north, less roads are found here. In this stage, the roads are shaped and created realistically.

These new road connections are mainly pedestrian road. However, they are sized for cars to use in some specific occasions like moving. In addition, these can be used for emergency services, such as getting a fire truck as close to the buildings as possible.

The connection in south-east is proposed as a roundabout, as the analysis part “3.3.3 Average Annual Daily Traffic” mapped out that there is a large amount of traffic on Sandesletta equal to a AADT on 7742.

Within each square, there will naturally be added access roads to underground parking spaces in relation to the new buildings structure. Parking is set to be underground as parking takes up valuable space when placed on ground. This creates more free space for green areas and other



Illustration 4.2.3.1 Spaces third stage

elements which can make the area more attractive for the people. Further, multiple pedestrian paths will be added in relation to the building masses, giving the people access to the housing units. Pedestrian crossways and sidewalks will be added in the final proposal, as they should be located where they lead directly to the buildings and playgrounds. Pedestrian paths should be located to get the best permeability in relation to the surroundings and the different targets.

Green structure

In illustration 4.2.3.1, showing the third step of the spaces, the final green structure is proposed. In this map, trees are shown to get a wholesome understanding of the composition of the new complete green structure. Playgrounds should be located within the free spaces. As the area has multiple public green spaces, these should work as private or semi-private playgrounds and spaces, and further development should focus on enclosing these areas with other structures. The southern part of the assembly point can accommodate a larger ball field or other activity, independent on the number of units, as the municipality plan suggests these activity fields for areas with over 150 units.

In this last step, the green structures have been shaped in relation to the final road structure to fill out any gaps and take full advantage of the space. All green areas have been merged to one final cohesive green structure. Pedestrian pathways will be developed in the final proposal, in relation to the buildings and other elements. Where the roads cross the green structure, pedestrian crossways need to accommodate to ensure a good connection between the green areas.

All green structures alongside roads should implement green vertical elements which function as natural barriers from noise and disturbance from the road network. Here, especially alongside Solasplitten and Sandesletta, which are the most noisy roads within the area. In addition, vertical elements along the green pathway in the west should be a focus to reduce noise from the airport, as some of the noise comes from ground level.

4.3 Buildings

4.3.1 First stage

At last, location of buildings should be placed in relation to information gathered from previous chapters life and spaces. Here, the main focus has been the height of buildings, specifically in relation to sensory effects gathered from the analysis. All new buildings should also consider the green structure of high value.

Tall buildings - 4 Floors

Because of the noise and wind, which are troublesome sensory effects, taller and larger building masses should be located in the northside of the area. This to decrease these negative sensory effects for the area to become better and more attractive for the new residents, as well as other people

visiting the area. As the noise from air traffic comes from the sky, tall buildings would achieve little effect on reducing the noise, however a noise barrier on the west side should be implemented to reduce noise from the airport and air travel happening on ground level.

Medium Buildings - 3 Floors

This area should not contain too high buildings, which will decrease the sun exposure for the taller buildings in the north. However, they cannot be too low, where this will cause these buildings not to gain any sun exposure due to the buildings in the south-west and south-east.

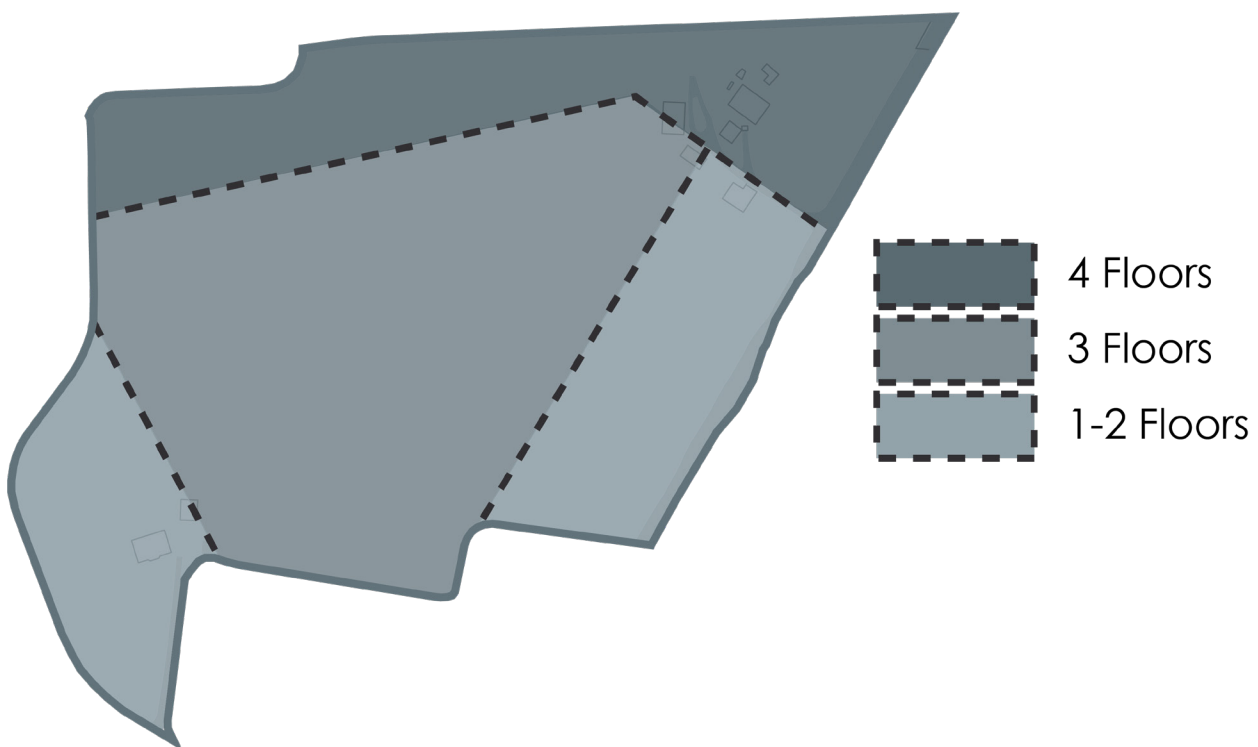


Illustration 4.3.1.1 Building heights.

