SOFT NODES

THE NEW MOBILITY HUB IN BOUET

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MSc02 Urban Design

TITLE PAGE

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The new Mobility Hub in Bouet

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PROLOGUE

Reading guide
The project is developed by group 7 at Aalborg University in relation to the project module 'Designing Urban Mobility'. It is reflected through this singular report. The report is split into six different chapters from the introduction to the presentation of the final design proposal. The six chapters are introduced in the table of contents list, however, does the design process feature its own contents list which is presented in the chapter. The report uses the Harvard method for referencing, both in-text and reference list.

The project is done individually, however, it could not be done without the feedback and critique of fellow students at Aalborg University from the MSc02 in Architectural Design, BSc06 in Architectural Design and BSc04 in Architecture and Urban Design. Each individual gave just the right input needed for the further development of the project.

Abstract
The following report presents the process of designing a mobility node in Bouet. Bouet is located within a rural context and is placed at the intersection of two highways, and is mainly used as a resting area and parking for shopping. The projects investigate the notion of the countryside and rural setting in a nordic context and its belonging qualities. Furthermore, it seeks to explore alternative means of transport in relation to mobility in rural settings. Different analyses are implemented to get a grasp of the identity of the site in a variety of scales from strategic context to atmospheric notions.

The vision for the design is to transform the existing site into a mobility hub which implements different modes of transport in order to move people from rural settings into the city. The proposal implements new functions whilst maintaining the existing, thereby changing people's perception of the rest area/ parking typology as something more than just movement. The design features different activities and measures in order for the area to be a soft node, a node which is not only about movement but also a pleasant place to be for people.

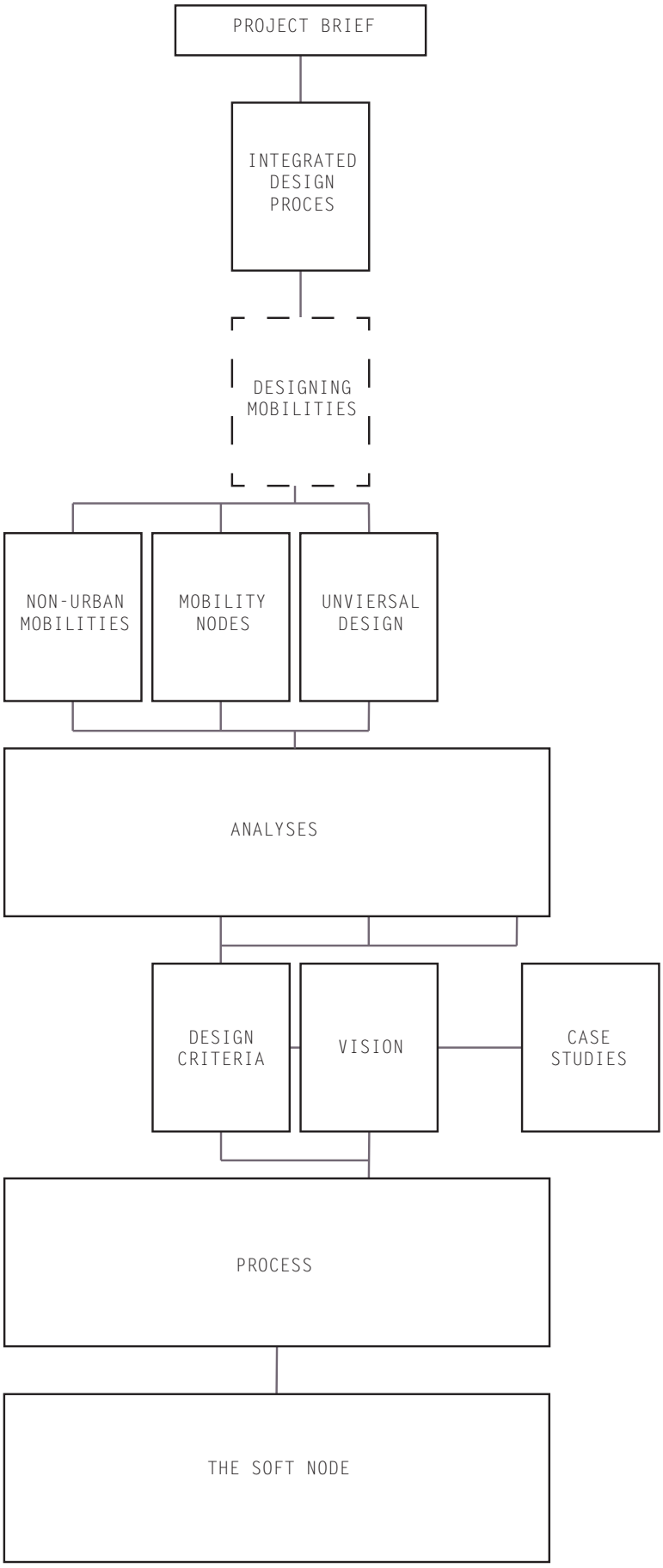
Problem/Idea

Method Description

Project Framework

Approach/ Process

Presentation



Ill. 1: Project structure

INTRODUCTION

THEORY

ANALYSES

APPROACH & DESIGN PROCESS

PRESENTATION

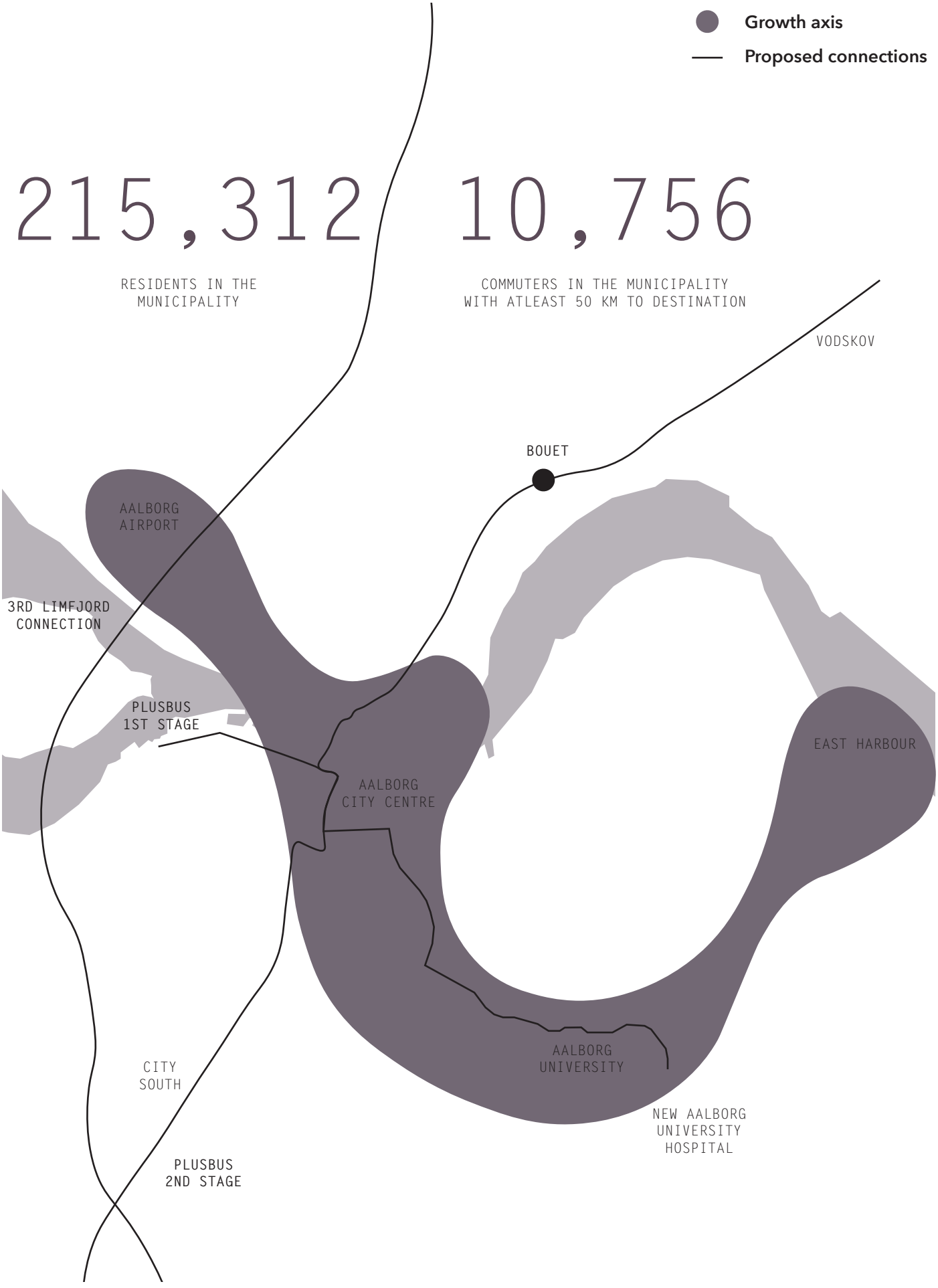
EPILOGUE

THE FUTURE?

The city of Aalborg envisions a liveable and vibrant city, and have further plans on connecting the smaller cities in the municipality, thereby creating better accessibility for people living in rural/suburban area to the main city's qualities (Andersen & Andersen, 2020).

The city of Aalborg is an important area in the northern part of Denmark and currently the main hub for development. Accessibility to the city of Aalborg is key, thereby connecting more people to main functions: the airport, public transport to the rest of Denmark, the harbor and other cities in the municipality. Currently, the development of the BRT - also called Plusbus is undergoing and is set to take-off in 2023 (Aalborg Municipality, 2020; Andersen & Andersen, 2020). The Plusbus' main function is to connect areas, but will also set up opportunities to create attractive and lively urban spaces close to the Plusbus stations. This Plusbus route will connect the recreational qualities in the western part of the city to the main functions in the city center and with the current main university campus and the new university hospital in Aalborg east, set to open in 2020. The first BRT route is an important part of the proposed growth axis within the municipality (Andersen & Andersen, 2020).

Welfare for all?
However, the first route only emphasizes the connections within the city. Therefore, the municipality has through preliminary explorations proposed a second BRT route, running from Vodskov to Svenstrup. Thereby connecting outer cities to the main cities. This proposed second route emphasizes better accessibility to jobs, education, recreation, and the opportunity to bolster the quality of public spaces outside the city. The spaces for improvement can be located at the future stations and mobility hubs, located on the Plusbus' second route. The aim of the second stage is also to improve the congestion problems and provide more efficient transport. The Plusbus will also be able to reach people in the smaller cities in the municipality, as they can reach a mobility hub with another mode of transport and then use the Plusbus. The Plusbus is not the only option for creating accessibility, as the municipality envisions a carsharing culture in the rural/suburban areas. To use the resources of the car better, as the average car during commuting hours accommodates less than two persons (Andersen & Andersen, 2020; DTU, 2015). This sets Bouet at a critical point, as the hub potentially will be able to connect people from smaller cities with the main functions of the city, creating better accessibility for recreation, jobs, and education.



Ill. 2: Development plans for Aalborg Municipality (Aalborg Municipality, 2014)

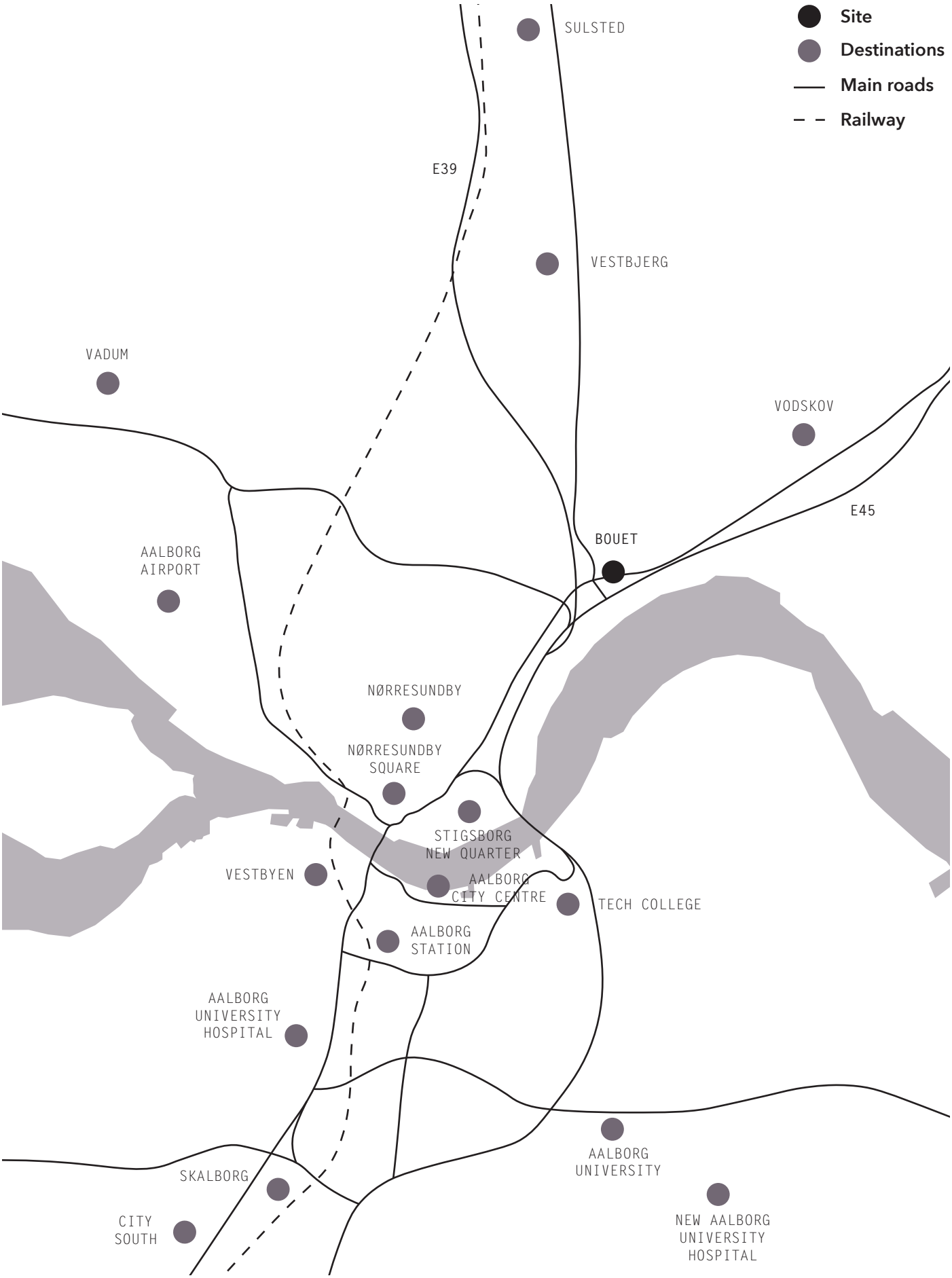
A MOBILITY HUB IN BOUET?

Project brief
Bouet is located on the outskirt of Nørresundby. It is located close to roads connecting Aalborg, the airport in the west and the city of Vodskov. The area is located close to the intersection of highway E45 and highway E39. E45 connecting the northern part of Denmark to Germany. and E39 connecting the Norwegian ferry connections to Aalborg. Bouet also features bike paths along the larger roads in the area and a small mall with a related parking lot.

The municipality of Aalborg is currently establishing the new BRT-line (Plusbus) running between Aalborg Vestby and the new Aalborg University hospital. As the municipality also strives to enhance the northern-southern connecting, a future BRT-line (Plusbus) between Vodskov and Svenstrup is currently under planning. Bouet will therefore in the future feature a Plusbus stop (Andersen & Andersen, 2020).

This places Bouet at an important location. The municipality of Aalborg envisions to design and establish a Park and Ride Hub at Bouet. The goal for this mobility node is to facilitate changes between different transport systems. People commuting from the northern part of Denmark to Aalborg or other adjacent cities by car can park at Bouet. The commuters will be able to change to the Plusbus or other alternative means of transport, for the last miles of their journey into the city of Aalborg. The mobility node should also be designed to facilitate carpooling activities and mode shit between BRT, car, and bike. Furthermore, should the area be able to facilitate pleasant waiting facilities and incorporate functions for activity. Furthermore, they suggest questions for consideration (Andersen & Andersen, 2020).

How can the hub be designed to facilitate efficient changes between different means of transportation (BRT and car; car and bike; car and car)? Furthermore, how can the hub be designed with functions, so it becomes a pleasant place to wait and facilitates efficient mode shift?



Ill. 3: Strategic Context

Ill. 4: The site

Ill. 5: View of farmland at the site

MOTIVATION

Why mobility nodes?
Present modern society is among others characterized by increased mobility in which people are more on the move each day (Urry, 2000). The mobility node is commonly known as a place that facilitates humans movement from A to B. Marc Auge criticizes these transportation infrastructure spaces as 'non-places', as they are designed to promote efficient movement from A to B and not for people to be (Auge, 1995). However, the present 'mobility turn' movement states that mobility is more than A to B (Jensen, 2013). A mobility node could be a space which is more than A to B, it could be a public domain for humans to connect through different spaces and activities (Hajer & Reijndorp, 2001; Sim, 2019). It can through different atmospheres impact our behavior, challenge our mind and creativity. The role of architects and designers should, therefore, be to enable efficient transportation, but also create the spaces to be interesting, attractive, meaningful and be a place for self-reflection. This suggests an interesting experimental question related to the field of mobility and urban design;

How can we design to enhance our everyday mundane transportation spaces to be lively and attractive spaces?

Site
This main project; Designing Urban mobility outlines six different sites. All of the sites present different challenges in which two of the sites present a more rural setting. In modern society research regarding architecture and urban design is mostly placed within cities. The ambition for this group is to work with Bouet which is located in a rural setting, thereby an opportunity for the group to explore the notion of the countryside in the nordic context and its possibilities within mobilities and urban design.

Scope and outline
Bouet is located in a rural setting, which currently is just a parking lot with only necessary activities, as grocery shopping. The scope of the project aims to explore the notion of the nordic rural setting and its qualities related to mobility. As cities are the main investment scopes for mobility, it presents a variety of collective transport opportunities. Mobility in the rural setting is at a critical point in which we have to rethink how people get from A to B. The project will, therefore, explore different means of mobility and related mobility nodes. It will use the notion of integrated design for creating the mobility node in which all means of transport are able to function in the space, meanwhile creating attractive spaces to stay for people. Universal design and affordances will be explored, as the mobility node will be able to enhance the availability for everyone, no matter the physical conditions.

How can a mobility hub in Bouet enhance a sense of community and be an attractive space to be, by exploring different modes of transport and exploiting existing site conditions?

METHODOLOGY

The role of the Urban designer
The integrated design process is applied for the designing of the mobility node in Bouet. The method was developed by former prof. Mary-Ann Knudstrup of Aalborg University. It describes the purpose of the process, as the creation of a synthesis between problem-based learning, urban design, and its technical aspects. The process is split into five phases, this is presented as an iterative process, which allows the urban designer to go back and forth in the process. The aim of the phases is that they inform each other, leading to the discovery of new knowledge related to the design. This is done in order to create a holistic design, which takes technical, architectural and planning aspects into consideration (Knudstrup, 2004). I believe in addition to the technical fields, that integrating knowledge from the humanities and social sciences will create are more holistic approach. Some architects, as they strive for integrating architecture with technical aspect seem to often neglect the human aspect. The role of the Urban designer in the public realm is then to cater for a social and humanistic approach to design, thereby being able to create pleasant and attractive spaces for social interactions whilst also integrating technical aspects.

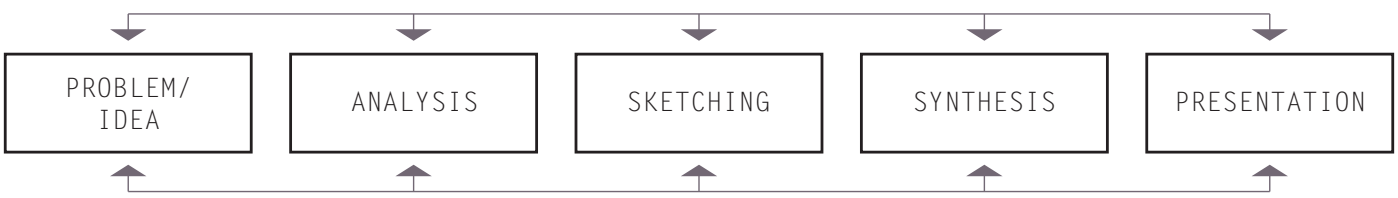
Problem
During the problem phase, the focus is on describing and investigating the content of the case. This is done through hermeneutical analysis in which data from literature studies are collected.

Analysis
The analysis phase is split up into two parts; theoretical framework and analytical framework. The phase attempts to uncover the problem with the use of different fields; social, technical, planning and architectural field. The theoretical part processes the thematic subjects related to the project. Furthermore, the notion of the mobility node and future mobile scenarios is explored. The analytical part applies a contextual approach in different scales, from a strategic scale to atmospheric studies of the site. This phase sets the framework for the design proposal.

Sketching
This phase seeks to incorporate potentials and solve challenges discovered in earlier phases. Various architectural, planning, social and technical studies are explored. All the studies provide new knowledge in relation to the design. Different types of tools were applied (e.g. sketching, modeling and 3d rendering), in order to understand the design from multiple angles.

Synthesis
In this phase, principles and elements found through the sketching phase are put together to form a solution which meets the criteria. The final solution is detailed and optimized through iterations between the sketching and synthesis phase. Architectural, social, planning and technical solutions are integrated to ensure a holistic design.

Presentation
The final phase in which the final design proposal is presented. The presentation material strives for being suitable in conveying the atmosphere and intention of the final design proposal. Furthermore also present the project for its aesthetic, functional and technical qualities, in relation to the social interactions the design proposal creates.



Ill. 6: The integrated design process (Knudstrup, 2004)

Ill. 7: Next stop

THEORY

The following chapter presents the theoretical framework for the project. The theory choice is based on the projects site selection, scope and outline.

THE NORDIC CONTEXT

The Nordic identity
Bouet is placed in Denmark, the Nordic countries contain a huge architectural tradition. As globalization and mass production are commanding the building industry it becomes clear, that we again need to look back at the old traditions in order to create architecture and urban design which is rooted in the nordic identity. Furthermore, how can we engage in past principles of nordic architecture to create architectural quality.

The sense of place and critical regionalism
As a reaction to the commanding 'international style' presented during the modernism era, the term 'Genius Loci' was introduced by the Norwegian architect Christian Norberg-Schulz in 1979. The term related architecture to the place and puts the architect as an interpreter of the place. The place is seen as a complex combination of substances which adds up to a total character (Norberg-Schulz, 1996; Louisiana, 2012). Around the same time, theorist Kenneth Frampton introduced the term 'critical regionalism'. The term encourages the architect to use modern methods but be critical of it, whilst respecting the cultural heritage and identity. Frampton summarises his term, describing the architecture among others should withhold itself towards the demands of the site, here mentioning light, climate, and terrain, hereby emphasizing the sensorial experience (Frampton, 1980; Lund, 2001).

Materiality and light
Frampton under his 'critical regionalism', thereby emphasizes the sensory and tactile experience instead of only focusing on the visual stimulus. At the same time, the nordic identity already revolves around these principles which can be seen by the choice of materials (Frampton, 1980).

Light is also an important factor, the nordic light is a constantly changing and unpredictable element. It can offer diffuse light through the skies, red sunsets, clear skies or everything in between these. The light is seen as a natural quality that can enhance a specific mood, it has the capability to create spaces and atmospheres (Frampton, 1980; Norberg-Schulz, 1996).

The welfare state through urban design
The architecture in the specific country is also reflected through current societal and political ideologies. The nordic identity is hugely affected by the notion of the welfare state as a justified hierarchy between ordinary citizens and its institutions (Louisiana, 2012). Design principal for Henning Larsen Architect; Louis Becker is quoted through his interpretation of the welfare architecture:

"An open building - also in the literary sense - with multiple functions for all ages will ensure life and activity throughout the entire week, both night and day (...) If the citizens have a strong incentive to use the performance space and its communal spaces, they will also take greater ownership of it, and it will become a people's house. This will help make the building a living icon for the whole city and the backbone of a community (...) Lure in the outside world with the architecture, and you will find that the people will give back to the building and the building to the people. As it should be." (Becker, 2019)

Pragmatism - or the new nordic
Another reaction occurred through the start of the 21st century. This reaction follows a pragmatic ideology in which function gets put over aesthetics. The architecture is now bound up through the consumer culture and the experience economy which has to follow the market demands. The architecture must not be an aesthetic principle, it must make a difference and solve the issues of today. (E.g. Copenhagen can now enjoy a ski slope and in Oslo, you can sit on top of the opera hall), this results in architecture being able to do new things and completely changing the perception of architecture and urban design (Louisiana, 2012; Weiss & Vindum, 2012).

The nordic identity can be interpreted between two paradigms. The first considers the spirit of place as a method of designing for a sensorial experience. The second follows a pragmatic approach taking point of departure in the welfare state. In relation to the position of this project, it will attempt to use a sensorial approach on the small scale to provide quality spaces for people whilst trying to cater for all actors. These themes will be elaborated, the sensorial approach will be discussed and the different actors will be listed.

Ill. 8: The SEB bank by Lundgaard & Tranberg, landscape by SLA

Ill. 9: Copenhill by BIG, landscape by SLA

Ill. 10: Oslo Opera house by Snøhetta

THE COUNTRYSIDE

Ill. 11: High-tech indoor tomato farm. The new nature presents artificial and sterile environments to create ideal environments (Shaw, 2020)

"In both pre-Christianity Rome and China, the countryside was a place of retreat where those seeking respite from the bustle and grime of the city would go for rest, relaxation, and creative inspiration. The Chinese founders of Taoism called this freedom and wondering Xiaoyao, while Roman philosophers referred to time away as Otium: and idealized existences—from off-the-grid hippy utopias to the peaceful bliss of Arcadia—have continued to crystallize in the natural landscapes of the rural. " (Shaw, 2020)

The non-urban agenda

The Countryside as an exhibition located in Guggenheim, New York. The exhibit is curated by Rem Koolhaas, OMA and AMO, and it meant to critique the notion of urban living in relation to living in the countryside. As urbanization dominates the agenda in the present modern society, it becomes clear that in 2050, 2/3 of the world will be living on the 2% of earth's surface covered by urban areas. This leaves an enormous gap for the remaining 98% earth surface. Rem Koolhaas has critiqued the urban agenda and has, therefore, become interested in non-urban environments. Perhaps from a political standpoint, the citizens living in the countryside are described as less sophisticated in relation to people living in urban areas. As they gather and live in small communities, with limited communication to the outside world Koolhaas critiques this line of thinking and proposes to look 'where most others are not'. As cities undergo major changes due to urbanization, Koolhaas argues in which the countryside and rural areas are undergoing bigger changes because of technological advancements (Shaw, 2020; Gibson, 2020).

Mobility node on the countryside?

As major developments are currently undergoing through countrysides, the question then becomes clear in relation to the mobility node at Bouet located in a rural setting. As the countryside is often presented as being able to offer relaxation, how will the mobility node at Bouet be able to enhance the notion of being in the countryside and its related qualities? And how will a sense of community, often characterized by countrysides, be facilitated? Furthermore, how can the node facilitate the experience of the ever-changing countryside and its technologies? This calls for an investigation in relation to how the mobility node will be able to fulfill these demands.

URBAN VS. SUBURBAN/RURAL

Do you also live in the noise?
The United Nations (UN) estimates 4 billion people living in urban areas as of today. This revolves around 55% of the world population and this projection is expected to grow exponentially over the next 30 years, as the UN expects 2/3 of the world population will be living in cities by 2050. In relation to Denmark, there are already 88% of the population living in urban areas (Ritchie & Roser, 2020).

Paradoxically, even though a large percentage of the danish population is located in urban areas, an investigation from Eurostat reveals danish citizens living in rural areas are some of the happiest people in Europe (Larsen, 2015). Bouet is located at the intersection of suburban and rural areas which is a part of the municipality of Aalborg. The following writing introduces a discussion of urban living vs. rural/suburban living, in order to gain knowledge and understanding of the qualities of rural/suburban living. Suburban qualities are put in relation to rural qualities as it presents similarities.

Urban living
Urbanization characterizes present modern society and is referred to as the transition from rural/suburban areas to urban areas. One of the reasons for urbanization is the high accessibility to education, workplaces, and healthcare. Young people move to bigger cities in order to get an education, paradoxically they never move back again. This can be seen in many smaller rural located cities (Ritchie & Roser, 2020). The offering of cultural activities is presented as quality, as it encourages social interactions and the crossing of different cultures. The automobile is not as important in urban areas, as it is in rural areas because of the separation of functions. Thereby, the need for private transportation is less demanding in cities because of the major investments in collective transportation (e.g. metro, light-rails and busses in cities).

Suburban/rural living
As the city feature many qualities, it also presents constraints as a research point towards people living in cities being lonely (Smith, 2018). This is based on unfamiliarity with many people creating anonymity, which relates back to sociologist Georg Simmel. He describes the metropolitan life as the overstimulation of nerves, resulting in people building up a special facade (Simmel, 1903). Suburban/rural is characterized by the limited noise from cars, a lot of nature and green spaces resulting in fresh air, and bigger living areas. Furthermore living away from the city is also characterized by a community feeling, in which people have a bigger chance of knowing each other. McMillan and Chavis describe four parameters that relate to a sense of community; membership, influence, the fulfillment of needs and shared emotional connections. E.g. roads in the suburbs are used as meeting points and playgrounds because of the lack of cars. The smaller rural and suburban communities also promotes small cultural activities, thereby engaging the smaller population to get to know each other (McMillan & Chavis, 1986). These criteria can be used as design parameters, thereby being able to engage in communities and encourage social interaction, a sense of belonging.

Living in suburban/rural areas is also made possible by the small distances into the cities. Prof. Christian Bjørnskov of Aarhus University mentions a part of the satisfaction in relation to living in rural areas, is related to the close distance to the city (Larsen, 2015), making it possible to still be able to maintain a job in the city. Problems regarding getting from a rural area to the city are mostly referred to young adults because of their limited economy, as collective transport is running less frequently in rural and suburban areas. Adults do not experience these problems as almost all have cars, but they experience problems regarding congestion and expensive parking (Mason & Higashi, 2019; Wendler, 2020). This calls for an investigation in alternative modes of transport, to facilitate efficient movement from A to B even for people living in rural/suburban areas.

MOBILITY NODE TYPOLOGIES

Bouet functions right now as a rest area for the highway and a parking lot for the shopping facilities. In addition to this, the municipality envisions Bouet as a mobility node along the second phase BRT route. The following writing discusses these three main typologies in order to gain an understanding of its opportunities and constraints. This is done through phenomenological observations of empirical examples of the three typologies.

Highway rest area
The highway rest area typology, a typology in which we do not meet often in our everyday life. When rewinding my life, I can only think of one reason why I was ever at a highway rest area which was when I was resting on long haul drives. The typology mainly features parking spots for the vehicles to rest. Characteristic for the area is the vegetation and greenery, in addition to this benches for relaxing and sometimes toilet facilities. When escaping the vehicle's nauseous atmosphere and climate after a long driving session, you are met with a breath of fresh air in the open space, in addition to the noises from the vehicles. Even tho, you are parked adjacent to the highway, you can still feel the vibration and noises from the fast vehicles. The green buffers attempt to embrace the rest area and thereby create a sense of security from the inhuman speeds on the highway. People often attempt to get as far away from the highway as possible to feel safer and get away from the noise. The area is not presented as a very attractive space to be and they will only stay a very brief moment as it does not offer a lot besides its main functions.

