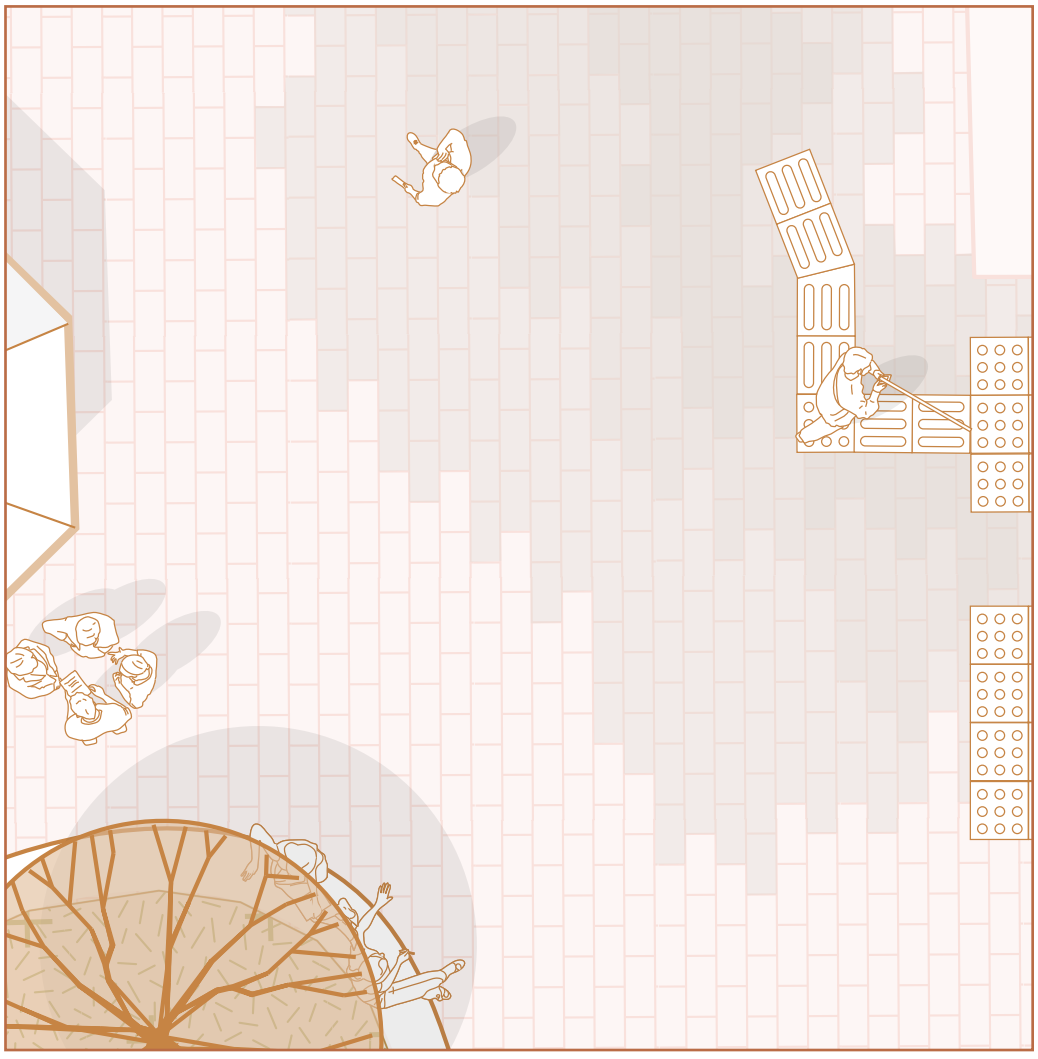
Designing for the visually impaired



Cindy Tuyen Cat Nguyen • MSc04 URB group 3 • Master Thesis

Urban Design, Aalborg University • Supervised by Hanna Mattila • Submitted May 2024

Illustration 2: Photography of the train station in Esbjerg

Title page

Department of Architecture, Design & Media Technology

Title	Designing for the visually impaired
Focus	Theory as the main focus, and design as secondary focus
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Urban Design Student

Acknowledgement

First and foremost, I would like to express my gratitude to my supervisor, Hanna Mattila, for her guidance and encouragement throughout my project. I am also thankful for my fellow students, especially Mathilde Fløjgaard Andersen and Shiva Ghasemi, with whom I had monthly meetings and gained constructive feedback, interesting discussions, and support that enhanced my work.

A special thank you goes to Dansk Blindesamfund and Blindes Arbejde, whom I met in the beginning stages of my master's thesis. Their contribution was essential for my understanding of how and what it means to lose one's sight.

On a deeply personal note, I want to thank my family and friends for supporting me.

Thank you all for being part of this journey.

\+ *Vision has been argued to dominate human sensory experiences, but how do we experience space when we cannot see?* (my initial thought)

Motivation

The motivation for doing this thesis project comes from my interest in and curiosity about designing for everyone. In the prior semester projects, we usually aim to create a good design that accommodates everybody, but who is everybody? We are all built differently and have different needs.

I have chosen the visually impaired as my specific target group because being visually impaired is not necessarily noticeable at first glance. However, it is a disability that is almost invisible compared to other apparent disabilities, e.g., people in wheelchairs. I do acknowledge that there are other disabilities, but to simplify the project, I want to delve deeper into this one target group and understand their point of view as well as their needs and challenges. In the end, we all want to be part of society, so why should people with visual impairments be excluded?

Abstract

This master's thesis, "Designing for the visually impaired", presents the design proposal, Esbjerg+, which is a transformational project that takes place in the city centre of Esbjerg. The site's name is based on adding a layer to Esbjerg, which considers the visually impaired in the planning from the beginning, resulting in a more inclusive environment. Esbjerg+ consists of two main areas: Banegårdspladsen and Museumspladsen, that have the potential to attract a diverse range of people.

The design proposal addresses the lack of inclusive spaces for blind and visually impaired people (BVIP) in Denmark. Designing for this target group yields an awareness and understanding of BVIP's challenges in the urban environment. Becoming visually impaired can be a significant loss and, for many, a taboo. However, as people live longer, more individuals are reaching old age, leading to increased health problems such as vision loss or reduced vision, which is why it is essential to design future cities that strengthen the accessibility and the inclusivity for BVIP. This also contributes to a future that ensures that if one becomes visually impaired, they will still be part of society and can navigate the city independently.

The design proposal "Esbjerg+", is centred around the creation of inclusive spaces. It employs the concepts of sensory urbanism, recognition, co-housing, and relevant cases to achieve this goal. The recognition concept, in particular, is explored in depth, focusing on how urban environments can be adapted to make BVIP feel validated and seen. The design proposal not only addresses the challenges faced by BVIP but also creates an environment that fosters interaction, socialisation, and inclusivity. This, in turn, reduces loneliness and promotes a greater awareness of the community's diversity. The proposal represents a significant step towards a more inclusive and vibrant Esbjerg.

Reading guide

This reading guide is intended to help readers clearly understand the report's structure and content. Each chapter builds upon the previous ones, and throughout the chapters Preliminary, Target group, Framework, and Project location, I have marked important text paragraphs in orange.

The first 56 pages of this report provide an understanding of the topic and framework based on theory, insight, knowledge, and analyses. From pages 57 to 99, the design proposal will be presented. Lastly, the report will summarise the project through a conclusion and reflection in the last chapter, along with an appendix.

All text is in British English. The names of places and organisations will be in Danish, e.g., Dansk Blindesamfund, which will be mentioned in the report as Dansk Blindesamfund and not as a Danish Visually Impaired Community. Lastly, the terms blind and visually impaired people will be shortened and referred to as BVIP. Both terms can be used to describe the project's target group, but the term visually impaired is preferred, as it defines people with various degrees of visual impairments.

Enjoy reading this report.

Table of content

PRELIMINARY

This section will introduce the project settings and highlight the topic's relevance, followed by the project's problem statement, vision and the methodology and design approach used for this project.

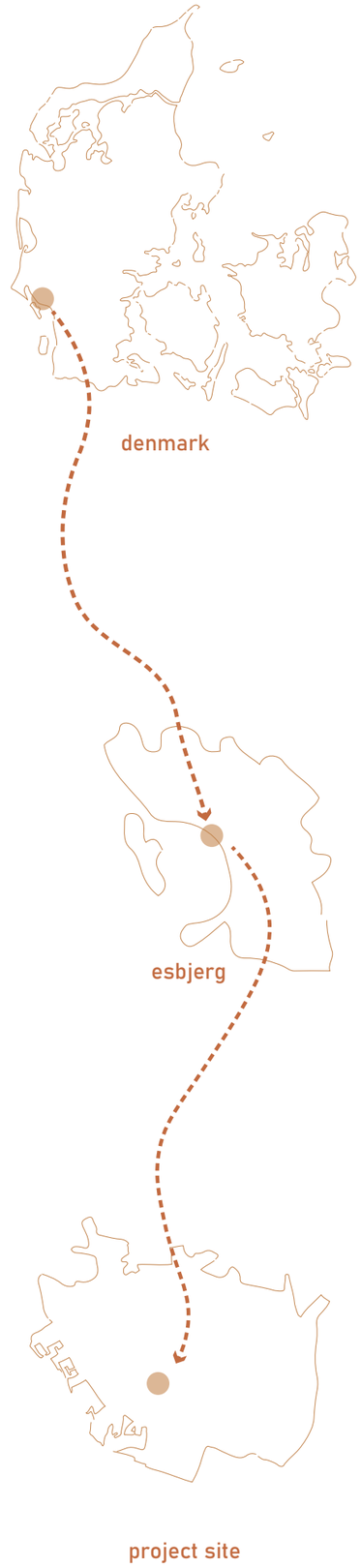


Illustration 3: Site location

Introduction

The report focuses on the importance of accountability for the daily needs and challenges BVIP faces. As people live longer, more individuals are reaching old age, which leads to an increase in health problems such as vision loss or reduced vision. Between 2010 and 2050, it has been anticipated that there will be an increase in age-related eye diseases (Norgate, 2012, pp. 231). Vision plays an important role when orienting in the city by providing visual cues, landmarks, and spatial information (Bredmose et al., 2023), followed by our hearing, touch, smell, and taste (Spence, 2020). But what happens to the way we experience space when vision disappears? With the anticipation of age-related eye diseases, it is, therefore, necessary to take accountability for the needs of BVIP.

The design proposal is based on my interpretation of the theory of sensory urbanism and Axel Honneth's recognition theory (Honneth, 1996) as an approach to supporting inclusivity and awareness of the visually impaired. Due to the physical and social barriers experienced in public areas, it can become difficult for the BVIP to navigate around the urban environment, leading to a feeling of exclusion and loneliness. This project aims to prevent social exclusion among citizens and create a safer and more inclusive city. When designing for the BVIP, physical and mental health must be considered, as they contribute to the group's well-being and how they thrive in the city.

The project is located in Esbjerg, the fifth-largest city in Denmark. More precisely, it is located in the city centre, connecting Banegårdspladsen to Museumspladsen. The project will aim to accommodate the BVIP's private and public needs through the selected site. Banegårdspladsen will focus on public needs, welcoming people to the city, and creating the first and last impression of Esbjerg. Meanwhile, Museumspladsen will focus on creating a community through housing and recreational activities.

Both Banegårdspladsen and Museumspladsen will be accessible to people with and without visual impairments. The site should create opportunities for people to engage with each other and normalise the thought of losing one's sight one day, as it can happen to everyone and should not be taboo.

How can sensory urbanism foster inclusivity within urban spaces in Esbjerg, recognising visual impairment to create inviting environments where people of varying abilities can participate and engage in the urban environment? (Problem statement)

Vision

The project's vision is to create an inclusive urban environment through the concept of sensory urbanism to enhance the experiences of BVIP in Esbjerg while raising awareness about visual impairment and what it means to be visually impaired and highlighting the challenges they face. The urban environment will meet the needs of the visually impaired through considerations of guiding lines, tactile cues, and easily navigable spaces. This enhances a sense of safety, belonging, and accessibility in the city, minimising social exclusion and loneliness within the BVIP. These factors will furthermore support the visually impaired and foster a dynamic, inclusive space that acknowledges individual differences.

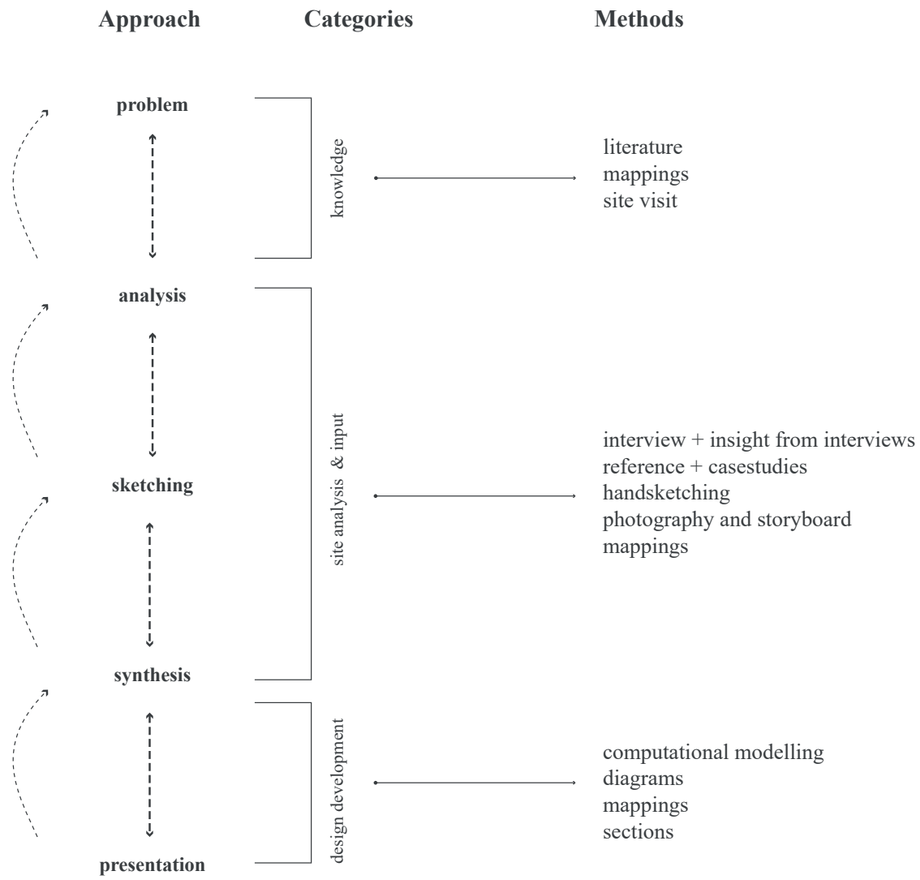


Illustration 4: Own interpretation of Knudstrup's IDP approach

Design approach

Illustration 4 showcases my interpretation of Mary-Ann Knudstrup's approach towards finalising a design proposal through the model she describes as "Integrated Design Process" (Knudstrup, 2004). The model consists of five phases focused on integrating knowledge to solve problems in relation to the design. The model consists of the following steps: problem, analysis, sketching, synthesis, and presentation.

The first step is to define a problem and an initial problem statement. This establishes the focus and framework for the project. This project, "Designing for the visually impaired," involves the visually impaired in the design due to an identified lack of inclusiveness in public spaces. It takes place in a Danish context, more specifically Esbjerg (more about Esbjerg can be read on page 42).

The following phase is the analysis phase, which consists of finding various information in relation to the topic, e.g., How do the BVIP orientate in public spaces? Furthermore, insights from experts within this field will also be beneficial in this phase. Dansk Blindesamfund provided insight, knowledge, and time for me to understand the daily challenges that some BVIP face. These findings and information create a foundation of knowledge for the project and an overall direction, which will prepare for the next step, sketching.

The sketching phase can be done by hand or modelling through a CAD programme. This phase aims to develop ideas based on the knowledge gained from the previous phase. In this project, most of the sketching phases were drawn through an iPad, which worked just as using manifolds on paper but digitally, giving a faster workflow. The sketching phase is a repeated process that aims to solve all the problems and challenges that were identified in the first phase. It can be necessary to go back and forth in Knudstrup's model if there is a need for more knowledge. Going back in the process is not wrong, as the model encourages an iterative approach, meaning there will be a jump back and forth in the process as new knowledge contributes to a reevaluation.

The following phase is the synthesis. This is where the project proposal gets revised and discussed in relation to the problem statement formulated for the project. If the design proposal fails to solve the initial problem, there will be a need to revise the proposal before finalising the project in the last phase, the presentation. The presentation phase presents the project proposal through visualisations, consisting of a master plan, diagrams, sections, and maps. It showcases the project proposal's qualities and how it solves the original problem that started the project.

Methods

Computer modelling
Between design process 2 and 3, I used the CAD programme Rhino to experience the design proposal's spatial dimension. It helped me understand the scale differences on the site. Compared to hand sketching, this method took a longer time but provided an understanding of how and what the pedestrian would experience when walking through the site.

Diagrams
In this report, diagrams simplify information from the theory and interview insights. They provide a visual representation of data or information, making complex concepts easier to understand. In the other report, diagrams illustrate principles and strategies for the design proposal.

Hand sketching
At the beginning of the design process, hand sketches were a quick method to convert ideas on paper without thinking about the scale. However, later in the process and around phases 2 and 3 of the design process, the sketches became more scale detailed to visualise the design proposals clearly (through section, perspective and top view).