Smaller buildings - 1-2 Floors

The smallest building structures in the new development should be located where the sun exposure is highest, which is in the south-east and south-west of the area. These buildings need to be low to enhance the sun conditions in the morning and evening for the rest of the area. The wind from south-east however has not been prioritised, as taller buildings in south-east would reduce the overall morning sun in the area. These buildings therefore need to be placed as a barrier to decrease the wind exposure as much as it will be possible considering the size.

First stage further concept

Illustration 4.3.1.2 shows the further concept for buildings in stage one. Here, the building concept from illustration 4.3.1.1 has been adjusted to fit the new situation from the last stage from the space concept. Now, each empty space for buildings from illustration 4.3.1.2 has been received a building height accordingly to illustration 4.3.1.1.



Illustration 4.3.1.2 Building heights including third stage spaces.

4.3.2 Second Stage

Illustration 4.3.2.1 shows a map of the general concept for the new building structures, which respectively is located in the open spaces left behind from previous stage of the planning. Colour of the buildings show the difference in height, which is brought from the first building stage. Here, the darkest are 4 floors, second darkest are 3 floors and the lightest are 1-2 floors, colour representation from the map in illustration 4.3.1.2.

Shielded From Unpleasant Sensory Effects

The building structures are arranged along the roads to create calm and people friendly spaces in between the buildings. The noise coming from the new roads will be reduced by these new building structures. In addition, some of the

building structure in the north is placed to reduce the noise from the existing road Solasplitten. The building structures leaves spaces between the buildings with a lower dB than the surroundings, which makes the spaces suitable for playgrounds. Further, the buildings will not only shield from the noise coming from cars, but also the visual disturbance from cars. Additionally, the spaces will be shielded from wind, then especially from the north-west, where the buildings are higher.



Illustration 4.3.2.1 Second stage buildings

Playgrounds and green structures

Developing this many new housing units, the area needs to accommodate with playgrounds as known from table 1.3.1.3 in chapter “1.3.1 Sola Municipality Plan”. This building structure propose open spaces in between the structures, which then further will accommodate for the new need of playgrounds and green structures. In addition, the new playgrounds in between the buildings will play an important role in creating a neighbourhood with a diversity of people.

As known from the theory part “2.4.2 Green Structure”, people prefer to be surrounded by green elements instead of grey elements such as roads and parking lots. Therefore, as the new separated spaces is shielded from this by the buildings, people would favour these spaces. Further, these spaces then need green elements to support this.

4.3.3 Third Stage

Illustration 4.3.3.1 shows the final structure for the buildings within the planning area. In this stage, the buildings are added based on the previous stage, and the types of dwellings are decided. New building structures are added to complete the building masses to create a wholesome urban structure. The choices made in the stage are listed down below.

Types of buildings

Few housing units are designed as detached houses, as the surrounding areas already accommodate for these types of dwellings. Developing other types of housing units will then secure a better diversity of people within the area. In addition, these types of buildings need more space, and does

not cover a large number of people. In the theory, it is mentioned in chapter “2.2.4 Access” that people need to have access to other people, and the theory supports that lively streets are important for people to feel safe. As the theory cover why it is important with lively streets, residential dwellings in form of apartments accommodates for more people within the planning area. Some of the units in the south-west are planned as townhouses, being attractive units for smaller families, supporting a variety of different people. The large number of apartments should further be developed in a variety of sizes, to fit people in different life situations. The apartments should have different design to attract as many different people as possible.



Illustration 4.3.3.1 Second stage buildings

Additional buildings

From the second stage to the third stage, multiple building masses are added to the proposal. These buildings are closing off larger, and breaks them into smaller, and more intimate spaces. This will help giving the residents a form of ownership over their semi-private spaces. In addition, larger areas can often look emptier even when several people are located within the space. Dividing these large spaces into smaller intimate spaces will help making the spaces look more crowded when people are using them. However, these spaces are still connected though different path, and are not completely closed off.

Connections and sightlines

The proposal is breaking up some of the building masses to create a better permeability for pedestrians. This decreases the walking distance as well as the time spent on traveling on foot within the area. The new paths between the buildings will make it easier for people to commute within the area, making the overall proposal improved for pedestrians.

Dividing the buildings and making gaps between also creates important sightlines for people using the area. As sightlines is important to give people interesting viewpoints within the different spaces, as one of Jan Gehls 12 criterias "possibility to look", known from the theory part 12 cuality criterias. These sightlines also makes it easier to orientate within the area, as they give a clear vision of a larger area.

05

Chapter 05 - Proposal



Illustration 5.0.0.1 Streets in the final 3D proposal.

5.1 Introduction

5.1.1 Introduction

Illustration 5.1.2.1 shows the final proposal in a 2D map, and illustration 5.1.3.1 and 5.1.3.2 shows the final proposal in a 3D model. It is important to note that the 3D model is only for illustrational purposes only, and does not have a 100% accuracy when it comes to all different dimensions. In addition, the specific tree species and vegetation added is only to illustrate the vision of the final proposal. Further, the 3D model is sketched on a flat surface, and does not contain the accurate terrain from the area.

The planning area is divided into 8 smaller areas. This to better see how each smaller neighbourhood is planed out and the vision behind each choice made. The planning area consist of the following smaller districts:

1. Townhouses
2. Detached Houses
3. Street Apartments
4. House Apartments
5. Modern Apartments
6. Apartment Complex
7. Assembly point
8. Community Garden

As the 2D and 3D model do not contain specific details considering the outdoor spaces and interior in the buildings, these aspects will be discussed in the end of this chapter. This should be used as a framework for further development in the area based on the proposal.