The parking lot
The parking space is a space in which most people get to meet every day and is very essential to their daily routines. Parking spaces can be found everywhere and are essential to the vehicle-based society. When entering the parking lot from the vehicle, you are met with other cars driving around at various speeds, either attempting to find a parking space or departing the area. Walking from the car to the destination is met with constant glazing, in an attempt to not encounter a vehicle. The people do often not get dedicated paths to the destination which further enhances the lack of safety in a vehicle prioritized area. The only purpose of this kind of area is to park the car to get the user to the destination, as it offers no human-based activities.

Rural bus stop
The rural bus stop is an attempt to connect rural areas to main city functions. The bus stop in an urban context is already the least satisfying waiting facility in relation to other modes of transport. I would much rather wait for a train or an airplane. The bus stop mostly only features a shed in which a maximum of three people can sit down, mostly only two people cause nobody wants to sit in between to random people. The service of busses in rural areas is not very frequent, meaning if you miss one you will have to wait either 30 minutes or 1 hour on the next bus. In some rural areas, there are no bus sheds, you will have to wave at the bus to get it to stop. Most of the time, lighting is very poor in which the bus company encourages the users to use their smartphone lighting to get the attention of the bus driver. This typology offers almost nothing to the people, only sometimes you will be able to sit.

Ill. 12: Bus stop with sitting facilities

Ill. 13: Parking lot

NON-URBAN MOBILITIES

Only 1.13 persons are average in a car during commuting hours in denmark (6.00-9.00) and 1.28 persons per car wile commuting 10-100 km (DTU, 2015).

How do we get from A to B?
As mentioned earlier, transportation problems occur for people living in rural areas. This is among others because of limited investment in public transportation in these areas. In a regular conversation with my friend, he narrates the everyday mobility problems he experiences, in relation to living in a small city needing to commute to Aalborg. He lived for many years in the city of Gjøl and mentioned how if you miss a bus, you will need to wait an hour for the next one. Furthermore, he elaborates on how you would need a car at the weekend, cause no bus is running. The transport company of Northern Jutland (NT) has already implemented measures to deal with limited service outside the city. Flextrafik is a service that is run by NT, in which you have to book the service and they will pick you up (NT, 2020). This writing will examine different modes of transport based on global trends and future planning.

Bus Rapid Transit system
With the establishment of the 1st stage BRT running in Aalborg, talks have already been made in regard to the 2nd stage BRT going from Vodskov to Svenstrup, running directly through Bouet. BRT was established as a cheaper solution to the LRT, although it will need its own dedicated lane, it does not feature tracks or cables. Making it possible to share the lane with normal busses and be used for other vehicles away from rush hour (Wirasinghe et. al., 2013) (appendix 7).

Shared autonomous (electric) vehicles
As carpooling becomes a growing subject for present society, more people have come to know to benefits of carpooling and are using it. GoMore is an established company in Denmark in terms of carpooling and they envision:

"With carpooling, humans will share their travels with others going the same direction. Carpooling saves money, gives better exploitation of the cars and creates the opportunity of meeting new people."
(Translated from danish, GoMore, 2020)

This promotes a kind of social sustainable agenda in which different people would be able to meet in an informal setting. Using the car and the destination as a common denominator as a point of departure. Carpooling can also be a critical point for mobility in rural/suburban areas. This provides an option for people going to the same small city, to share a ride, thereby also promoting a sense of community. Bouet can here be imagined as a hub for carpooling activities.

Electric car companies continue to expand and the transportation lifestyle promotes the reduction of emissions. A future is imagined which will be dominated by electrical cars, however, the problem often discussed in relation to driving electric cars is the charging time. Research has examined the electric car and the charging infrastructure. It argues for a stronger and faster charging infrastructure, thereby, being able to grow the electric car culture and facilitate higher performance for a sustainable future. They elaborate on the need for different types of charging stations; normal charge, rapid charging and battery swapping (Vosooghie et. al., 2020). This sets up a vision for a sustainable future, as Bouet can be exploited as a catalysator for this. By setting up different modes of charging infrastructure, it encourages the use of electric vehicles.

Last-mile transport
Electric car-sharing is a good solution, encouraging a social, economic and environmental sustainable agenda. However, the car-sharing typology will mostly be used as a means of getting to the smaller cities. The vision for the transport hub in Bouet is the cars will be parked there and last-mile transport options will then be used. This could be the aforementioned BRT, but electric-powered two-wheelers are also a talking point. This could be; e-bikes, e-scooters or e-motorbikes. These means of transport will get you right where you need to be, as easy parking is the most recognizable asset. However, bad weather, baggage restrictions, and safety are the most discussed disadvantages (Hardt & Bogenberger, 2018). Giving the user control over how they will get from A to B, based on advantages and disadvantages by different means of transport.

MOBILITY NODES

Soft nodes
As mentioned earlier, the mobility node should be able to accommodate everyone using the notion of Universal design. Because of Bouet's location, should the node be able to facilitate the experience of the countryside and its ever-changing landscape, but also cater to all the different modes of transport. Bouet is located close to many big roads meaning it is mainly a car-dominated area. NT envisions the concept of the mobility node as a place that features a variety of activities and good waiting facilities. They elaborate on the concept by emphasizing the safety of the area (Olesen, 2020).

"Future mobility hubs should accommodate many functions and serve as nodes in the everyday life of the citizens. In addition to being a hub of public and private transport, this is where you pick up your packages, charge your electric vehicle and buy a sandwich for your trip. " (Olesen, 2020, p. 14)

The question is then how do we make the node pleasant and safe for people waiting or using their last-mile transport or shared vehicle? Furthermore, how the different modes of transport should be serviced? This writing will attempt to elaborate on the question through the theory of Soft City. David Sim, creative director at Gehl architects writes this about mobility design (Sim, 2019).

"Urban Mobility is also about social mobility. The business of getting about connects you not just to where you are going, but also to the places you pass and the people you meet on the way." (Sim, 2019, p. 95)

People and the two-wheeled transport
Using two-wheeled transport is beneficial, as it results in easy accessibility to almost everywhere. Sim uses the city of Copenhagen as an example of quality environments for bicycles. Here, he emphasizes the bike lane as a dedicated lane with curbs separating pedestrians and motorized vehicles. These curbs feature an 8 centimeter depth, making it possible to separate different means of transport. The dedicated bike lane emphasizes an easy understanding of the space and promotes a feeling of safety. The bike lane will also be a part of the bigger road landscape, being able to experience the city and countryside, the stimulation of the senses and the sensation of the natural forces while moving. Furthermore, Sim reflects how to dedicated bike lane should accommodate at least two people. Three people would be ideal, as it encourages conversational cycling and lets quicker cyclists come through (Sim, 2019).

People and motorized vehicles
Sim argues for the street-based public transport as a major quality for an area. The street creates easy accessibility for public transport or car-sharing, minimizing the need for unnecessary crossings. Sim also discusses the people on the street and how waiting facilities can afford social interaction if designed properly. Furthermore, how people at waiting facilities work as a time table, sometimes more accurate than a time table. If many people are waiting at the same spot, we will be able to know intuitively that the public transport system hasn't arrived yet and is soon arriving. For better safety measures, Sim emphasizes the median on the street, cause it allows a stop in the middle of the street resulting in people not rushing, slowing down and enjoying the activity on the streets instead (Sim, 2019).

Integrated design
This writing has emphasized the importance of dedicated bike lanes, the median and street-based transport services for safety. The aforementioned principles can be upheld through an integrated design approach. The insights of the traffic engineering field in addition to urban design is essential and will add quality to the final design proposal. Roads, road turns, and ramp norms will offer clues on how to facilitate safety for pedestrians and soft mobilities while servicing cars and busses.

UNIVERSAL DESIGN

Ill. 14: Schandorff Plass is a public square in Hammersborg, Olso. It opened in 2009 and is designed by landscape architects Østengen & Bergo AS (SBi, 2019).

"Universal design is about designing for human diversity. By breaking down the division of people with and without disabilities, universal design becomes the architecture direction that creates space for everyone. It is not just about access, but about the opportunity to participate and gain experiences." (Translated from danish, SBi, 2019).

Designing for human diversity

People experience different needs at different stages of their lives. At the same time, some people also experience temporary or permanent disability. Universal design is a notion which seeks design for everyone. The vision of universal design presents a paradigm of design for everyone regardless of gender, age, ethnicity, religious beliefs or ability. The design of universal spaces is the integration of functional, practical measures and atmospheres (SBi, 2019). This understanding of integrated relates back to Vitruvius and Vitruvian triad (Bech-Danielsen, 2013). It works to understand users, in a way of offering holistic approaches in relation to designing lively and functional spaces for everyone.

An integrated approach
Availability and accessibility in relation to universal design is not an approach in which can be implemented at the last minute. Traffic guidelines are also trying to implement the notion of universal design in urban environments, paradoxically it typically ends up in a last-minute implementation (The Danish Highway Agency, 2017; SBi, 2019). A last-minute approach can result in aesthetic unsatisfactory. Therefore the approach must be incorporated from the beginning, in order to create inclusive and exciting spaces. This results in a quality of design and a thrilling atmosphere for everyone (SBi, 2019).

Social sustainability
Design which accommodates a variety of people creates value in society, a kind of social sustainability agenda. By breaking down the separation of people sat up by the built environment, it allows people at all stages of life to meet. It creates a framework for people - disable or not to meet and engage, and allows different cultures and beliefs to meet. The physical environment is, therefore, a key factor in the discussion of social sustainability. If the designers/architects make sure that everyone can have jobs, study or go to cultural events, it will create value for the society and community, allowing different cultures to engage and learn from each other. This also reduces the need for special solutions (SBi, 2019).

7 principles for Universal Design
Universal Design can not be approached by one solution. North Carolina State University has since 1997 worked on 7 principles for designing (SBi, 2019). These principles will be mentioned, but not elaborated further in this theoretical framework.

1. Equitable use
2. Flexibility in use
3. Simple and Intuitive use
4. Perceptible Information
5. Tolerance for Error
6. Low Physical Effort
7. Size and Space for approach and use

(SBi, 2019)

Ill. 15: Schandorffs Plass used the notion of Universal Design as the primary approach. Resulting in a green and inviting urban space, attractive for everyone (SBi, 2019).

DESIGNING MOBILITIES

Staging mobilities
In order to design mobilities, we need to understand the mobile situation and what factors are influencing this. The staging mobilities framework developed by prof. Ole B. Jensen discusses these exact things (Jensen, 2013).

"It concerns how the movement of people, goods, information and signs influences the human understanding of self, other and the built environment" (Jensen, 2013 p. 3).

The framework argues for the mobile situation is staged by three factors; physical settings, social interactions and embodied performances. The factors are all related to each other and can either be staged from above (planning and design) or from below (individual performance) (Jensen, 2013). The following writing will discuss the physical settings, firstly how it affords social interactions. Secondly, how it creates embodied performance (atmospheres).

Affordance; what the place can the offer?

Atmosphere; how should the place feel?

Affordances
Affordances are a term developed as a tool, creating a vocabulary for being able to describe how materials and objects relate to humans and facilitate their social interactions (Gibson, 1986; Clark, 1999).

"The affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or ill" (Gibson, 1986, p. 119)

Prof. Albena Yaneva narrates her morning routine which she argues for how the built environment improves her mood. As she is constantly in doubt of choosing the stair or elevator for getting to her office, she often ends up taking the stairs. She here argues for how the narrow stair design and the handrailing affords her the opportunity to have a conversation with her colleagues in the morning (Yaneva, 2009).

Atmospheres
Architectural quality is often a highly discussed topic. Theories imply the atmosphere as the main element for quality, as the human has special capabilities to perceive the built environment and its materialities (Zumthor, 2006; Pallasmaa, 1996, 2014; Böhme, 1993).

"Our capacity to grasp qualitative atmospheric entities of complex environmental situations, without a detailed recording and evaluation of their parts and ingredients, could well be named our sixth sense, and it is likely to be our most important sense in terms of our existence, survival and emotional lives." (Pallasmaa, 2014, p. 245)

The atmosphere of a place is the combination of all the senses, a space is not only perceived with the visual sense. The shaping of the built environment influences all the senses. E.g. it influences the microclimate (sun and wind) the feeling of natural elements on your body, (the sound) how your ears perceive the space, (the orientations) how your eyes also are able to perceive the environment. The atmosphere should then be shaped in relation to the functions within a space, thereby enhancing the experience of the function (Zumthor, 2006).

The dilemma mentioned earlier with mobilities, is often that it is characterized by optimization of movement and not for human comfort. 'The mobilities turn' and other architects argue for mobility spaces which are more than A to B (Urry, 2000; Sim, 2019). With the consideration of atmospheres and affordances through the design process, we will be able to design material space for social interactions and a variety of embodied performances. Thereby improving our everyday mundane spaces to do more.

Ill. 16: Ultra-fast charging station in Fredericia

Ill. 17: Karen Blixen square in Copenhagen

SUBCONCLUSION

SUBURBAN/RURAL MOBILITIES
The chapther attempted to gain insights in relation to challenges of mobility in a suburban/rural context.

- The nordic identity of architecture relies on interpreting the spirit of the place

- The pragmatic paradigm presents architecture in being able to do more

- The mobility node should be able to create a sense of community and enhance the qualities of living on the countryside

- Living in suburban/rural area challenges the notion of public transport and therefore it is necessary to unveil other modes of transport

- E-scooters, e-bikes, carsharing and BRT should be incoporated in the mobility node

SOFT NODES
The chapther uncovered the node as a notion which needs both spaces for people and spaces for mobility.

- The mobility node should feature both mobility and softness for people

- A Universal design should be implemented early in order to include everyone

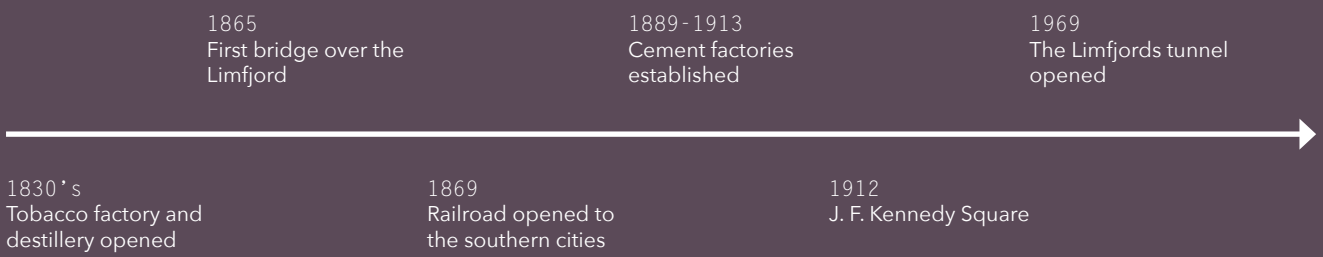
- Traffic engineering can give insight in how the node should be shaped to cater for all modes of transport and provide safety for soft pedestrians

- The quality of designing a node can be defined by the affordances and atmospheres it creates

ANALYSES

The following chapter presents the analytical framework for the project. The chapter starts at a strategic scale and then narrows down to the site and its qualities.

THE MUNICIPALITY OF AALBORG



Ill. 18: Timeline (Lykke-Andersen & Mikkelsen, 2017)

Bouet is located in the municipality of Aalborg and the municipality is based in the main city of Aalborg. The city of Aalborg has experienced exponential growth in the last two decades and it is continuing with ambitious goals. The growth of Aalborg can be tracked back through the industrial era, mainly with establishments of the key industries among others: tobacco, distillery, and cement. With the establishment of the university before the 21st century, the city shows signs of a transformation from heavy industry into a knowledge-based city. One of the examples of city regeneration in Aalborg can be traced back to the industrial harbor which now presents as a recreational waterfront area with a variety of functions and activities (Andersen & Andersen, 2020). Furthermore, with an emphasis on cultural architecture by renowned architects. Kunsten Museum of Modern Art by Alvar Aalto, the Utzon Center by Jørn Utzon, the House of Music by Coop Himmelblau, Budolfi Square by SLA, and Cloud City by among others Thomas Saraceno, Bjarke Ingels Groups and Henning Larsen Architects.

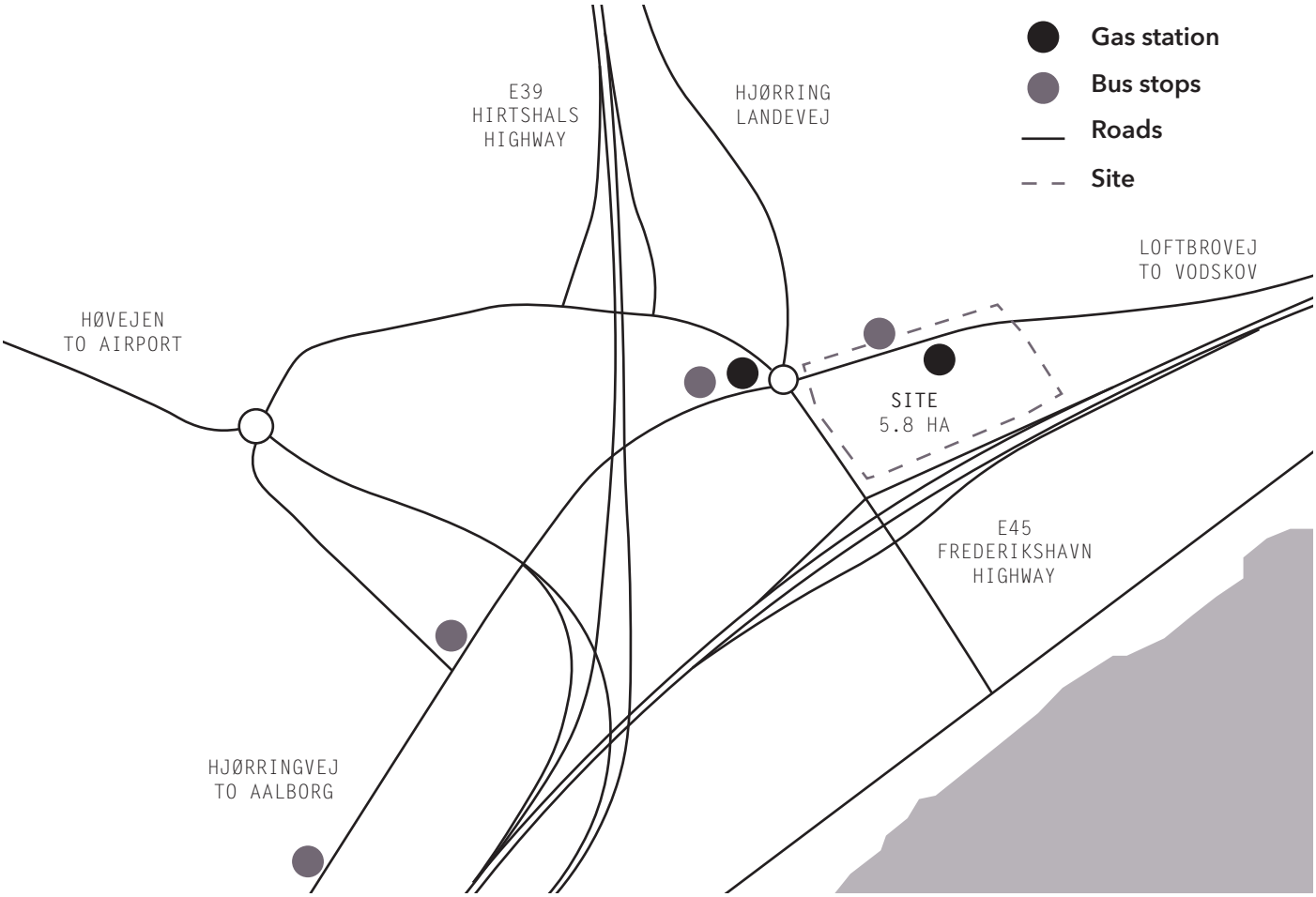
Ill. 19: Establishment of Aalborg University in 1974
(CREATE by Henning Larsen Architects, 2014)

Ill. 20: Investments in culture
(Utzon Center by Jørn Utzon, 2008)

Ill. 21: Budolfi church, 1943

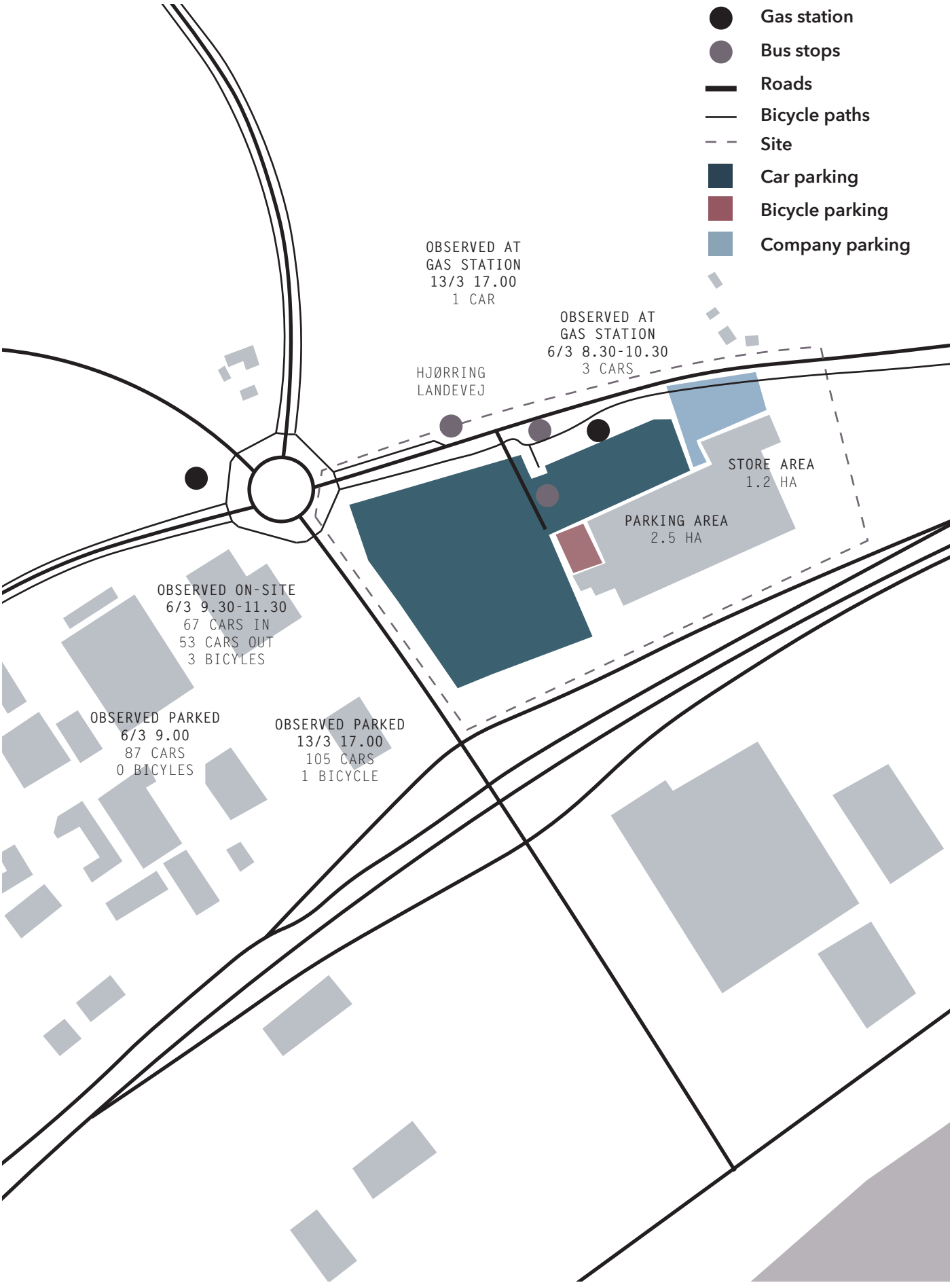
Ill. 22: Cloud City currently undergoing

BOUET



Ill. 23: Contextual mobility

Bouet
Bouet is located at the cross-section of two highways and the road connecting the airport. The site is located at the end station of the bus 1E going from Aalborg to Bouet. Bus stops are also located at the main road adjacent to the site, which bus 1A, B, C, D, and V go from the south to the north. The other around features bus 1J, K, L, and M. The site also features a gas station with the capacity to serve four cars at the same time. Furthermore, shopping opportunities as Kvickly and Jysk are located on-site, with plenty of parking opportunities for a car. A dedicated bike lane moved away from the traffic, is located at the main road, connecting Vodskov with Aalborg on bike. However, does Bouet currently lack bicycle parking, as only one bicycle rack was observed on-site which also was broken.



Ill. 24: Mobility close up

SENSE OF PLACE

This analysis takes a point of departure in the theoretical framework concerning genius loci. It attempts to address the sense of place through a variety of analyses described in the following section. Five different methods will be used to get a grasp on the phenomenological qualities of the place.

Materials
The first method will analyze the different materials the place is featured with. The Urban Tomography method will be the point of departure. The method is compared to medical imaging, as they attempt to see everything through small slices. This method will be performed by taking photographs of different materialities, as a method of sensing the material space as a whole (Krieger, 2011).

Site characteristics
In order to discover the secret aspects and qualities of the place, we will need to use a method taking point of departure in the situationist movement. In a smartphone developed app named 'Derive', the user gets to walk around and discover the site through different instructions (Derive, n.d.).

Critical contacts
This analysis attempts to address the critical points of contact on-site (Jensen & Morelli, 2011). These points are either routes or specific points in which the next method will take point of departure in. These critical points are essential on-site and need to be addressed in depth. This will be done by observing the flow of people on-site, at different times a day (specifically 07.40 and 17.00).

Microclimate
This analysis addresses sensorial climate perceptions at the site. It will be done by emphasizing four parameters for comfortability; thermal environment (heat and sun radiation), atmospheric environment (wind, humidity and air change), acoustic environment (perceptions of noises) and visual environment (perception of light and darkness). The analysis will be carried out through a mental diary of perceptions from arriving on-site and walking towards the grocery store, with the use of a critical flow line.

Sound
Sound perception is an extension of the discoveries carried out in the microclimate analysis and will use the critical points of contact as the point of departure. This analysis will use sound measuring at the critical points, to get a grasp of the sound levels on the site and how they potentially can change throughout the site.

Ill. 25: The site

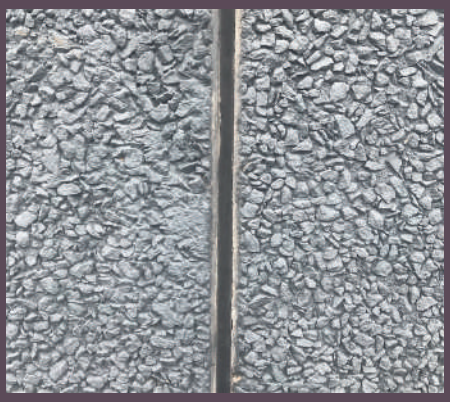
Ill. 26: View from the site

Materials
The materialities on site are a mixture between newly installed asphalt, makeshift solutions and signs from the past. This results in a huge mixture of materials in small areas.

The worn down asphalt shows signs of usage by heavy vehicles. The different patches presents a sense of history of the material, as the patches are implemented on each other.

The asphalt stops as the poll penetrates down through the surface, in a search for restrainment. The screws shows its fighting battle with the natural forces.

The mixtures of materials afford different speeds of movement. The open channel in addition to the black asphalt segregates the two surfaces.



The wall cladding features a mixture of stones. Alle the stones are mixed and put together through a specific color. The joint segregates the different panels.

The smooth dark asphalt indicates a heavy emphasis on the automobile. It afford fast movement and is relatively new, as it shows no signs of history.

The four different surfaces shows diffrent phases of the asphalt history. The rough surface afford slower movement, however, a chance to read the material history.

The new cladding is contrasted through the worn down door. The materials shows the effect of the natural environment in a big area with no buffers.

The metal is presented as newly implemented. Its smoothness affords a leaning gesture while walking through the site. The material lines tells a non-linear story of the space.

The line between the natural and built is blurred, as the grass attempts to cross the defined lines. The rusty knob is a small insight of what the space was used for in the past.

Ill. 27: Collage of materials

Look for a tree

Find sound

Look for some shade. Document something inspiring.

Go somewhere dark

Find something inspiring

Walk north until you find a stop sign. Continue and take a photo looking back.

Continue ahead

Head to a low point

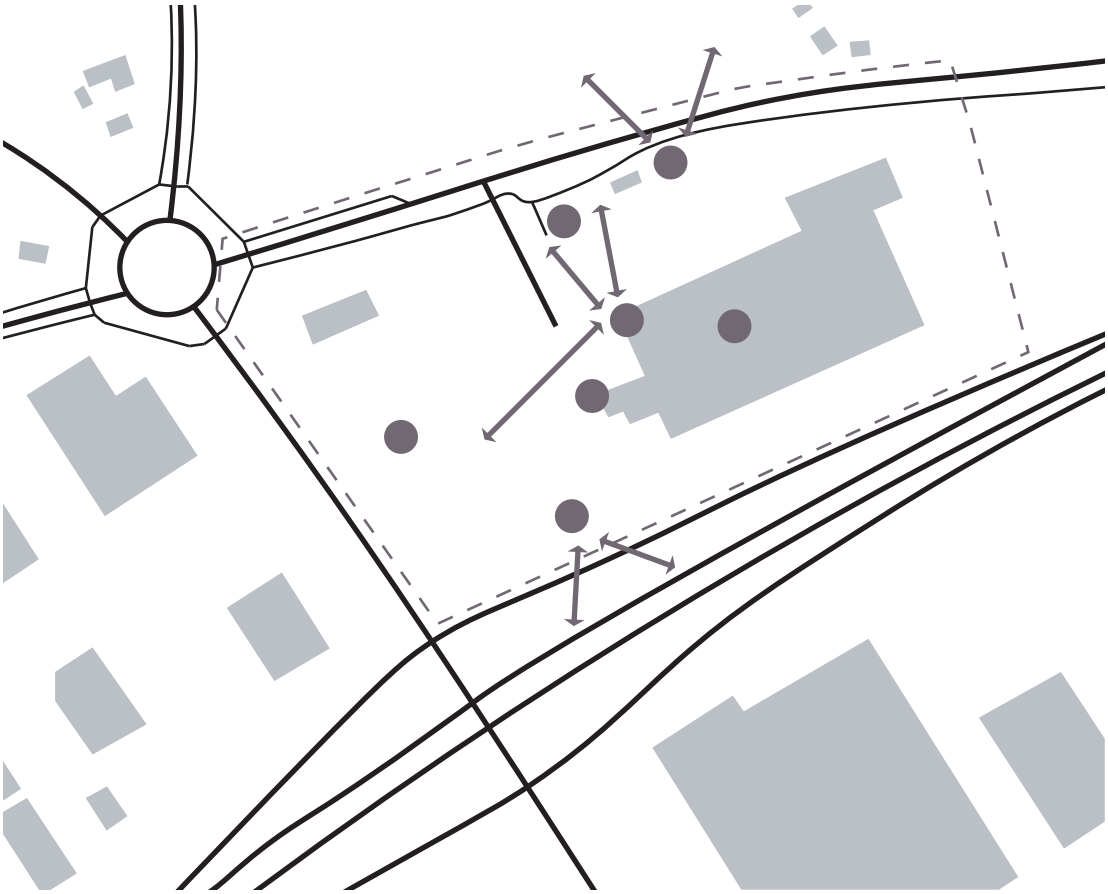
With the sun to your left, walk for a few minutes. Find something beautiful that stands out.

Ask around for a nearby factory. Head towards it.