Interviews
The interviews (see Appendix 01) conducted with a worker from Blindes Arbejde was semi-structured. while the interview (see Appendix 02) with Dansk Blindesamfund were structured, with prepared materials and questions. Both interviews were used to obtain insights into participants' perspectives, experiences, and thoughts.

Literature
Gathering information from books, articles, reports, and research papers has been used to develop a theoretical framework and understanding of topics such as visual impairment, loneliness, co-housing, sensory urbanism, and more. The sub-conclusions of the written theory chapters are marked with an orange colour to highlight the substance of the text.

Mapping
Mapping is a way to simplify the project area in layers and scale to highlight specific qualities or challenges from a 2D perspective without needing to visit the site. It can be done using input from GIS data and Google Maps and provides a better understanding of the context's physical structures of buildings, flow, and landscape.

Meeting Dansk Blindesamfund
Reaching out to Dansk Blindesamfund offered me valuable input through the perspectives of John and Torben, who are visually impaired. Through a physical meeting in Copenhagen, I got to see how they oriented themselves in a vibrant context, in Copenhagen.

Photography and storyboard
During the site visit, it was possible to take pictures of the site to document its physical place and atmosphere through materiality. Selected pictures were then chosen for the storyboard to retell how the site was experienced phenomenologically (see page 54), and it can be seen as my point of view with observations of the site's challenges and potential.

References studies
I have used references through collages, which allow visual representation of ideas and concepts in a creative way through pictures. Both case and reference studies can help during the design process as a method to learn from previous experiences or successes in a particular area.

Site-visit
Visiting the project area provides another depth of understanding of the site from a phenomenological aspect. The visit provided an opportunity to experience the site at an accurate scale, not at 1:5000, which is through mapping. Furthermore, the senses of hearing and smelling were activated during the visit so that the site could be experienced fully.

Sections
Sections provide a spatial understanding of the site. Though they are in 2D, they provide a visual representation of the site and how users interact with it. The sections can be a tool to understand the relation between the human scale and the built environment.

TARGET GROUP

This section will briefly examine the target group, define what it means to become BVIP, and elaborate on how they orient themselves in public spaces. Interview insights will be presented with illustrations and photographs to convey the target group's challenges and perspectives.

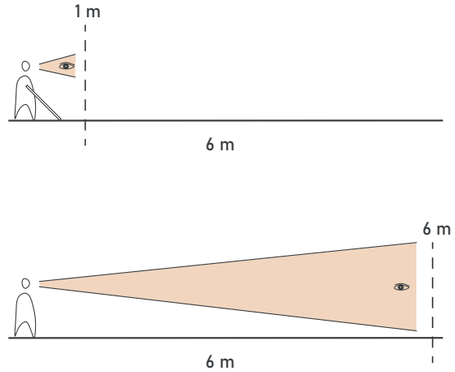


Illustration 5: Vision difference between a visually impaired and normal visual acuity

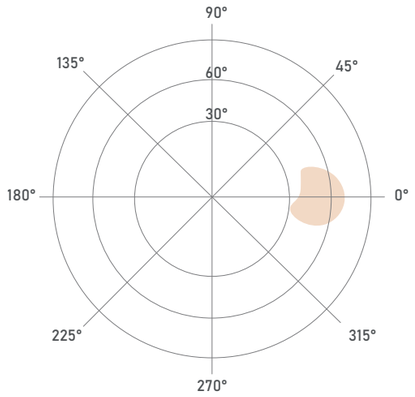
Defining being visually impaired

The medical definition
There is a slight distinction between being blind and visually impaired. Being blind means having no vision, while being visually impaired means the individual's vision has been reduced. However, the term can also be used for individuals with reduced and total vision loss (Disability Language Style Guide, 2021). Both degrees of vision loss can be caused by innateness from childbirth, ageing, post-trauma from injuries, or medicine (World Health Organisation, 2023).

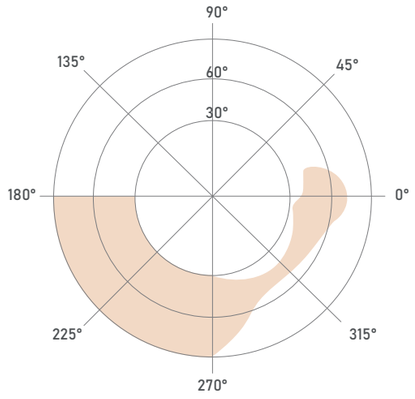
There is more than one type of visual impairment, but the most common type of visual impairment in Denmark is glaucoma (Carsten, 2023). Glaucoma can be divided into different stages (see illustration 6). In the beginning stages, it is not noticeable, but through time, the sight-threatening disease will cover more significant areas of the field of vision. In general, the optic nerve consists of millions of nerve fibres that transport visual impressions from the retina to the brain, but if the nerve fibres die, parts of the visual impressions will not reach. Therefore, there will be spots in the field of vision. (Carsten, 2023).

Visual acuity is the ability to determine details and distinguish between objects. A typical visual acuity for a person with perfect vision would be 6/6, while for a visually impaired, it would range from 1/60 to 6/60 (Bredmose et al., 2023). This means that a person with reduced vision can see 6 metres, while an average person would be able to see 60 metres away.

Normal vision with a blind spot



Early stage of glaucoma
with areas disappearing



Glaucoma in the late stages
with a binocular vison

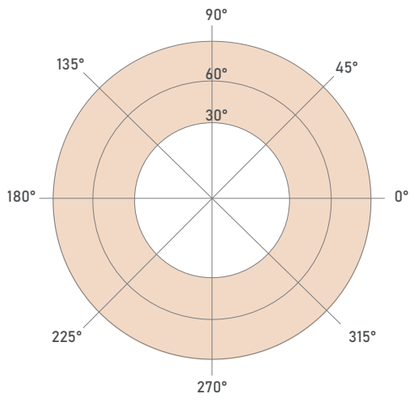


Illustration 6: The stages of glaucoma

Louis Braille
Inventor of braille writing

Marla Runyan
Runner champion in women's
5,000 meters

Claude Monet
Painter and founder of
impressionist painting

Ray Charles
Pianist, who shaped the
sound of rhythm

Illustration 7: Examples on inspiring visually impaired

Acknowledgning being visually impaired

As mentioned earlier, individuals can either be born blind or become blind later in life, and the change they experience from being able to see the world through their vision to one day not being able to can be hard to accept (Royal National Institute of Blind People, n.d.). It can be a significant loss for people becoming blind later in their lives, as they have to start all over again and learn the basics, like how to walk without falling. They can learn that through rehabilitation, which Dansk Blindesamfund offers in Denmark for individuals who have lost sight (Dansk Blindesamfund, 2024). Despite the opportunities offered, some people still do not want to accept that they are blind. One of them was Anders from Blindes Arbejde, whom I interviewed. He was in denial for the first 20 years because he did not feel blind. However, after many years, he slowly began to accept reality, which made his everyday life easier.

One of the reasons Anders found it challenging to identify himself as blind is the taboo associated with it. According to Anders, losing hearing is more acceptable to recognise and tolerate because it is more common than young adults losing sight. Furthermore, becoming visually impaired is, according to Anders, associated with shame. One reason could be that becoming visually impaired makes one stand out from the rest, especially if there are not any people around with the same disability. That is why I find it essential to normalise that vision can disappear or weaken over time. This can be done by providing spaces in the urban environment where possible interactions between people of varying abilities can meet. It could also be done by honouring people with an eye-related disability, changing the association of becoming visually impaired with a positive picture. Illustration 7 shows different people with visual impairment who, to this day, are famous in different fields such as art, music and sport, and proved to the world that it is possible to live like other people and gain success.

Bollards assisting pedestrians

Traffic lights providing alerting sound

Tonal contrast in pavement making a distinguish between pavement

The sound of flowing traffic helps the pedestrian orient themselves

Curbs or elevated surfaces allow a distinguish between pedestrian and vehicles

Tactile paving guiding the direction and stopping cues

Illustration 8: Elements in the built environment aiding the navigation

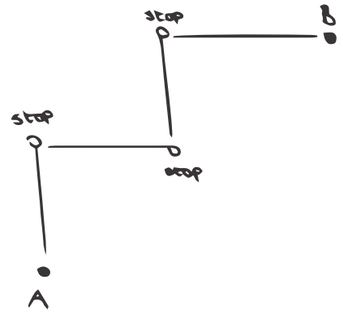


Illustration 9: Diagram of how a mindmap can be structured

Navigating the city as visually impaired

BVIP can move freely around public spaces with the support of their other senses and the built environment. Two types of guidelines have been defined that can help BVIP navigating: natural tactile cues (naturlig ledelinje) and built tactile cues (anlagt ledelinje). The natural cues are elements that naturally belong to the environment, which the visually impaired can use as orientation, such as curbs, walls, or grass verges (Tilgængelighed for blinde og svagsynede, n.d). In bigger spaces with a higher frequency of people, it is advised to integrate built tactile cues to guide the visually impaired (Tilgængelighed for blinde og svagsynede, n.d.). The most commonly used built cues are tactile pavement, but they can also be used when there is a change of colour in the pavement or a surface differentiation (Atkin, 2010). These small details in the urban space allow identification and orientation for visually impaired people.

Typically, BVIP are seen with a cane that supports their movements and extends their sense of touch and hearing (Atkin, 2010). They are taught to create a mental map of their surroundings, focusing on details on a route, pausing, and orienting themselves to ensure they are on the right path (see illustration 8)(Bredmose et al., 2023). However, one of the challenges that BVIP faces is when to avoid danger. Sighted individuals can avoid danger faster than visually impaired as they can see what is coming towards them. Meanwhile, BVIP cannot quickly orient themselves and avoid danger through fast observation (Bredmose et al., 2023). This is why it is important to consider the small details of how and where the built environment is arranged.

FRAMEWORK

The framework consists of the project's focal points, selected based on an interview with Dansk Blindesamfund, theories, case studies and reference studies that are presented and used as tools later in the design process.

> *... It is easy to just put everybody into one standard, but it is not helping everybody*
>
> (interview, appendix 01)

The need for inclusive design

Even if a person has physical access to a room, this does not mean that the person has access to what is happening in the room. This is another problem related to designing for the visually impaired. Especially for visually impaired, there needs to be more inclusive urban spaces, but how can the city not feel inclusive when there have been defined standards and regulations for the built environment?

Standardising architecture became a tool in 1943 when the architect Le Corbusier (among others) defined a standard as creating a pleasing and balanced relationship between humans and the built environment (Buzzi, 2017). His modular man is a six-foot-tall, healthy man who has been based on mathematical proportions found in the golden ratio and Fibonacci sequence (Buzzi, 2017). The standard does not take accountability for people with disabilities but rather ableism and discrimination against individuals with disabilities since they do not reach Le Corbusier's standard. The problem with defined standards and regulations, according to Anders from Blindes Arbejde, is the lack of consideration for the individual with the disability. By neglecting the needs of people with disabilities, public spaces can hinder participation in community activities, leading to feelings of isolation.

One architect who aimed to embrace this was Ron Mace in the 1990s. He introduced the concept of universal design (Ryhl et al., 2021), which ensures that everyone is given an equal opportunity to enjoy the architecture through usability, accessibility, and an understanding of the activities a place offers (Grangaard et al., 2022). There has been a growing awareness of integrating inclusive design into architecture in recent years. However, it is still needed, as it is mainly thought of towards wheelchair users or associated with environments like hospitals and assisted living facilities (Grangaard et al., 2022).

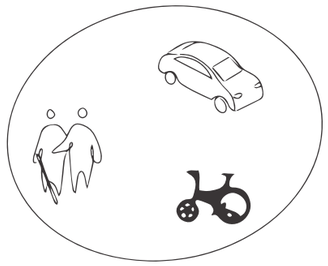
We need more inclusive design to provide equal access and opportunities for everybody, as that is part of human fundamental rights (Amnesty International, n.d.). With this in mind, the focus of my project is to create inclusive urban spaces that foster a sense of belonging for all citizens and room to participate.

Illustration 10: Dansk Blindesamfund facilities and communities marked

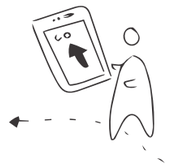
Dansk Blindesamfund

Dansk Blindesamfund is led by visually impaired and is located all over Denmark (see illustration 10). The organisation was founded in Denmark in 1911 to form a community for people with visual impairment, reduce loneliness and create equality between individuals with and without sight (Dansk Blindesamfund, n.d.b.).
They offer consultations, rehabilitation, and communities where their members can socialise (Dansk Blindesamfund, n.d.b.). Rehabilitation is one of the organisation's current strategies for 2024–2028 (Dansk Blindesamfund, 2024) and consists of physical training and support groups. Through rehab, they have seen success in improved mental health, less loneliness, and less isolation (Dansk Blindesamfund, 2024).

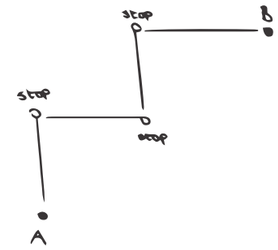
It was possible to gain information regarding the organisation and insight into the challenges that visually impaired people face (see illustration 11) through an interview with Dansk Blindesamfund's members: John and Torben. Based on the interview, I have selected four challenges that BVIP faces: 01) how to reduce loneliness, 02) how to navigate in the city when obstacles are covering guidelines, 03) how to create cues for the visually impaired pedestrian to orientate and identify during their walk through the city, and 04) how to integrate BVIP's safety in shared spaces.



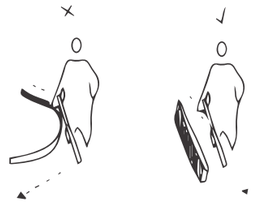
Dislike shared spaces because of their shared surfaces with no detectable curbs or tactile pavement.



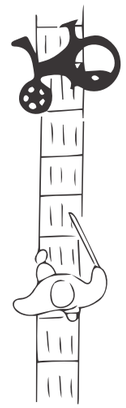
The younger generation is very dependent on technology and are not bold



Commonly people stop up to orientate where they are



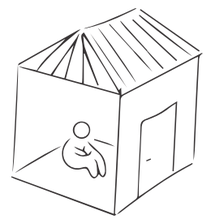
Prefer guidelines that are designed with straight lines



Obstacles covering guidelines make one frustrated and confused

Only 250 people in Denmark have a guide dog

Different weather conditions affects how and when visually impaired goes outside



Often visually impaired chose to isolate inside their home, due to fear which can lead to loneliness

Illustration 11: Input based on meeting with Dansk Blindesamfund

> *Often I want to participate in social activities and get to know other people, but the events don't consider people with disabilities, so I struggled getting access to the event due to the pavement*
> (interview, appendix 01)

Considering the challenges of loneliness

Based on information from speaking with Dansk Blindesamfund, its shown that loneliness is one issue that the visually impaired faces. Loneliness is when an individual feels left out of social connection (Jo Cox, n.d.). One reason why visually impaired can feel left out is when the city excludes them from participating on equal terms as others. BVIP may become uneasy if they encounter an unforeseen barrier when walking, particularly if they find navigating the city challenging. This can result in the group wanting to stay home alone rather than going out and meeting other people (Chu et al., 2022).

The state can occur at all ages, and based on Danish statistics, it is primarily for young adults in the age range of 16–29, as well as seniors above 65 (Danmarks statistik, 2022). Many people, despite disabilities, face loneliness, and it can hurt a person's well-being. People with visual impairment, however, are more likely to experience loneliness for a more extended period due to their lack of ability to perceive the world on the same terms as other people. Long-term loneliness can affect a person's physical and mental health. (Jo Cox, n.d.).

One of the barriers to socialising is the lack of accessibility. Navigating in the public realm demands an extra effort for the visually impaired to compensate for their disability when they move around (Bredmose et al., 2023). They need to move carefully, leading to a need for more confidence to navigate outside their home (Jo Cox, n.d.). It is important to take accountability for reducing loneliness when designing new urban areas, as it contributes to different qualities within, e.g., well-being. When one feels lonely, it can be linked to health problems such as depression, stress, and anxiety (Reid, 2024). If the urban space considers social interactions and community, the risk of experiencing loneliness for a more extended period might be reduced. Some people feel lonely even though they are surrounded by people all day (Reid, 2024). This might be inevitable when dealing with a group of people. However, by increasing awareness, improving social activities, and removing physical barriers, more BVIP will feel included in socialising with others.

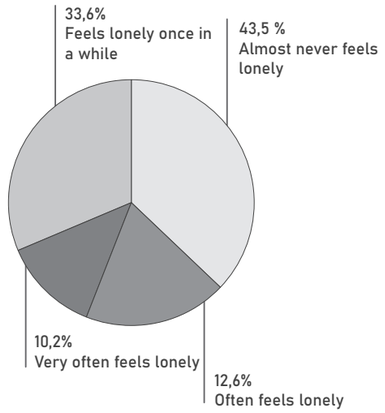


Illustration 12: Loneliness statistics based on "Det nationale forsknings og analysecenter for velfærd: Blinde og stærkt svagsynedes levevilkår, muligheder og barrierer for samfundsdeltagelse

Sensory garden

Singing birds

parrallel paths with different tactility

Illustration 14: Visiting Dansk Blindesamfund's community centre

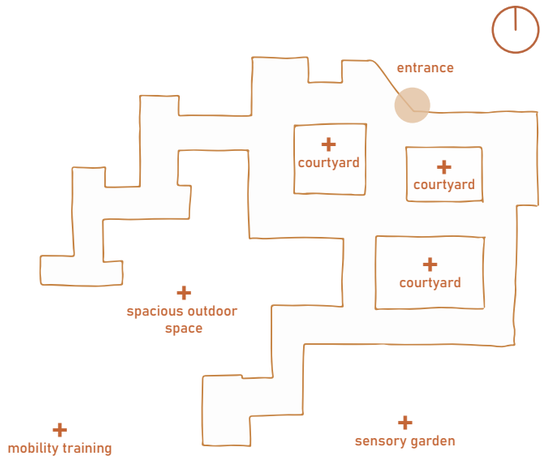


Illustration 13: Plan of Fuglsangcentret and the provided spaces

Case: Fuglsangcentret

This case will examine which activities have been implemented in Fuglsangcentret's outdoor spaces, as well as how the orientation and identification inside the building have been created, as these elements and details can be used further in the design process.