5.1.2 Proposal 2D



Illustration 5.1.2.1 Final proposal in 2D

5.1.3 Proposal 3D



Illustration 5.1.3.1 Final proposal in 3D seen from south-west



Illustration 5.1.3.1 Final proposal in 3D seen from south-east.

5.2 Townhouses

From step one buildings, this area should not exceed 2 floors. Because the area should support a diversity of different people, there would need to be different types of houses in the planning area. Most of the smaller sections within the planning area are proposed as 3 floors or higher. This area is therefore most suited for houses instead of apartments compared to the rest of the area. In addition, this area is shaped elongated, and apartments would not be able to form a semiprivate space. Therefore, houses with private gardens would be a better fit. Further, as most houses in Sande are detached houses, townhouses would support a wider diversity. As both the surrounding roads are for vehicles, these townhouses should have some sort of barrier to shield the private gardens. In the proposal, it is implemented hedges, as a natural elements.

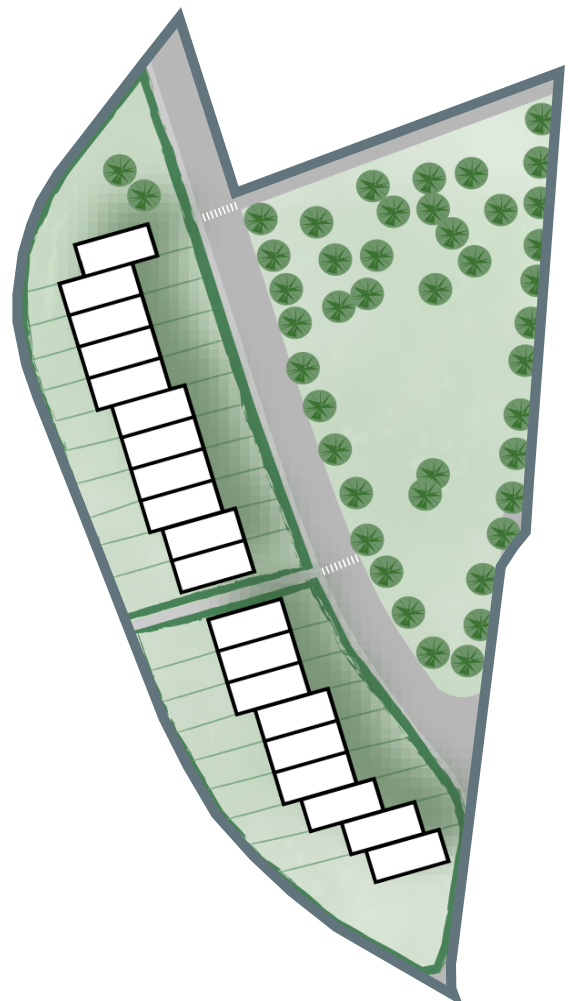


Illustration 5.2.0.1 Townhouses 2D



Illustration 5.2.0.2 Townhouses 3D seen from the east.



Illustration 5.2.0.3 Townhouses 3D seen from the west.

5.3 Detached Houses

This area is from the concept development chosen as 2 floors buildings. As the surrounding areas contains multiple detached houses, this area is the only area within the planning area which will contain detached houses. This structure is able to provide private gardens in the middle of the buildings, somewhat shielded from the surroundings. Also here, hedges are implemented to achieve private areas, with a sense of ownership for the residents. A new road is implemented to provide access to the private parking garages. These are the only private garages on ground within the area, providing a different need to support a specific group of people, further creating diversity in the area. As seen in illustration 5.3.0.2 and 5.3.0.2, these are classical houses with some detailing. However, in the illustration, all houses look similar, and it is recommended to have some differences in the houses to achieve some level of identity towards each house.

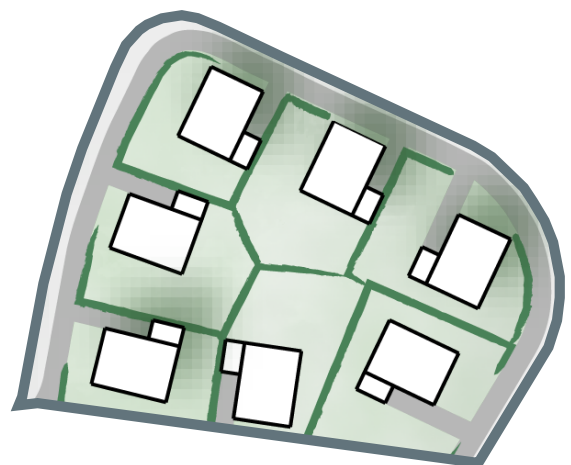


Illustration 5.3.0.1 Detached houses 2D



Illustration 5.3.0.2 Detached houses 3D seen from the south



Illustration 5.3.0.3 Detached houses 3D seen from the east.

5.4 Color Apartments

These buildings are designed in a classical architectural style, and has different textures and colours. The texture, as seen in illustration 5.4.0.3, is different from the top and bottom for each building. The facades also change colour for each building along the street. This gives each building its unique identity for the residents, as well as making it easier to orientate within area and giving people different facades to look at. The identity is known from Lynch to be an important aspect of peoples basic needs, in addition to be discussed in chapter "2.4.2 Identity - Genius Loci". Interesting views are an important aspect in Jan Gehls criteria "possibility to look" and "aesthetic qualities / positive sensory impressions".

These apartments are built as 3 floor apartments, with one exception where the one structure in the west is proposed as a 2-floor apartment. The apartment will have the same qualities as the rest, where the only difference is the height.

Within each square, these apartments will

have a semi-private space within. These should follow the recommendations from the following chapter "5.10 General". Trees are added in the south to make the spaces more semi-private instead of public, giving the residents a sense of ownership over these spaces. Further, this is also done alongside the west side. In addition, some trees are placed to shield the area from disturbance coming from the road network.