Ill. 28: Discoveries along the way

Site characteristics

The analysis attempted to uncover potentials within the site. It discovered natural elements and also a lack of places hidden away from the sun, leaving you exposed throughout the whole area. Furthermore, the instruction of finding sound was easily accomplished as it was present everywhere. As the site was primarily car-dominated, the most inspiring thing on site was the one bike present. This analysis was done extensively, but only a few characteristics and instructions were presented, surely because of the lack of elements on-site.



Ill. 29: Critical points/lines of contact

Site

Critical points of contact

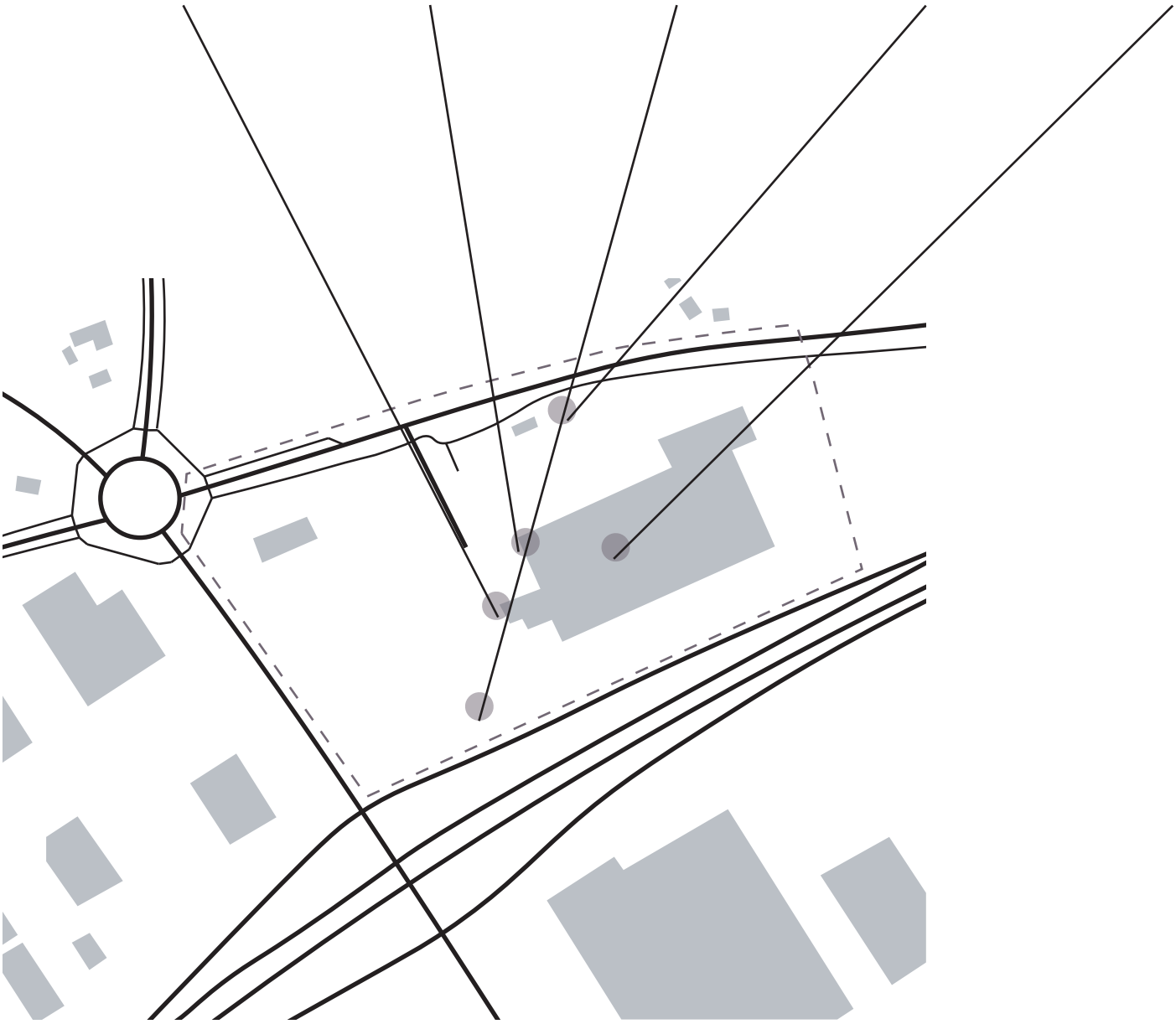
Lines of contacts

Critical contacts

The analysis discovered six critical points outside and one is marked inside the shopping facility. Lines were drawn from the main parking spots which were used, these spots were located closest to the shopping facility and had easy access to shopping carts. All the critical points show different characters, which is further elaborated in the microclimate and sound analysis. Three of the critical points are located at the center of the site at the parking axes, which allows the visitor to easily identify the location of the mall, through the linear view lines directed by the parked cars. The other three outdoor points are located on the outskirts of the site, here the opportunity to look beyond the site and experience horizontal views of nature and mobility.

Microclimate

As I arrive upon the site, I was met with the sun shining through the dark clouds and lighting up the surface around me. I was quickly dazzled by the soundscape from the main road, as the cars blew past me and there were no buildings to protect me. As I walk into the parking lot, the sun was still out and lighting up the whole parking lot surface. The sensation of the cold weather in relation to the warm sun couldn't be resisted, as I opened my jacket. When opening the jacket, I was met with the cold western wind and the dark clouds were slowly occupying the space in front of the sun. The direct sunlight was denied by the clouds and the space now featured only dark diffuse lighting. When walking on the parking lot, the dark clouds were presenting a few raindrops, I quickly ran through the space and the noise from the cars got more silent. However, the cars moving on the parking lot made the ground shake from the uneven asphalt surface. Thereby creating a buzzing rhythm to the ground while I was moving. A shelter appeared from the dark clouds as a small structure to shopping carts was right ahead. The structure was low, but the rain couldn't penetrate the plastic roof. 5 minutes later, the clouds moved slowly away, given small glimpses of the hot sun. I move around the structure and was quickly given the feeling of shadow, as the structure placement denied the direct sunlight. Moving closer to the grocery store and the sound went from a low point to suddenly becoming higher. I was curious and the western wind directed me away from the entrance. The dark clouds were now moving east and my attention was quickly directed at the highway and its high noise levels. The noise from the fast cars blew right through the natural buffer to the parking lot. I turned around to escape the sound and move closer to the entrance. As I moved closer to the entrance, I was met with high noises above me and quickly directed my face upwards, but the dark clouds were disguising the flying object making all noises. I arrived at the entrance and moved inside, it was completely silent...



Ill. 30: Sound measured at critical points of contact

Sound
The sound was measured at the critical points. During the measurement, some unknown factors appeared. In a time span of an hour, two planes flew past the site very close to the ground, resulting in a very loud noise. A plane can be heard with 100 DB at an altitude of 300-500 m above sea level. Big trucks also appeared close to the critical points resulting in unwanted noise in addition to the two big roads adjacent to the site. Inside the shopping facilities, almost complete silence was experienced which enhances the contrast between the spaces. All the road noises can be prevented if necessary, however, can measurement not prevent noises from planes as the site is located below open airspace. Therefore, an opportunity arises for discovering how the noise from planes and highway can be seen as disruption, but also an opportunity for placemaking.

PEOPLE ON SITE

Introduction
This writing summarizes interviews done with people on site. The purpose is to gain an understanding of why people currently are occupying the space, thereby being able to detect current attractive qualities of the site. The interviews were carried out using a semi-structured methodology with some start off questions and elaborating questions in relation to the answers. The interviews were carried out during a time frame of two hours and chosen people were asked simple questions in relation to why they were at the site. The interview session was carried out a 6/3 10.00-12.00 and the findings are described as a mental diary.

Findings
At first observed, many craftsmen arrived at the site in company cars together, for the purpose of shopping groceries. When asked, they elaborated that they do not make their own lunch, so they often buy food and drinks for the lunch break (and use some of their break time on acquiring the food) and then drive back to the site. When asked, in relation to why they do not eat it on-site, a wondering doubt came to mind because they never thought about it. However, does the site also not invite to stay, referring to the lack of urban furniture. After 5 minutes of talking they quickly rushed into the car, as the oldest one looked at his watch and reminded everyone of how late they are if they still wanted to have time to eat at the construction site. They apparently spent more time looking at snacks and cakes today which delayed their ordinary drive-by routine, as it was one of their colleague's birthday.

A mother arrived with her child and she was quite anxious, it was her day off and she wanted to do some grocery shopping for the coming days. Her child was a girl around 6 years old with plenty off energy, the child didn't wanna go shopping but wanted to play instead. The child was given a chocolate bar and some juice to ease the situation, her face was quickly covered in chocolate which made the mother even more stressed. I quickly asked my questions because of the tense atmosphere and after a quick run to the car after napkins, they were off to do the shopping. In this particular situation, the mother expressed her wishes for some kind of transactional space for the child to quickly ease off some steam before the shopping.

A couple of retired elderly arrived and expressed their enthusiasm for the large scale shopping area, and the variety of options it brought to a suburban area. The husband expressed his opinion about the site and how the parking lot is on the brink of being the most boring area he has witnessed. He elaborated on the lack of urban furniture and that he did not wish to stay here for anything other than shopping. Meanwhile, his wife was caught glancing at the huge selection of flowers and pots outside of the shopping facility. At the final remarks of the conversation, the wife could not stop paying attention to flowers and suddenly had a glimpse of an idea. She gasped for air through her inhaler and elaborated on the lack of natural elements on the parking lot, as she lacks a comfortable transition from the car to the shopping facility.

As I was standing at the entrance of the grocery store, I often tried to look for people using the gas station. After the talk with the elderly, I glanced my view over to the three long haul busses holding on the outskirts of the site and thought about why they were there. After that, I was on my way to the bus going to Aalborg when suddenly a car rolled into the gas station. A quick run to the gas station and the driver was surprised by the sudden appearance of a person. A conversation ended quickly, he was late for work because of the sudden need for gas and resulting detour. He was on his way to Aalborg for a meeting and chose the closest gas station to the highway E45. A final question about the use of public transport, which he expressed the car as efficient and the freedom of being able to control when to go or not.

GESTURE & PRINCIPLE

Introduction
This analysis will attempt to understand the site's spatial qualities, through the examination of different assemblies within the urban space. Through the notion of assemblages, we will be able to identify and describe the site in a poetic sense. The analysis will use the theory of urban tectonics as the point of departure.

Tectonics
Tectonic theory in architecture revolves around the notion of implementing knowledge of construction and engineering, to create architecture in which the construction is exploited to enhance the intended architectural atmosphere. Marco Frascari discussed tectonic theory through the notion of the detail. The detail or the joint is the sensation of assembling different elements to the creation of space. It is the most exciting and complex part of the built environment, to merge thoughts in the head to real materialities. The detail will be able to tell stories of the space and its heritage (Hvejsel, 2018).

Urban tectonics
*"**Gesture** as describing the experienced spatial quality existing in the spatial relation between the architectural volume and the urban surface explaining what the space does*

***Principle** as describing the structural build-up of the spatial relationship between the architectural volume and the urban surface explaining how it works"*

(Hvejsel, et.al., 2017, p. 18)

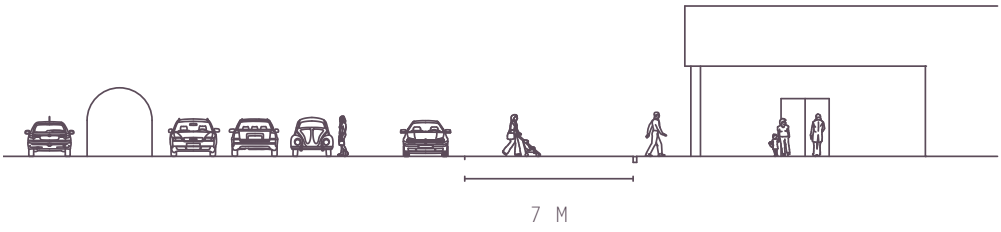
As research mostly revolves around buildings, but the recent addition to the discourse is how to apply the critical thinking of tectonics into urban design. The notion of urban tectonics takes its point of departure in the urban environment and argues for the envisioning of ambiances in the urban environment through details. This analysis of the spatial qualities of the site takes its point of departure in Hvejsel's understanding of ambiances in the urban environment, relating to how the architectural volume and urban surface are assembled (Christiansen, et.al., 2017).

Spatial qualities
The analysis recaptures the spatial qualities on-site by using the section as the representation. All in common for the sections is the heavy emphasis on the car as the main form of transport in the area. The first section shows how the natural environment acts as a sound barrier for the highway and attempts to put a focus on the natural instead of the highway. A grass crossover is located before the green buffer, which further emphasizes the flat topography on-site and thereby gestures views far away. Here, the experience of watching the cars drive by with tremendous speeds through the trees and shrubs.

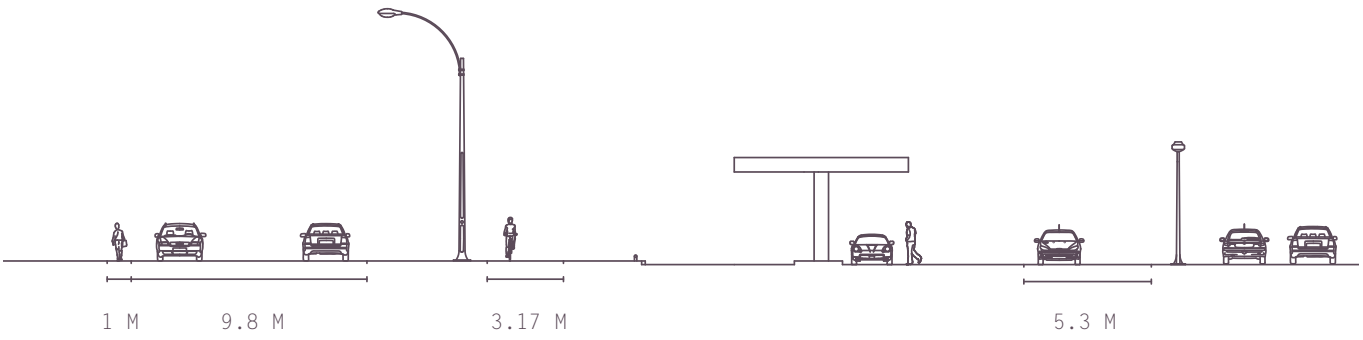
The second section is located at the entrance of the grocery store. Before arriving inside, a heavy roof covers your whole body, which shelters you from the outside weather. It creates a smooth transition from outside to inside, as the roof attempts to blur the lines between inside and outside. The built environment seems to appeal to humans, as it is mainly low structures. However, the large open area, reveals a feeling of exposure as there is no niches or small areas to seek cover. Everything is just wide open, leaving the user completely vulnerable and uncovers the lack of privacy on-site.

The third section again emphasizes the homogenous topography and big open spaces. The gas station attempts to break the linearity of the open space, thereby adding a shelter point. The dedicated bicycle lane is surrounded by grass covers which acts as a barrier for the cars surrounding the lane, this gestures a feeling of safety for the cyclist. The topography again gestures the long view, being able to experience the surrounding countryside.

Ill. 31: Section of highway



Ill. 32: Section of parking lot and store entrance



Ill. 33: Section of countryroad and gas station

ARRIVAL

Introduction
The arrival analysis takes point of departure in Gorden Cullen's 'serial vision' methodology. It attempts to uncover different sectional shifts through the site and thereby identifying changes in atmospheres in relation to the built environment (Cullen, 1961). The site is analyzed through 4 different routes through arriving in different modes of transport. The shopping facilities are used as final destination as it is the only current attraction point for people (appendix 10 for map of routes).

Serial vision
When arriving with the bus 1E, it seems as there is no direct intuitive route to the shopping. When entering the site from the bus, you will be met with a narrow stone carpet that is detained by grass lawn. At bus 1C it seems like a path has been made by humans cause of the need for connection. This is characterized by the inconsistent width, shape, and materiality. Arriving with bicycles consists of two options; to follow the car traffic or use the independent bicycle lane and connection. The dedicated bike lane creates a sense of security from the car lane. The car arrival is resulting in easy access to the shopping cause the parking facilities are located close to the shopping. Common for all of the arrivals is the last mile from the human perspective. The parking lot is prioritized resulting in a shared surface between humans and vehicles, as there are no clear lines or defined materials for pedestrians or bicycles. This indicates the need for defined arrival spaces and roads for humans and bicycles.

Ill. 34: By bus with end station at Bouet (1E)

Ill. 35: By bus going north (1C)

Ill. 36: By bike

Ill. 37: By car

LINES OF DESIRE

Ill. 38: View to green structure

Ill. 39: View to the highway

This analysis attempts to identify potential attraction point in relation to views and will draw lines from specific points to the view. This analysis relates back to the theoretical framework related to the countryside, trying to identify views creating opportunities for experiencing the ever-changing landscape (appendix 10 for locations of lines of desire).

The analysis identified two different landscape views worth considering; a highway showing the flow of cars on the eastern part of the site and a green field with surrounding trees on the western part. These views are currently accessible at many locations and at the critical points of contacts, it is possible to experience one of the views. However, does the car park block some of the view of nature and trees block the view of the highway as the topography is also just even. This could set up the design proposal to implement shifts in elevation in order to experience the different landscapes.

MAPPINGS

The cartographic mappings will be done in order to obtain necessary understanding of the site and its related context. The mappings are done on different scales in order to obtain a strategic understanding and of the specific site. Five different mappings will be used and the choices of these specific categories take point of departure in the theoretical and analytical framework.

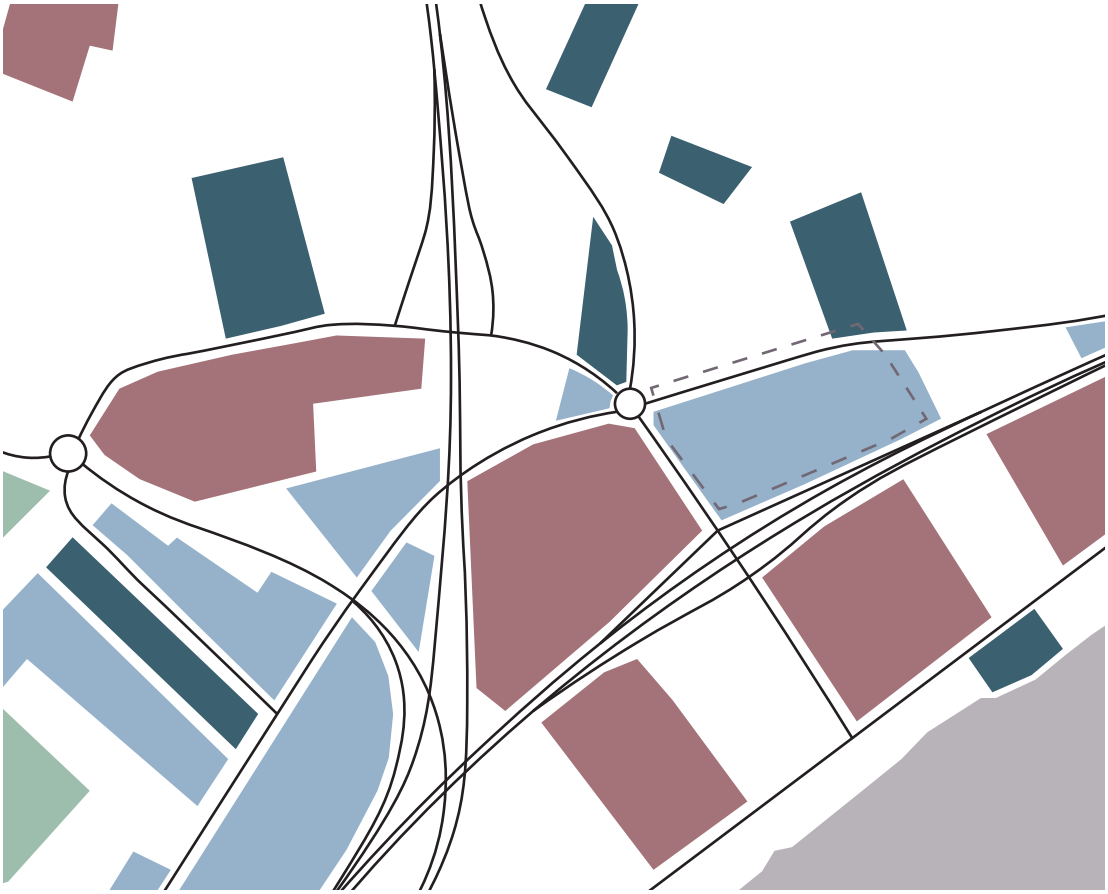
Functions are analyzed in order to understand which existing functions are featured. Thereby, new functions can be implemented to facilitate a mobility node which is more than A to B.

Green structure takes point of departure in the nordic context and notion of the countryside, and supplements the lines of desire analysis. As two viewpoints from the previous analysis are already clear, the analysis attempts to uncover the other green areas, to be able to design for a variety of views on the countryside.

Legibility takes the point of the departure in Kevin Lynch's 'the image of the city' (Lynch, 1960). According to Lynch, a site features five different elements that are connected in order to understand the legibility of the site, in relation to its surrounding areas. The five elements consist of; Nodes, Roads, Edges, Districts, and Landmarks.

The Contextual Appraisal summarizes key characteristics and elements discovered from previous analysis, in order to get an overall understanding of the site related to the context.

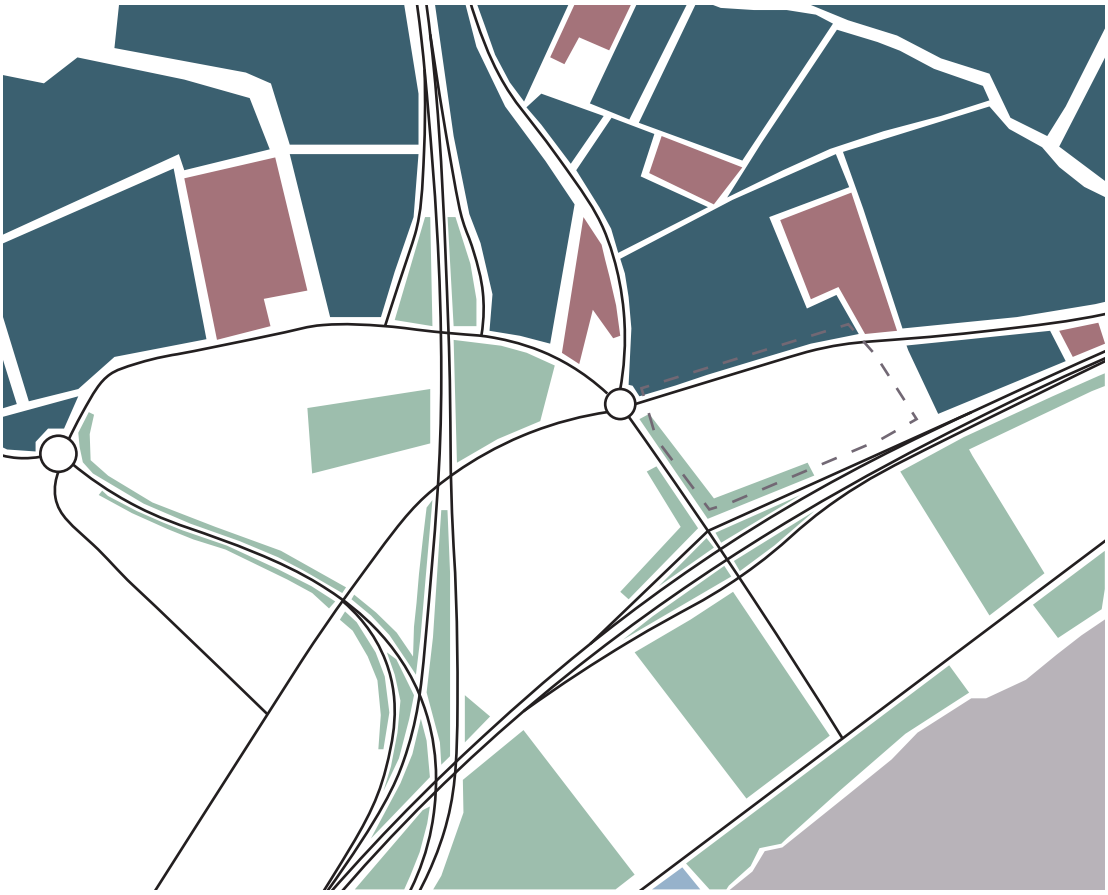
The Opportunities and Constraints map takes point of departure in the contextual appraisal and uses the key characteristics as points for the specific site. The analysis only maps the specific site and the different locations are marked as different opportunities or constraints.



Ill. 40: Functions map

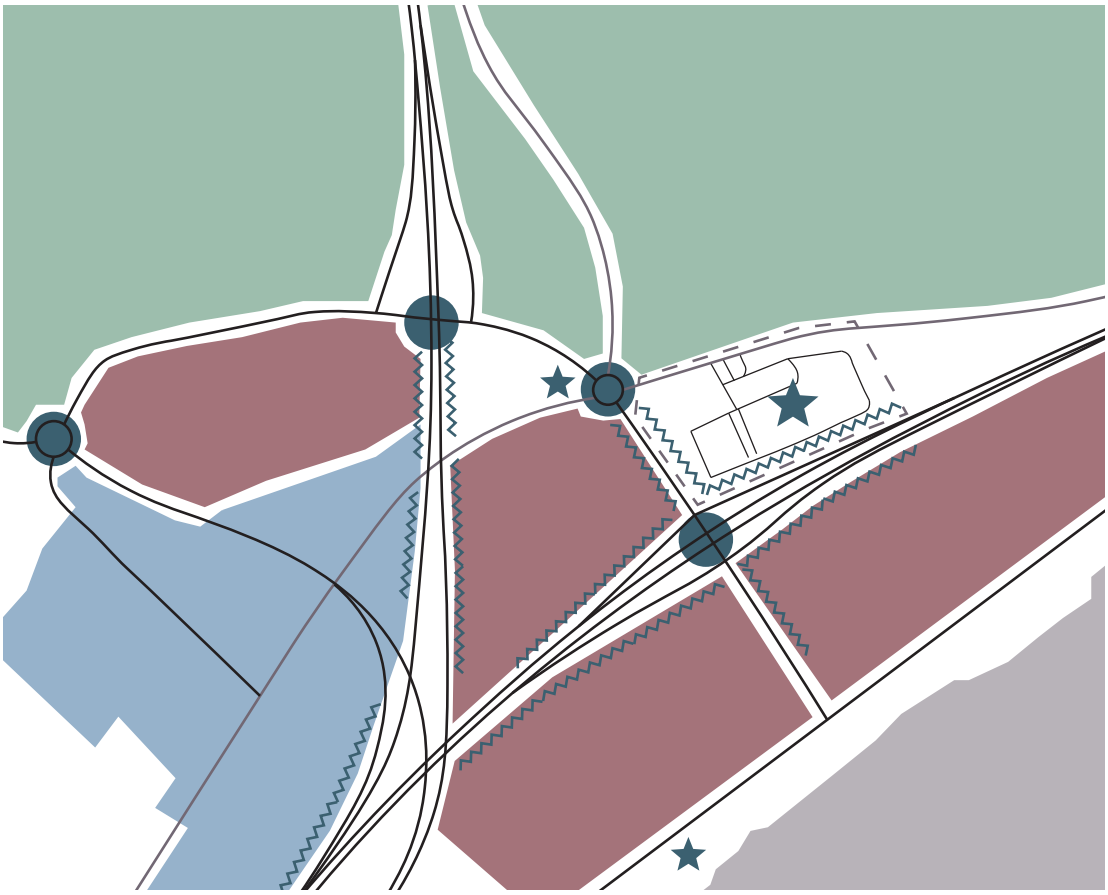
Site
Industry
Commercial
Housing
Service/institution

Functions
The functions located at the surrounding context is split into four different themes. The area contains a small amount of housing with huge plots of land that is located far away from each other, a result of the countryside. These housing areas are all in relation to the farmland. The site itself is for commercial purposes and features among others a Kvickly which is the main point of attraction. Adjacent to the site features mostly industry, which are areas that the public cannot enter without permission. The commercial extends mostly in the southern direction, closer to the city of Nørresundby. The service/institution is the barracks of Aalborg, which is also not accessible to the public.



Ill. 41: Green structure map

Green structure
The green structure is analysis is also split into four different themes. The private gardens are in relation to the housing, because of the location in a non-urban area, the space does not lack, the houses are big and features big gardens. The northern part of the site contains primarily farmland, which is also in relation to the private housings. Therefore, the farmland areas are not accessible, but the different phases of farmland production in relation to different crops can be experienced instead. The wild vegetation and grass covers mainly serve as buffers for the loud traffic, from the highway and countryside. The site and surrounding area does only contain a small recreational area, which features shelters located at the Limfjord.

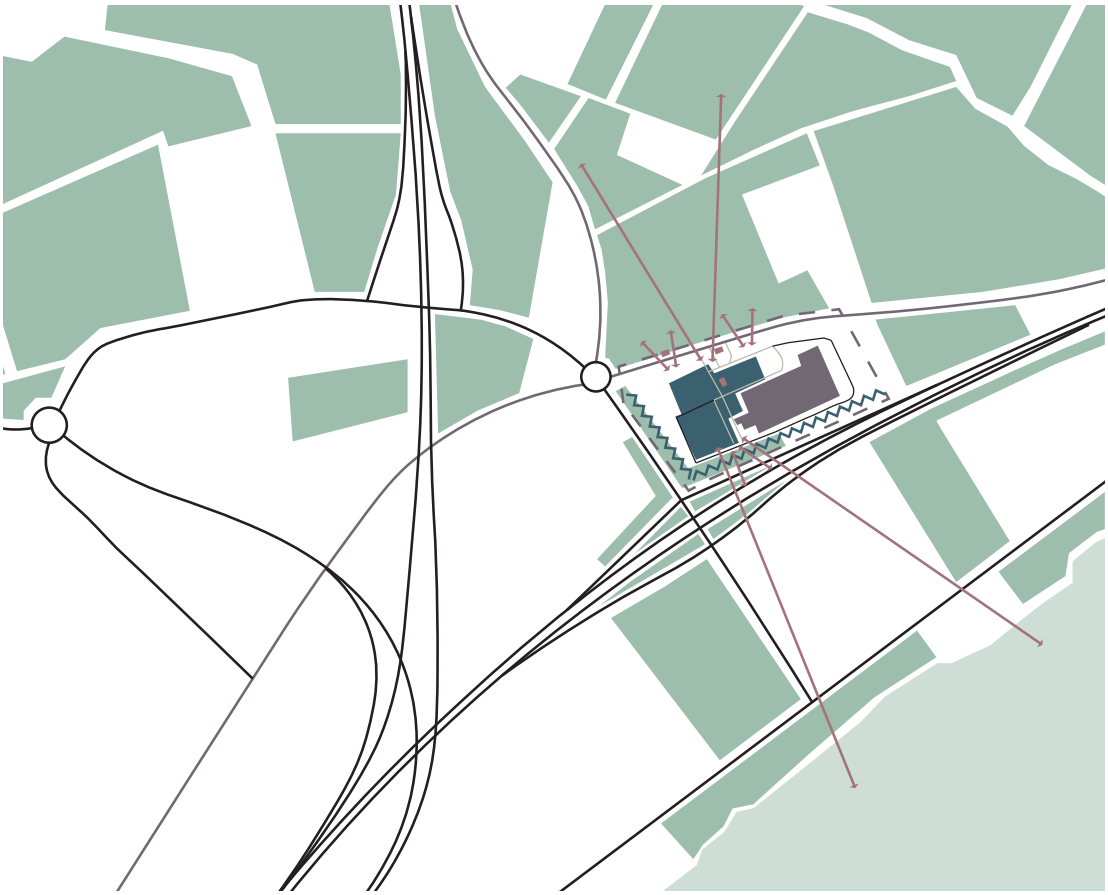


Ill. 42: Legibility map

Legibility

The surrounding context can be split into three districts which were discovered in the functions and green structure analysis. The industry districts surround the site and the commercial district closest to the city of Nørresundy. The location of districts is an indicator of the site being located at the intersection of the end of the city, as industry and farming mostly are placed outside of the city, but commercial areas should be closer to the city because of the accessibility of people. The highway and cut-off roads create barriers between the different districts and also among each other. The main nodes are located at the roundabouts and cut-off roads from the highway, which all are close to the site. Not many landmarks can be identified, however, the size and amounts of visitors make the Kvickly grocery store the biggest landmark. The other landmarks are identified as a gas station and the recreational area containing shelters.