Fuglsangcentret is located in Fredericia and gives blind people in Denmark the opportunity to visit the centre all year round. It is specially designed for the visually impaired and offers various activities, from hotel accommodations to training and presentations (Dansk Blindesamfund, n.d.a.). The centre strive to reduce loneliness by providing acitivities for their members to meet and engange.

The outdoor facilities offer quiet and highly pulsating activities, offering something for everyone. North from the centre, there has been placed a training area where the visually impaired are challenged by activities to practise the challenges that can be encountered in the city and traffic and consists, among other things, of steps that are crooked and undulate up and down. South of Fuglsangcentret, there is a sensory garden where people can sit together, listen to the surrounding nature, and smell the flowers or herbs in the planters. Inside the centre, orientation points and identification through echolocation and contrasts have been used to give pedestrians a better idea of where they are in the building. Sound can be used as a guide, and in Fuglsangcentret, there is, among other things, a fountain and a birdcage. Both elements act as sound beacons and indicate where one is located in the building.

Qualities

- The outdoor training area includes paths with different surfaces and mobility challenges to enhance sensory experiences and practical skills for navigating urban spaces.
- The centre features a sensory garden and quiet courtyards for relaxation and sensory engagement with nature.
- Inside the centre, orientation points and identification aids like echolocation, contrasts, and sound beacons to help pedestrians navigate effectively.

The qualities of co-housing

The co-housing concept originated in Denmark in the 1970s and has re-emerged in the following years. One reason is loneliness. Co-housing can reduce loneliness, as it provides a strong sense of community with spaces for activities and socialising (LaFond et al., 2017). Another reason is the need for meaningful spaces within urban environments where individuals can connect. Nowadays, many people live in isolated bubbles, unaware of their neighbours and lacking a sense of community (Nielsen, 2020).

Co-housing gathers residents who all aim to participate in shared activities and exchange experiences. People who choose to live in co-housing still have their private areas, so privacy is still allowed. In this master thesis, the concept of co-housing will contribute as a tool to ease the loneliness that BVIP face. Co-housing fosters an environment that is more inclusive and accessible. It may benefit BVIP as it can help individuals with visual impairments feel more independent and included in their surroundings through community involvement and creating inclusive community facilities.

In the following pages, three cases of co-housing will be presented to showcase different types of co-housing, highlighting their qualities and approaches to building a solid community

Architects: Dorte Mandrup
Location: Albertslund, Denmark
Size of area: 7.698 m²
Year: 2008
Residents: 200
Housing: 54

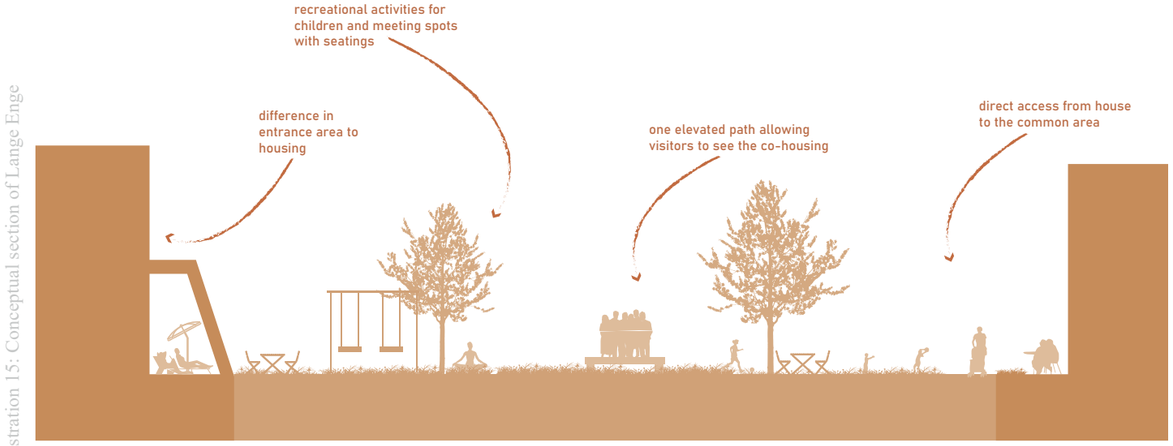


Illustration 15: Conceptual section of Lange Enge

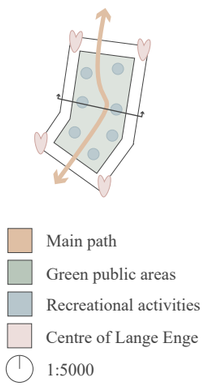


Illustration 16: 1:500 topview analysis of Lange Enge

Case: Lange Eng
Lange Eng consists of one building with residences and a communal house. The residential area prioritises common areas and community between families. The shape of the building expresses the focus on community. Lange Eng is a large building with two gates, with one path running through the gates connecting Lange Eng to its surrounding environment. The building frames a green area where children can move around safely, and residents have a direct view of the green area (Dorte Mandrup, n.d.). The common area consists of playful elements aimed at families with children. In addition, there are seating areas where you can meet the neighbours and enjoy the surrounding nature.

Qualities

- Promotes community and social interactions by providing common spaces and facilities
- All the homes face the green area
- One large building that frames the activities and nature
- Gradient transition from private to public green spaces

Architects: Vandkunsten Architects
Location: Lejre, Denmark
Size of area: 25.468 m²
Year: 2015-2021
Residents: 438
Housing: 99

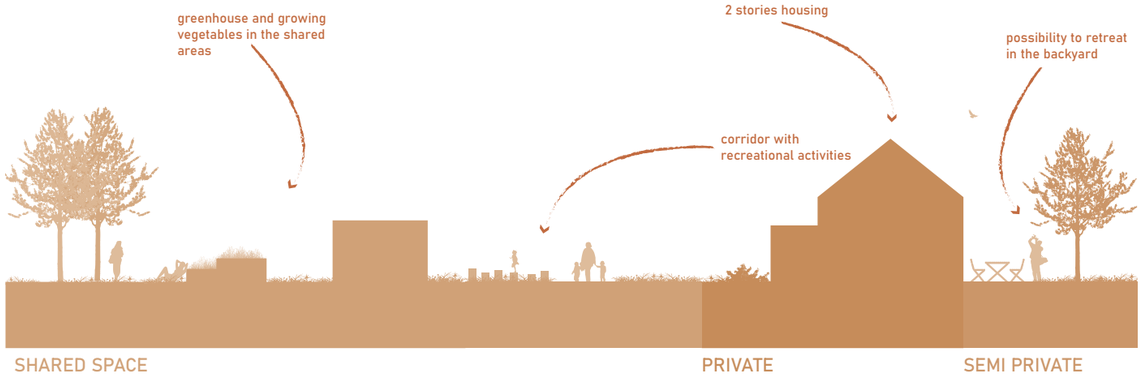


Illustration 17: Conceptual section of Skråningen

Case: Skråningen
Skråningen takes inspiration from the principles of old villages, where people can live closer to each other in small communities and grow vegetables together, which they can use for cooking when they need to cook together (Vandkunsten, n.d.). There are people of all ages, and the residents must be part of the community. The houses vary in size and layout, but the facades look similar. For the 99 homes, there is a shared house with facilities and functions that were not necessary for the individual home but could be used as shared spaces for socialising with others. In addition, all the residents have access to a green, landscaped area that leads towards the communal house. (Eco Village, n.d.)

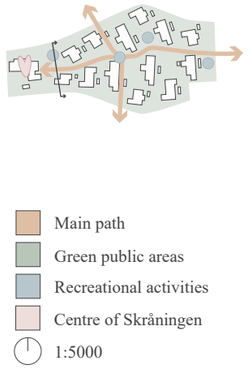


Illustration 18: 1:500 toview analysis of Skråningen

Qualities

- A corridor of shared space and activities leading in the direction of the community house
- Clear sense of privacy and public spaces
- Small houses in clusters with a small front garden
- Same building facades cultivating the community feeling

Architects: Arge Futurafrosch Duplex, Miroslav Šik, pool, Müller Sigrist, Müller Illien Landschaftsarchitektur
Location: Zürich, Switzerland
Size of area: 53.226 m²
Year: 2007-2015
Residents: 1200
Housing: 395

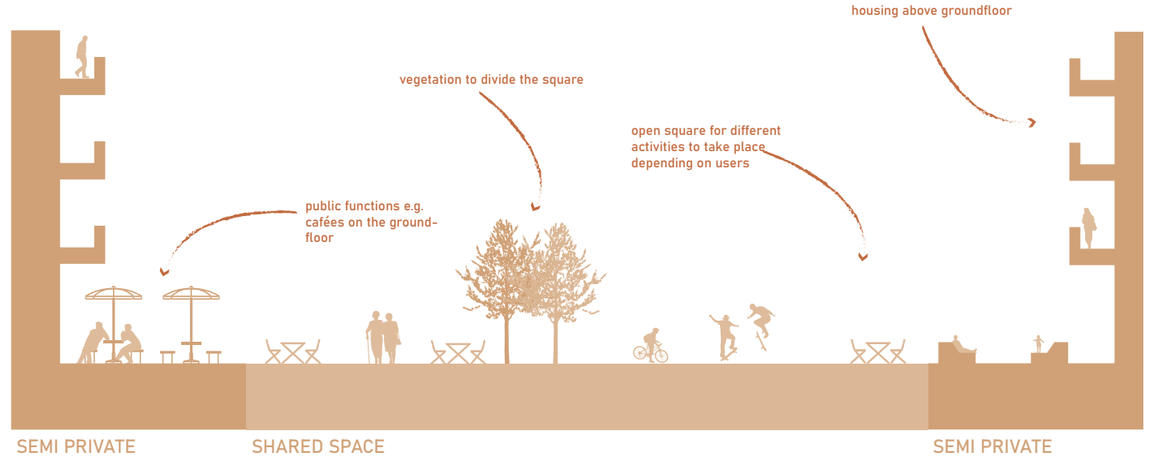


Illustration 15: Conceptual section of Lange Enge

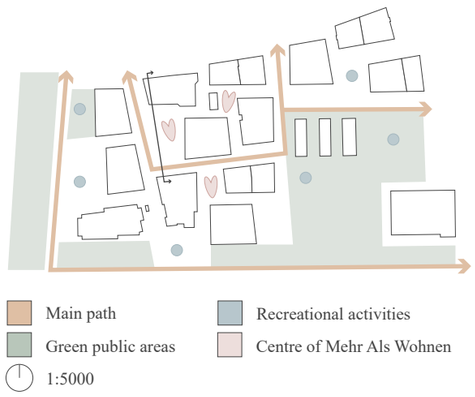


Illustration 16: 1:500 topview analysis of Lange Enge

Case: Mehr Als Wohnen
Mehr Als Wohnen translates to" more than living" and differs from the other cases by being locateed in the city. The case study showcases how to integrate co-housing into the city by extending the co-housing community and activities outside of the building. The common spaces on the ground floor are available to residents and visitors and consist of workplaces, shops, and shared rooms. From above the ground floor, there are private, semi-private, semi-public, and public spaces on each floor. This allows the residents to meet and enhance the community in between (LaFond et al., 2017)(McMaster, n.d.).

Qualities

- Several buildings which are placed independently of each other around a public space
- The ground floor offers community for residents and outsiders, making it a lively part of the city
- Wants to become part of the city and not just a residential area
- Provides a range of privacy in the co-housing

Creating inviting environments

Combining theories from Axel Honneth and Jan Gehl will present more perspectives and a broader understanding of creating more inclusive and inviting urban spaces. Honneth is a German social philosopher who introduced the theory of recognition (Honneth, 1995) as a philosophical approach to creating conditions in which people feel validated as human beings, while Gehl is a Danish architect and urban design consultant, who is recognised for his human-scale orientation and putting people's experiences first (Sim, 2019). While Honneth's theory provides a philosophical approach, Gehl provides a spatial understanding of how urban spaces can form.

Open ground frontages

The three case studies from the previous section about co-housing showed three cases of creating inclusion in a housing community. One of the repeated elements was the strategy of having an active floor plan where residents have a visual connection with the people passing by. This can relate to Gehl's concept of open-ground frontages (Gehl, 2011). According to Gehl, attractive ground-floor facades engage the pedestrian with the built environment and enrich the experience of the public space. He states that a bad ground floor is an inactive facade that does not encourage people to stay but rather walk by. In comparison, an active ground floor is good and valuable, providing spaces for people to engage and feel invited (Gehl, 2011).

Illustration 19: Ground floor frontages in Poznan, Poland

Illustration 20: Ground floor frontages near Banegårdspladsen

Illustration 21: Initial collages with Honneth's theory applied to the project site

The value of recognition

Honneth defines three types of recognition: private, legal and social recognition (Frandsen et al., 2023). ***Private recognition*** is about personal relationships that the physical framework supports. With the design proposal for "designing for the visually impaired", co-housing is the element for private recognition. Private recognition revolves around recognition in the private and the nearest relations, who can give love, care, and attention. Here, the individual develops self-assurance without the fear of abandonment (Honneth, 1995). If an individual finds themselves in a situation where private recognition is lacking, it can cause uncertainty and doubt about themselves.

Legal recognition revolves around equality, equal access to public space, and fundamental rights. For this project, the legal sphere takes accountability for the challenges the visually impaired face in public spaces. This could include ensuring no obstacles cover tactile guidelines and providing the visually impaired safe access to the city. Honnecth says people will receive self-respect when they achieve recognition in this sphere (Honneth, 1995).

Social recognition is about the value the visually impaired individual contributes to society. It is about recognising what value is being added and being recognised by others. By feeling like a valued member of a community, the visually impaired will experience a sense of communal belonging within the city. (Honneth, 1995). If an individual does not gain recognition in the three spheres, it can result in losing their sense of personal and social growth. However, if individuals reach all the recognitions, they will thrive and participate in public space activities (Frandsen et al., 2023). With Honneth's theory of recognition, I have interpreted how his theory can be used in the city for BVIP to reduce the loneliness factor, develop an identity and participate actively in society through my concept (see on page 62).

Three pedestrian activity types
The following text highlights the importance of thinking about the functions and activities on the site and relates to the two previous texts by looking into how to create an inviting urban space through activities. Gehl's theory regarding pedestrian activities is necessary, as it argues that the conditions of the physical environment can affect BVIP and their ability to access public spaces on equal terms as others.

Gehl has classified three types of activities for pedestrians. ***The necessary activity*** does not encourage the pedestrian to stay longer but accommodates the need to walk from A to B despite the conditions of the physical environment. This could be walking to school or work, waiting for the bus, or grocery shopping. ***The optional activities*** occur when the climatic conditions and physical environment are good and inviting. It could be activities like going for a walk, talking on a bench, or visiting a friend, and it depends on what the space offers, how it makes people feel, and how they perceive the space's opportunities. ***The social activities*** include children's play, communal activities of various kinds, and simply the ability to see and hear other people. It depends on the presence of other people in the public space. (Gehl, 2011). The problem is that if BVIP are discouraged from using public spaces, they will tend to stay at home, and the loneliness factor would increase.

Conclusion on Creating inviting environments
The theories are helpful design tools to give the visually impaired a sense of inclusion and belonging. The text is organised so that Gehl's ground frontage theory helps readers understand how physical spaces impact social interactions. Honneth's theoretical perspectives on social inclusion are examined, and design principles are presented, which can be added to the urban space to create a more inclusive and inviting urban space. Lastly, Gehl's pedestrian theory argues that the conditions of the physical environment can affect BVIP and their ability to access public spaces on equal terms as others.

Qualities

- Engaging ground-floor facades to enhance pedestrian interaction and create vibrant public spaces
- Applying Honneth's three types of recognition to foster a sense of belonging and self-worth for visually impaired individuals
- Encourage various pedestrian activities

> *"Our bodies and movements are in constant interaction with the environment; the world and the self inform and redefine each other constantly.*
> (Pallasmaa, 2012, pp. 43-44)

Integrating sensory urbanism in modern cities

Inspired by the way BVIP orientates themselves within the public space without being able to fully see their environment through their sight but other senses, there has been an interest in sensory urbanism and a look into how it can benefit the city.

David Howes is a researcher in sensory urbanism and anthropology professor (Howes, 2022). Howes highlights that people who can see have become used to looking at the city and not using their other senses to experience it. According to Howes, today's cities are flat and only appear aesthetic to the eye. People do not experience the city because they have gotten used to it and are occupied with other things, e.g., looking at their phones. He argues that cities should include sensory impressions in their design to develop a stronger identity and create a stronger sense of belonging among their residents, making the experience more memorable for the visitor (Howes, 2022).

The interaction between space and body is something that the architect Juhani Pallasmaa discussed in his book, The Eyes of the Skin (Pallasmaa, 2012). He viewed the body and space as defining each other. Although sight is the most dominant sense, space is experienced at the multi-sensory level because humans use the whole body and the senses to understand the environment. Both Howes and Pallasmaa are concerned about how people interact with urban space. In this project, sensory urbanism contributes as a concept to provide a more lively environment where unique sounds, smells, or visual elements become characteristic features of a city, enhancing its unique charm, attracting visitors, and improving people's experience of the city.