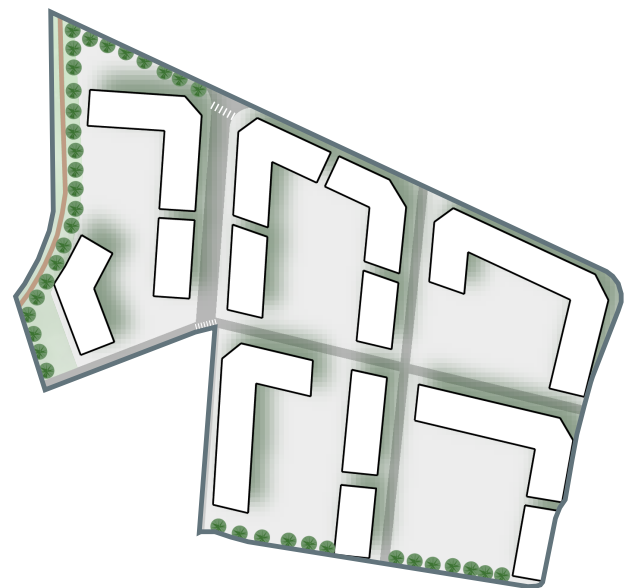


Illustration 5.4.0.1 Color apartments 2D



Illustration 5.4.0.2 Color apartments 3D with an illustrative playground example.



Illustration 5.4.0.2 Color apartments 3D streets

5.5 House Apartments

These are apartments on 3 floors, however they look like larger townhouses, hence the name. Similar to the previous apartments, these have different textures on the first floor. In addition, these buildings have different colours every other building. This strengthens the variation of facades, and creates interesting views for the users in the area. Giving these buildings some of the characteristics of the other apartments also create a holistic identity to the whole area. These buildings are shown in illustration 5.5.0.2 and 5.5.0.3, where they have a classical roof and windows are centred, which is favourable according to the findings in the theory part "2.5.2 Styles". Because the style and form of these buildings are different from the adjacent buildings, it creates an interesting street in between with multiple different facades, seen in illustration 5.5.0.2.

A semi-private space is located north for these buildings, alongside the coherent green structure. Some trees from the current situation frame the semi-public area, however this space is still a quite open area.

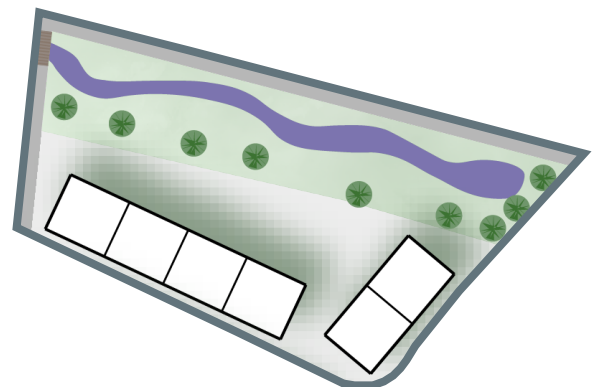


Illustration 5.5.0.1 House apartments 2D.



Illustration 5.5.0.2 House apartments 3D meeting with color apartments.



Illustration 5.5.0.3 House apartments 3D street view.

5.6 Modern Apartments

The modern apartments are designed with centred windows and a classical roof in a more modern wood texture. These also have windows on the roofs, giving the top apartments a more exclusive feature. As more modern apartments, these have larger windows and have the same texture and colour for the whole apartments. Developing these along with the rest of the classical buildings, can help providing a wider diversity within the area. These still have the characteristics of the favourable structures of buildings from the theory illustration 2.5.3.1.

The shape of the buildings creates a sheltered area from wind, in addition to disturbance from the road. However, the structure is open towards the community garden, as people tend to enjoy green structure and other people. Some trees have been placed along the community garden to make the space seem more semi-private, giving the residents a better ownership over the space. This is done by placing trees to maintain the good sightlines towards the community garden. Additional trees are placed alongside the road to give pedestrians a shielded path along the road. In addition, this gives residents better view, as green structure is favourable by people, knowledge gathered in the theory part "2.4.2 Green Structure".

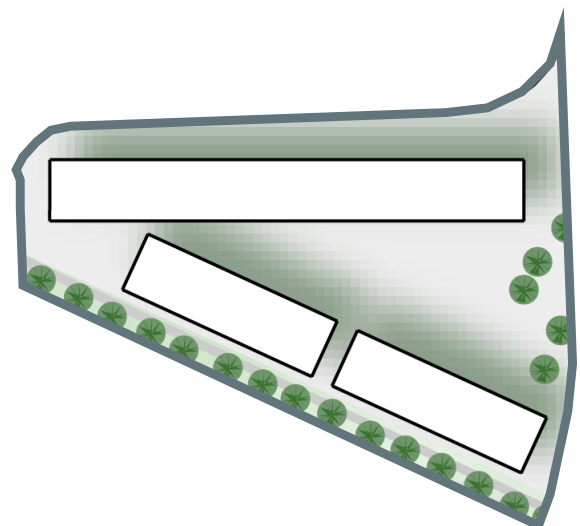


Illustration 5.6.0.1 Modern apartments 2D.