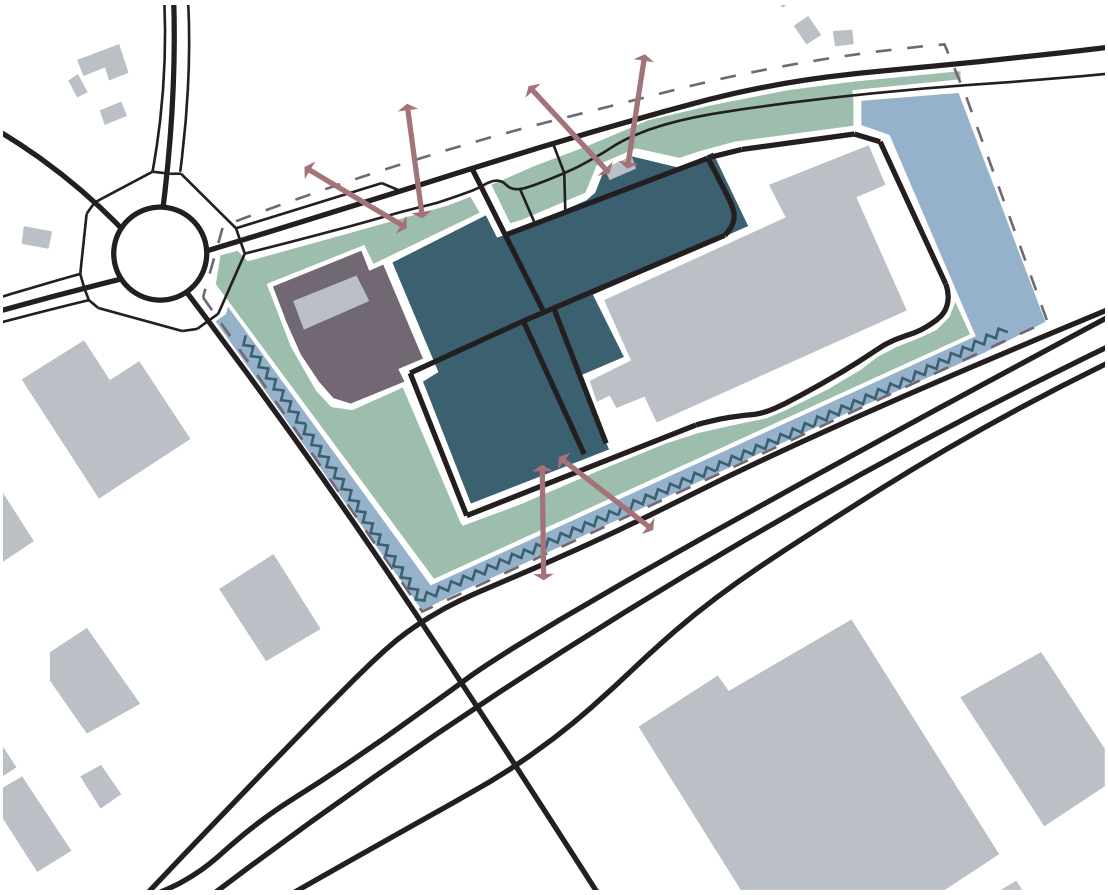
CONTEXTUAL APPRAISAL



Ill. 43: Contextual Appraisal map

The contextual appraisal uncovered surrounding context as a variety of green spaces, which can be experienced from within the site through different lines of desire. The lines of desire faces the farmland areas and highway, as we believe experiencing cars rushing through the highway can be an activity of desire. The natural buffers in relation to the highway create edges around the site's southern boundaries. The country roads going to Vodskov and Hjørring both feature a dedicated bicycle lane, which indicated the potential for two-wheeled transport options to the bigger cities. The Limfjord is also marked as a blue/green asset, as there is potential for the site, to be able to experience the Fjord.

OPPORTUNITIES & CONSTRAINTS



Ill. 44: Opportunities and Constraints map

Site
Lack of activity
Area with potential
Grass area
Wild vegetation
Lines of desire to enhance
Edges

This mapping will explore the opportunities and constraints of the site in relation to the context. The green area from previous mappings is uncovered into two different categories. The wild vegetation will mostly have the function as the sound barrier for the highway and the grass acts as an extra buffer that places the users of the site far away from the highway. However, the highway can still be experienced through the small opening in the vegetation, which further enhances the variety of views, as the views are constantly changing. The area of potential is marked because of the mobility of people, goods and cars. This area is completely contrasted with the area which is marked as a lack of activity.

SUBCONCLUSION

The analytical framework attempted to gain insights into the site at Bouet and its surrounding context. The main points of the analyses are here listed:

- Bouet is located at the cross section of two highways and the site also experiences a huge flow of cars, as the site mostly features parking

- The materiality of site shows signs of the car as the main user of the site

- The critical lines of contact are all located within the main parking area

- The site is a big open space, which exposes the user for all the senses to be stimulated by natural forces

- The site is presented as loud, the noises originates from the highway, country-road and sometimes planes

- The low laying homogenous topography allows long sigthlines through the site

- The site only functions as necessary activities (rest area and parking area for shopping) and is not a attractive or pleasent place to be

- The highway and farmland are the main lines of desire

- The adjacent areas are identified as an industrial district and farmland

- The surrounding context does not contain any big points of attraction. The Kvickly is uncovered as the only landmark as it attracts many people

- The current site conditions present both wild vegetation and grass covers for potential recreational purposes

- Roads with dedicated bike lanes connects the site with both south and north

APPROACH & DESIGN PROCESS

The following chapter presents the approach for the project based on the theoretical and analytical framework. Furthermore, the design process is presented as the last part of the chapter.

PERSPECTIVES ON MOBILITIES

The generic space
As discovered earlier, Bouet is a place that has a lot of challenges. The site is mainly used as a parking lot, a rest area and a gas station. It contains a highway on the one hand side and a country road on the other side. The roads are major infrastructural connections, connecting the northern part of Denmark with the rest of the country. In addition to the car noise, planes use the airspace to arrive in Aalborg airport, this results in an area which is very loud. This kind of place is social and cultural constructed as a non-place, a place that has no qualities in relation to humanity and is only used as an infrastructural space. This typology of a place is very common and is a necessary activity to sustain the mobility infrastructure. It is generic and is not perceived as an attractive place. Before we arrive at this kind of place, we already know what is gonna happen, only necessary activities and no positive experiences.

What is beautiful?
In society, we know what we define as great and attractive architecture before we get to experience it. When visiting a church or a theater, we already know the architecture is going to be spectacular before we arrive, the opposite feeling appears in the transit space Bouet represents. We do not in society appreciate infrastructure as aesthetic or experience worthy, this is how it has always been. Therefore, Bouet and this typology of a place is already culturally judged beforehand.

The aforementioned 'mobility turn' creates the notion of mobility being more than A to B. In this paradigm, they believe in mobility as not just movement but a part of the individual's social formation and shaping. They criticize the moral geography of mobility spaces which people have developed a prejudice for as the opposite of attractive and spectacular (Jensen, 2013). Airports were usually presented as non-places, the place only allows long-distance travel and is not pleasing for people (Auge, 1995). However, in recent years this prejudice has been challenged. In the role of the architect, airport design is a highly competitive area, who does not wanna design an airport? Its potentials of creating attractive and desirable transit spaces in which a huge amount of people visit are unparalleled to other spaces. In Changi Airport, people book long layovers or arrive at the airport 10 hours early, just to experience the place through its spectacular architectural imagination (appendix 3). The modern airport is constructed through a pragmatic paradigm in which the transit space is able to do more than just move people, it features a variety of activities which exploits the qualities of being in an airport.

Mobility as the new aesthethic
The highway is not a place which we sympathize with and car travel is often affiliated with discomfort and a waste of time. However, we are constantly amazed by the cars and the infrastructure which allows mobility. When people drive on vacation and need a rest, a constant glazing at the highway and the fascinating speed and noise is unavoidable. The highway can actually feature experiences by exposing the mobility and how it is facilitated. A new kind of aesthetic which is also reflected in architecture, as architects often work with visible ventilation channels and construction details. There is a beauty in the unveiling of how the built environment is assembled and how it facilitates our everyday life. Same with the visible highway, there is a beauty in the uncovering of how the world is connected through the assembling of the infrastructure and its elements.

In addition to the typology of the resting node on the highway, Bouet also has to facilitate an efficient shift in the mode of transport for a more sustainable future, which also means more built infrastructure for the new modes of transportation. This project envisions Bouet and the typology in being a catalyst for activity and embodied experiences whilst on the move. The pragmatic thinking believes in turning the cons of the site into pros. The design should attempt to work with the infrastructural challenges of the site and embrace them as qualities instead of disguising the site's character. This mundane generic place should do more than just move people from A to B. It should be known as an attractive space. Here, architecture and urban design is the key to critically transform these places into something more. It should be intriguing and spectacular!

Ill. 45: Solberg Tower and rest area, Norway

SOFT NODES

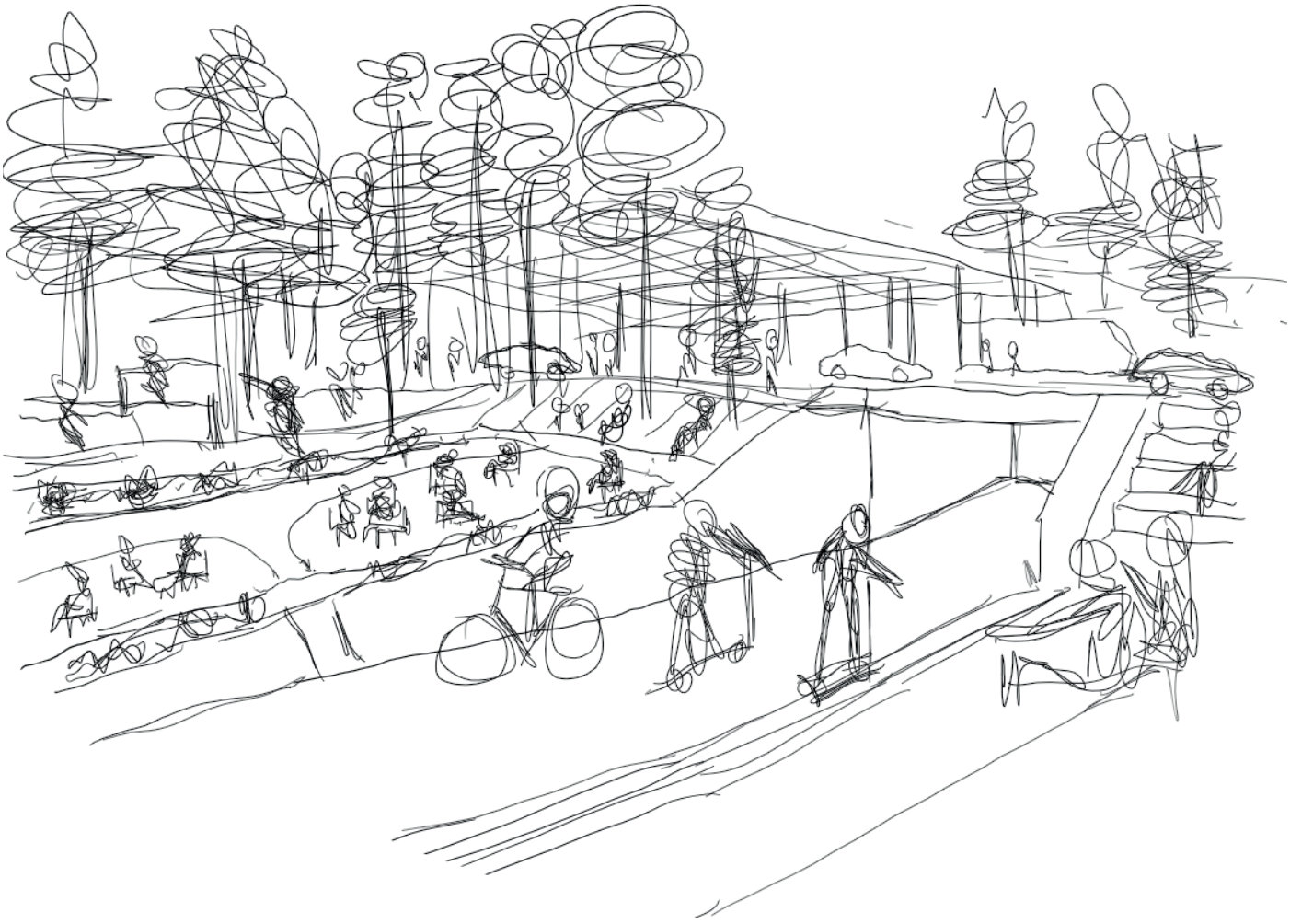
The present mobility node is as mentioned earlier, a space that attempts to accommodate the mobility which is present in the area. The node is solved in regard to facilitate mobility and easy accessibility for the user to get to the mode of transport. This results in a place that is often only for movement and seems to neglect the human scale. The mobility node is engineered with the vehicle as first priority which worsens the safety for humans.

Defining the soft node
Imagine a mobility node that is safe from vehicles and appeals to the human scale. A place that offers visual variations and offers a variety of spaces with different kinds of activities. A space that emphasizes walkability and comfortability for humans. Spaces which stimulates all the senses through small microclimates and materialities. All these aforementioned qualities are mostly affiliated with spaces that do not feature vehicles or modes of transport. The qualities can be connected to criteria within the design of public urban spaces and can be traced back to among others Jan Gehl and Jane Jacobs (Gehl, 2010; Steinø, 2016b; Sim, 2019).

We should treat the mobility node with the same sensitivity as the public spaces and design it for humans. We should use the same framework for public space design for the mobility node, in order for the node to be soft. The mobility node is usually designed to facilitate and direct transport effectively without repressing the comfort for the driver and users. This means a lot of big roads without too many sharp turns and a very hard surface materiality. But, what if the mobility would be able to do both? The term soft nodes represents a paradigm that attempts to critique the current notion of nodes and how they should be designed. The soft nodes should be soft in the sense that it should be able to create areas which appeal to the human scale and be able to fulfill the aforementioned criteria for public space design. The soft node should be a node in the sense that it should be able to facilitate comfort and movement for different modes of transport. The challenge then becomes in relation to how it will be able to do both?

The soft node as an approach
The relationship between the soft and the node should be relatively equal, this means if we divide the area in two and categorize the soft and node elements it should be close to equal. This also means that smaller areas within the site can differ between the two terms and some areas can feature mode soft elements than node elements and vice versa. Some places can also only feature soft elements and vice versa. The third option is a blurring between the two terms which some areas within the site will need. This means five possible kinds of relationships between the two terms are used as the point of departure, depending on the character and qualities of the specific area.

In order to approximate the soft node and its qualities, two case studies of architects will be exploited for their form-giving abilities. The two contemporary architects, even tho they are both Japanese represent two widely different paradigms that appeal to the human scale. This is based on the interest of attempting to solve the same problem through different paradigms. One of the paradigms will be chosen at the end. However, should the two ways of thinking be able to inform and learn from each other. Kengo Kuma reinterprets traditional materials to create unique spatial experiences emphasizing tactility through materialities. SANAA's architecture is simple and does not overwhelm a site. Instead, it attempts to enhance the surrounding landscape.



Ill. 46: Vision of mobility and people existing together

CASE 1: KENGO KUMA

Introduction
Kengo Kuma is a renowned contemporary Japanese architect, born in Yokohama. His architectural focus is related to the reinterpretation of natural traditional materials and how it can be used in a new way (Goodwin, 2019).

"His reinterpretation of traditional Japanese architectural elements for the 21st century has involved serious innovation in uses of natural materials, new ways of thinking about light and lightness and architecture that enhances rather than dominates. His buildings don't attempt to fade into the surroundings through simple gestures (...) but instead his architecture attempts to manipulate traditional elements into statement-making architecture that still draws links with the area in which it's built." (Goodwin, 2019)

Kuma's interpretation of materialities is done in a way that highlights its properties and tactility which can be linked with the notion of nordic traditional architecture. This case study takes its point of departure in his form-giving and ability to create spatial experiences with the use of his unique architectural imagination.

Yusuhara Wooden Bridge Museum
The museum is supported by one column in the center. A pile of wooden beams is stacked on top of each other as the structure expands horizontally whilst gaining height. The single columns presents a light foundation for the heavy building, here the relationship between heavy and light is reversed as you usually want the heavy elements in the bottom. The buildings almost seem like a sculpture or art installation as the natural environment emerges is the background. The built structure seems to enhance the surrounding landscape as the fabricated wood creates dynamic nuances to the greenery.

GC Prostho Museum Research Center
The building is the result of the assembling of many small wooden elements. This wooden grid structure presents a transparent facade in which it creates small viewing lines through the structure to the natural environment. The light construction seems complex but is in reality just joined through homogenous wooden elements. The imaginary repeating structure is used as a space-defining element and features small niches whilst letting in light through the structure. Again, Kuma reinterprets wood as materiality and exploits its property and tactility. The structure results in open transparent spaces, creating connecting between different spaces.

Ill. 47: Yusuhara Wooden Bridge Museum in Yusuhara-cho, Japan

Ill. 48: GC Prostho Museum Research Center in Kasugai-chi, Japan

CASE 2: SANAA

Introduction
SANAA is a Japanese architecture firm based on a collaboration between Kazuyo Sejima and Ryue Nishizawa (The Hyatt Foundation, 2010). When winning the Pritzker Prize, the jury was cited saying this:

"The buildings by Sejima and Nishizawa seem deceptively simple. The architects hold a vision of a building as a seamless whole, where the physical presence retreats and forms a sensuous background for people, objects, activities, and landscapes. They explore like few others the phenomenal properties of continuous space, lightness, transparency, and materiality to create a subtle synthesis." (The Hyatt Foundation, 2010)

The case study of SANAA takes its point of departure in their form-giving and ability to enhance the adjacent landscape element.

Naoshima ferry terminal
The ferry terminal's primary task is to facilitate ferry departure, both humans, motorbikes, and cars depart with the ferry. The terminal solves this with a shared surface principle, as the surface is homogeneous within the space. The terminal features a light construction with columns and beams supporting a metal roof which affords sheltering. The construction uses tall slender columns as an element affording views of the sea's ever-changing horizon. Here using the landscape as the primary approach and not trying to overcome it, instead, it is placed as a calm piece trying to enhance the surrounding landscape. The space is using the columns as a way to frame different views of the landscape.

Grace farms
The farm is a combination of sheltered walkways and indoor glass spaces. The glass boxes are extensions of the sheltered walkways, as the walkway turns into huge squares. The boxes are meticulously placed at critical points in which the architects chose specific landscape elements to afford viewing through the glass boxes. SANAA again uses the slender columns to facilitate the light appearance of the construction. The columns are placed with a defined distance between them, as the construction twists through the landscape to enhance the nature surrounding the farm.

Ill. 49: Naoshima ferry terminal in Naoshima, Japan

Ill. 50: Grace farms in New Canaan, Connecticut, USA

DESIGN CRITERIA

THE MOBILITY NODE SHOULD

- Be a Soft Node

- Be able to facilitate all necessary means of transport

- Enhance the sense of community by implementing activities which can enourage social interaction

- Use universal principles, for everyone to find the area an attractive and pleasent space to be

- Create the opportunity to experience the surrounding countryside

- Maintain the existing functions as rest area and shopping

- Embrace other aspects of the site the highway and countryroads to create experiences

- Use the notion of the nordic tradition to create a sense of place

- Challenge the non-aesthethic approach of the pragmatic paradigm

- Change the existing prejudice of the typology by creating unique architecture which will be able to attract people

PROGRAM

FUNCTIONS	DESCRIPTION	CAPACITY
Community activities	Activities to enhance the sense of community	Min. 3 different activities
Observation decks	The opportunity to experience the surroundings of the site	2 towers
Recreational area/ waiting facilities	Pleasent facilities which enhances the sites qualities	Unknown
Public toilets	Necessary activity	2 toilets 1 handicap
Coffee to go	Optional enjoyable activity	1 person serviced at a time
BRT stop	Integrating the municipality's future vision	1 lane for stops in both direction
Car parking area	For the change of transport mode, to shop or rest	120 + 20 % parking spots
Carpooling area	Share a ride into the city or to your home	5 holding spots
Area for two-wheeled transport	Should feature bike workshop area	50 parking spots min. 25% sheltered
Electric charging station/ gas station	Combining the existing with a new sustainable approach	4 electric chargers

PROCESS OVERVIEW

The design process is presented as ten phases which are split into different categories. All the phases intertwine and are not linear as presented. They all discover new knowledge based on design explorations. Some phases attempts to solve specific problems and other attempts to merge the knowledge acquired. All the presentation material is presented in diagrams and the underlying sketches will be presented in the appendices.

Categories
RESEARCH: The three first phases attempts in addition to the already gathered knowledge, to explore theories and cases as a point of departure in the sketching. The phases will firstly explore theories and cases, and then sketch based on the gathered knowledge. The end result contains design principles that can be implemented in the later phases.

EXPERIMENTAL: The next three phases explore design through a more design experimental approach through map sketching. The end result of the phases will be design principles. The first two categories does not provide specific solution to the given challenge, but enriches the question with a variety of solutions. Thereby, when solutions are merged together, the different choices will be able to enhance specific concepts/ideas.

DEVELOPMENT: The two next phases merge the knowledge gathered in the theoretical framework, analytical framework, and principles discovered from previous sketching. The phase will attempt through synthesis to get closer to the final design proposal. The process should now approximate the final design proposal.

DETAILING: The last two phases attempts to finalize the last details from the design proposals discovered previously. Furthermore, to evaluate the proposals in terms of the criteria and narrow it down. The end result of this phase can be explored in the chapter presenting the design proposal.

PHASES

01 RESEARCH: INVITING AREAS
// *People for the people and the architectural promenade*

02 RESEARCH: CREATING COMMUNITY
// *Sense of community and Yes is more*

03 RESEARCH: MATERIAL STUDIES
// *Material properties, nordic traditions and ambiances*

04 EXPERIMENTAL: FLOW LOGISTICS
// *Flowstudies of vehicles and pedestrians/soft transport*

05 EXPERIMENTAL: RECREATIONAL SPACES
// *Exploiting the existing natural environment*

06 EXPERIMENTAL: MOBILITY ALLOCATIONS
// *Mapping and connecting the different means of transport*

07 DEVELOPMENT: CONCEPT
//

08 DEVELOPMENT: MASTERPLAN
//

09 DETAILING: OPTIMIZING FORM
// *Creating ideal settings through form-giving and materialities*

10 DETAILING: JOINING THE SPACE
// *Integrating traffic engineering aspects*

01: INVITING AREAS

Exploring the narrative
This phase attempts to formulate ideas related to how the mobility node could be inviting. This is the first meeting between the user and the space, and at the first glimpse, the user will know if they want to be there. This phase will primarily based its sketching on the theories on arriving to the space:

'Cities for people' by Jan Gehl, describes how people attract other people in the public domain (Gehl, 2010).

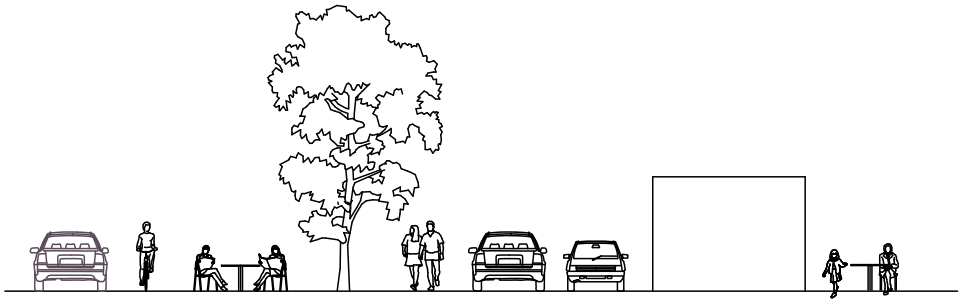
'Ordering initiation' by Flora Samuel, describes spatial experiences in phases based on Le Corbusier's narrative path (Samuel, 2010).

People for the people
The group envisions the mobility node as an environment striving to express the sense of community, experiences of the countryside and diversity. Jan Gehl expresses the presence of people as an important factor, for people being attracted to there are:

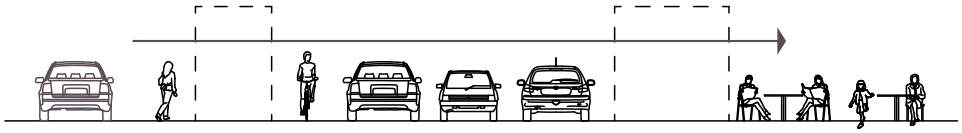
"People come, where people are (...) is a common saying in Scandinavia. People are spontaneously inspired and attracted by activity and the presence of other people. From the window, children see other children playing outside and hurry to join them" (Gehl, 2010, p.65)

The current state of Bouet does not offer any activities, except the necessary grocery activity. In relation to creating activity, it becomes clear that an attractive environment must be created in terms of the visual presence. It must be there for both bypassers and people in the area, in being able to lure people to the site. Gehl set up 12 criteria for quality urban spaces which will be explored in relation to Bouet (Gehl, 2010).

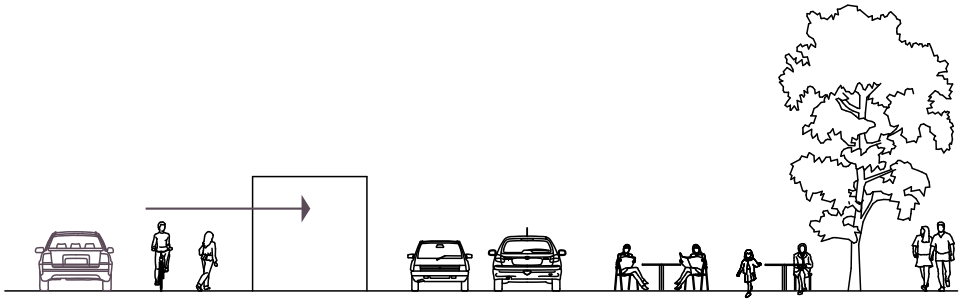
The mobility node as a theatre play
In addition the presence of people at the site, the group believes a spatial experience arriving will further enhance the attractiveness of the area. Flora Samuel attempts through Le Corbusier's narrative path, to explore a set of rules which the user experiences subconsciously. Le Corbusier architectural rhetorics can be described through Gustav Freytag "Techniques of Drama", in which he describes five phases of drama. It interprets the arrival at a place as a theater play in which the built environment can affect the arrival experience. The five phases of the narrative are; ***Introduction, Disorientation, Questioning, Reorientation, and Culmination*** (Samuel, 2010).



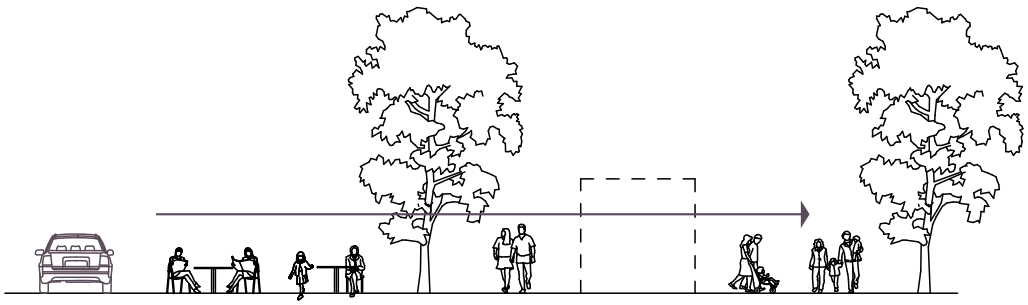
Ill. 51: Introduction



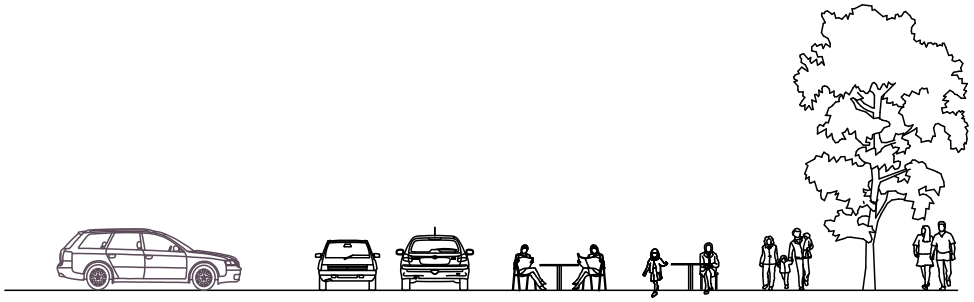
Ill. 52: Disorientation



Ill. 53: Questioning



Ill. 54: Reorientation



Ill. 55: Culmination

02: CREATING COMMUNITY

Imagining social activities
This phase explores how social interactions can be created by different activities and functions, and its related spatial qualities. The sketching will take point of departure in the following theories:

'The sense of community' McMillan and Chavis, already mentioned in the theoretical framework very briefly (McMillan & Chavis, 1986).

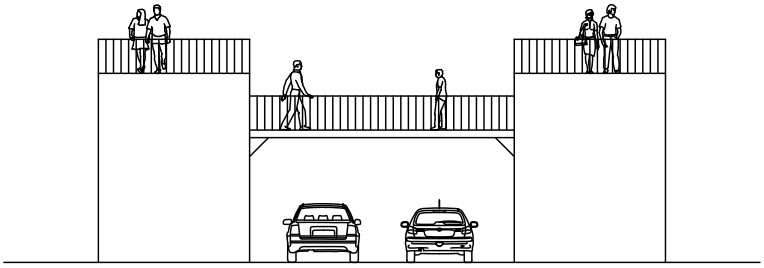
'Yes is more' by Bjarke Ingels Group, the case is explored in terms of how to transform architecture and urban design, to do more. Thereby creating functions people can gather for and experience together (Ingels, 2009).

Sensing the community
The theory on sense of community takes the point of departure in four criteria; Membership, Influence, Integration and fulfillment of needs, and shared emotional connection. Membership can include a variety of attributes, here the most important for the project concerns the sense of belonging and identification, and a common system. In a community, members need to have a feeling of influence, that they are being heard in terms of their opinion. In relation to the influence, members also need to feel an emotional reward for their participation, thereby fulfilling their needs. A sense of togetherness can include the shared participation, the ability of being able to do things together, creating a shared reference identification to historical events (McMillan & Chavis, 1986).