Illustration 22: Close-up pictures of Castlefield Viaduct

Reference: The Viaduct

This reference showcases how to stimulate the senses beyond sight in an urban context. Castlefield Viaduct, located in Manchester, United Kingdom, is a historic railway structure that has been repurposed and serves as a pedestrian passage close to nature(Twelve Architects and Masterplanners, n.d.). It is possible to feel, smell, and touch different elements when walking through the Viaduct. People are encouraged to interact with the construction, vegetation, and interventions throughout (see illustration 22).

The reference has qualities that naturally engage multiple senses, contributing to a rich and memorable experience. The vegetation is a barrier to the surrounding noise of people, trains, and trams, creating a dynamic contrast when accessing the site. Inviting visitors to engage with nature is one of the qualities I wish to take from this reference, as is the mindset of transforming my project site while honouring its historical context and previous structures.

PROJECT LOCATION

The following part will introduce the project site, Esbjerg. Both through desktop and phenomenological analyses, which will provide an understanding of the chosen location.

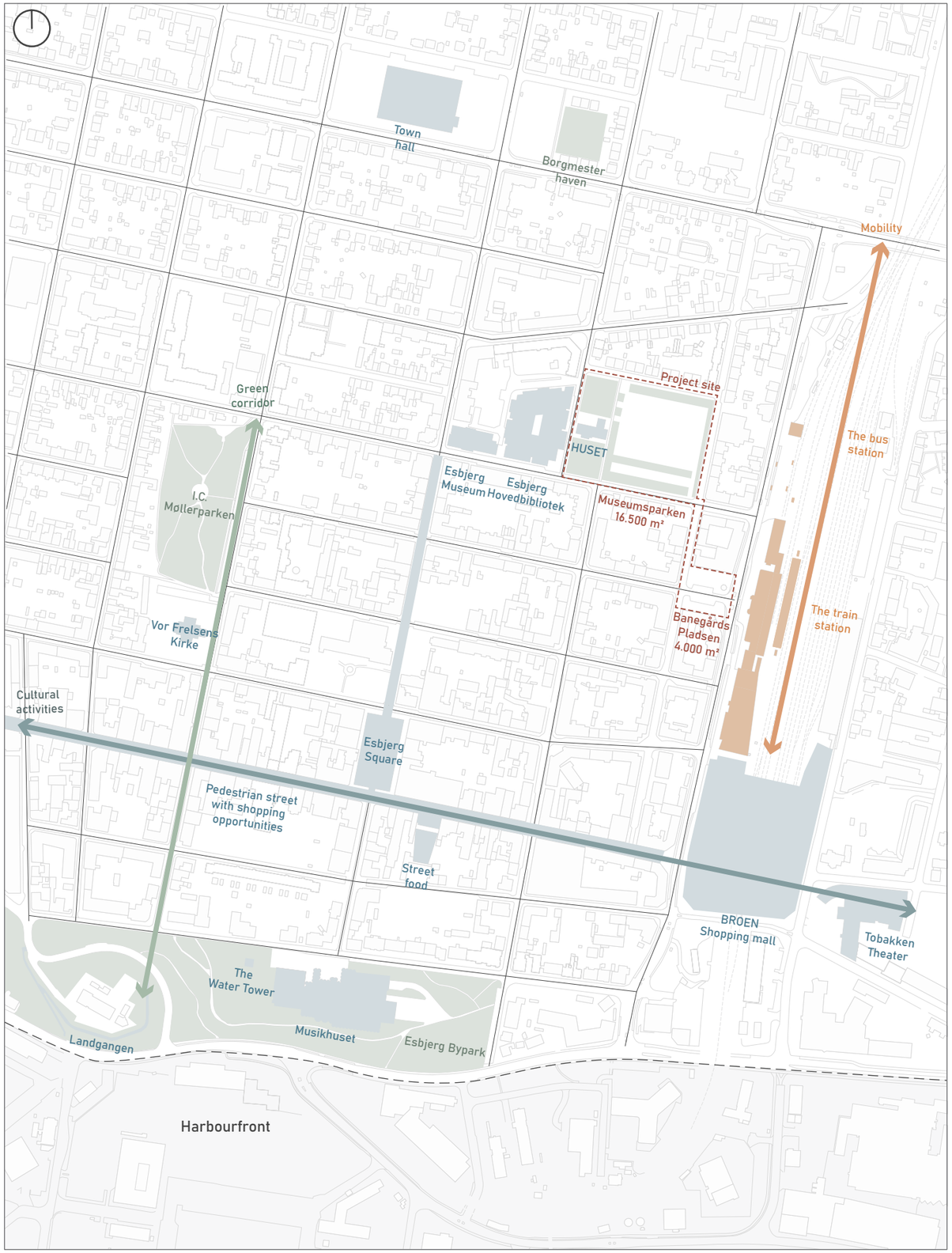


Illustration 23: Overview of Esbjerg in 1:5000

Project location and thefuture plans

Esbjerg
Esbjerg, Denmark's fifth-largest city, traces its origins back to when it primarily consisted of farms. In 1868, the city became known as a prominent fishing and shipping hub (Esbjerg Havn, n.d.), resulting in Esbjerg's history and reputation intertwined with its maritime roots. Despite its rich history and maritime significance, the city is currently experiencing more moving away from the city than to the city.
Looking forward, Esbjerg has set ambitious goals for its future development. They have chosen experiences and culture as the way forward for Esbjerg (Esbjerg Kommune, n.d.). The city aims to foster an inclusive and diverse community with good, safe, and publicly accessible spaces open to all citizens. The city addresses the challenges of social inequality and is incorporating the Global Goal for Sustainable Development (Esbjerg Kommune, 2022) into Esbjerg's future strategies between 2022 and 2034.

Project site
The project site spans from Banegårdspladsen to Museumspladsen and has the potential to attract a diverse range of people. Banegårdspladsen is in front of the train station and serves as the first and last impression for visitors arriving in or departing Esbjerg. It consists of a kiss-and-ride spot, a hotdog stand, and 25 parking spots, which support the rapid flow of people arriving by vehicles and making their way to the train station. 700 metres from Banegårdspladsen, the second part of the site can be found, Museumspladsen. Museumspladsen has 227 parking spots, a skating court, basketball, and space to play petanque. It is next to the library and the cultural house, HUSET, which hosts musical events. While Banegårdspladsen can be seen as the entrance point of the site, Museumspladsen can be seen as the city hub offering different activities for a broad age group.

In 2019, the municipality designated the project site for development, representing an opportunity to shape the city's future and aiming towards connecting urban space and the urban environment (Esbjerg Kommune, 2019). The main plan consists of removing the parking lots below ground and using the space for housing and public urban spaces to facilitate the city's residents and visitors. The second plan is to provide around 50% of Museumspladsen for recreational activities and the rest for housing (Esbjerg Kommune, 2019).

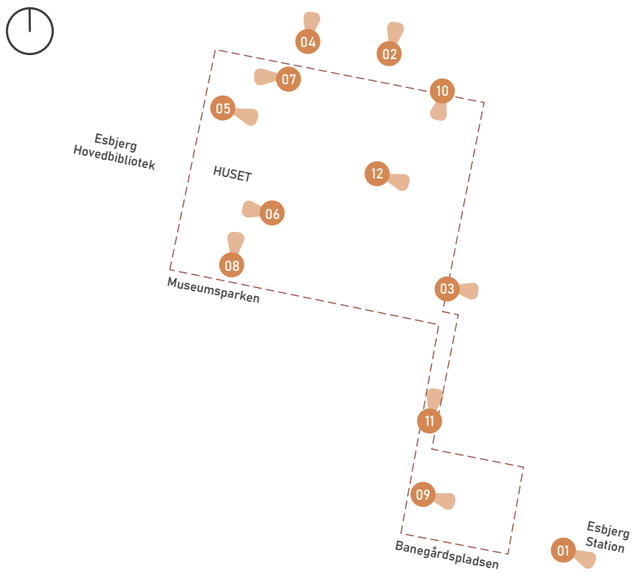


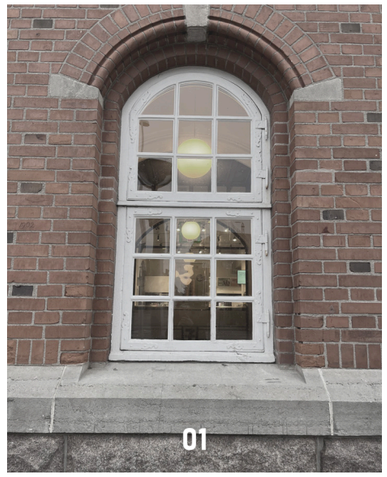
Illustration 24: Map showing the placement of the taken pictures

Materiality and spaces

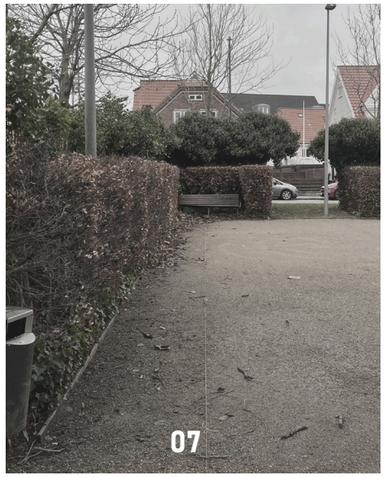
The materiality of the project area can be divided into facades and hard and soft pavement. The three categories tell a story of the area's history, function, and lived experiences. By examining the materiality, the project will gain insight into the site's identity and character.

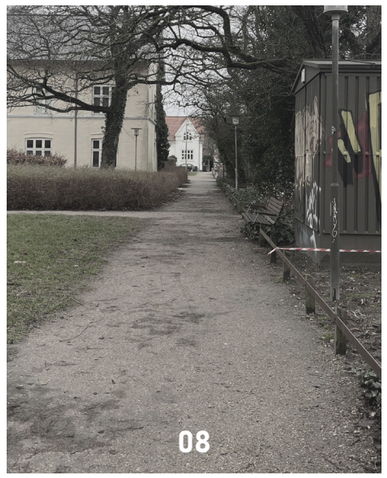
The colour palette consists of greyish shades with a hint of a yellow and red tint, which illustrates a continuous narrative from Banegårdspladsen to Museumspladsen. These nuanced shades create a cohesive identity for the space and contribute to the area's heritage by having traditional red bricks that date back to the 1100s (Gravesen, 2016). Red bricks were frequently used in buildings in the area back in the day, and their warm, rustic colour also contributed to the area's unique aesthetics and charm.

The overall pavement consists of asphalt, tiles, and gravel. The soft pavement, in gravel, indicates where the recreational activities are, which is a nice detail that ensures that the visitor knows where to stay for a longer time and what is meant for transit. However, only a small portion of the site has gravel compared to the hard pavements. The rest of the site consists of broken tiles and asphalt, which influences how the route is experienced. Pavement cracks can occur due to frequent traffic loads (Golos, 2021). It can detract from the visual appeal of the environment and give a sense of neglect and deterioration. They can also create a sense of uncertainty and discomfort among visitors, who may worry about their safety and tread carefully to avoid falling or tripping. Concerning BVIP, this might discourage them from using the site, as the uncertainty would be alarming for them. This may ultimately affect the use of the area, which is why the design proposal needs to consider long-lasting materials that can endure different types of activities and uses for a long time.



Facades





Soft pavement

Hard pavement

The built environment

The following text will examine the built environment to provide a base for understanding the context of the project. The project area is close to different functions, from culture and commercial to offices and the city's bus- and train station. The most dominant function in the area is primarily housing. Most of the housing south of the site is mixed-use, with public use in the ground frontage, inviting people to engage with or stay in the area longer. While the housing north of the site only consists of housing between three and four stories. In Esbjerg, the municipality recommended building apartments within five stories in the city centre (Kommuneplan, 2022), which restricts building heights but ensures a cohesive character within the city. The existing buildings are around three to four stories high, with a few exceptions near Banegårdspladsen, which are five stories tall.

The municipality has selected buildings and ranges that they believe are worth preserving. Common to these buildings is that they are well-maintained buildings in red brick. I have then selected three buildings I found valuable for my project: the station, Huset, and the library. This is because they are public functions that can attract people to the project site. The close location of the library and the station creates a natural hub for public life and social interaction. The library attracts a wide range of people, including students, families, and cultural enthusiasts, who can explore and enjoy the project area during their library visit. At the same time, travellers and visitors passing through the station may be attracted by the project area's offerings and facilities, increasing the diversity of people visiting the area.

Illustration 26: Mappings of the built environment in 1:5000

Infrastructure

The infrastructure of Esbjerg will be looked into in the following text, as it helps address current needs while anticipating and preparing for future challenges. Esbjerg has a grid system of perpendicular streets that do not promote a natural guiding line into the centre. This layout can be an advantage but also a problem for the visually impaired's orientation in urban spaces. The advantage is the predictability of the perpendicular streets. On the other hand, there will be a lack of characteristic features that make it easier to differentiate between the different streets. Based on the data from Strava (Strava's Global Heatmap, n.d.), a tracking device for people on the move, it was possible to access the flow of pedestrians in the area. From the train station, most people walk in the direction of Nørregade towards the city centre, and some walk towards Banegårdspladsen, where they later turn towards Nørregade. Near Museums Pladsen, most people come from Østergade and Nørregade. This data indicates that many people pass by the site daily, meaning that it has great potential for attracting people after transforming it and providing it with new functions.

The project area is easily accessible for both pedestrians and cars. This is specifically true at Museumspladsen, where there are two car openings and four for pedestrians. The multiple openings reduce potential traffic jams and allow pedestrian accessibility, ensuring the site is reachable from different directions. Regarding guiding lines for BVIP, there have been integrated directional tiles and warning tiles on the path from the train station towards Banegårdspladsen when passing through a road. However, besides that, the visually impaired has to rely on the natural tactile cues provided in the city, e.g. curbs and walls. Both Banegårdspladsen and Museumspladsen's current function is primarily parking. However, the design proposal for this project envisions transforming it into an urban space that prioritises sensory experiences and pedestrian activity, which is why there is a need for change and to integrate more tactile cues for the visually impaired. Furthermore, the transformation also involves removing 252 parking spots, which relates to the municipality of Esbjerg's plans (Esbjerg Kommune, 2019) for underground parking.

Illustration 27: Mappings of the infrastructure in 1:5000

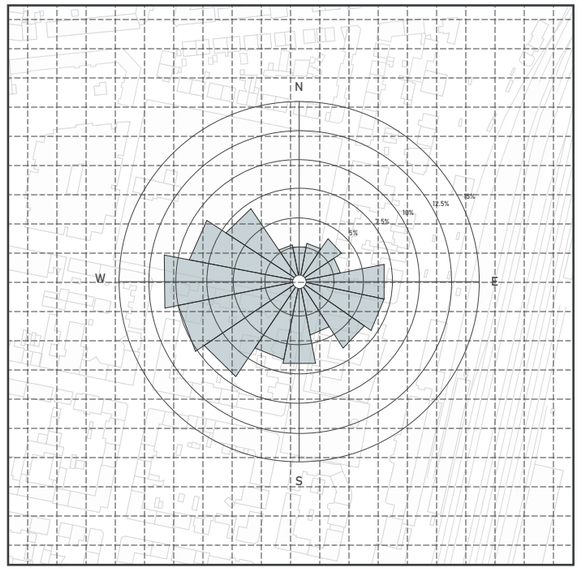
Microclimate

This section will examine Esbjerg's microclimate to understand the site and investigate its impacts on BVIP orientation in the city.

The topography of Esbjerg is characterised by its flat terrain and a gradual slope extending from the northwest to the southeast, from the highest point (17.5 metres) to 12.5 metres. During extreme rainy conditions, gravity leads the rainwater to run off through the landscape, and in areas where the terrain flattens out, the rain is collected. This is also known as blue spots. Blue spots indicate areas with a risk of flooding during extreme weather conditions. Data from Dataforsyningen (Dataforsyningen, n.d.) shows that the blue spots are collected on the outer edge of the site. Awareness of these spots is essential to prevent future flood risk. Another important microclimate element is the wind. Strong winds are blowing from the west-northwest to the southwest. This can be reduced by strategically placing buildings, trees, bushes, or walls to create a comfortable environment for people to stay longer without being affected by the force of the wind.

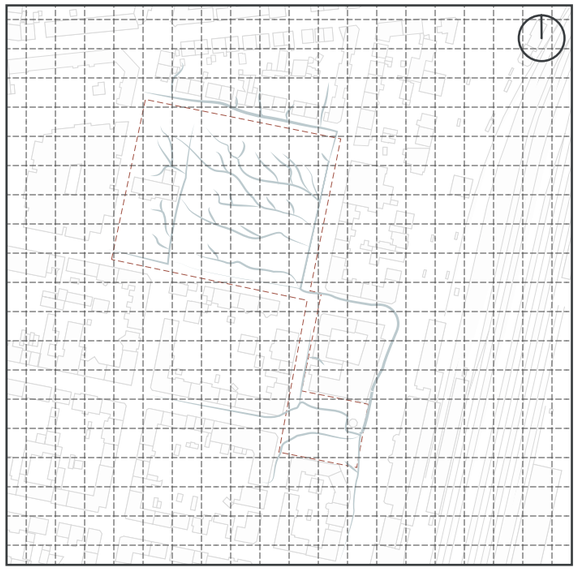
During the interview with Dansk Blindesamfund, they mentioned that the weather plays a role in their orientation. When it comes to extreme wind conditions, it can be difficult for BVIP to navigate, as the wind can temporarily change the environment by moving objects and creating obstacles that are not usually present. It can also increase the risk of falling and maintaining stability and balance. As mentioned earlier, BVIP notices the small details in the built environment, from the sounds of the surroundings to the tactility of the pavement, so during rainy weather, it can also become challenging to orient as the rain creates a constant noise that dominates the sound of the surrounding environment (e.g. traffic lights or traffic noises), this makes it harder for the visually impaired to interpret the environment. Besides the challenge of the noise, the surfaces are also more slippery, making it challenging to use a cane, and it increases the risk of falling. Based on this, the design proposal will decide the accountability for the BVIP's safety through the choice of pavement, and based on the analyses.