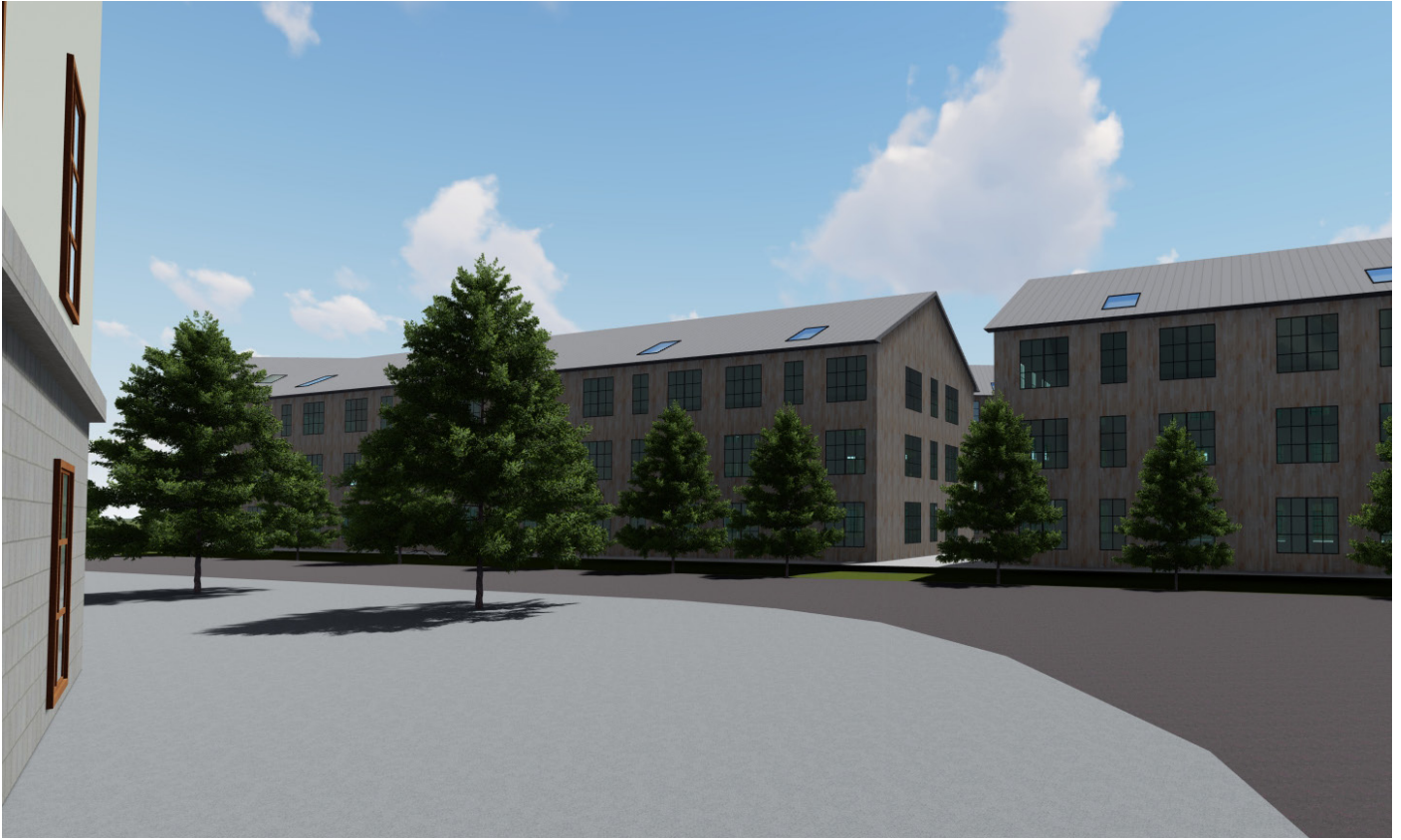


Illustration 5.6.0.2 Modern apartments 3D street view.



Illustration 5.6.0.3 Modern apartments 3D Space.

5.7 Apartment Complex

The northern buildings are 4-floors and shields the semi-private spaces from noise coming from Solasplitten. As they are placed vertically, these will get sun most of the morning and evening. As most of the surrounding roads are pedestrian/bicycle paths, these buildings do not need trees to shield them from disturbance from cars.

Buildings located in the south-east are placed to be more exposed for the evening sun. Additionally, these are located the closest to bus-stop and a square/assembly point. Therefore, these buildings are most suited for elderly people, and the apartment sizes should therefore be regulated to support elderly people (Peters, 2020). This area is also in close proximity to the community garden, which can be an attractive element for the older generations.

A longer building is placed in the middle to break up the large space, as larger spaces often can feel empty when being too big. This can help make the streets and spaces feel livelier, even if used by fewer people. However, this should not separate specific groups of people, and it is important to include activities for all types of people in each space.

As this area is surrounded by green space, this can become an inherent identity to this area. Future planning and development should therefore focus on bringing green elements also inside the spaces, to strengthen this identity.

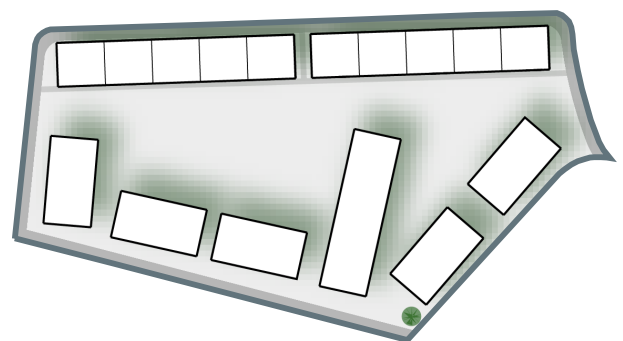


Illustration 5.7.0.1 Appartment complex 2D.



Illustration 5.7.0.2 Apartment complex 3D street view from east.



Illustration 5.7.0.3 Apartment complex 3D street view from west.

5.8 Assembly point

The assembly point only contains one building structure, which is 2 floors. Because of its location, this building should provide the area with central functions on the first floor. This will help create more lively streets in the area, as people will visit this area more often, and further make the assembly point a busy area. To further support this, the function within the building should accommodate for outdoor seating options. Some bakery, café or restaurant would support this, and attract people towards this space.