Yes is more, Viva La Evolucion!
The yes movement derives from the danish welfare state, it is based on the principle of saying yes and pleasing everybody. Making everybody happy usually leads to compromises, but what if it didn't? (Ingels, 2009)

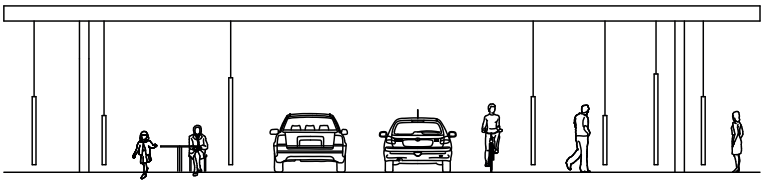
"What if design could be the opposite of politics? Not by ignoring conflict, but feeding from it. A way to incorporate and integrate differences, not through compromise or by choosing sides, but by tying conflicting interests into a Gordian knot of new ideas." (Ingels, 2009, p. 14-15)

Ingels' design philosophy attempts to cater for all, thereby not compromising, but using the conflict to create interesting spaces. Architecture has the potential to make meet from different cultures and background, it can create new opportunities for people to meet through shared functions or the merger of different interests. As the sense of community is important, it now becomes clear that the design should explore ways of people to meet through different functions and the connections between the functions (appendix 4).



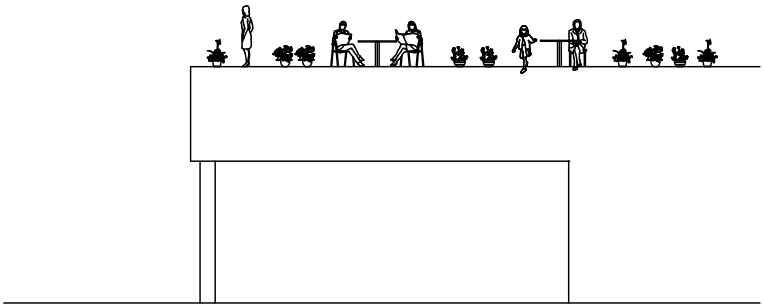
Ill. 56: Observations decks

The observation deck attempts to exploit the lines of desire as a gathering point for the people at Bouet. This is also an qucik activity, as you can watch as your mode of transport aprroaches.



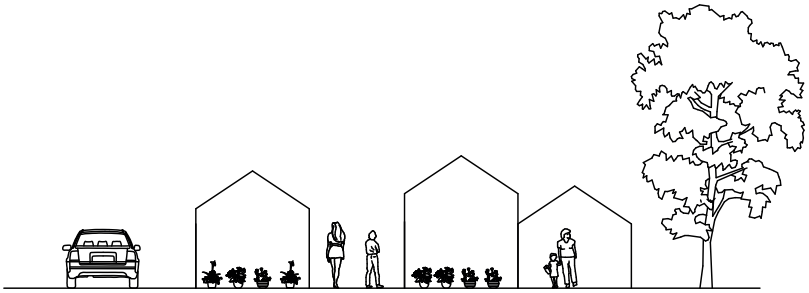
Ill. 57: Art gallery

The art gallery invites people living in smaller cities to showcase their art. People from the same cities can look at the art, thereby enhancing the knowledge of people in the community.



Ill. 58: Rooftop garden

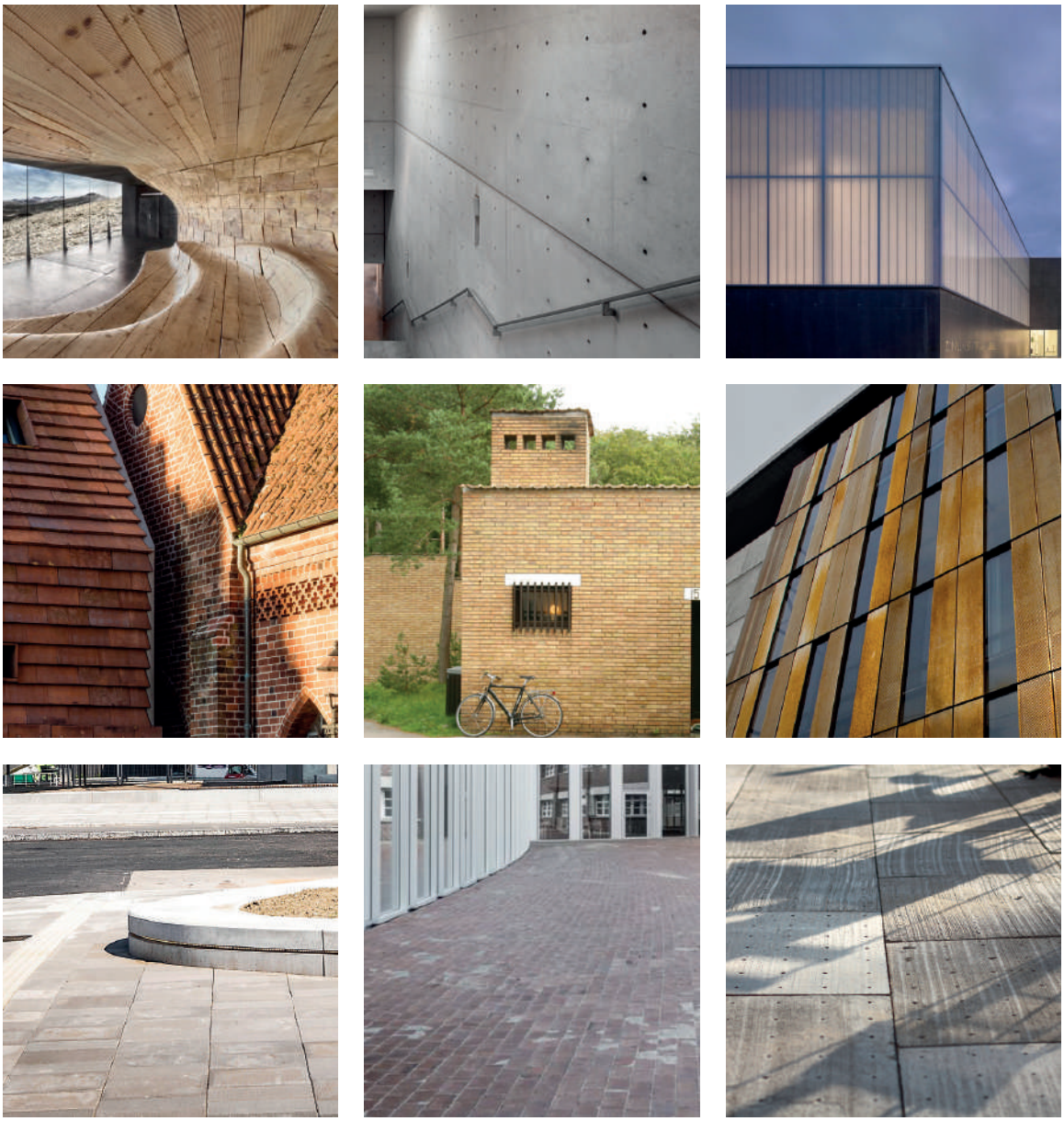
The rooftop garden exploits the existing built environment to enhance the lines of desire. The also creates relaxing spots in a higher density away form all the cars.



Ill. 59: Greenhouses

In the greenhouses, the users waiting for their mode of transport can take a walk around in the greenhouses, to pick up some fruits for their way home and experience nature.

03: MATERIAL STUDIES



Ill. 60: Collage of different materials

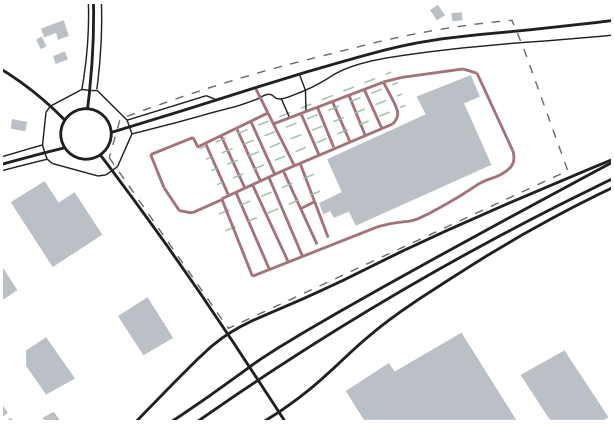
This research showcases materialities through case studies. The materials were chosen based on its relevance in relation to the nordic tradition. Most of the materials showcased are based in the nordic context. The existing materials on the site is mostly asphalt as surface material which afford the car to have a smooth drive. The cladding on the store building features a newer kind of steel material. Common for the surface and cladding is the big homogenous blocks, which this studies attemtps the challenge through smaller blocks.

04: FLOW LOGISTICS

This phase attempts to uncover the different possibilities in relation to flow for the relationship between vehicles and pedestrians/soft transport options.

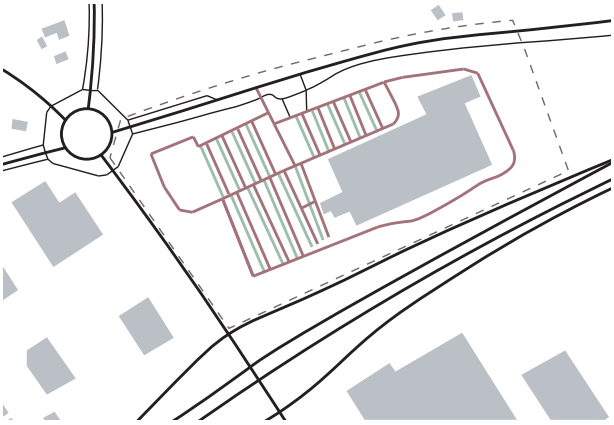
Vehicles

Pedestrians/Soft transport



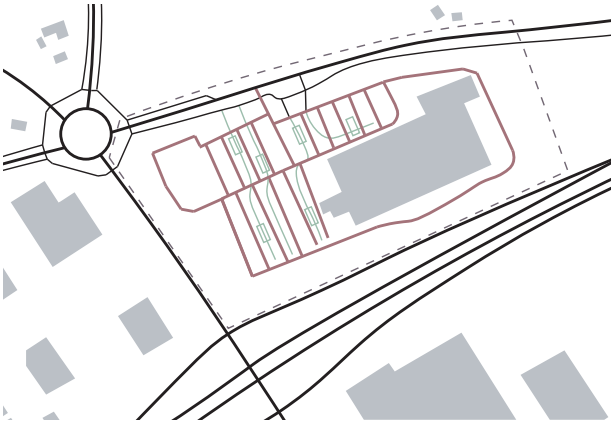
Ill. 61: Idea/Principle 1

The idea takes the point of departure in Le Corbusier's vision of Villa Radieuse which humans and vehicles are separated. Humans and soft transport is located a level above the vehicles.



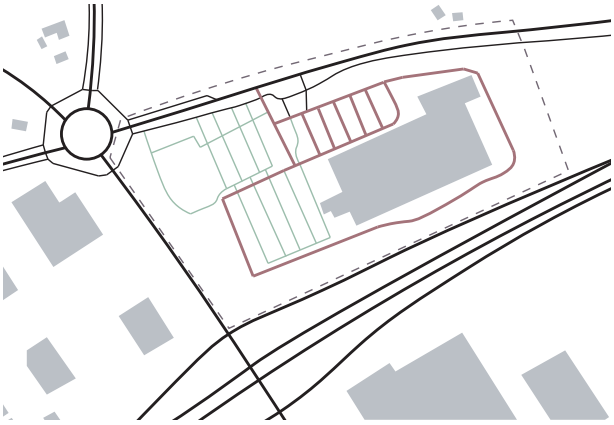
Ill. 62: Idea/Principle 2

This idea takes the point of the departure in a shared space principle in which all areas is shared by all. A smooth surface affords the vehicle to move fast which compromises security for people.



Ill. 63: Idea/Principle 3

The humans and soft transport options are located in in small corrioders in between the vehicle flows. The corriodors contains small areas that allow human and soft transport flow.



Ill. 64: Idea/Principle 4

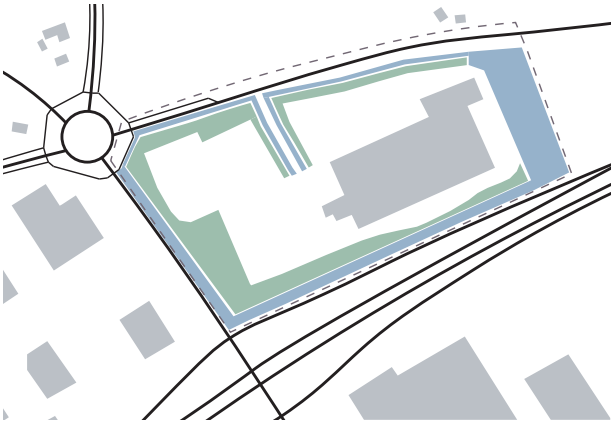
In relation to the shared surface, this idea takes a opposite approch in which the vehicles and soft transport are seperated. This afford people to be safe from vehicles.

05: RECREATIONAL SPACES

This phase takes the point of departure in the existing green conditions on site and explores how they can be used as recreational spaces.

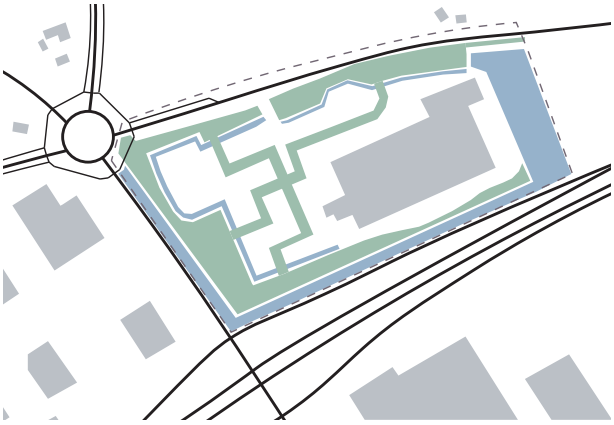
Grasscover

Wild vegetation



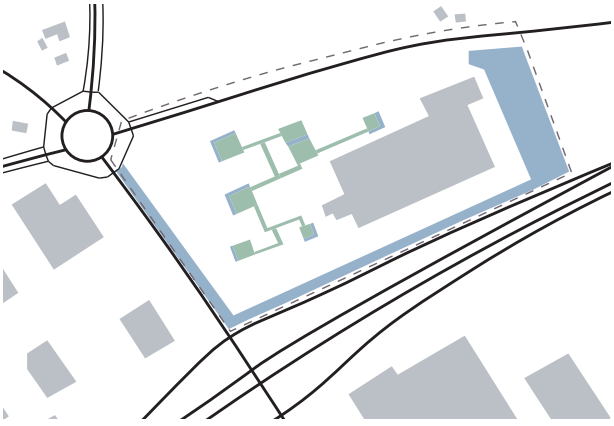
Ill. 65: Idea/Principle 1

The idea extends the existing green areas to a boulevard at the arrival point with vegetation as a buffer for the cars. The existing green wedge is maintained in the outskirts.



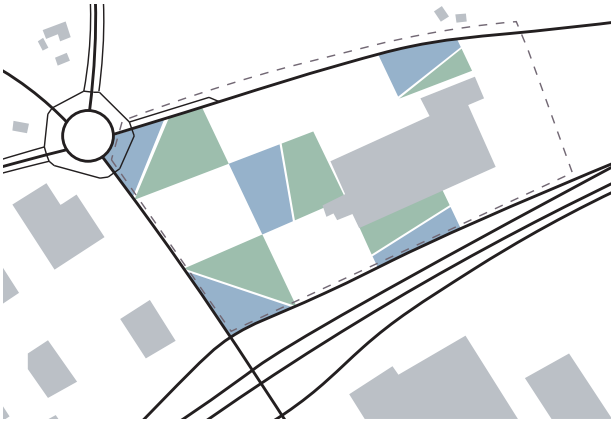
Ill. 66: Idea/Principle 2

The vegetation is maintained on the outskirts as a sound buffer for the traffic. However, alleys of green connects the green areas and creates recreational spaces in the center of the site.



Ill. 67: Idea/Principle 3

The wild vegetation is maintained on the outskirts. The grasscovers is split out as fragmented islands in the center and wild vegetation protects the islands. Paths connects the islands.



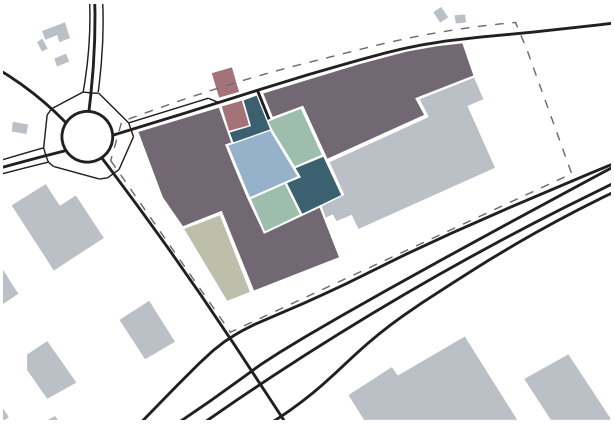
Ill. 68: Idea/Principle 4

This idea takes the point of departure in a grid system in which the site is split in different blocks. The blocks either contains greenery or not. The green block are only for recreational use.

06: MOBILITY ALLOCATIONS

This phase attempts to gather all the necessary vehicle based activities on site and explores the connection between them.

Carsharing
Bus parking
Two-wheeled transport parking
Gas station/Charging station
Car parking
BRT stop

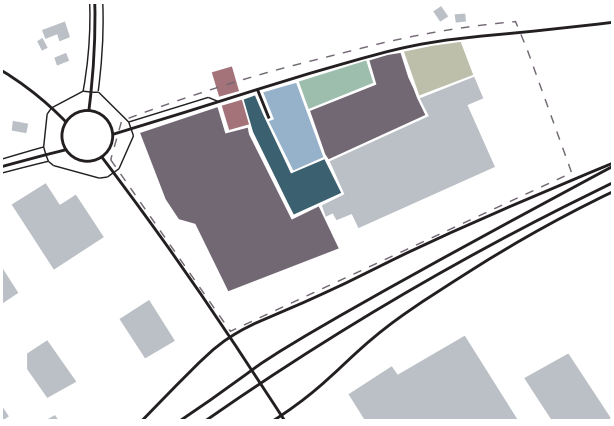


Ill. 69: Idea/Principle 1

The gas/charging station is located in the center on the site and is closely connected to the carsharing activities. Vehicles can get fuel/electricity while arranging the route or waiting for passengers.

Ill. 70: Idea/Principle 2

The two-wheeled transport parking is located at the store entrance to optimize the the distance for the last mile transport options to the shopping. The gas/charging station is on the outskirts.



Ill. 71: Idea/Principle 3

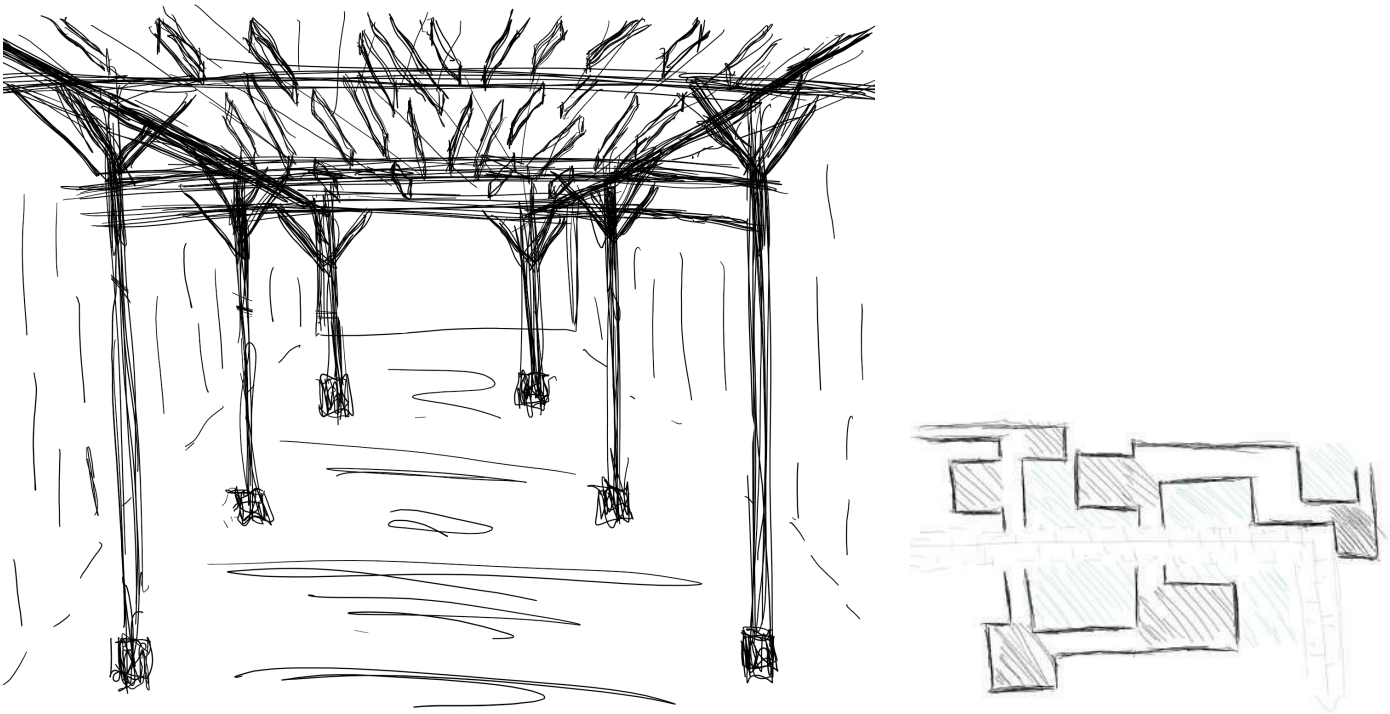
The parking for the two-wheeled transport optiions functions as a boulevard for pedestrians from the BRT stop to the carsharing area and store entrance.

Ill. 72: Idea/Principle 4

The carsharing area is placed at the center, affording the opportunity for a quick shopping trip for the driver while waiting for passengers. The carsharing are a integrated part of the parking.

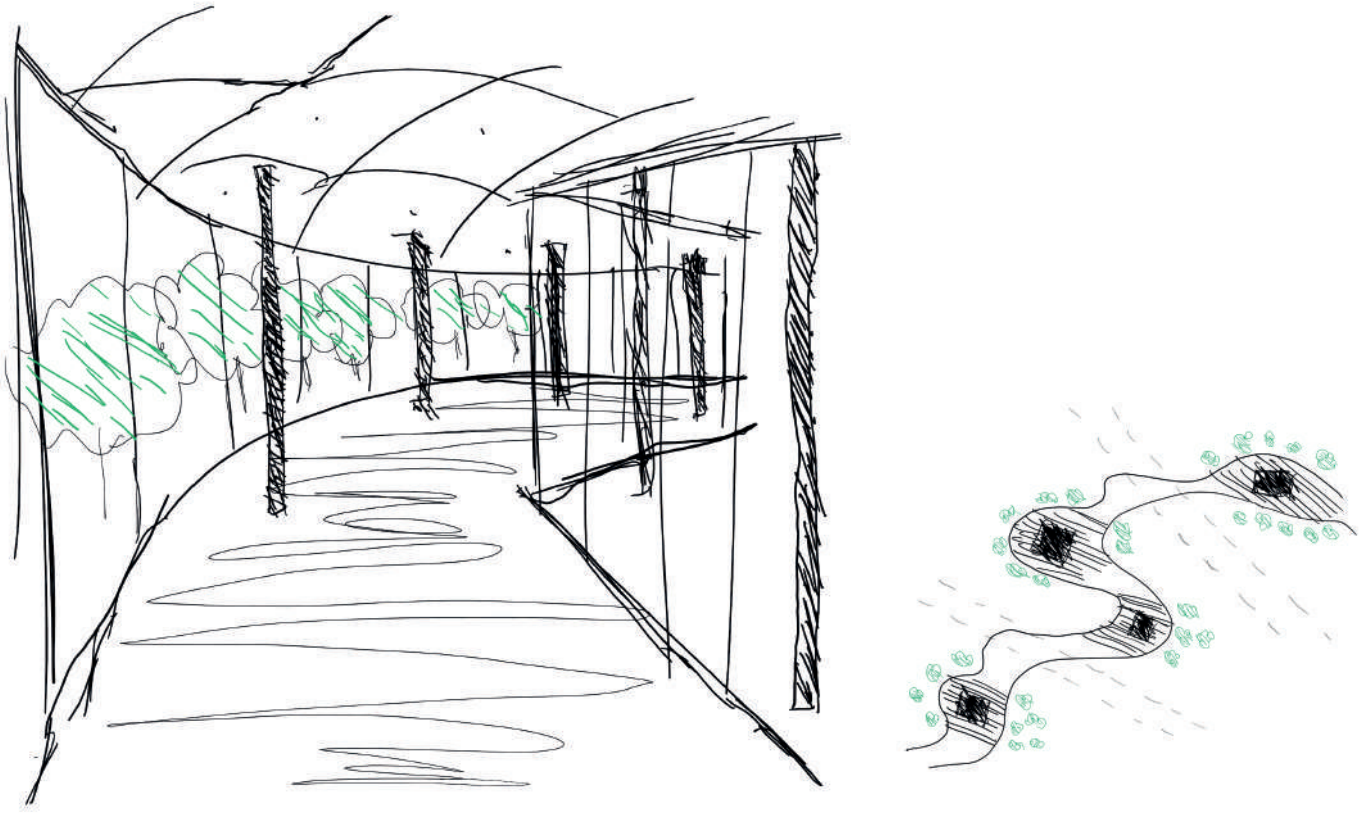
07: CONCEPT

This phase merges the six previous phases into two design concepts that attempt through synthesis to solve the criteria. The concepts take the point of departure in two different design philosophies described through the aforementioned case studies; Kengo Kuma and the reinterpretation and manipulating of traditional materials, and SANAA with a discrete philosophy which does not attempt to overwhelm the surrounding landscape. The two concepts are both illustrated through an abstract 3D view and plan (appendix 11 for other not chosen concepts).



Ill. 73: Concept 1 proposal

This concept takes the point of departure in a forest and how light through treetops can create interesting atmospheres. The hallways are assembled through a simple column beam system which supports the treetop. The column and beams extend through different branches that are stacked on top of each other. The branches do not resemble any specific system but are placed to enhance the notion of the unpredictability of the natural environment. The stacked branches leave holes through the roof, allowing the light to penetrate through. The structural principle is here the critical point which creates interesting spatial experiences, as the user will be able to experience the surrounding landscape through peaks in the construction.

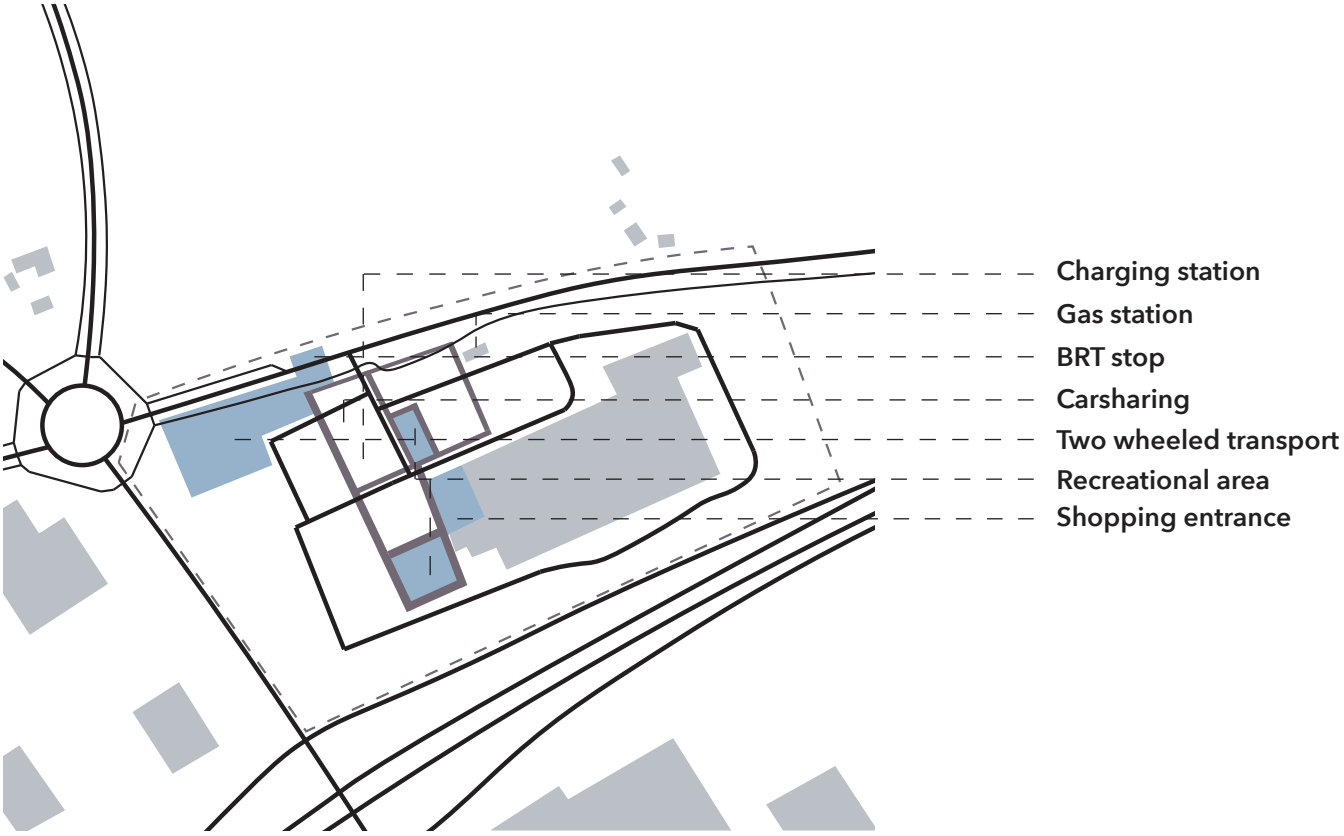


Ill. 74: Concept 2 proposal

This concept presents an organic structure in plan which slithers through the site like a snake. The constant turning creates the notion of unpredictability in the built environment as the user is directed through different areas with different qualities. Different critical points are located on the slithering path in which observation towers are placed, giving the user the opportunity to experience the surrounding landscape. Columns support a singular roof structure that extends through the whole plan proposal. The walls feature a transparent character in which again the surrounding are the critical point of attraction. The architecture does not attempt to overwhelm the landscape, but rather affords the experience by the construction of the simple and discrete structure.