Wind



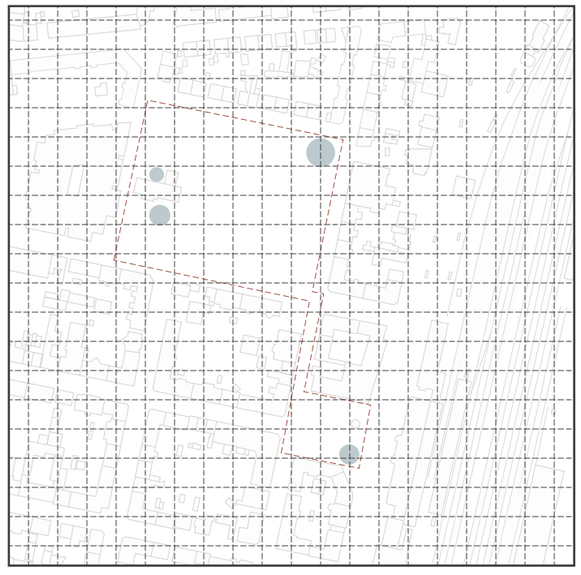
Wind rose provided by Esbjerg airport from 2003 to 2019, by NOAA NCDC climate data service, DS3505 (Esbjerg Kommune, 2020)

Water flow direction



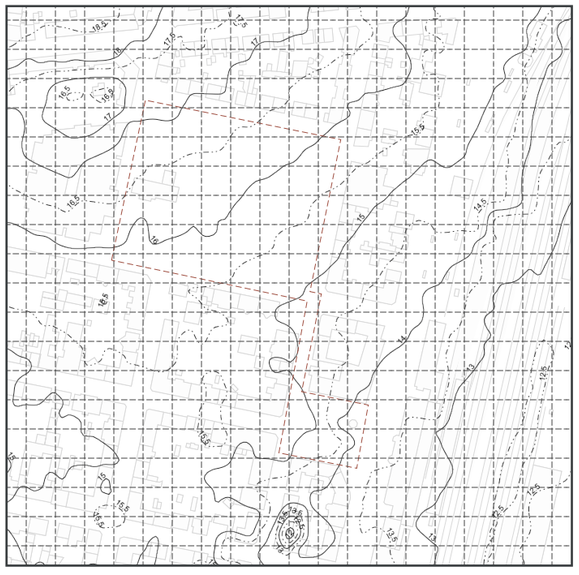
Rain flow

Bluespot



Risk of bluespot

Topography



Topography
0.5 m

Illustration 28: Mappings of the microclimate in 1:5000

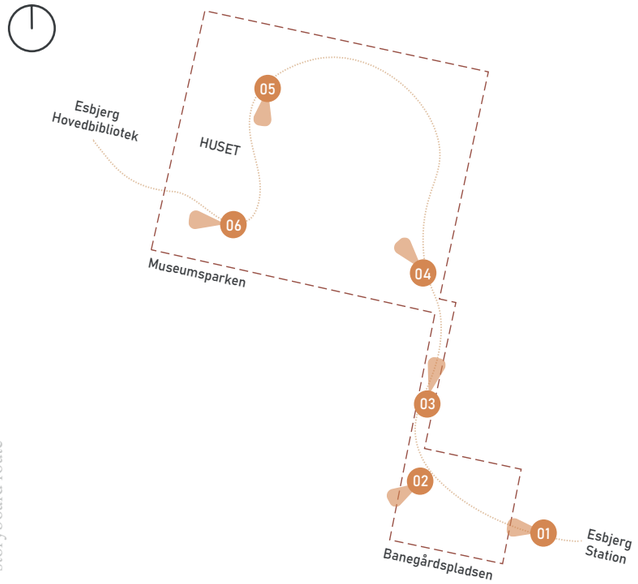


Illustration 29: Map showing the placement of the taken pictures and storyboard route

Experiencing the site

The following pages look at the site from a phenomenological point of view, highlighting how it is experienced. Illustration 30 and 31 shows the main differences between Banegårdspladsen and Museumspladsen. The surfaces of the two areas have been illustrated through a conceptual section, where it shows that Banegårdspladsen has a flat surface, indicating that it is meant to be a passage. In contrast, Museumspladsen is more dynamic, with a change in the surfaces from flat to bumpy, indicating the interplay between hard and soft pavement. This distribution between Banegårdspladsen and Museumspladsen will remain the same in the design proposal due to the surrounding functions, where it makes sense to have a transit area close to the train station and a recreational area close to the library, where people stay longer.

The storyboards on the following pages are inspired by Anna Aslaug Lund (Lund, 2021), who emphasises the importance of viewing space through sequences over time to gain a deeper understanding of its character. The storyboard shows how the site is experienced, with an additional layer of focus on the sensory experience and argues that the existing project site has a gloomy atmosphere with limited human activity, mainly centred around car parking. Though the site has some elements that accommodate the visually impaired, e.g., tactile pavement and curbs, only a few attractive spaces invite visitors to stay longer. This prevents the visitor from staying and encourages pedestrians to walk away. This indicates that the activities are primarily functional rather than social or cultural. In order to enhance the differences between Banegårdspladsen and Museumspladsen, Museumspladsen needs to activate and add recreational activities that are attractive to a broader group of people. This could include play areas, seating, green spaces, or cultural events.

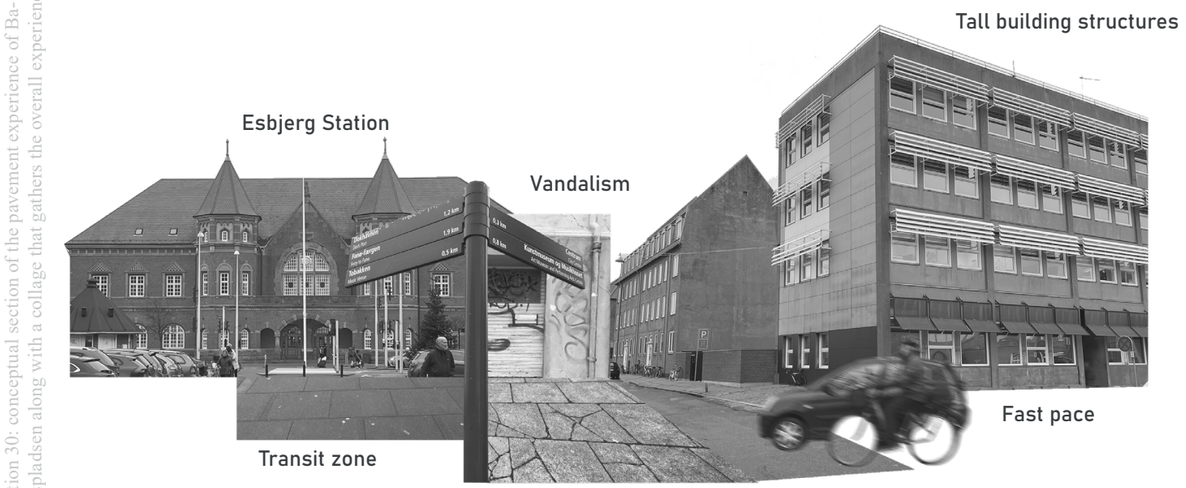


Illustration 30: conceptual section of the pavement experience of Banegårdspladsen along with a collage that gathers the overall experience

Banegårdspladsen

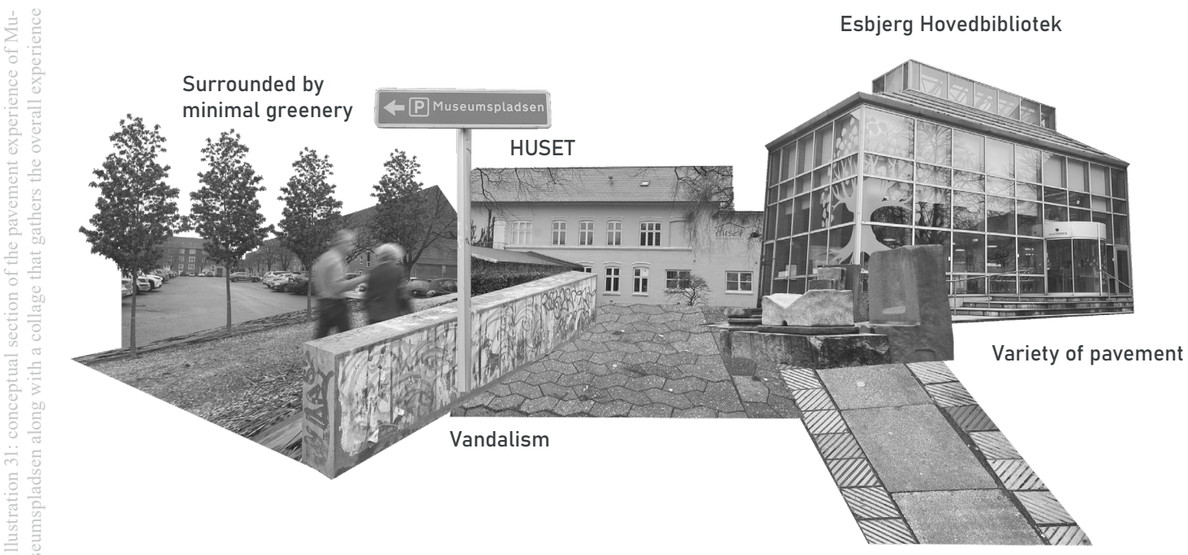


Illustration 31: conceptual section of the pavement experience of Museumspladsen along with a collage that gathers the overall experience

Museumspladsen

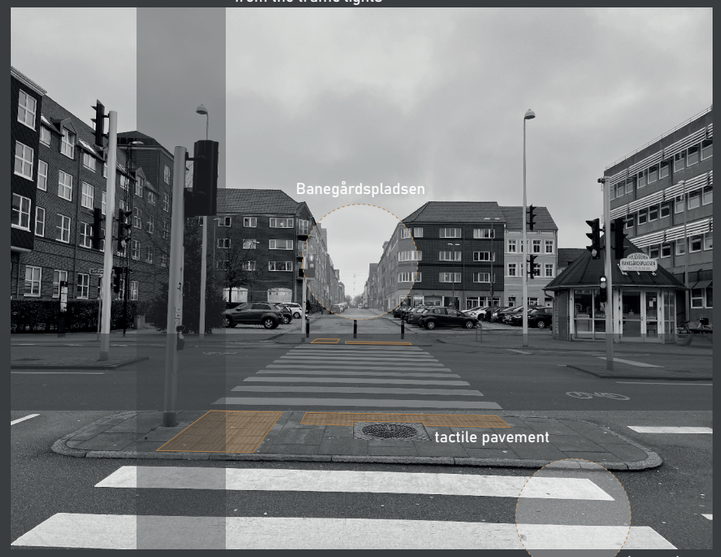


Illustration 32: Storyboard, the first meeting

01 // The first meeting

Illustration 33: Storyboard, traversing

02 // Traversing

Illustration 34: Storyboard, passageway

03 // Passageway

Illustration 35: Storyboard, museumspladsen

04 // Museumspladsen

Illustration 36: Storyboard, observing the activities

05 // Observing the activities

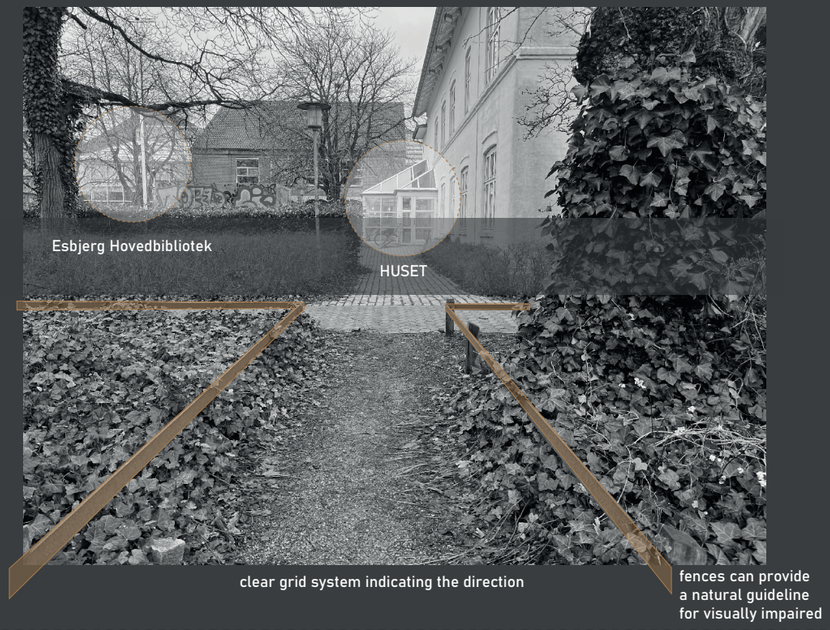


Illustration 37: Storyboard, entering the green space

06 // Entering the green space

PRESENTATION

The following chapter will present the final design proposal through a strategic point of view. Afterwards selected areas within the project site will be presented through plans, sections and diagrams.

Illustration 38: Masterplan in 1:2000 of Esbjerg+

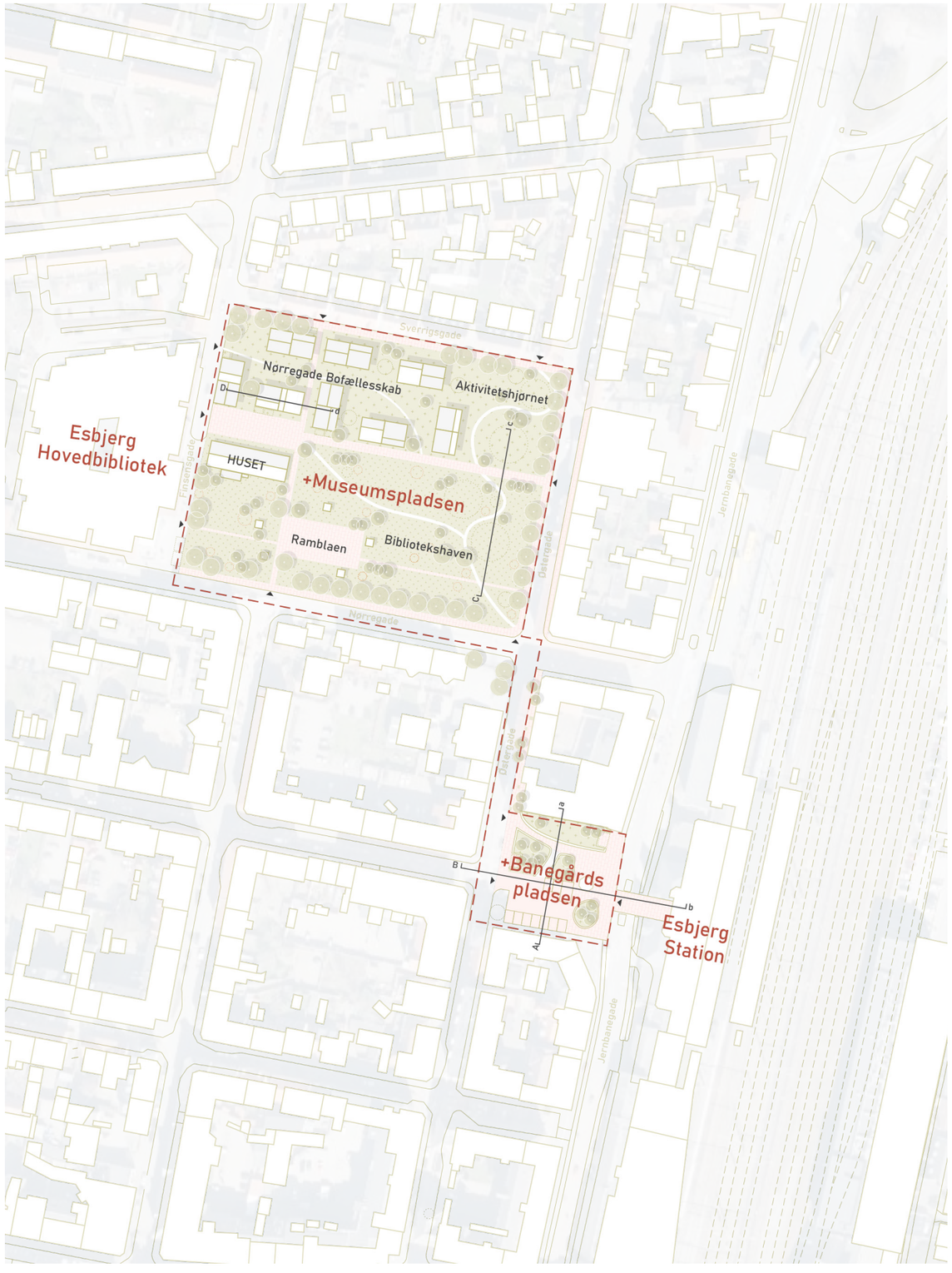
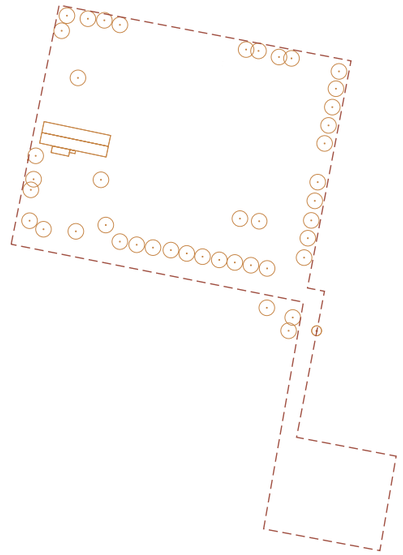
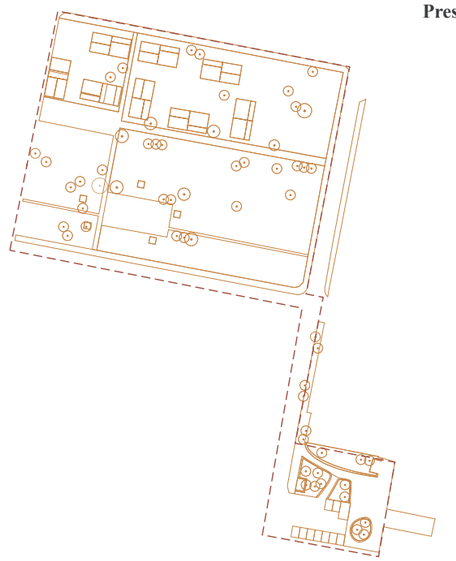


Illustration 39: Overview of what has been kept and added in Esbjerg+



kept from existing site



design proposal

Welcome to Esbjerg+, the inclusive city

This is the design proposal for a more inclusive city that demonstrates how urban design can create environments where everyone, regardless of ability, can navigate, interact, and feel invited to participate in activities, reducing loneliness by implementing co-housing and accessible spaces for gatherings. It is based on a design approach that focuses on designing for the visually impaired and their needs in the built environment. The name of the design proposal is Esbjerg+ and relates to the symbolism of addition, positivity and including another layer to the existing, enhancing the overall experience for everybody.