As this is a large area, in addition to be surrounded by car-roads, a football field is located here in the proposal. A football field creates noise, and does not need to be shielded by disturbance such as other playfields. To further attract more different people, and for the assembly point to support a diversity, additional volleyball and basketball field are implemented alongside the football field. An example on how this larger field could incorporate different activities is shown in illustration



Illustration 5.8.0.1 Assembly point seen in 2D

5.8.0.3. Furthermore, seating and green elements should be placed in this area to be attractive for those not wanting to use any of these other elements at the assembly point. This will be further discussed in chapter "5.10 General". Trees are placed alongside the roads surrounding the area to shield from disturbance and noise. However, these trees will still preserve important sightlines, as trees are less compact and shield less than fences and other elements. In addition, they provide natural green elements to the area.

In the present state, the road is currently shifted inwards to accommodate for the bus stop. This has created a road with only one lane for cars in that specific section. It is proposed that this road will become a two-lane road, where the bus stop is relocated inwards to accommodate for the new lane. This will help support the new residents in the planning area, as the traffic on this road is expected to increase.

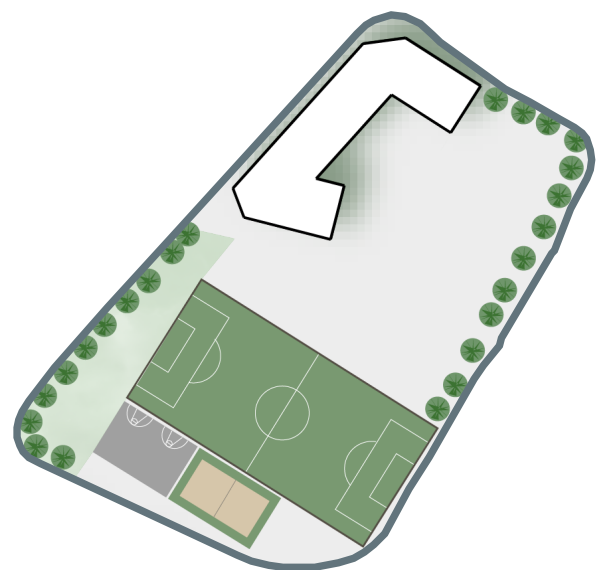




Illustration 5.8.0.2 Building within the assembly point.

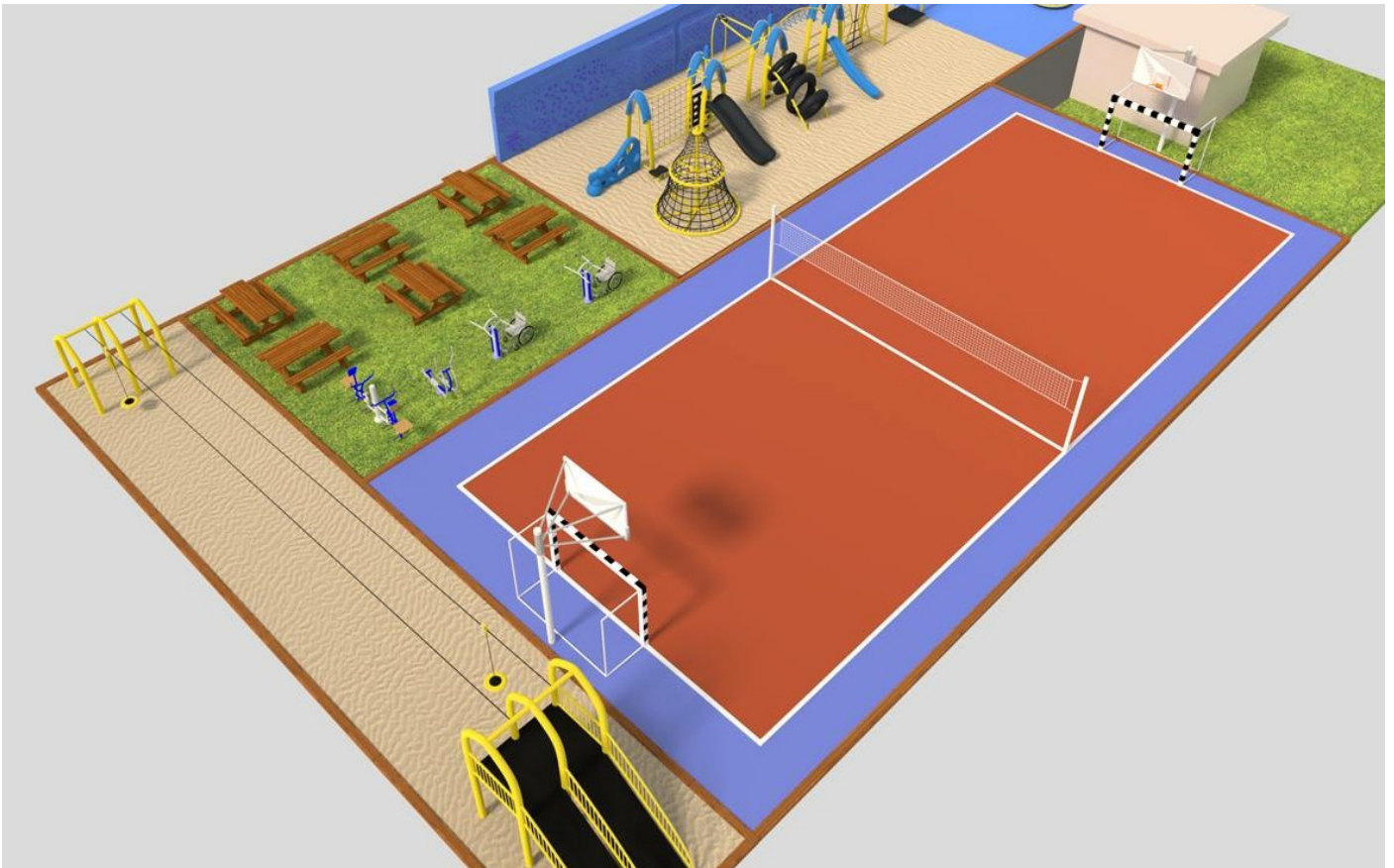


Illustration 5.8.0.3 Inspiration for activity within the assembly point (Spleis, n.d.).