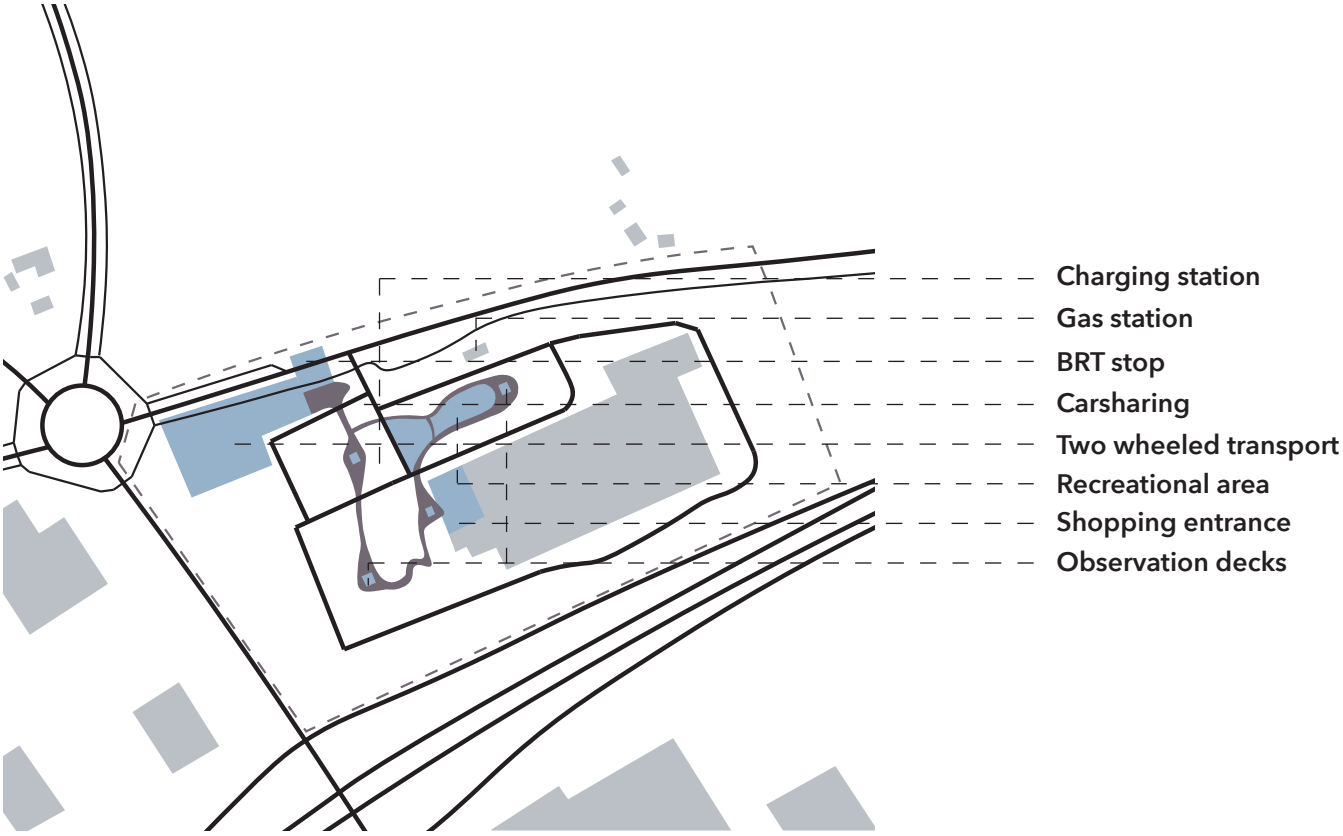
08: MASTERPLAN

This phase takes the point of departure in the previous phase and develops masterplans for the two discovered concepts. In this phase, the two masterplans are developed in relation to their atmospheric principles and the design criteria. Both concepts in relation to their masterplan will be evaluated. One masterplan which is based on one of the concepts will be chosen as the framework for the final design proposal (appendix 5; appendix 6). The concept and idea will be further developed and detailed in the next phases.



Ill. 75: Concept 1 masterplan proposal

This masterplans takes the point of departure in concept 1 and attempts to rearticulate the proposed atmosphere and geometric principle through a plan. The end result proposed a grid structure in which leads the user through narrow corridors on the parking lot. The blue blocks are defined as areas for people, in this masterplan it mostly features different gardens and recreational areas with a courtyard atmosphere as it is surrounded by built structure. The grid follows a geometric principle which attempts to ease the legibility of the different corridors. The different areas for people will emphasize different kinds of activities and is split out equally on the site. The corridors will feature open facades which allows the users to experience the surrounding landscape.



Ill. 76: Concept 2 masterplan proposal

This masterplan takes the point of departure in the second concept and its organic principle. The path weaves through the parking lot and is extended at the analyzed critical points of contact. In relation to functions, this plan features observation decks that are located at the lines of desire which offers views in a heightened location. Most of the activities for people are along the pathway. The activities in this plan are not distributed equally on the site and the recreational area is located on the eastern part of the site. This is an attempt to gather all the people in one area, which also leaves more parking spaces for the vehicles close to the shopping facilities. The paths are not a specific width but instead expands or narrows down based on the features of the surroundings.

09: OPTIMIZING FORM

The choice between concept and masterplan ended up being a hybrid between concept 1 and masterplan 2. Concept 1 is chosen because of its ability to create an atmosphere through the structural principle. However, does the structural principle seem to be taking too much focus from the surrounding landscape. This phase will then attempt to optimize the form in relation to the structural principle, for it to be able to create the notion of being in a forest but at the same time, do not overwhelm the surrounding landscape. The structural principle of the frame will be explored through the human scale by walking the path (appendix 8).

Ill. 77: Exploring the frame through the path

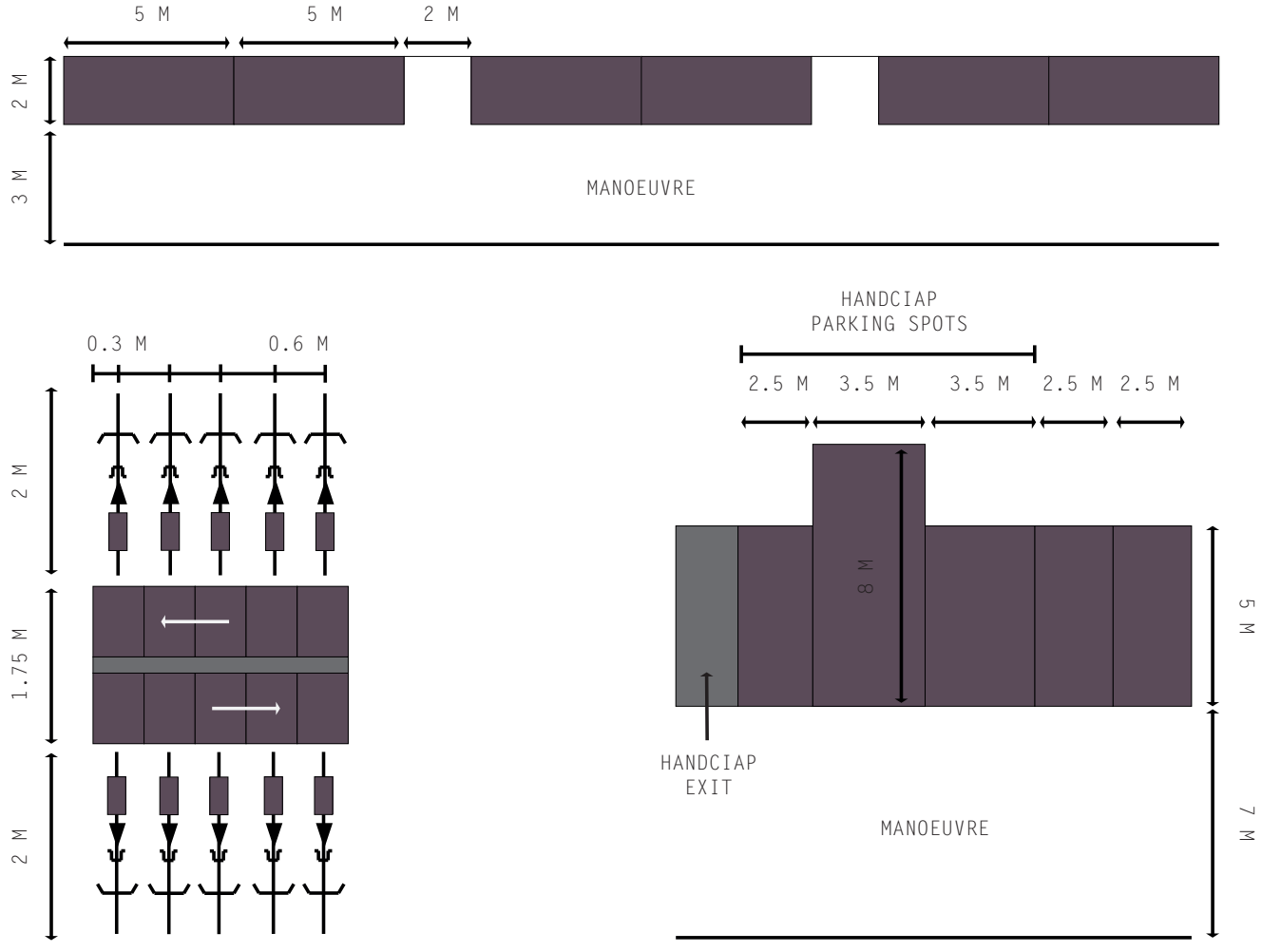
Ill. 78: Exploring the frame through the path

Ill. 79: Exploring the frame through the path

Ill. 80: Exploring the frame through the path

10: JOINING THE SPACE

This final phase attempts to facilitate safe spaces for pedestrians while also cater for the vehicles by optimizing and connecting traffic safety norms with the proposed masterplan. Masterplan 2 was chosen because of its ability to enhance the notion of the surrounding landscape and create unique atmospheres by leading the user through unpredictable organic paths. While this is being said, the main purpose of the area is still the mobility hub which presents the concept with some challenges. The vehicle has a universal defined form which does not suit well with organic shapes, the challenge then becomes how the space also can be comfortable for vehicles. The phase explores traffic principles in order to optimize the spaces for vehicles. Furthermore, design of the BRT lanes are explored (appendix 9).



Ill. 81: Parking principles (Aarhus Municipality, 2018)

PRESENTATION

The following chapter presents the final design proposal for the project. The presentation material highlights the proposals qualities in relation to beauty, usability and durability.

Ill. 82: Presenting the node

THE NODE

The design proposal merges different mobility node typologies into one area; the parking lot, the rest area, carsharing, and BRT station. The proposal is an attempt to change the perception of the aforementioned mobility typologies, thereby transforming the prejudice into something else. A new perception of mobility in which the users do not affiliate all aspects of mobility with a bad experience. This node is a manifesto in the way of thinking the specific mobility typologies into something more than A to B, thereby putting more focus into some of these mundane structures we encounter a lot in our everyday life. These typologies should be constructed and designed with the same curiosity and quality as urban public spaces or any other kind of attractive space.

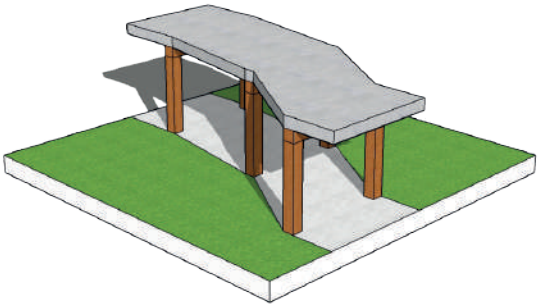
The proposal takes the point of departure in the notion of the soft node in addition to the existing site conditions. The parking spaces are placed at the edges of the area, whilst existing roads on the site are exploited as the main connections for vehicle-based mobility. Pedestrian zones are placed on islands located between the roads and parking spaces, with paths and roads crossing connecting the islands. Observations decks are the main attractions in the design proposal which enables the user to experience the existing surroundings. The soft node in this specific proposal emphasizes four main elements:

The path
The man paths slither around the site and thereby allows the users to experience different things whilst walking through the path. The path allows pedestrians to move freely and safely from the vehicles whilst being able to experience it from a distance. The path also connects important landmarks on the site; the shopping facilities, activity zones, observation decks, and green recreational areas.

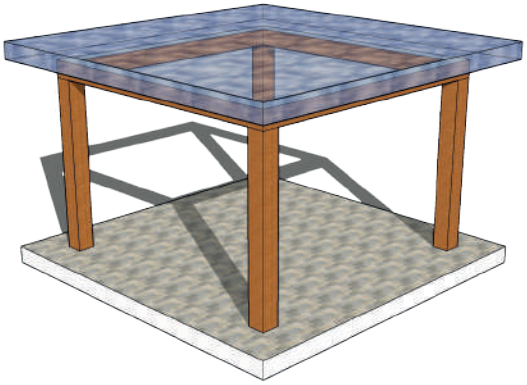
Transition zones
As the area mostly features vehicle-based activities, it requires many road crossings in order for the user to have total accessibility of the site. These road crossings are called transition zones in which the pedestrian and vehicle spaces are merged into a shared space under a big roof. Here, the materiality defines the shared spaces and affords low speeds for the vehicles, thereby creating a sense of security for the pedestrians.

Activity zones
The path is clearly defined in relation to width, however, it extends at specific points in which a small box is placed in the middle of the path. The activities differ from active to passive, bringing a diverse range of opportunities for the users. The chosen functions take the point of departure in the notion of community. The activities consist of; art gallery and library as the passive activities, and swing and climbing structure as the active activities.

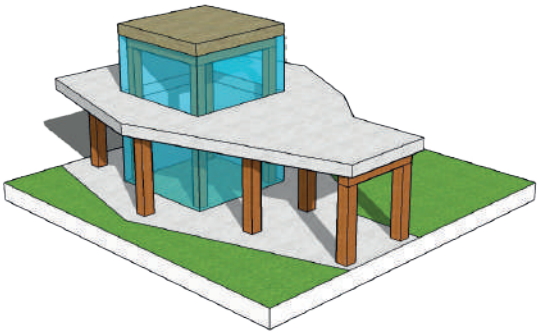
Nature as surroundings
Nature is placed adjacent to the path. Grass areas are placed between the paths to offer recreational areas for relaxing. The trees are tall and the treetops are only located at the top of the tree which allows the user to use the space under the tree for shelter. The tree trunk as placed with a specific distance, therefore the spaces in-between the trees frame different lines of desire in the surrounding areas.



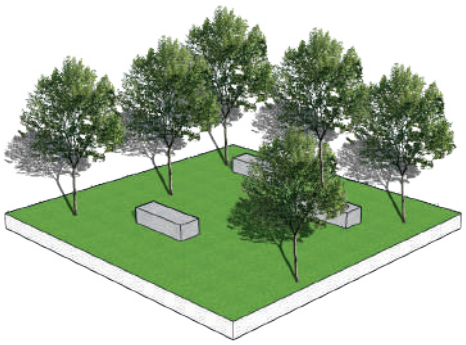
Ill. 83: The path



Ill. 84: Transition zones



Ill. 85: Activity zones

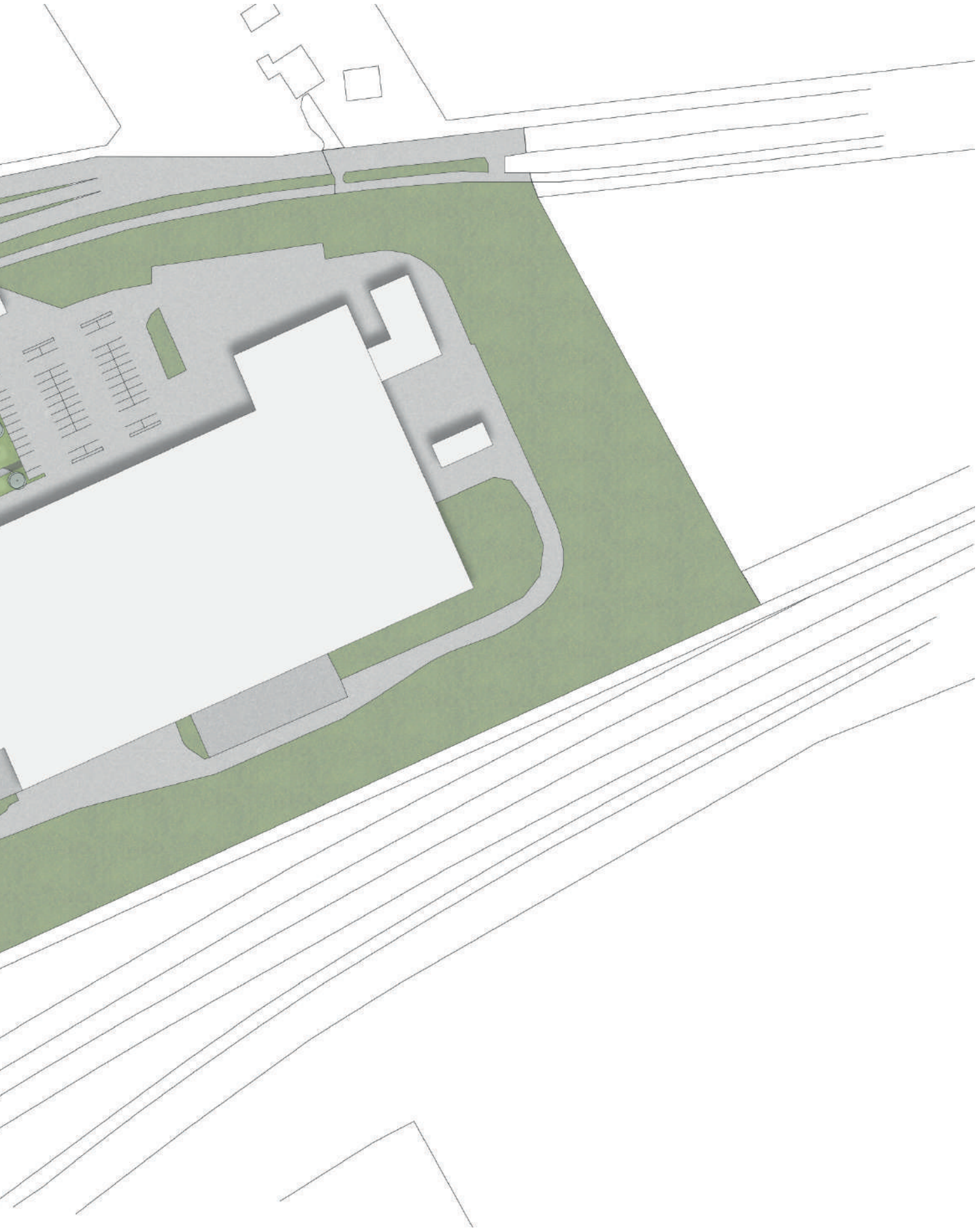


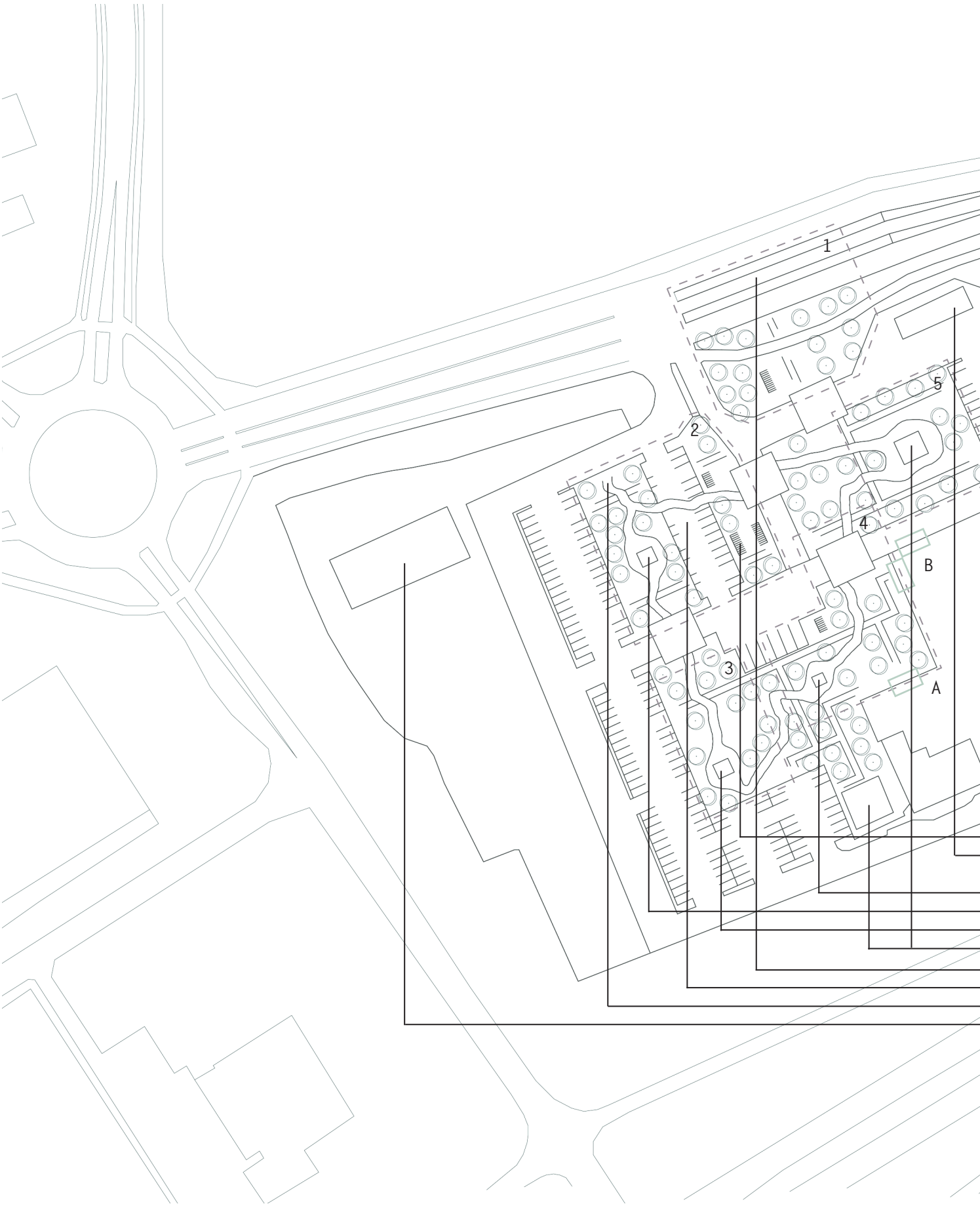
Ill. 86: Nature as surroundings

Ill. 87: Presenting the node

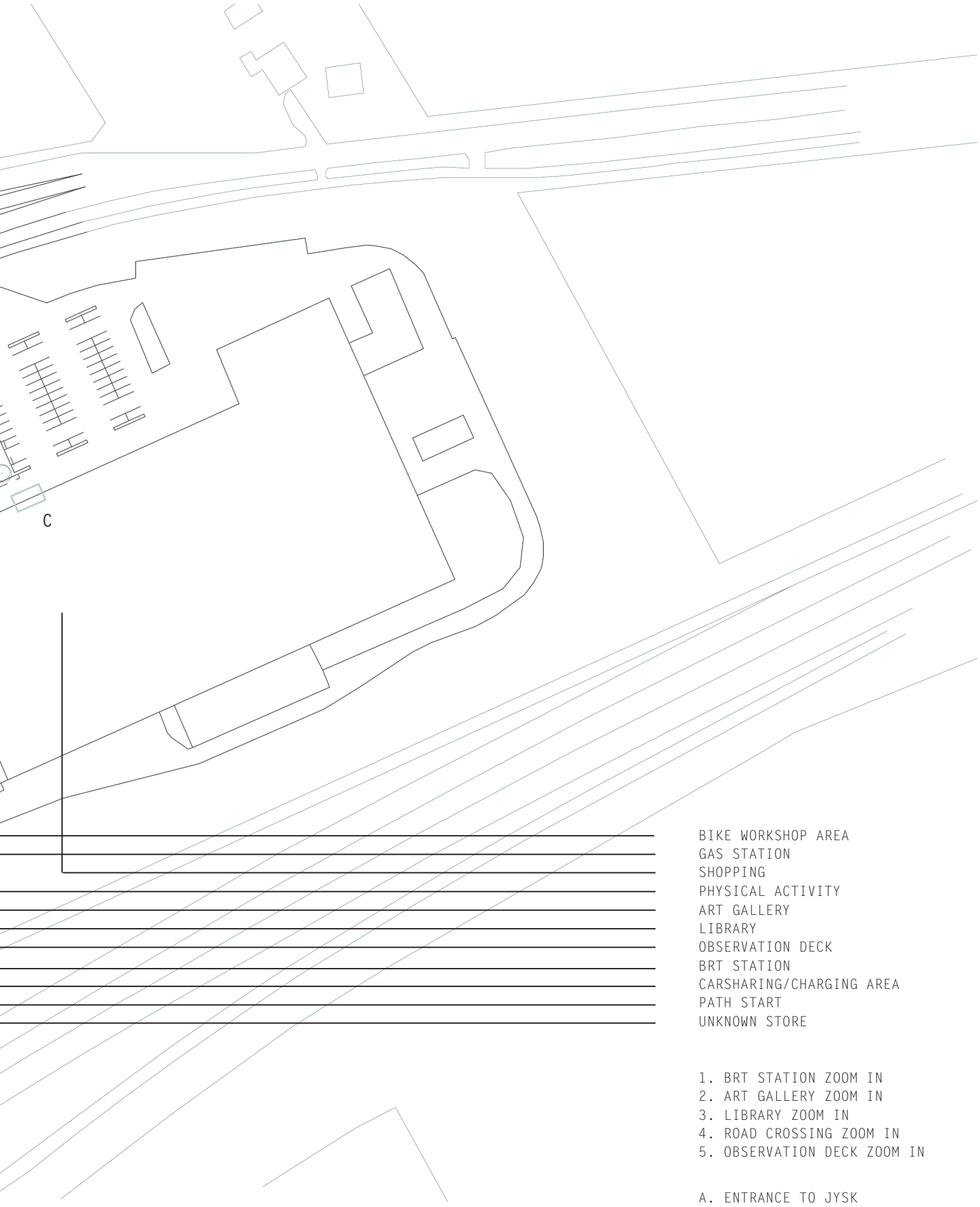
Ill. 88: Presenting the node

Ill. 89: Masterplan 1:1500





Ill. 90: Masterplan function overview



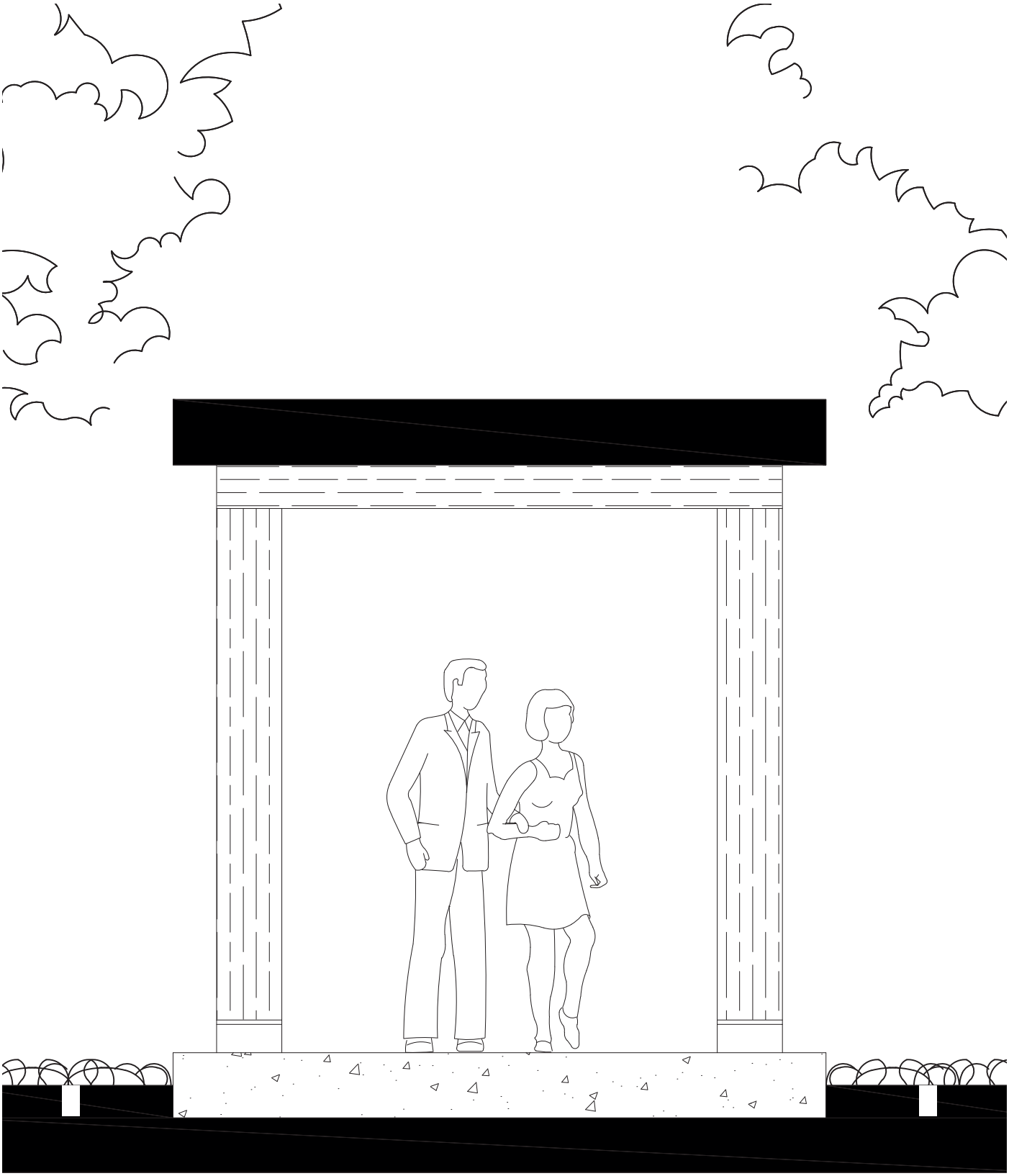
BIKE WORKSHOP AREA
GAS STATION
SHOPPING
PHYSICAL ACTIVITY
ART GALLERY
LIBRARY
OBSERVATION DECK
BRT STATION
CARSHARING/CHARGING AREA
PATH START
UNKNOWN STORE

1. BRT STATION ZOOM IN
2. ART GALLERY ZOOM IN
3. LIBRARY ZOOM IN
4. ROAD CROSSING ZOOM IN
5. OBSERVATION DECK ZOOM IN

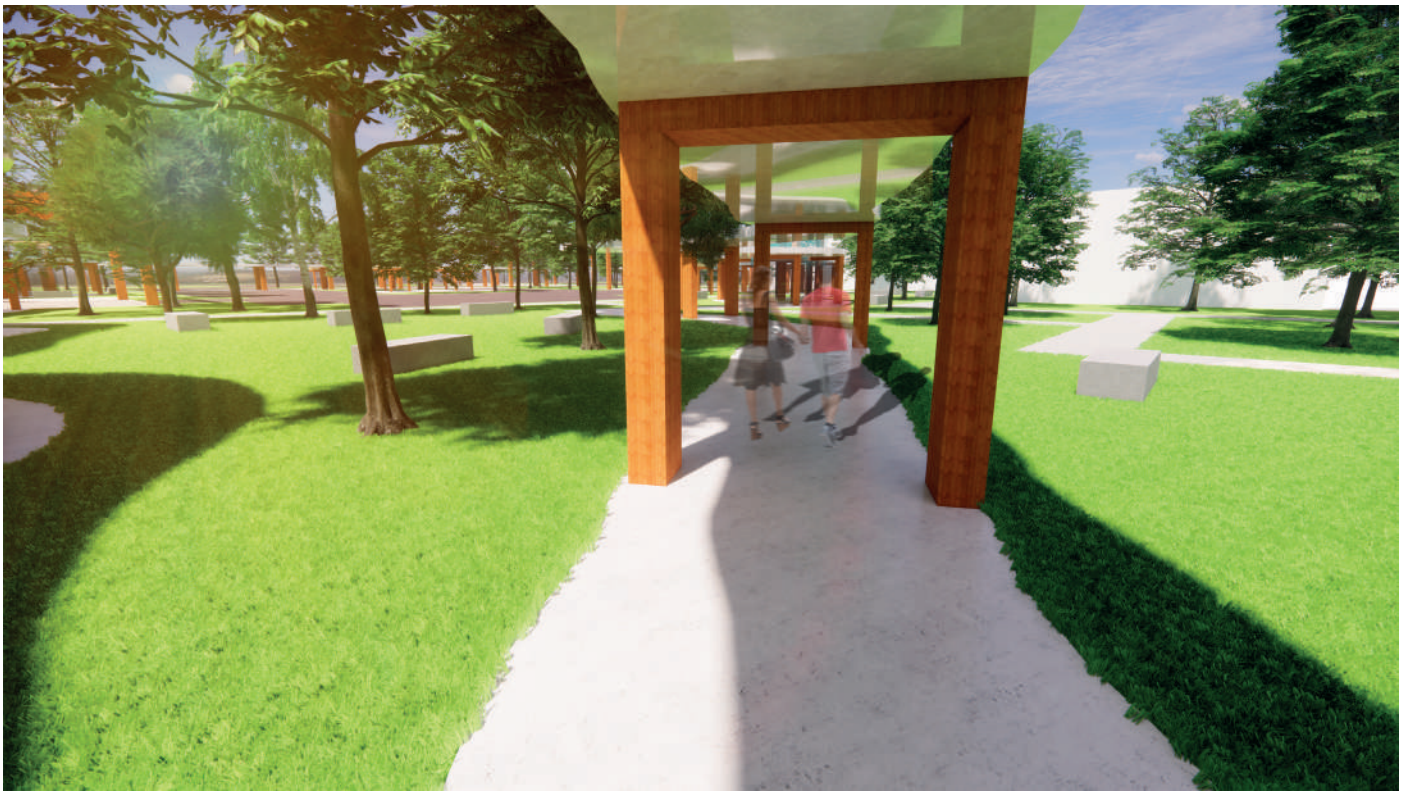
A. ENTRANCE TO JYSK
B. ENTRANCE TO KVICKLY
C. ENTRANCE TO MAXIZOO