Esbjerg+ consists of two main areas: Banegårdspladsen, a public space close to the train station with a fast-paced atmosphere and a constant flow of people. Banegårdspladsen focuses on welcoming visitors to the city and serves as the entrance where people can stay for a while. The second area is Museumspladsen, located closer to the library, cultural activities, and housing, and it is meant to be a place where people can stay longer. This area features different functions and zones, which ensures that there is at least one attractive zone for everybody to participate in or visit. Common to Banegårdspladsen and Museumspladsen is the focus on accessibility and inclusiveness, and in the following pages, the design proposal and the thoughts behind the design will be unveiled.

Strategies for the physical planning

Seven strategies based on the theories and analyses presented earlier in this report have been developed. The strategies are designed to guide the transformation of Esbjerg into a more inclusive urban space, thereby reducing the challenges of loneliness and taking accountability for the needs of BVIP through the considerations of navigation and experiences. These strategies can be grouped into three categories based on their intention:

01) Accessibility and Navigation: these strategies focus on improving the navigation and the accessibility of the urban spaces, with BVIP's needs and challenges in mind, making sure that the visually impaired independently can navigate, as well as ensuring equal accessibility.

02) Social interaction and Community: focuses on building communities and reducing loneliness through social interactions in different site areas.

03) Sensory and Knowledge, which connects people to their surroundings by activating the senses to enrich the experiences in the city. By grouping the strategies, it becomes clearer how they all support achieving the goal of creating an inclusive urban environment.

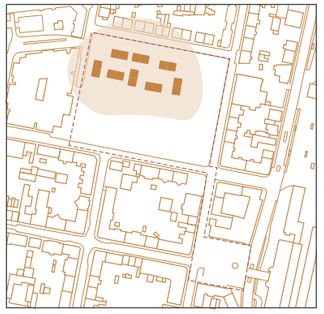
Accessibility and Navigation

Context
Utilise the surrounding context to create an attractive and natural hub for public life.

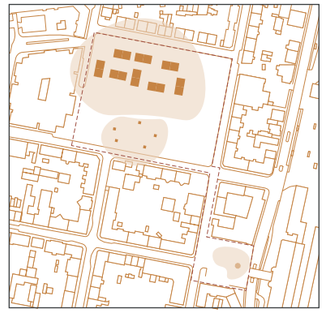
Tactile guiding lines
Differentiate between natural and built tactile guiding lines and ensure pathways with clear sightlines.

Social interaction and Community

Meetings
Create different opportunities for meetings to increase the social interactions.



Co-housing
Develop a housing community consisting of people of BVIP in different ages with non visually impaired peers to reduce loneliness.



Human scale
Activate the ground floor and keep the relation to the public space below five stories, to create inviting public spaces in human scale for people to meet.

Sensory and Knowledge

Awareness
Integrate educational opportunities for people to gain knowledge about the challenges that people with BVIP face.

Sensory
Lead people through the site by enhancing their senses through sounds, smells, and tactile elements.

Illustration 40: Strategies used for the development of Esbjerg+

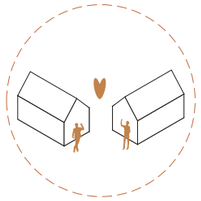
Concept

The aim is to create an environment that fosters BVIP individuals to thrive and participate on equal terms in the city, this is done through the usage of the three types of recognitions which are the private recognition, social recognition, and the recognition of rights. It can contribute to a city where people of varying abilities can participate equally and fully, as it considers both the private and the public needs of an individual.
The private recognition focuses on the needs and experiences of the BVIP's personal life, mainly around the residential area, Nørregade Bofællesskab. Social recognition combines private and public needs and relates to the feeling of acknowledgement and acceptance. This involves creating spaces that promote empathy and understanding, which can be reached through recreational activities, e.g. mobility training in Bibliotekshaven and tactile elements. Lastly, recognition of rights operates with the individual's public needs, ensuring that everybody has equal access and opportunities to engage with the site.

aim → **An environment that fosters individuals to thrive and participate within the community**

=

concept tools



private recognition

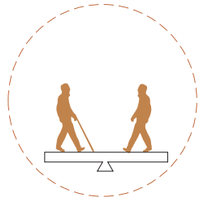
the private needs of BVIP

+

social recognition

the private & public needs

+

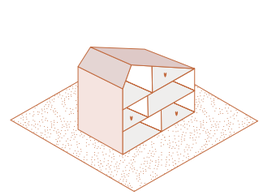


recognition of rights

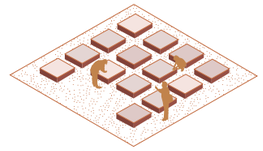
the public need of BVIP

Illustration 41: Concept of recognition

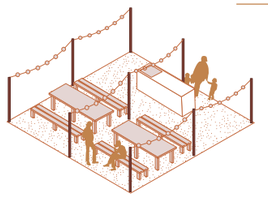
→ **spatial elements**



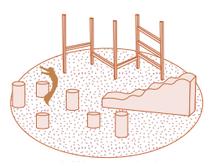
co-housing homes



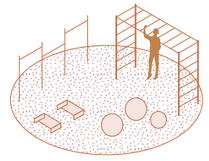
urban gardening



outdoor kitchen

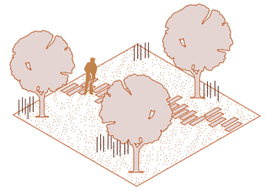


mobility training

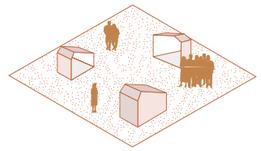


outdoor fitness

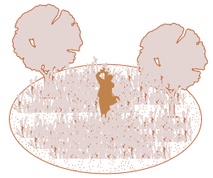
playground



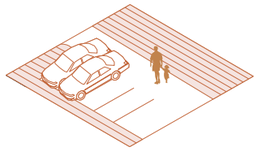
courtyard



workshop

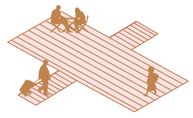


sensory garden

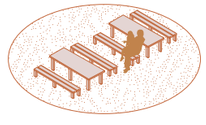


kiss & ride

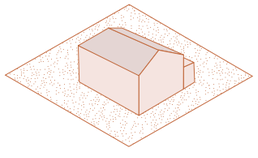
urban landscape



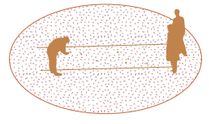
rambla



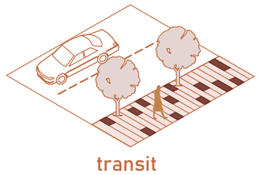
stay



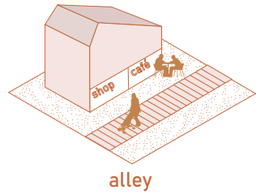
HUSET



petanque



transit



alley

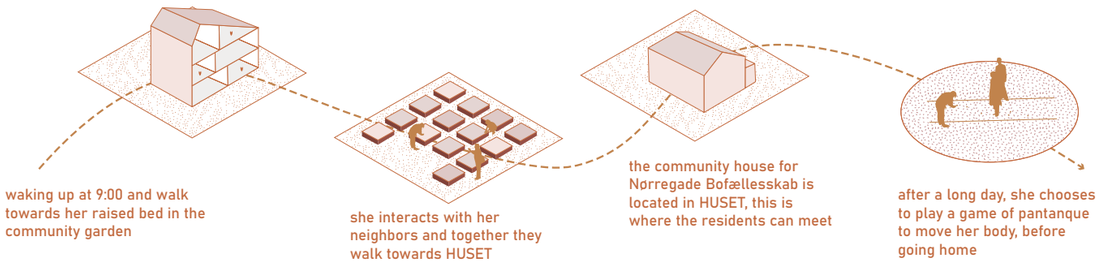
bikeparking

recognition type

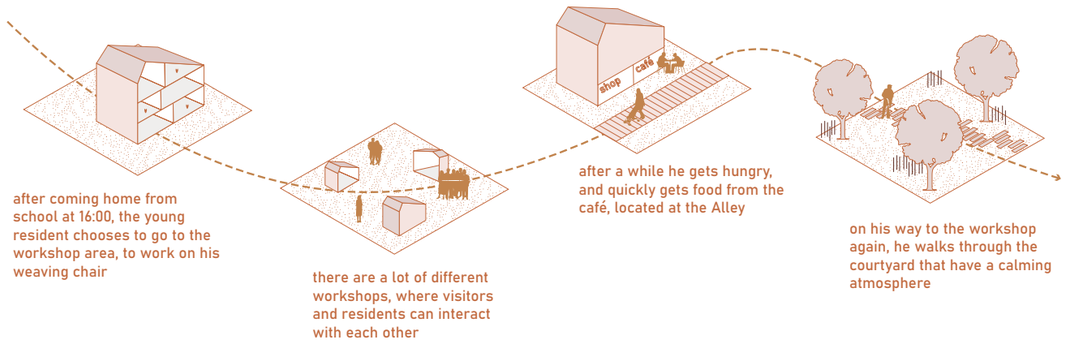
- *private recognition*
- *social recognition*
- *recognition of rights (residents)*
- *recognition of rights (visitors)*

Illustration 42: Concept turned into spatial elements in Esbjerg+

scenario for a elderly resident with BVIP



scenario for a young resident with BVIP



scenario for a family visiting

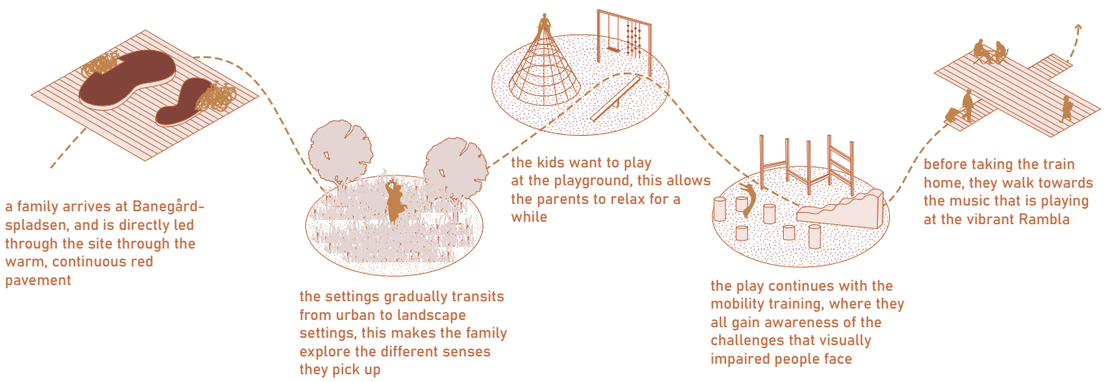
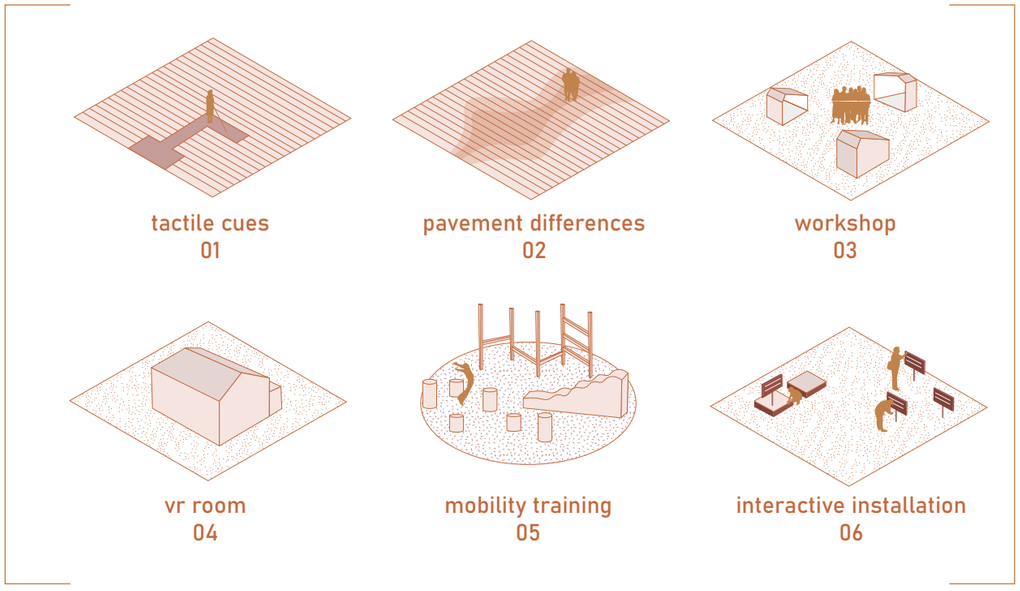


Illustration 43: Three different scenarios of how people can interact with Esbjerg+

The target group

The target group is people who are visually impaired, encompassing residents of Nørregade Bofællesskab. Some residents have moved into Nørregade Bofællesskab alone, while others come with their family or partner. The housing community consists of people of BVIP of different ages with non-visually impaired peers to reduce loneliness. This is to break down the misconceptions about people who are visually impaired and to create a community life where loneliness is reduced and to promote a sense of belonging for BVIP.

The secondary target group is non-visually impaired, who either live in the city or come for a visit. The broader target group ensures that the site is dynamic, inclusive, and engaging. To showcase how the project site can be experienced, illustration 43 shows three scenarios, telling a story of how different groups can use the site.



elements raising the awareness of visually impairment

Illustration 44: Elements offered in Esbjerg+ that raises the awareness of BVIP

Illustration 45: Placement of the awareness elements throughout Esbjerg+

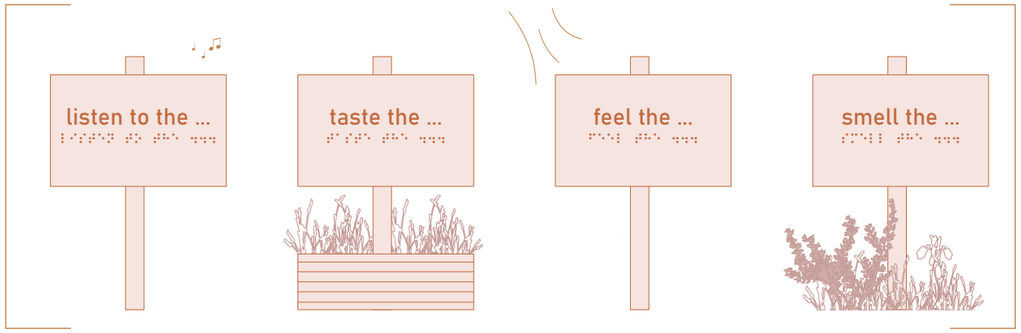
Awareness

Throughout the site there have been integrated elements to raise the awareness of BVIP in the urban space (illustration 44). All functions operate under the concept of social recognition, shifting the focus towards how blind people experience the city. One of the approaches towards raising awareness is through the choice and design of the pavement with tactile cues and tactile tiles, aiding the visually impaired to safely navigate in the city. This can be seen in Banegårdspladsen, where there is a constant flow of people, making it essential to provide proper navigation. Another approach is through the choice of functions, which can be seen in Museumspladsen. Among some is the mobility training area that can be used by BVIP as well as the sighted.