5.9 Community Garden

Knowledge from the theory chapter “2.4.4 Community Gardens” give reasons to assume that a community garden will be beneficial for the new residents in the area. As this area is large and is located in close proximity to multiple residents, it is proposed to locate the community garden here. In addition, the proposed freshwater is passing by this area. Illustration 5.9.0.3 show an example of how community gardens are structured. The trees however create some shadow in the area, and it is suggested to locate the community garden on the east side, to receive the morning and day sun. The other side of the trees can be used for other activities the residents feel they are missing. This could be decided by a board of residents in the area. This will give the residents some sort of control over their own space, in addition to give them a level

of ownership over the public space. These are important factors found in the theory part “2.2 Dimensions of performance”.

Some additional trees are also added along the road in the south. The freshwater will provide with calming sounds to the users of the garden, as some noise disturbance may occur from the highway located in the north.



Illustration 5.9.0.1 Placement of the community garden 2D

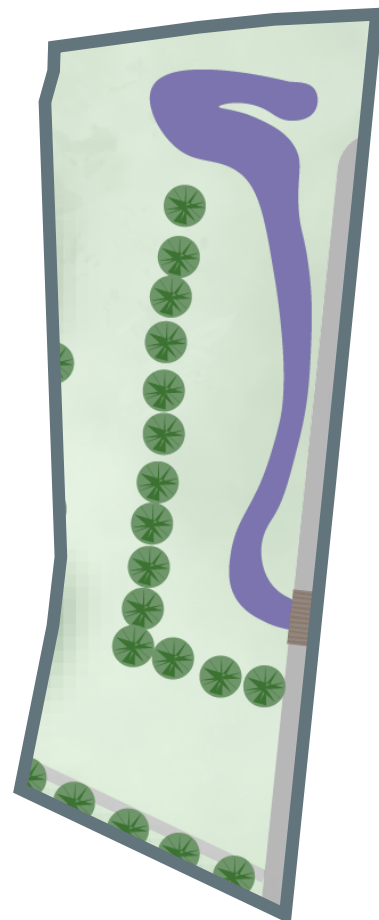




Illustration 5.9.0.2 Placement of the community garden 3D



Illustration 5.9.0.3 Inspirational picture of community garden structure (Dreamstime/TNS, 2020),

5.10 General

5.10.1 Lightning

From the theory, one of the 12 quality criteria for a good urban area is protection against crime and violence / experience of safety (Gehl, 2010). Here lightning is one of the key elements to achieve this safety within the area at night-time. In addition, light will be important to maintain the different sightlines in the area. Kevin Lynch also mentions the wellbeing and safety of the species within an area in the concept vitality, where lights would support this concept (Lynch, 1981). Lightning is important for the future residents and other users of the space to be able to use the area throughout the whole day. Light should be developed as lampposts throughout the whole area. In addition, some sitting arrangements and other objects in the different spaces could have lights, as seen in illustration 5.10.0.1.

5.10.2 Seating

Chapter “2.4.3 Seating” explains how various seating elements in different spaces give the people a sort of social comfort (Project for Public Spaces, 2008). As the spaces in the proposal are not designed with such details, further development needs to focus on different seating elements within these public and semi-public spaces. As seen in illustration 2.4.3.1, optional seating can provide seating for different types of people and their unique needs. Optional seating can be done as seen in illustration 2.4.3.1, however this does not provide any back support, and will therefore not be suited for elderly or others who struggle with their back. Therefore, it is important that the area supplies all the different seating elements. Another option for the optional seating however can be to use wavy benches, which can have back support as well as introverted and extroverted seating. Furthermore, trees within these spaces can create seating arrangements shielded with shadow from the sun.



Illustration 5.10.0.1 Inspirational picture of combined light and seating (Simmonds steel, 2020).

5.10.3 Playgrounds

As mentioned previously, playgrounds should support the diversity within the area. It is then important that the playgrounds contain multiple activities for all ages, and should facilitate for people with disabilities. To accommodate for these different people, each age group should be able to use the area, through seating arrangements, structures for play and other activities. All structures should be accessible by wheelchair, and there should be guidance systems with guide lines for the blind (Norges Blindeforbund, n.d.). Further, these spaces should avoid having sudden edges around the playgrounds.

Known from the theory chapter "2.4.2 Green Structure", people favour green elements over grey elements. The playgrounds and semi-public spaces should therefore focus on green and natural elements. These could be horizontal or vertical elements.

5.10.3 Playgrounds

As the number of units are not calculated, the number of parking lots cannot be calculated. Number of parking lots should be determined by table "1.3.1.1" from the municipality plan for Sola, in relation to numbers of units. The parking lots should be located underground, to shield this form of grey structure from the people. Further, they should be located within each quarter to achieve proximity to the residential units. Trees are not placed within the quarters, as larger trees can create complications on top of utilities (Colorado 811, 2019). Here, further investigation towards what types of trees and green structures can be implemented must take place.

06

Chapter 06 - Discussion & Conclusion



6.1 Discussion

The new development in Sande is proposes a people-based design, where the people has been in the centre of the planning. Strategies and principles that support the demands and wishes of the people has created a solid framework. A focus on the social environment has created large coherent green structures with attractive neighbourhoods supporting a wide diversity of people.

As the literature was setting the framework of the concept, it was important to look at strategies that supported the vision of the design. Multiple urban planners provide different planning principles. However, Jan Gehls principle on the three planning stages life, spaces and buildings, was based on creating quality design for people. His principle was implemented as a base of both the theory and the concept development, where the three stages include further literature and participatory studies including what people favour. The literature of Kevin Lynch however was not separated into the chapters based on Jan Gehl, as these dimensions gave a basic understanding of planning, and would not benefit from being separated into the different chapters.

Development based the stages life, spaces and then buildings, required thorough analytical data. The analysis discovered important advantages and disadvantages within the specific research area. These key findings where further implemented within the framework of the literature in the concept development. Here, the literature was the base of the structure, and findings from the analysis worked together with findings in the theory as the sources of data which led to the choices made.