Ill. 91: Observation deck

Ill. 92: The path and the landscape



Ill. 93: Path section 1:25

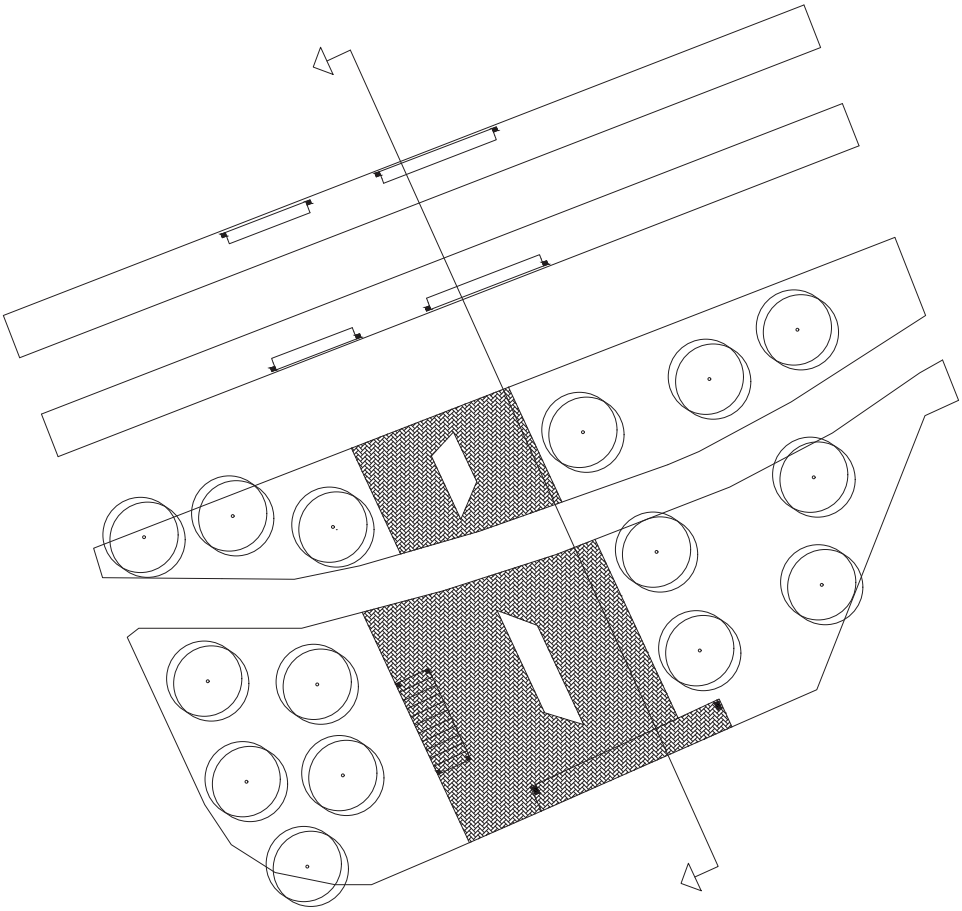


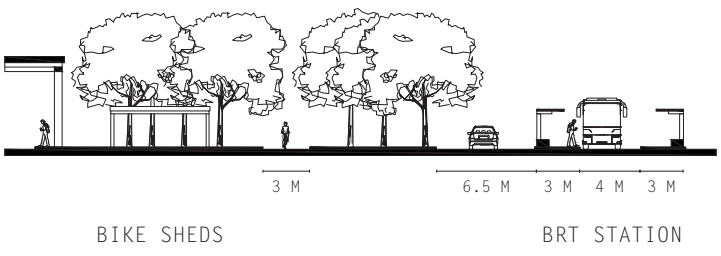
Ill. 94: The path

The path is the key element of the proposal which connects all the activities of the area. The roof above the path ensures shelter to visitors and creates a sense of embracement by the surroundings. The wooden frames attempt to lead the visitors through the path and establishes a direction. Lighting is placed in the grass on both sides of the path, to enhance the path as a path in the dark.

Ill. 95: Transition zone

Ill. 96: The starting point

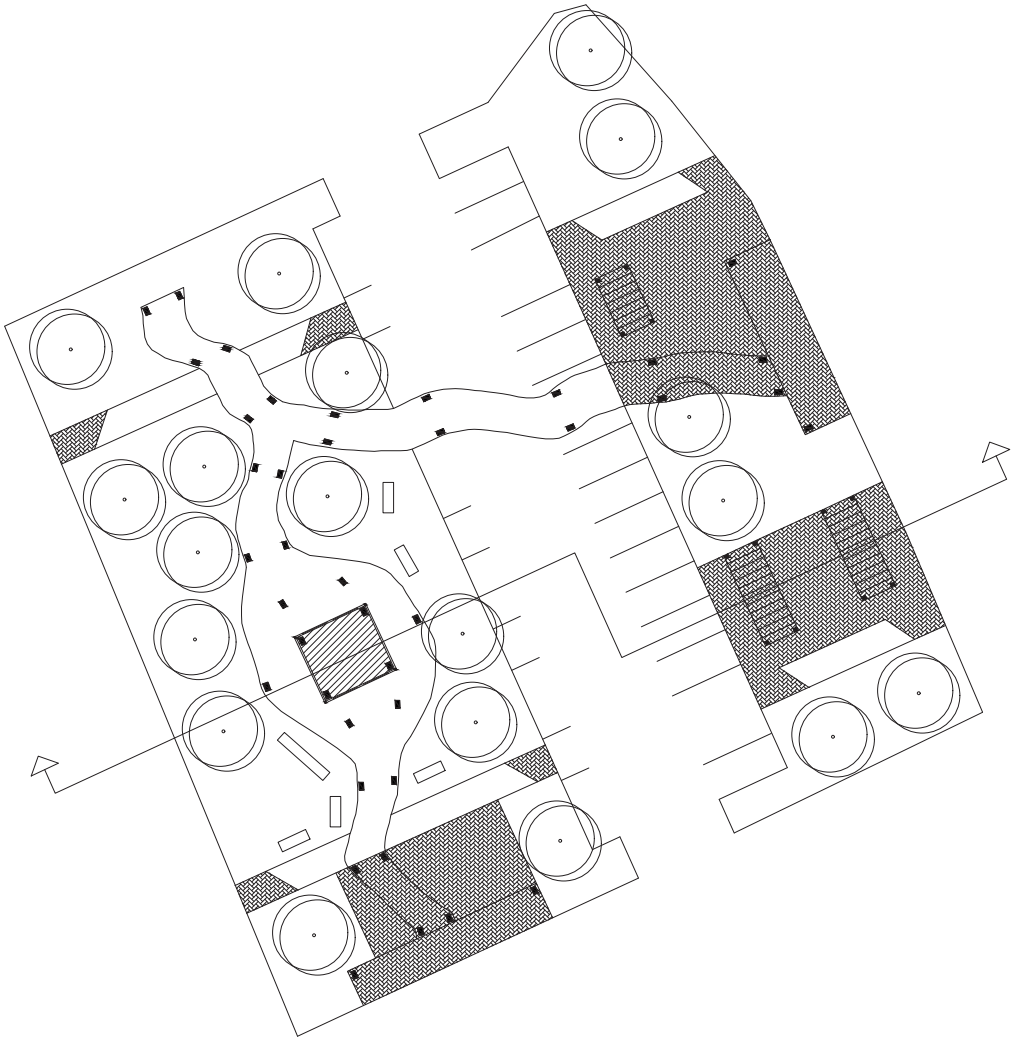


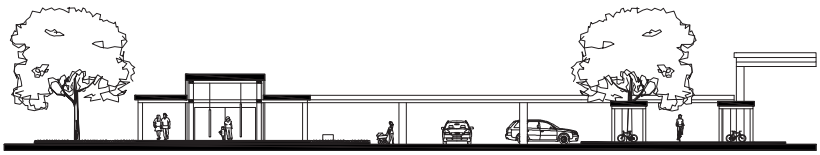


Ill. 97: Zoom in 1 - Map and section (1:500)

Ill. 98: BRT station

The BRT station is located at the main country road adjacent to the rest area parking lot. The waiting facilities embrace the same materialities as the rest of the design proposal to create a sense of similarity throughout the area. Users of the BRT can use the activities and green areas while waiting for the BRT.

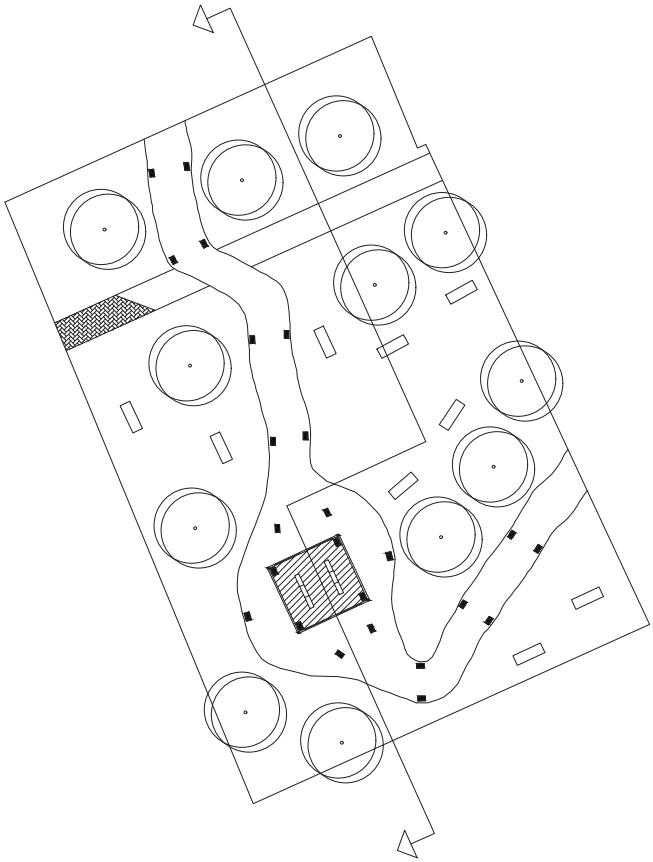


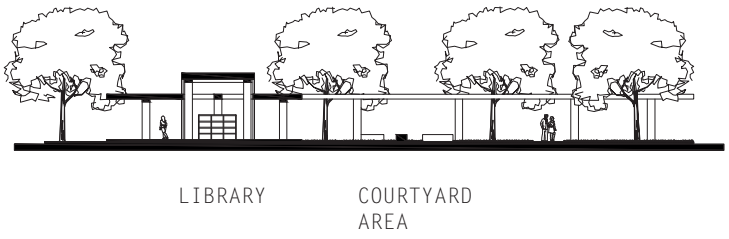


Ill. 99: Zoom in 2 - Map and section (1:500)

Ill. 100: Car sharing waiting facilities

The car-sharing area have dedicated parking spaces which only will be used at a limited timespan. The area is located close to the entrance and exit to get the vehicles on the roads as quickly as possible. Passengers and drivers will be able to use the adjacent green areas or check out the art gallery.

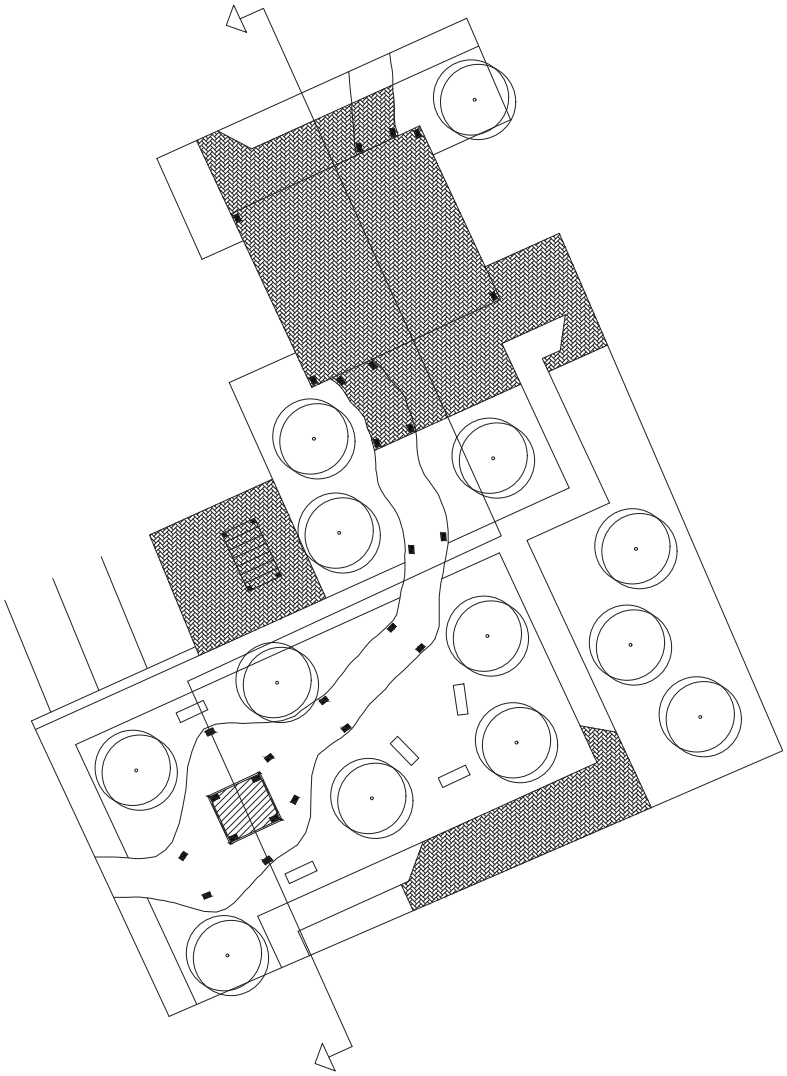


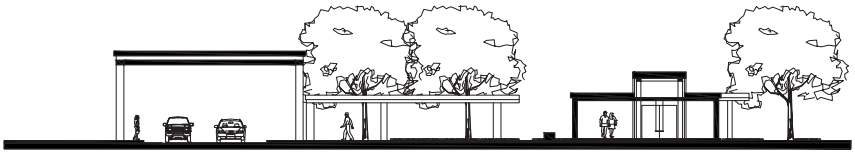


Ill. 101: Zoom in 3 - Map and section (1:500)

Ill. 102: Inner courtyard

The path wraps around green areas to create a feeling of the enclosure as an urban courtyard. The green areas can be used for travelers waiting for their mode of transport or drivers traveling for a long time who needs a rest. This area features a small library in which books can be brought outside to enjoy.

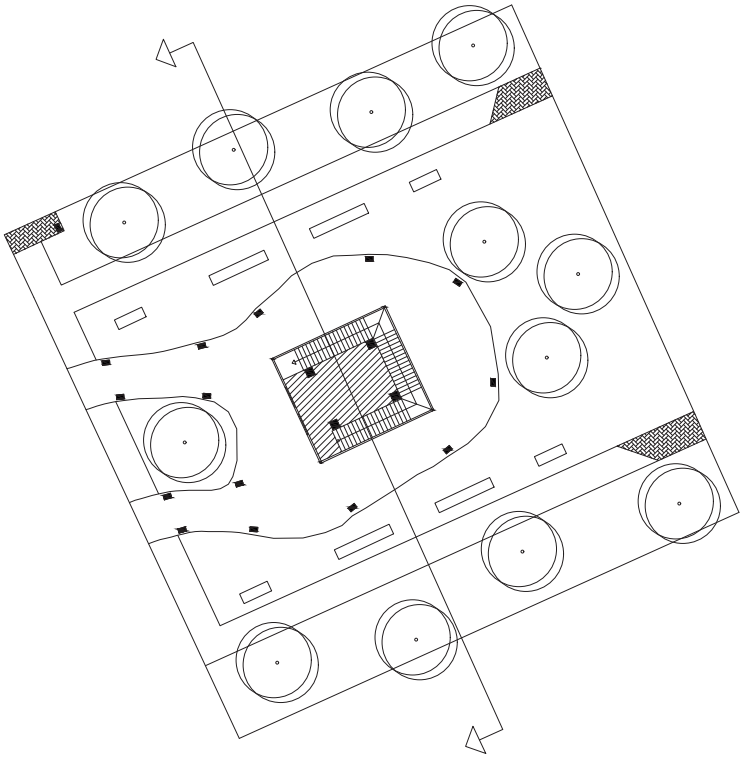


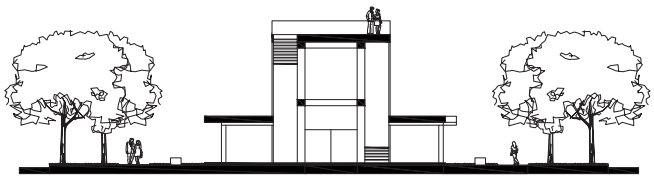


Ill. 103: Zoom in 4 - Map and section (1:500)

Ill. 104: Path leading to a transition zone

The path connects all the mobility facilities to the main attraction of the existing area which is the shopping facilities. The transition zones ensure safe crossings through the parking area. Handicap parking spaces are located close to the shopping entrances to ensure easy accessibility.





Ill. 105: Zoom in 5 - Map and section (1:500)

Ill. 106: The path leading to a observation tower

The observation decks are the main attractions of the area in which the guest are able to experience the surrounding countryside landscape and the Limfjord. You move under the roof of the path and trees, but suddenly you experience the sensation of being above the treetops instead.

Ill. 107: Arriving at the BRT station

Ill. 108: The path crossing parking spaces

ROADS AND PARKING

The project places vehicle parking at the outskirts of the area. Bicyle parking are located at critical points (close to the shopping facilities, carsharing area and BRT station).

Inspiration
Amount of bicycle parking is taken from cases around rural/suburban areas in relation to the Århus lightrail (appendix 2). Width for BRT station is taken from cases around rural/suburban areas in relation to the Århus lightrail (appendix 1) they were all around 5-6 meters (appendix 7).

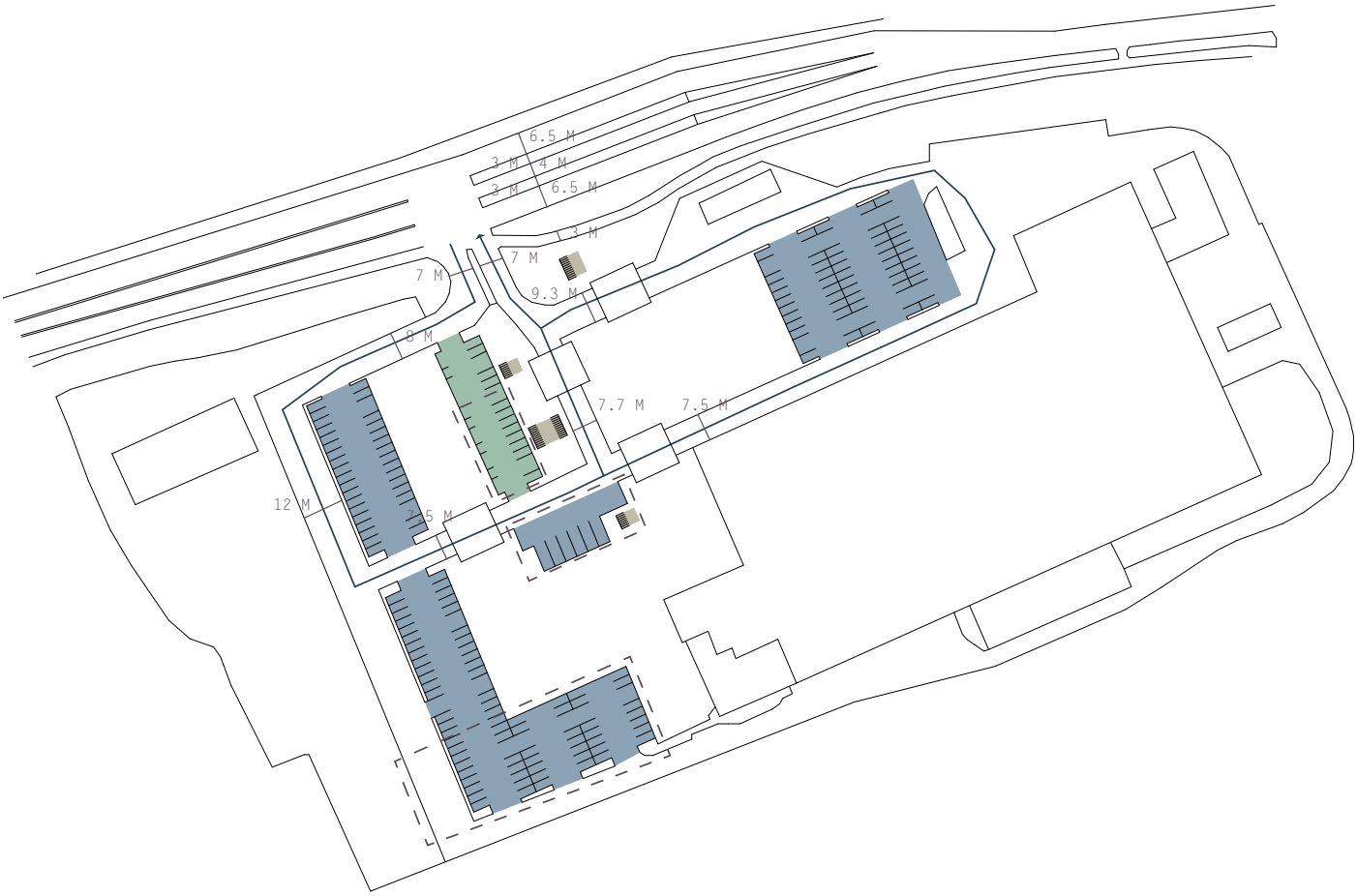
Amount of parking for two wheeled transport: *52*

Calculated parking with 20% to take saturday rush in consideration: 120 + 20% = 141 rounded up to 150
Amount of car parking: *159*

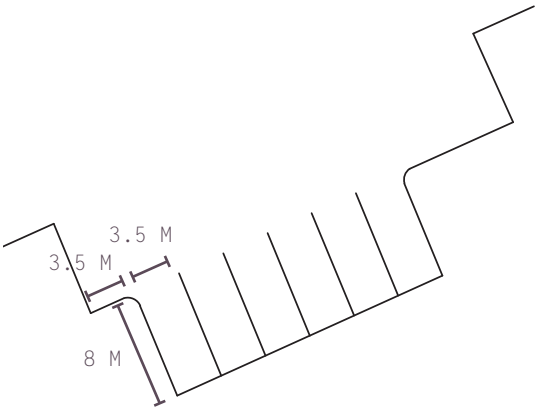
Parking for carsharing/quick wait: *18*

Handicap parking: *6*

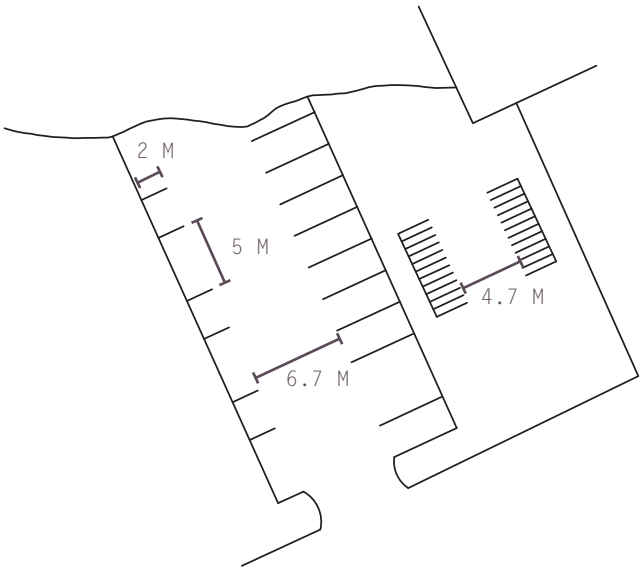
Car parking area
Two-wheeled parking area
Car-sharing/Charging area
One way road



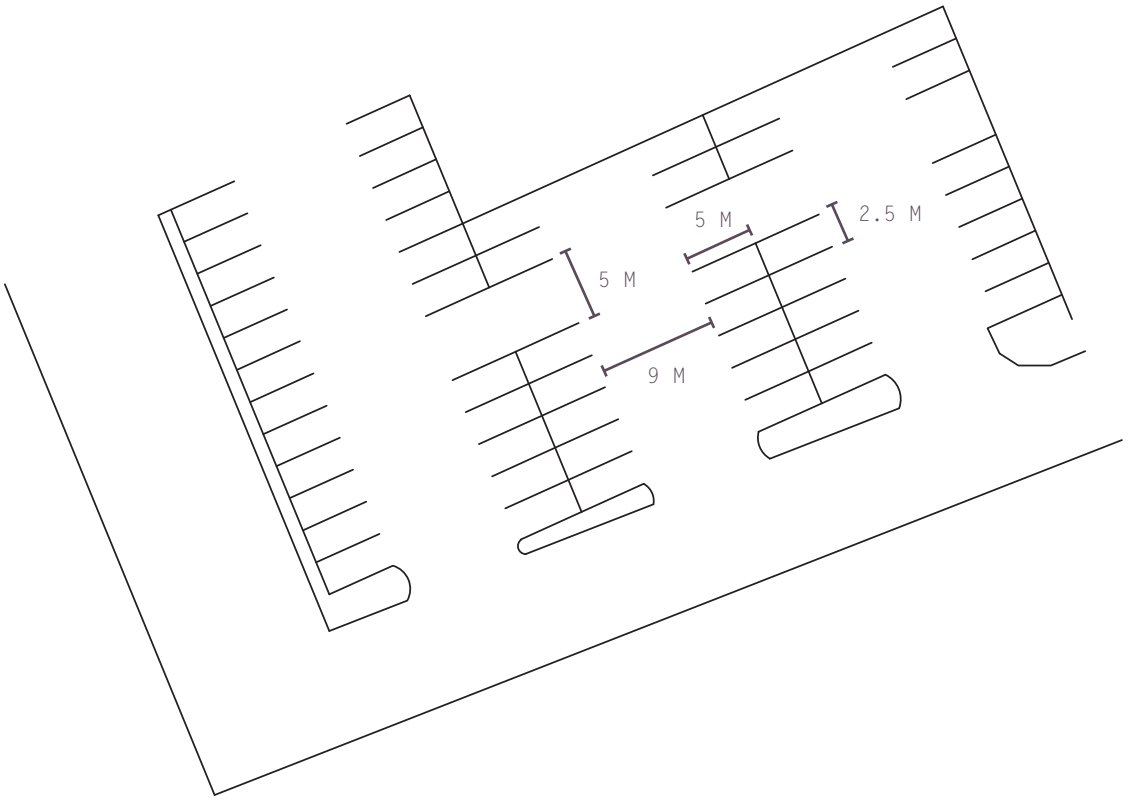
Ill. 109: Road and parking plan



Ill. 110: Handicap parking detail 1:500



Ill. 111: Car and bicycle parking detail 1:500



Ill. 112: Car parking detail 1:500

MATERIALS

Ill. 113: Stone pavement

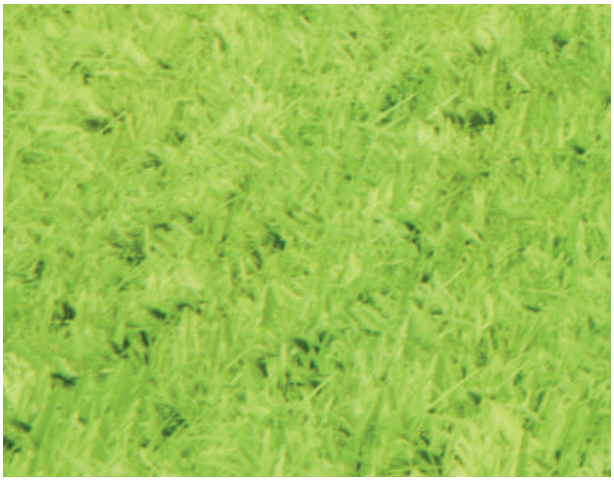
This materials is placed at crosswalks. The material is more rough and does not afford fast movement. This creates awareness for the user, that they now have to be aware of the surroundings which involves vehicles. Thereby ensuring safe transitions between vehicle roads.

Ill. 114: White concrete

The white concrete is placed at all pedestrian streets. The concrete surface is presented as smooth which affords fast movement and ensures mobility for everybody. The concrete is white because of its ability to reflect sunlight, thereby lighting up the areas adjacent to the path.

Ill. 115: Wood

All load bearing construction on the site is wood. The wood attempts to reference the nordic tradition which emphasizes architecture in relation to the experience of tactility. The wood is inhomogenous which also attracts the user to experience the materiality from all is aspects.



Ill. 117: Grass

The grass is located at areas which are not intended for mobility. The change from hard to soft surface defines the function of the area. The soft surface afford slow mobility which indicates the user to slow down and relax. Here, the user is invited to stay and enjoy the surroundings.

EPILOGUE

The following chapter concludes and reflects on the project, both process and final proposal.

CONCLUSION

Through this semester project; Designing Urban Mobility, a new mobility hub in Bouet has been proposed. The mobility hub's main purpose given by Aalborg Municipality is to facilitate efficient shifts in modes of transport in which the new BRT is the turning point of the hub. Options for car-sharing and the use of two-wheeled transport are also made possible in the area. In addition to the new functions, it was decided that the site should maintain its existing functions as a rest area and parking lot for shopping facilities.

The design proposal takes the point of departure in the notion of the mobility turn in which mobility is more than A to B. The paradigm critiques mobility infrastructure in only focusing on efficient flow and mobility of people and vehicles. The mobility node should also be an attractive and pleasant space to stay for people. The design proposal involves two visions that both complement and affect each other. The notion of the soft node attempts to discuss the vocabulary of urban public space design, and thereby adapt them to mobility nodes. This indicates how the mobility node should be designed and constructed with the same sensitivity and quality as urban public spaces, which are designed to facilitate social life and self-reflection. The second vision critiques the prejudice and community perception of the rest area and parking lot typology. It attempts through a pragmatic paradigm, to work with the trouble and turn the negative perceived site conditions into something positive.

The design proposal at Bouet reinterprets the parking lot and rest area typology whilst integrating new mobility functions to the area. The result is a green public space in which human activities are located on islands in between all the mobility functions. The islands ensure a feeling of safety from the vehicle whilst still attempts to facilitate the beauty of vehicle-based transport. All the activities chosen for the site ensures a pleasant shift in the mode of transport or rest from a long journey. The specific design elements take the point of departure in the nordic architectural tradition which emphasizes tactility and atmosphere for all the senses. Furthermore, the notion of the welfare state in which all people should be able to do the same things. Hence, the whole population should be able to access the same areas and be able to enjoy the same activities. The proposal attempts to unveil the qualities of rural/suburban living and works with the challenges of spaces close to big loud roads. Observation towers are the main attraction points of the area in which the visitors or mobility users will be able to enjoy and experience the vehicle on the roads and the countryside.