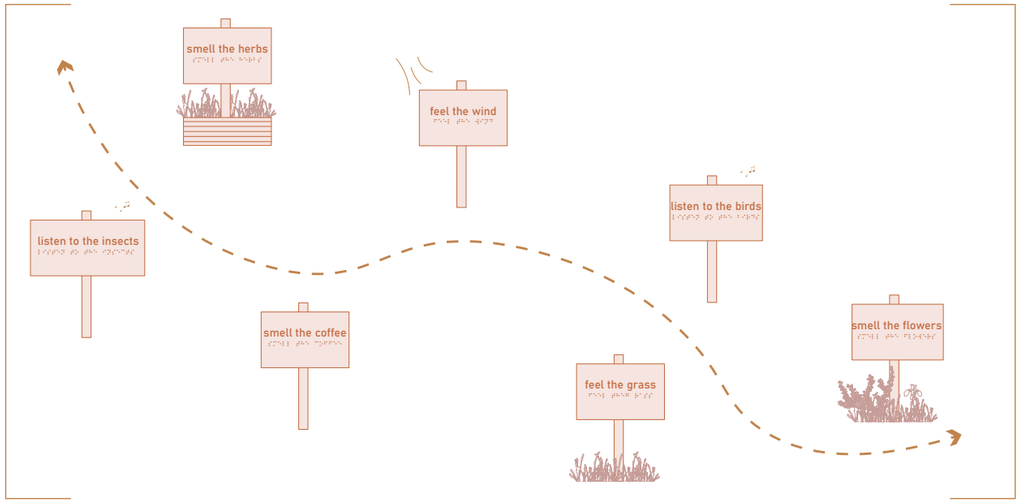
The mobility training allows people to challenge their navigation skills safely; for BVIP, it can be seen as an area to strengthen their abilities to navigate and gain more confidence, while for people with sight, the mobility training can be experienced to understand which challenges BVIP may encounter in the city. It is placed along Østergade, where there has proven to be a significant flow of people walking by daily. By placing these interactive functions close to the constant flow of people, there is a bigger chance of attracting more people to the site, as it can draw curiosity and encourage spontaneous engagement and raise awareness.

Illustration 46: Examples on which senses that gets activated in Banegårdspladsen and Museumspladsen

	sight	hearing	touch	smell	taste
Banegårdspladsen	+ green areas + vegetation that changes according to the season + brick pavement in different shades + the contrast between the green structure and the brick building	+ traffic sounds + birds chirping + footsteps on gravel + echo from the concrete frame bench + people talking + pedestrian light signals + the coating differences	+ surfaces such as gravel, brick and concrete + tactile marking on paths and shared spaces + tactile map of the area + interactive installation that responds to touch	+ flowers + trees + food from the hotdog stand + cars and the station	+ food from the hotdog stand
Museumspladsen	+ green areas + vegetation that changes according to the season + brick pavement in different shades + the contrast between the green structure and the brick building	+ birds chirping + footsteps on gravel + echo from the steel frame + people talking + interactive installation	+ surfaces such as gravel, grass, brick and concrete + tactile marking on paths and shared spaces + tactile map of the area + interactive installation that responds to touch	+ flowers + grass + Herbs + trees + coffee and freshly baked goods	+ fruit trees and shrubs



interactive intervention



conceptual placement of the interactive intervention

Illustration 47: Intervention of how to activate the senses in Bibliotekshaven

The sensory experiences of the site

The sensory experience focuses on how the urban environment can engage and affect the senses, creating spaces that are felt, heard, smelled and tasted, and not only visually appealing. The aim of sensory urbanism is to improve people's experience of the city. Illustration 46 showcases which senses can be activated when visiting the site. Banegårdspladsen activates the senses, among others, through the incorporation of tactile paving and textured surfaces that guide the visually impaired through the site, ensuring accessibility. In Museumspladsen, multiple senses are being touched and explored, one of which is through the interactive intervention in Bibliotekshaven that activates all senses by telling the visitor how to interact with nature. By activating multiple senses, the experience of Banegårdspladsen and Museumspladsen will be more memorable and interactive as people are encouraged to connect with their surroundings more.

Illustration 48: Storytelling from the perspective of a fictive BVIP who walks from Banegårdspladsen to Museumspladsen

Banegårdspladsen

04.
I pick up a strong scent of grilled sausages and bread, which stimulates my appetite. I choose to drop by the hotdog stand to get something to eat

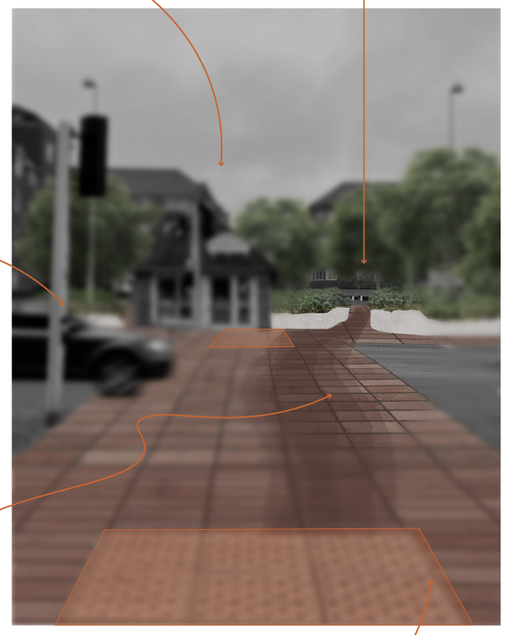
05.
I choose to eat my food among the trees in Banegårdspladsen, and enjoy the smell of nature despite being in a city center

03.
the sound of cars driving reduces the closer I get to Banegårdspladsen

06.
Afterwards I continue walking towards Museumspladsen, by following the red pavement

02.
I sense a contrast in the pavement, leading me forward, providing a route

01.
after coming out of the train, I'm met by a tactile map of the city and bright red pavement, where there has been integrated warning tiles, helping me safely navigate



Museumspladsen

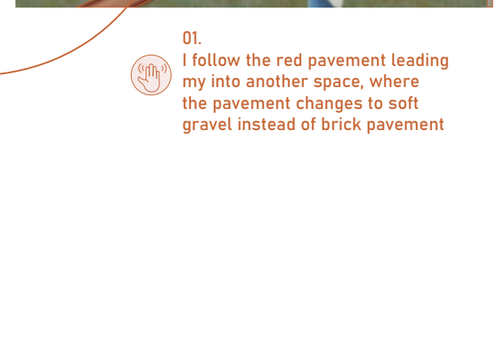
04.
throughout my walk in Bibliotekshaven I come across different signages, and after identicating what it was I realised that the text was written in braille

03.
I notice there is a clear red lane that stands out from the surrounding, I choose go to the lane

05.
one of the signages made me stand and pick berries that I could eat

02.
everythings feels slowed down, and all I hear is the birds above singing and smell the fresh air. It feels like one with the nature

01.
I follow the red pavement leading my into another space, where the pavement changes to soft gravel instead of brick pavement



Banegårdspladsen

Museumspladsen

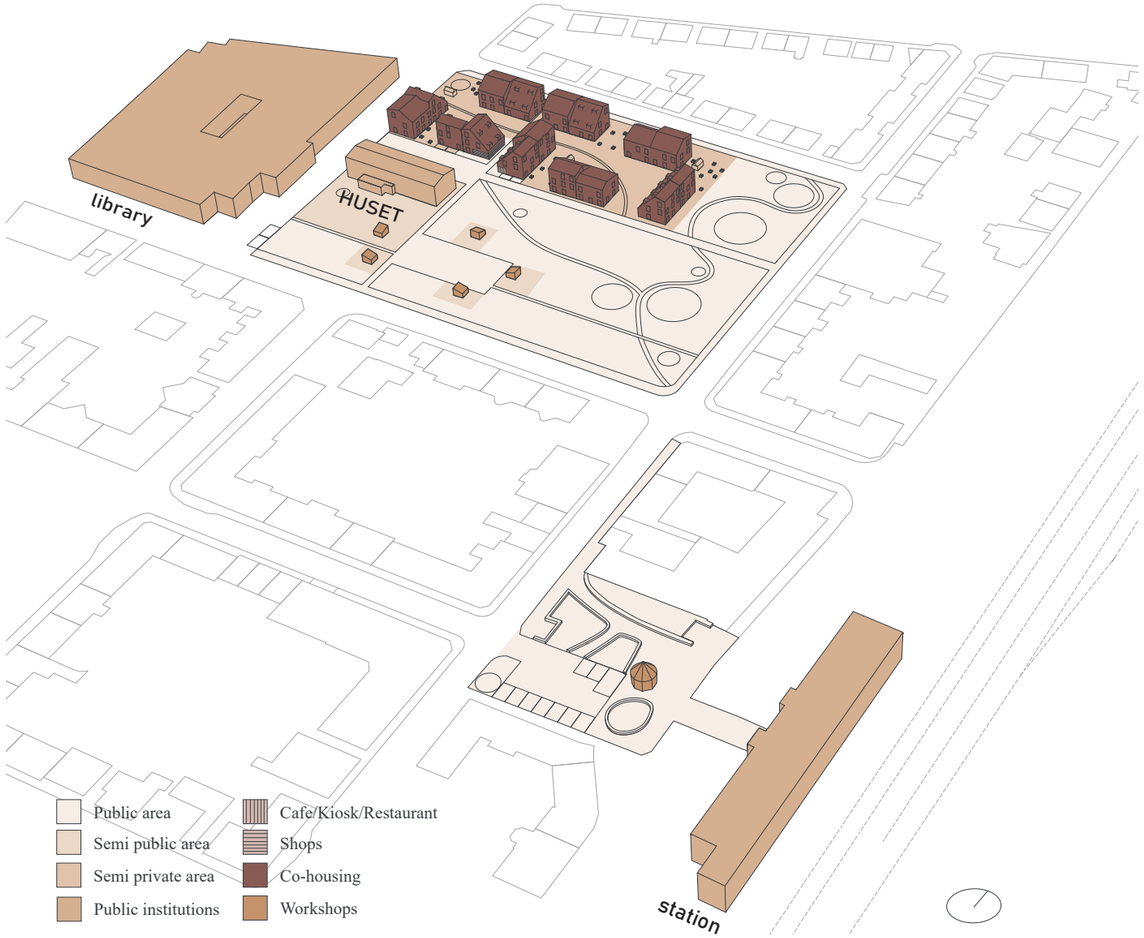


Illustration 49: Isometric view of Esbjerg+ marking the functions and zones

Functions and zones

Banegårdspladsen and Museumspladsen consist of functions that extend from their surrounding context, as a strategy to make the site feel more connected and become integrated with the rest of the city, with the additional focus on visually impaired and inclusivity. Banegårdspladsen is a natural extension of the station, meaning that the functions that can be found in Banegårdspladsen mainly focus on mobility and the fast pace atmosphere that lingers from the station. Museumspladsen is a dynamic mix of public, semi-public, and semi-private areas that respond to the surrounding context, with housing, cultural activities and recreational zones. The overall site offers different functions, to accommodate the different needs of a broader group of people.

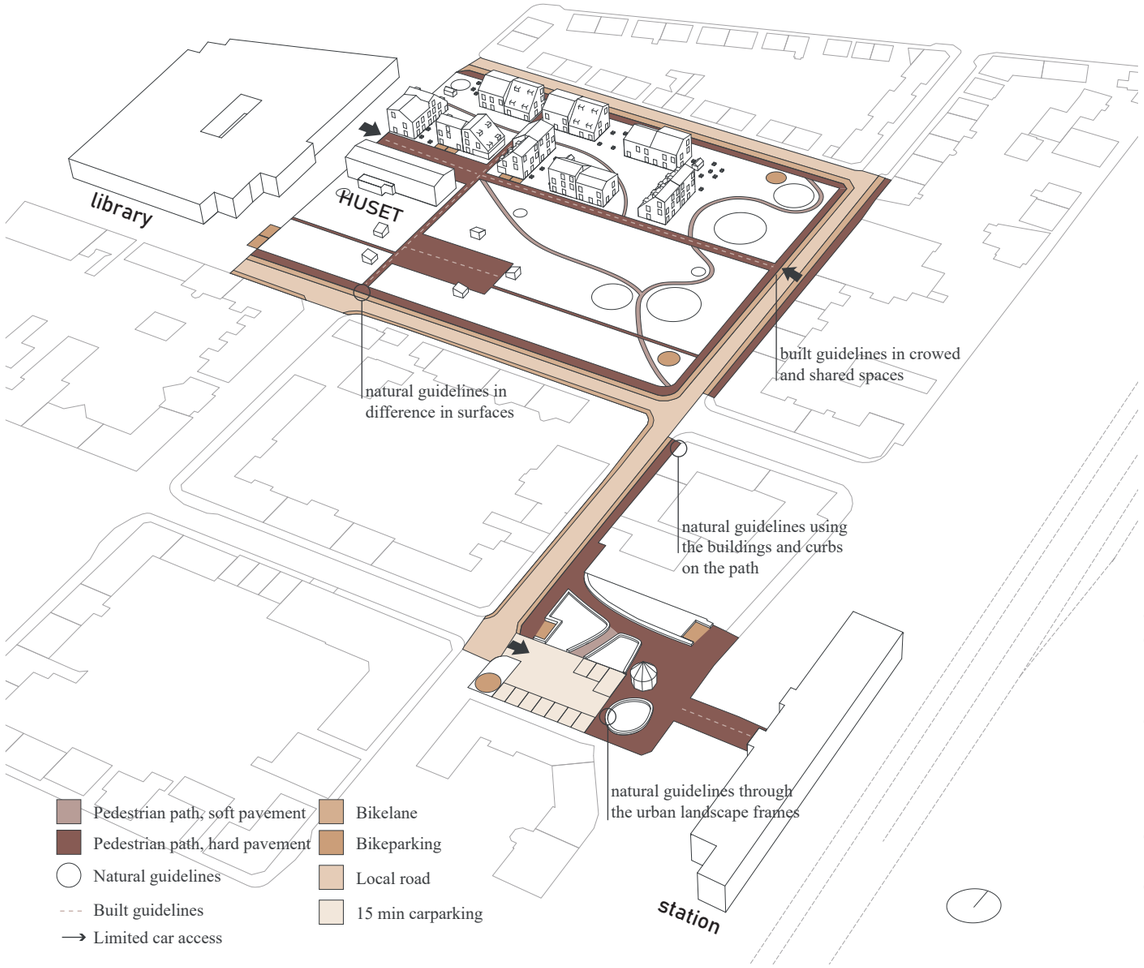


Illustration 50: Isometric view of Esbjerg+ marking the flow and guiding lines

Flow and guiding lines

One of the most essential elements of the project has been to create accessibility and clear guiding lines focussing on the experiences of BVIP. After arriving at the city, the visitor is led towards Banegårdspladsen through red pavement assisted with tactile directional and warning tiles. Banegårdspladsen is covered in hard paving with smaller brick tiles to accommodate the flow of people and cars, acknowledging that the atmosphere close to the station is fast, and that people are on an errand. The flow changes when walking from Banegårdspladsen to Museumspladsen, along with the atmosphere where everything slowly slows down.

Illustration 51: Isometric view of Esbjerg+ marking the activity level and type

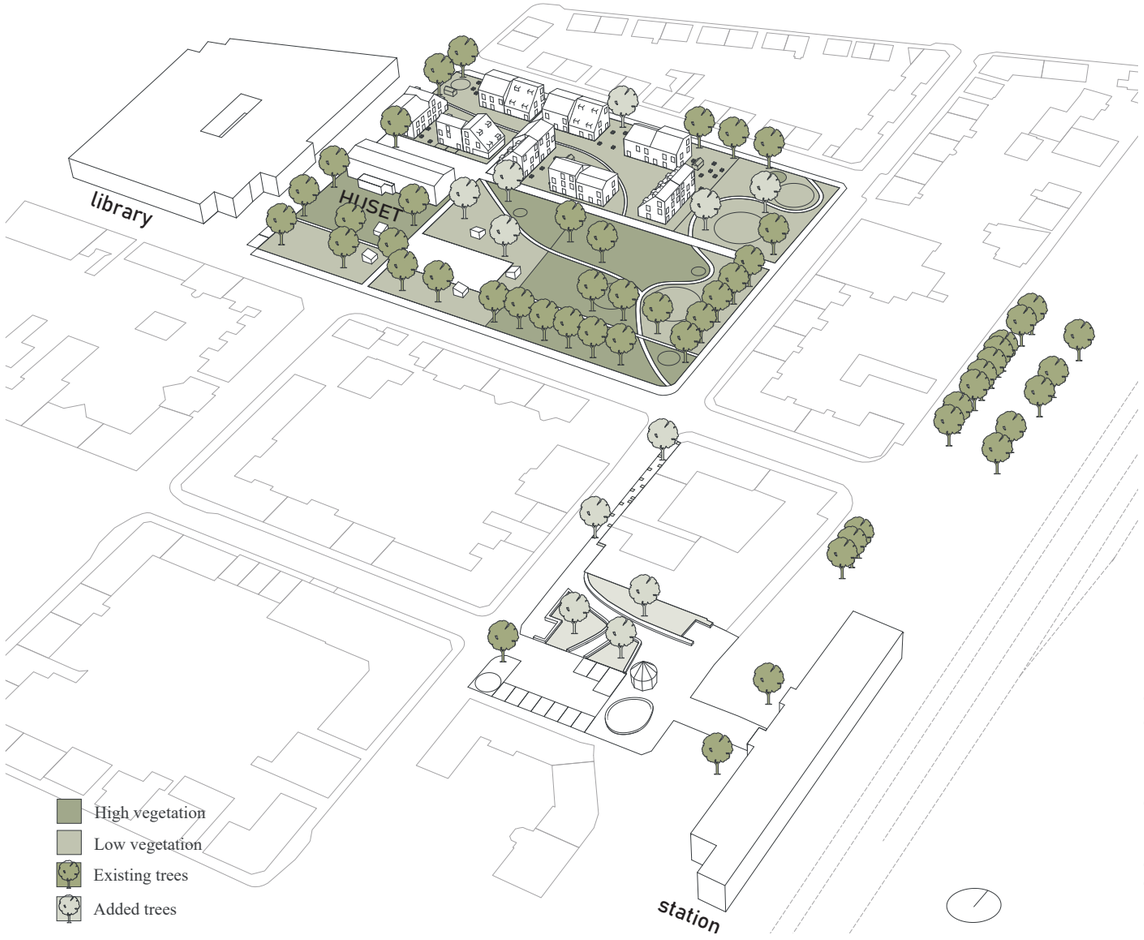


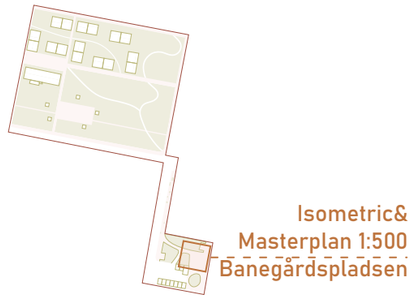
Illustration 52: Isometric view of Esbjerg+ marking the vegetation

Activity level and type

A range of activities are offered in both Banegårdspladsen and Museumspladsen, providing rich opportunities for people to participate and engage with each other. High pulse activities, such as the playground and outdoor and mobility training, are placed along Østergade, where there has proven to be a significant flow of people walking by daily. By placing these active functions close to the constant flow of people, there will be a bigger chance of attracting more people to the site, as it can draw curiosity and potentially spontaneous engagement. The low pulse activities are placed inside the site, and among others, they consist of the sensory garden, where people can take a walk and activate their senses through smell, feel, and hearing.