The research question asks: "How to develop a residential area in Sande with focus on the social environment". The proposal shield people from troublesome sensory effects such as wind and noise, in addition to take advantage of the sun conditions as important criteria. This was in the proposal mostly handled by the building structures, with regulations regarding height, and the positioning. This created sheltered semi-private areas, in addition to larger public green spaces. Pathways has been implemented trough multiple of the quarter structures, to match the pathway patterns to the customary behaviour of the users which compliments the fit of the area (Lynch, 1981, pp. 118–150). Dividing the building structures will not only increase the permeability, but also create important sightlines for the users within the area. Sightlines are by Jan Gehl (2010) an important criteria providing a sense of comfort. As people likes to be accompanied by other people, these pathways and sightlines plays an important role of connecting the people in the different areas.

According to the literature, green structure is a source for happiness, stimulation, harmony, safety and relaxation for people (Steffner, 2009, pp. 50–119). Kevin Lynch (1981, pp. 118-131) mentioned vitality as one of the most basic of planning dimensions. Green structure secures the survival and health of different biological species, which further supports many ecosystem services demanded by humans (Adams et al., 2005, s. 714–724) (Apfelbeck et al., 2020, s. 1–2). Green structure is implemented within the proposal through a larger cohesive structure, in addition to private backyards and semi-public spaces. One of the larger green structures will function as a community garden, which is found as a huge beneficial element.

Lynch (1981, pp. 118-143) mentions that the simplest form of sense is identity. Further, place identity is a versatile concept upon the relation between human and environment (Peng et al., 2020, pp. 1–4). As the analysis found that the identity within the area is based on the green structure, all new green structure has strengthened this inherent identity. The surrounding classical buildings, together with the new structures gives a classical architectural identity to the area, and makes Sande stand out from the surrounding. As people tend to prefer styles that fit their recognized structures, the proposal focused on creating buildings with favourable structures, found in the literature (Stamps & Nasar, 1997, s. 27–30). These favourable structures were found to be similar to classical architecture, and further fits well with the identity.

Further, the literature found that people attract other people, and it is important for people to have access to people (Lynch, 1981, pp. 118–189)(Jacobs, 1961, p. 109). As different people create activity different times of the day, a diversity of people was found to be a key solution towards creating lively neighbourhoods. As people likes the view of other people, the proposal is based on a design to attract as many people as possible. The solution to bring people to the area has been planning for a diversity of people.

The proposal did not provide a complete detailed design over all different features that should be incorporated within the area. However, it has created a foundation of an attractive residential area to which will support a wide range of people. Some of the aspects that were not included in the 2D and 3D proposal were incorporated in the end of the proposal as general requirements. Because the seating arrangements were not included within the design proposal, it was found necessary

to be added in the end of the proposal, along with other aspects such as lightning and playgrounds. Seating has had a large focus because seating has the opportunity to facilitate for everyone, as elements all people can use.

The assembly point is the only space which contains a somewhat design of a playfield. As the area does not incorporate seating, lights and other details, the area still includes a football, volleyball and basketball field. These social structures are implemented to encourage activity, exercise, play and entertainment, which according to Jan Gehl (2010) is an important criteria to ensure a comfortable environment. Further, these activities are important for the health of the population, which according to Kevin Lynch (1981, pp. 118-131) primarily depends on the social structure.

All of these aspects operate together to form a design which focus on the social environment, the people. Who the area should focus on, has been a focus point throughout the thesis, as a sub-question is regarding who to focus on and how the area can provide for these people. The literature found that people attract other people, and it is important for people to have access to people (Lynch, 1981, pp. 118–189) (Jacobs, 1961, p. 109). As different people create activity different times of the day, a diversity of people was found to be a key solution towards creating lively neighbourhoods, answering the other sub-question “How to achieve living streets and urban spaces?”As people likes the view of other people, the proposal is based on a design to attract as many people as possible. The solution to bring people to the area has been planning for a diversity of people. Further, it was a key point to find out how to provide for the targeted group. As the area plan for a diversity of people, all aspects of the design have

been targeting all kinds of people. Different building arrangements, buildings structure and sizes, green structures and spaces has been working towards a diversity of people.

The buildings vary from shapes and sizes to fit different types of families. Further, some are more modern, and some more old fashion and classical to ensure all have something within their preferences. As most surrounding areas are larger detached houses, the majority of the buildings within the planning area are apartments to corporate new types of people. Some buildings are more exposed for morning sun, and some for the evening sun. Further, the green structure provides a community garden for elders, and assembly point for activity for younger. The proposal has implemented all kinds of private, semi-private and public areas, suited for every taste.

As all people are different, they will not favour the same elements, and find the same things attractive. The literature is based on what the majority of people favour, however it is impossible to plan for something all people will appreciate, as everyone is unique. Therefore, planning for a diversity does has limits, as some people will always be excluded. In addition, as this proposal is not a complete physical development, it is impossible to know whether the people would favour the area or not. The level of achievement is therefore unknown.

It is important to note that the literature and analysis only focus on some of the main theories within urban planning, and there are multiple studies and principles regarding people-based planning which could be incorporated. However, as the time-spend on this thesis is limited, the amount of literature and data collected will be limited as well. Further, it is important to note that as the proposal does not include all details such as the playgrounds, the proposal is dependent on the further development. Some of the aspects are discussed in the end of the proposal, however these rely on further planning and development.

Conclusion

The vision for the development in Sande is to plan for the future residents and users within the area, and place the people in the centre of the planning by using literature based on principles by known urban planners in addition to participatory studies. The design proposes a coherent green structure surrounded by attractive neighbourhoods in quarters supporting a wide diversity of people. In the design, life, spaces and buildings operate together to create lively spaces with a social environment connected with nature.

07

Chapter 07 -References



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