REFLECTION

The reflection will reflect upon four different aspects of the project in which all aspects reflect different phases of the project.

Theory
All of the theoretical standpoints presented in the preliminary phases of the project attempted to obtain principles for designing the mobility node in Bouet. However, when working in an intense iterative design process, it seems as some theoretical inputs are emphasized more than others. Working with the nordic architectural tradition in the design felt obvious, as the materials and atmospheres let me reflect upon how it staged the mobile situations. Furthermore, the nordic tradition correlated directly with the notion of affordances and the tectonic principles which were active tools for evaluating the design proposals in the process. The principles of universal design seemed not prioritized through the design process, as the conceptual pragmatic way of thinking replaced the principles.

Process
Working in a design process alone is already filled with challenges, as there is no one to bounce ideas and feedback with. The emergence of COVID-19 and the shutdown of the university facilities led to more challenges, as working from home would not let me directly contact my network at the university to get feedback on my work. Instead, I attempted to contact my fellow students on social media to ask small questions and arrange discussions and small pinups. A huge amount of people were asked from different years of architecture and design education. This led to a lot of feedback which informed and improved the design. All the feedback was, however, a struggle to document as it was a very dynamic process.

Design
In the design, some things were emphasized more than others. The emergence of the notion of the soft node and vision of the project led to a kind of conceptual thinking which lasted almost until the end of the project. This meant, the detailing of specific areas can be lacking. The BRT station challenged in the way as it was necessary to place it on the country road to ensure comfortable passenger experience and reduce travel time. The connection from the main site to the road was filled with challenges as it required many crossings. To do design interventions on a big country road could slow down the vehicles, but would, however, create congestion in the area. Furthermore, bike parking spaces are split on the site at many locations which could lead to some areas being less available with bike parking spaces than other areas. A more comprehensive evaluation of the bike parking strategy could be done, but the vision was, however, to ensure bike parking at the critical points of contact on the site. The vision of the soft node emphasized how mobility and human activity should be in symbiosis and it was envisioned for the whole site to split an equal 50/50 split of the two elements. Working with that notion meant the end result in some areas, was the vehicle roads were wide enough to have two cars side by side, but the site only required to have one car on the road.

Vision/Soft node
The notion of the soft node and the vision of changing the perception of the mobility nodes could be implemented in a broader context. As the design of every mobility node faces its own challenges, it is important to understand the opportunities and constraints of a site. Thereby, working with the negatives of mobility and attempting to turn them into qualities can be implemented at the design over every kind of mobility node. Hence, the same goes for the notion of the soft node. The soft node attempts to critically evaluate the everyday mundane mobility nodes, in order to exploit the quality and sensitivity for designing any other public space, as the mobility nodes should be designed as equals to any other public space.

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ILLUSTRATIONS

Ill. 1-7: *Own illustration*

Ill. 8: *https://www.ltarkitekter.dk/seb-da-0*

Ill. 9: *https://www.archdaily.com/925970/copenhill-energy-plant-and-urban-recreation-center-big/5d977e0d284dd1ffa4000012-copenhill-energy-plant-and-urban-recreation-center-big-photo?next_project=no*

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Ill. 51-59: *Own illustration*

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Ill. 61-117: *Own illustration*

Ill. 118-133: *Google Earth*

Ill. 134: *https://www.flickr.com/photos/globetrekimages/30549861624*

Ill. 135: *https://www.arup.com/projects/jewel-changi-airport*

Ill. 136: *https://www.moviatrafik.dk/media/6758/112212emultiskift-guide-til-stoppestedudvikling.pdf*

Ill. 137-138: *Own illustration*

Ill. 139: *https://www.aalborg.dk/media/8217587/udredningsrapport.pdf*

Ill. 140-147: *Own illustration*

APPENDIX

The last chapter presents related themes and aspects needed further explanation.

1. ÅRHUS LRT STATIONS (PLATFORM WIDTH)

Ill. 118: Assedrup Station (5.5 m width)

Ill. 119: Viby J Station (6 m width)

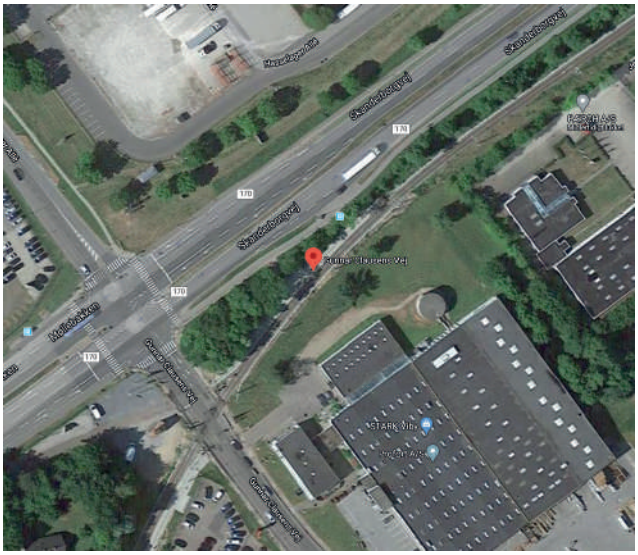
Ill. 120: Odder Station (6 m width)

Ill. 121: Tranbjerg Station (5.5 m width)

2. ÅRHUS LRT STATIONS (PARKING)

Ill. 122: Nørrevænget contextual map

Ill. 123: Nørrevænget street view (5 parking spots)



Ill. 124: Gunnar Clausens Vej contextual map

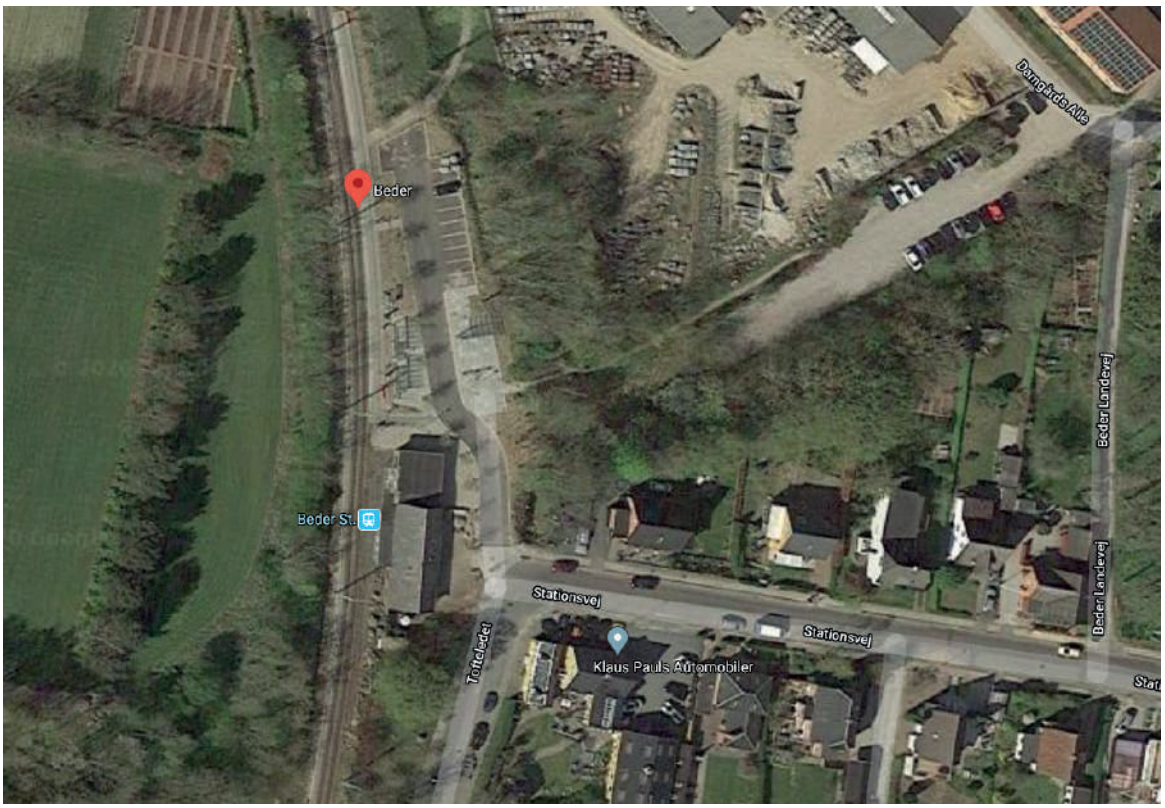
Ill. 125: Gunnar Clausens Vej street view (10 parking spots)

Ill. 126: Mårslet contextual map

Ill. 127: Mårslet street view (+15 bicycles parked without facilities)

Ill. 128: Vilhelmsborg contextual map

Ill. 129: Vilhelmsborg street view (10 spots, rounded parking installation)



Ill. 130: Beder contextual map

Ill. 131: Beder street view (72 parking spots compared to 10 car parking spots)

Ill. 132: Viby J contextual map

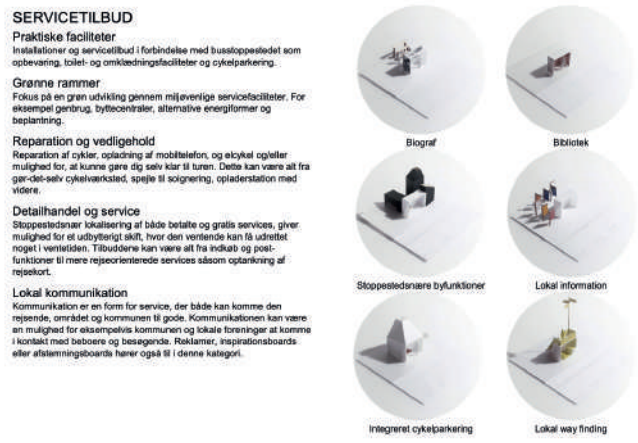
Ill. 133: Viby J street view (+50 parked bicycles with 30 not free car parking spots in the area)

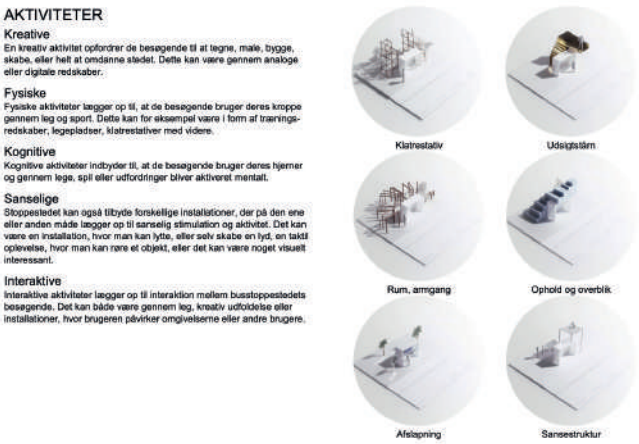
3. CHANGI AIRPORT

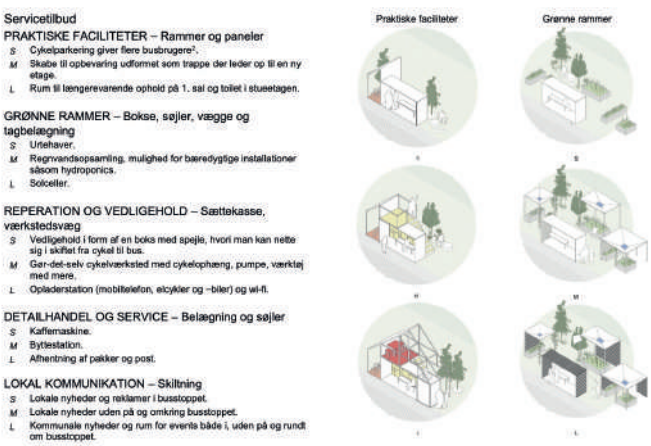
Ill. 134: Changi Airport Terminal 3 in Singapore by Skidmore, Owings & Merill

Ill. 135: Jewel Changi Airport in Singapore by Moshe Safdie

4. ACTIVITIES







Ill. 136: Activities suggestions from Movia (Movia, 2018)

5. CONCEPT 1 MASTERPLANS






Ill. 137: Concept 1 masterplans proposals

6. CONCEPT 2 MASTERPLANS






138: Concept 2 masterplans proposals

7. BRT DIMENSIONS

STOPPESTEDER

OVERORDNEDE RETNINGSLINJER
En letbane eller BRT skal binde de byområder sammen, som den passerer. Det gælder både det fysiske anlæg i form af spor og køreledninger men også det identitetsmæssige. En identitetsmæssig sammenhæng skabes ved at hele transportsystemet, både tracé, stoppesteder og andet teknisk udstyr, har samme overordnede udtryk.

De 24 stoppesteder på etape 1 indgår i forskellige bymæssige og landskabelige sammenhænge, ligesom de vil komme til at variere i størrelse og kompleksitet.

Stoppestederne skal være genkendelige, uanset hvor på strækningen de ligger, for at gøre det overskueligt og komfortabelt for brugerne. Samtidig skal designet være tilsvarende robust i forhold til at kunne indpasses i de forskelligartede by- og landskabsmæssige sammenhænge.

I VVM fasen vil der skulle laves et egentligt designprogram for hele transportsystemet.

DIMENSIONER PÅ PERRONER
Det er tilstræbt at anlægge perroner på retlinede strækninger.

De sidelagte perroner har en længde på enten 40 m eller 60 m på strækninger, hvor etape 1 kører i delt tracé med busser. Bredden på perronerne er minimum 2,7 m.

Perronhøjden tilpasses valg af materiel, så der sikres trinløs indstigning. Eventuelle forskelle i indstigningshøjden mellem busser og letbanetog kan eventuelt nødvendiggøre særlig udformning af stoppesteder, som både betjenes af busser og letbanetog.

ADGANG, TILGÆNGELIGHED OG KNUDEPUNKTER
Det er vigtigt, at der er gode adgangsforhold til stationerne for alle typer af trafikanter. Det vil sige, at det bør være nemt at komme til og fra stationerne, uanset om man er med bus, i bil, på cykel eller gående.

Hvor etape 1 krydser den lokale, regionale og nationale bus- og togtrafik, bliver stoppestederne vigtige trafikknudepunkter med mange omstigende passagerer. Ved disse knudepunkter vil der være behov for ombygning af et større areal for at sikre optimale omstigningsforhold.

Den videre planlægning af knudepunkter og optimering af skifteforhold sker i VVM fasen.

MATERIEL

Der er i udredningsarbejdet lavet en analyse af mulighederne for rullende materiel for både en BRT og letbane. Af hensyn til pris og leverancesikkerhed forudsættes både for BRT og letbane valg af materiel, som er velafprøvet standard på udbudstidspunktet.

BRT
Det er forudsat, at det rullende materiel for en BRT er 24 m dobbeltledbusser, så der tilbydes nogenlunde samme kapacitet for letbane og BRT løsningerne. Der findes forskellige leverandører af denne bustype, men udbuddet er dog noget mindre end for de mere traditionelle bustyper.

Bussernes længde stiller særlige krav til længden og indretningen af stoppesteder for at sikre, at busserne kan holde tæt på perronen. En optisk ledning af bussen, hvor bussen guides ved hjælp af ledelinjer, kan forbedre busdriften. Det øger komforten for chaufføren og forbedrer adgangen til bussen for passagererne via en bedre styret tilkørsel til perronerne.

I Rouen har optisk ledning bidraget til driftsmæssige forbedringer. Teknologien har dog visse udfordringer – få leverandører, funktion under klimaforhold med sne, økonomi mv. – hvilket nødvendiggør særlig opmærksomhed. Særlig de driftsmæssige udfordringer i vintermånederne kan hindre brug af løsningen i Aalborg.

Forskellige motorteknologier vil være mulige. Det kan eksempelvis være traditionelle dieselmotorer eller hybridløsninger – seriel og parallelhybrider – som er designet til brug i bymæssig bebyggelse og karakteriseres ved et mindre brændstofforbrug og mindre støjemissioner.

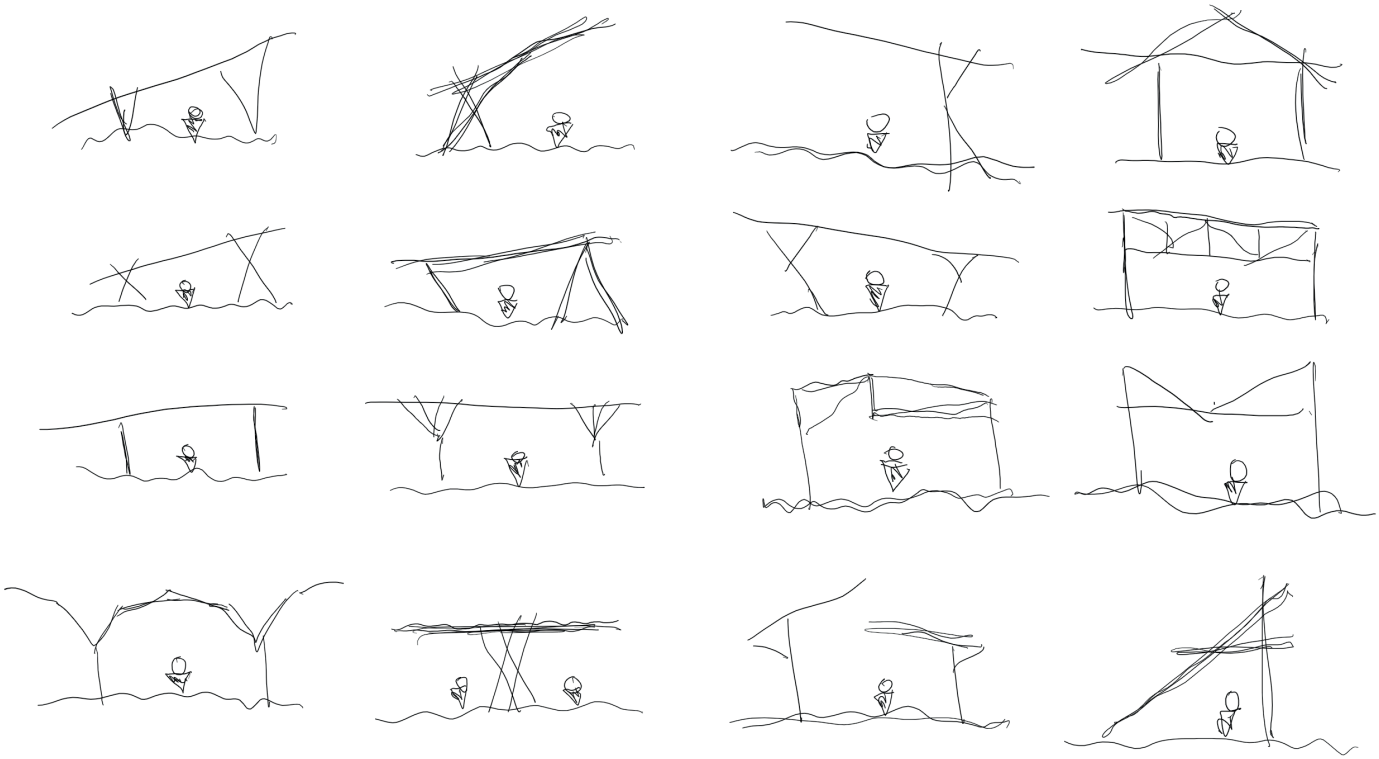
Flertallet af busleverandører tilbyder hybrid løsninger og erfaringerne hermed er generelt positive, selvom omkostningerne er højere og busserne kræver dyre vedligeholdelsesarbejder hver 5-8 år i forbindelse med udskiftning af akkumulatorer.

Der findes i dag ikke typegodkendte dobbeltledbusser, som kan anvendes i Danmark, så brugen af denne bustype vil forudsætte en forudgående godkendelse af Trafikstyrelsen.

I den videre bearbejdning af projektet skal der tages nærmere stilling til valg af materiel.

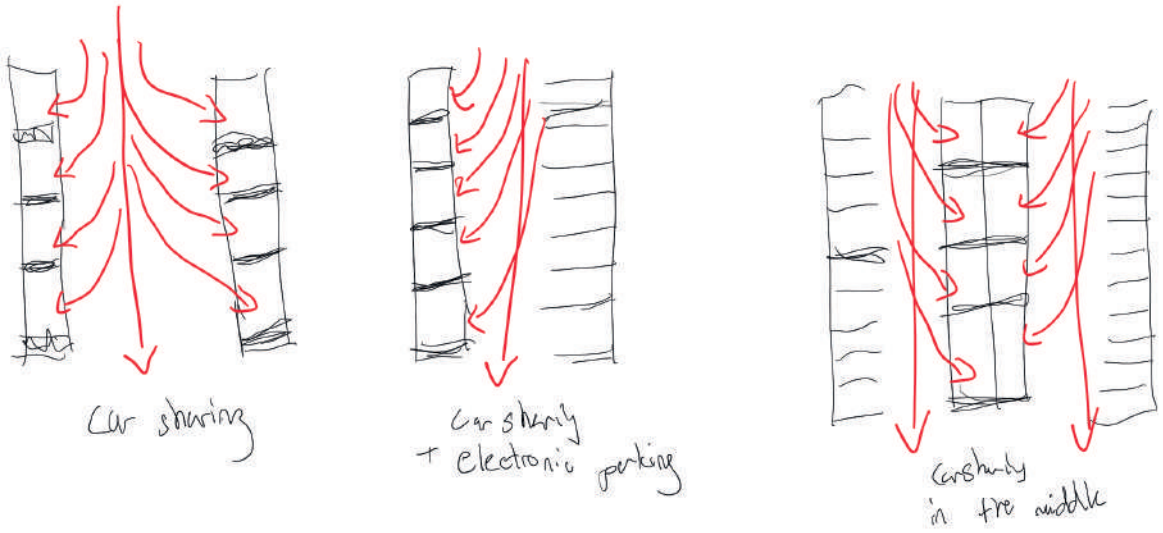
Ill. 139: BRT properties from Aalborg Municipality (Aalborg Municipality, 2014)

8. FRAME EXPLORATIONS

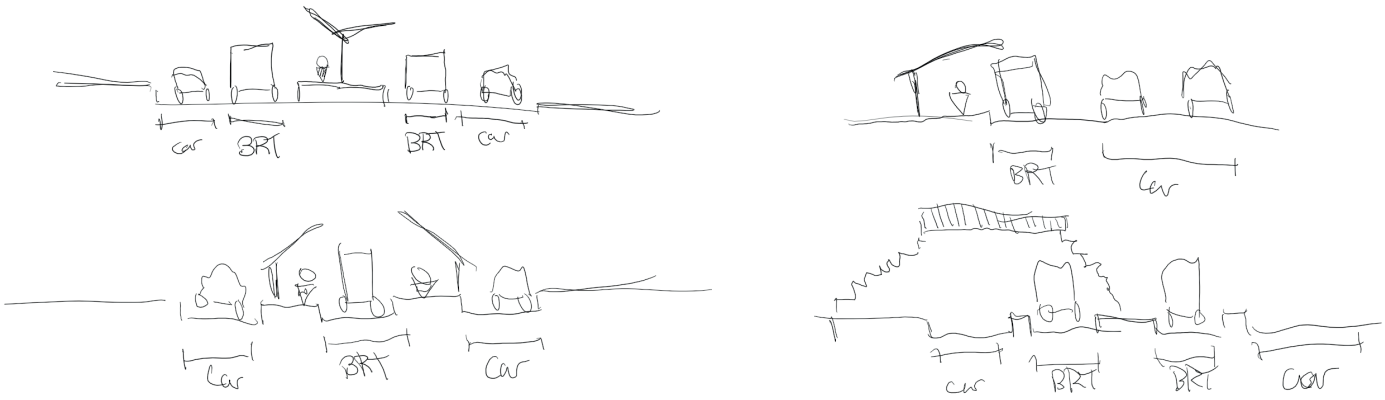


Ill. 140: Sketches of different frame which have been explored

9. BRT & PARKING EXPLORATIONS

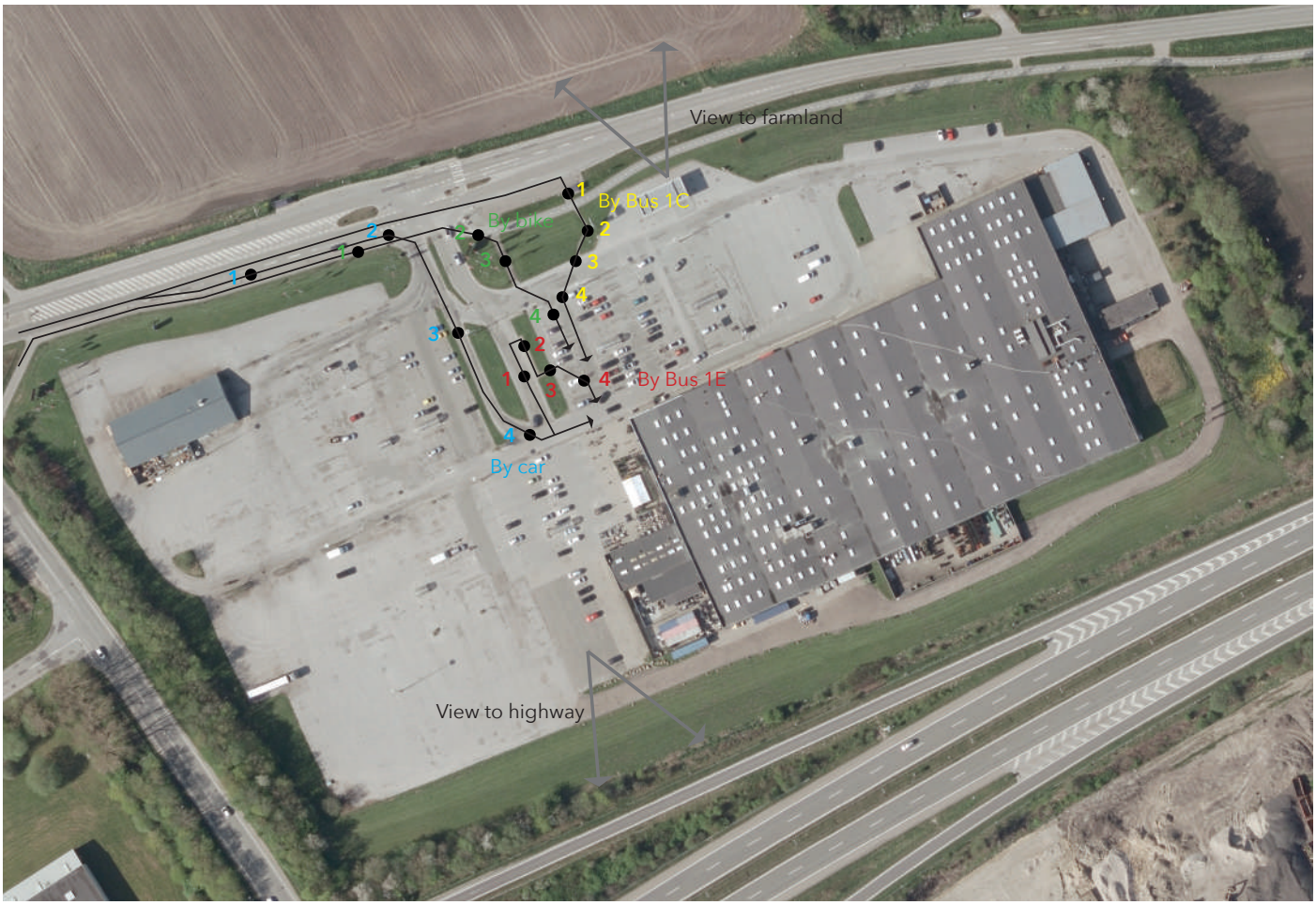


Ill. 141: Explorations of possible carsharing area



Ill. 142: Explorations of possible BRT lane designs

10. SERIAL VISION LINES OF DESIRE

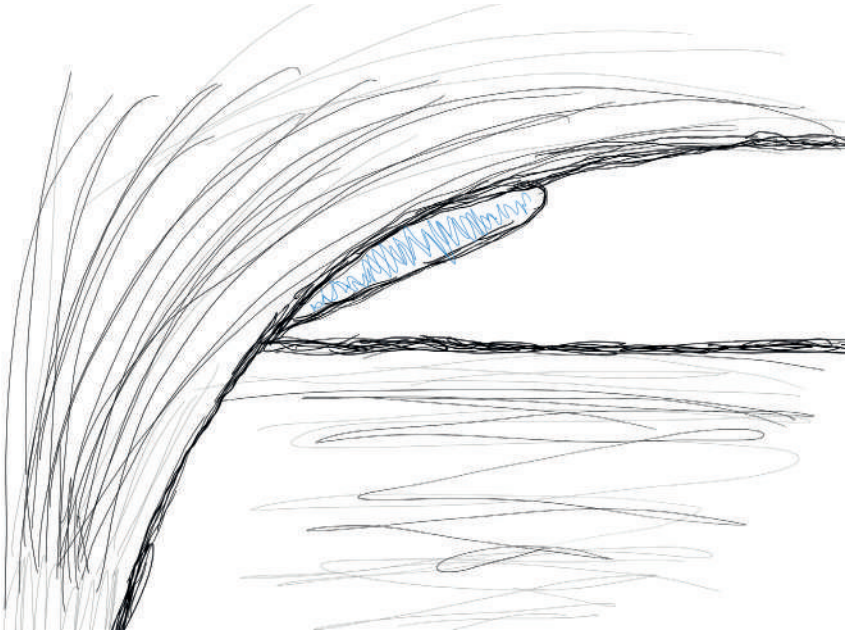


143: Map of serial vision and lines of desire

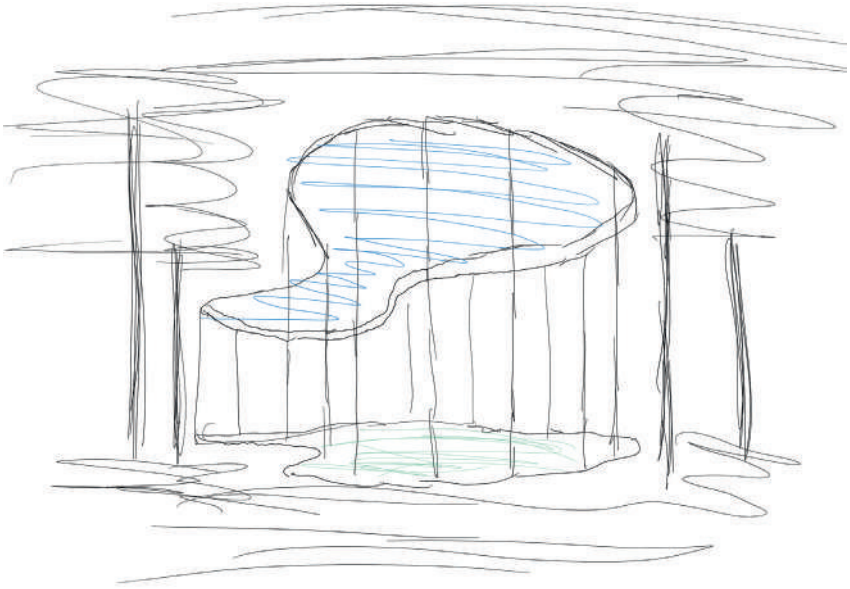
11. CONCEPT EXPLORATIONS

Ill. 144: Catenarty roof concpet

Ill. 145: Observation deck as the heart of the site



Ill. 146: Simple shell roof construction



Ill. 147: Simple construction with courtyard