Vegetation

Many of the existing trees have been kept, but some trees have been added to break up the otherwise strict expression that was experienced with the trees, placed on a straight line. There is a differentiation between the placement of low and high vegetation. Low vegetation areas indicate the controlled areas, where there are specific functions and activities for people to participate in. In contrast, the high-vegetation areas offer people the opportunity to discover and explore the different types of planting that activate the sense of smell and possibly the sense of taste.



Isometric&
Masterplan 1:500
Banegårdspladsen

Illustration 53: Keymap of Banegårdspladsen

Banegårdspladsen

Banegårdspladsen is a critical point within the site, as it leaves the first and last impression of Esbjerg for visitors when they arrive and leave Esbjerg. It extends from the train station, and when visitors walk towards Banegårdspladsen, they encounter a variety of mobility-related functions that facilitate the users of the train station. For those visiting their family or friends in town, a kiss-and-ride spot is strategically placed to ensure that travellers can be dropped off and picked up close to the station. In addition to that, Banegårdspladsen also offers opportunities for relaxation in the urban landscape, where people can comfortably wait to be picked up, wait for their train or enjoy the environment.

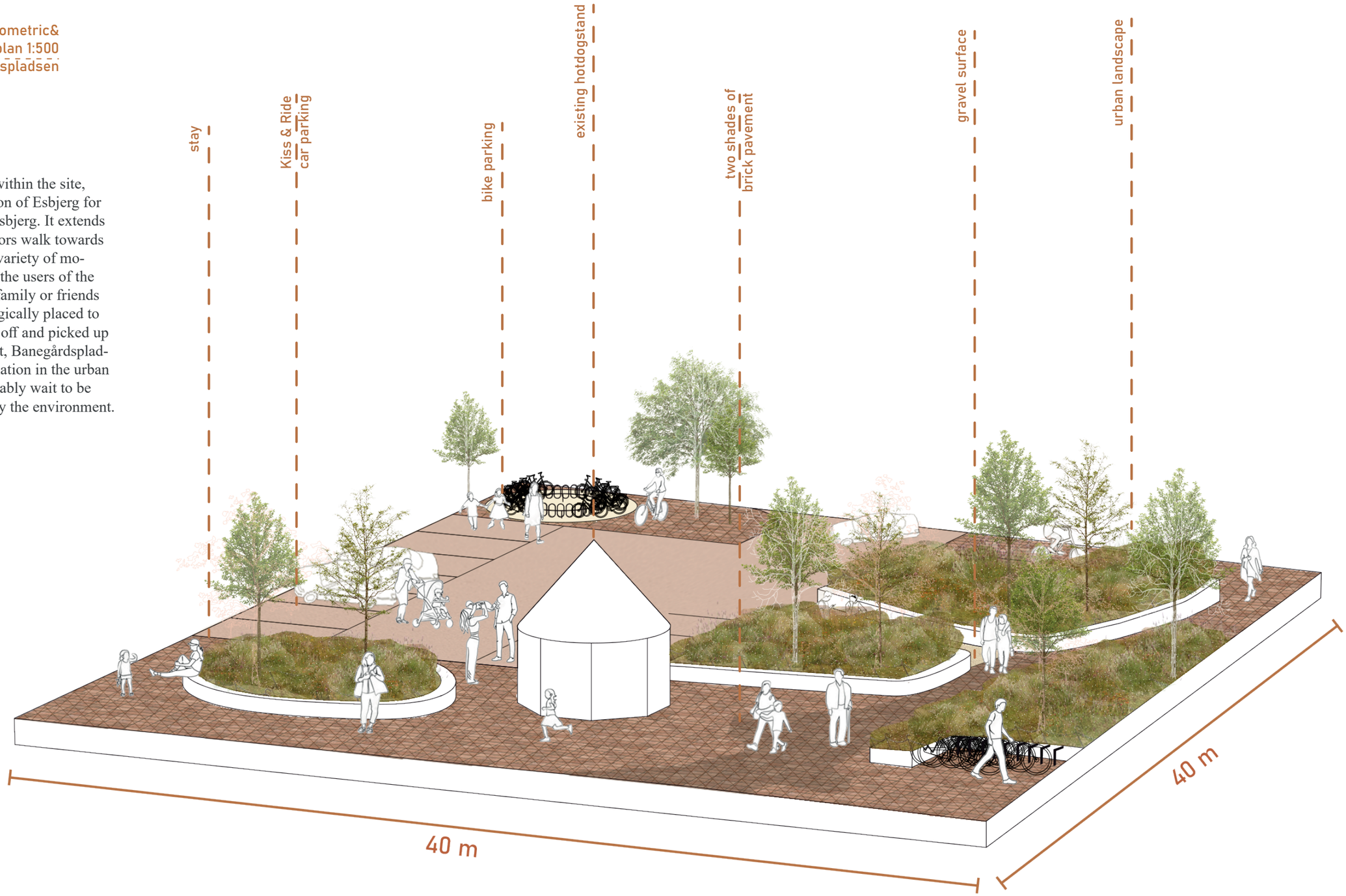


Illustration 54: Isometric view of Banegårdspladsen

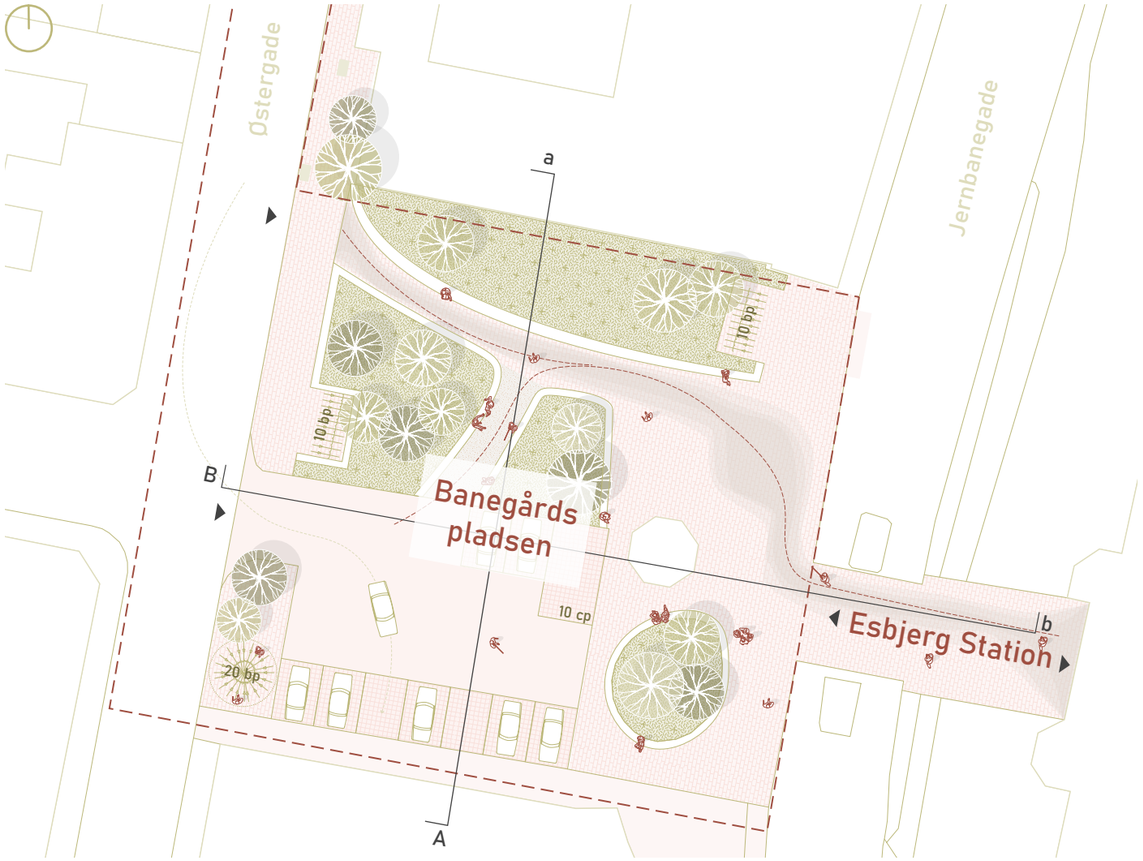


Illustration 55: Masterplan in 1:500 of Banegårdspladsen

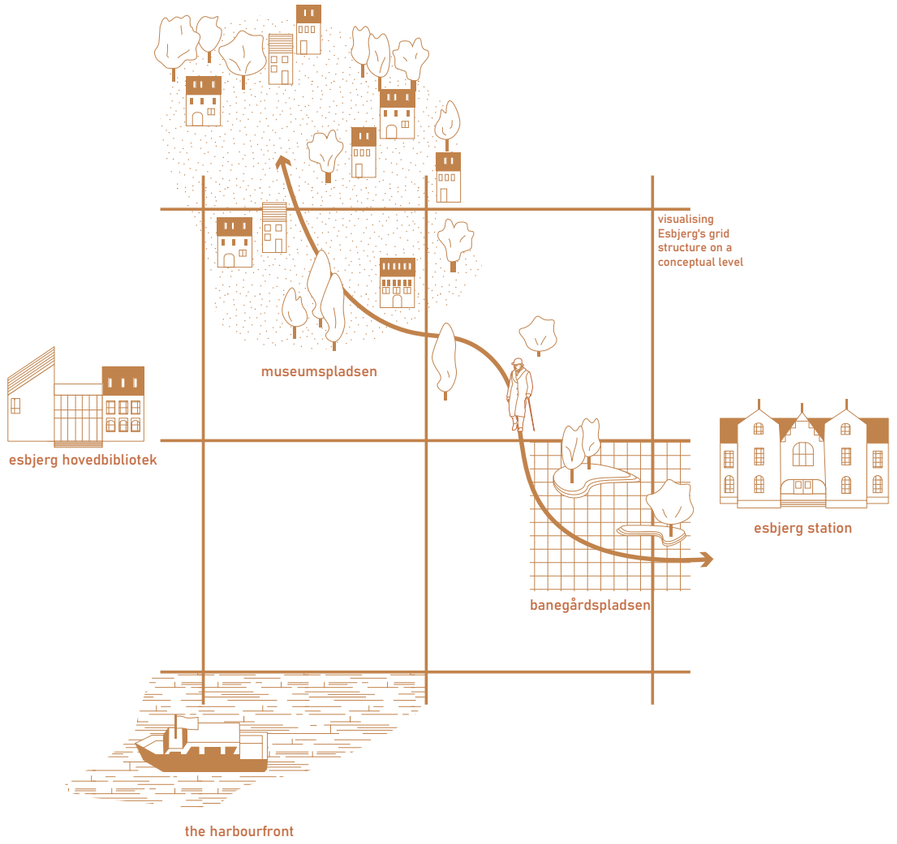


Illustration 57: Principle of having a gradual transition through an urban to landscape settings from Banegårdspladsen to Museumspladsen

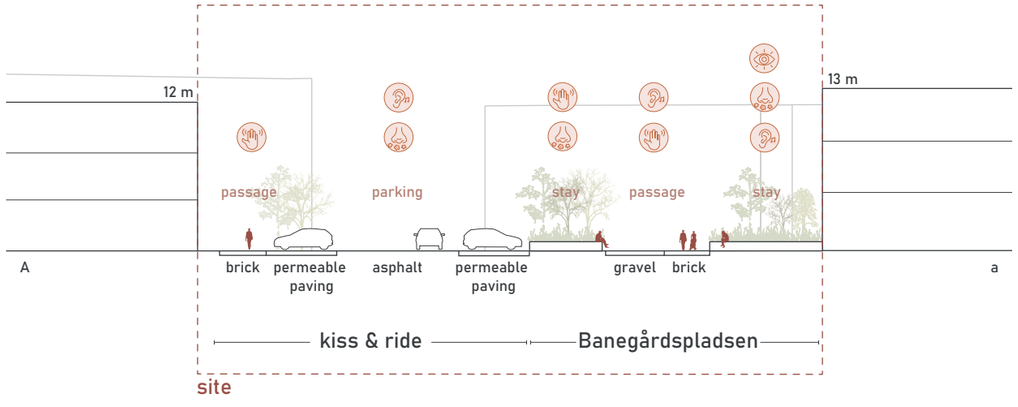


Illustration 56: Section AA in 1:500 of Banegårdspladsen

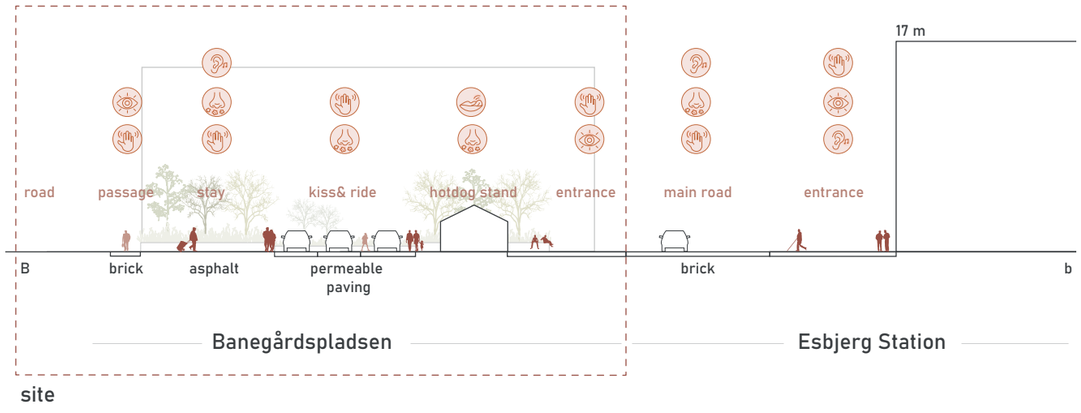


Illustration 58: Section BB in 1:500 of Banegårdspladsen

Isometric&
Masterplan 1:500
Banegårdspladsen

urban landscape
+ stay

urban landscape
+ stay

urban landscape
+ stay

urban landscape
+ stay

1000 mm

3600 mm

2300 mm

gravel
pavement

10 bikeparking

10 bikeparking

red asphalt

300 mm

5000 mm

permeable paving
10 carparking

3500 mm

8000 mm

brick pavement in
different shades

hotdog stand

kiss & ride

directional
tiles

warning tiles

Illustration 59: Keymap of Banegårdspladsen

Illustration 60: Detailplan in 1:125 of Banegårdspladsen

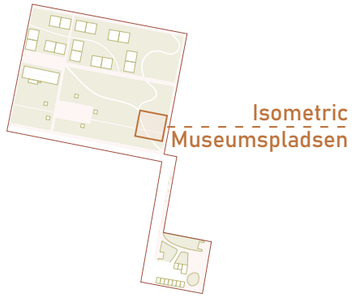


Illustration 61: Keymap of Museumspladsen

Museumspladsen

The second part of the site is Museumspladsen, a dynamic space designed to offer a range of activities and experiences. Compared to Banegårdspladsen, the intention is to have more extended stays and create a vibrant city hub of activities. Museumspladsen is located closer to the library, cultural activities, and housing, which are functions extended into Museumspladsen to attract a broader group of people towards the site. Museumspladsen features different areas that ensure at least one attractive zone for everybody to participate in or visit. These areas cater to different interests and activities, whether it is socialisation, relaxation or movement, which encourages people to stay longer.

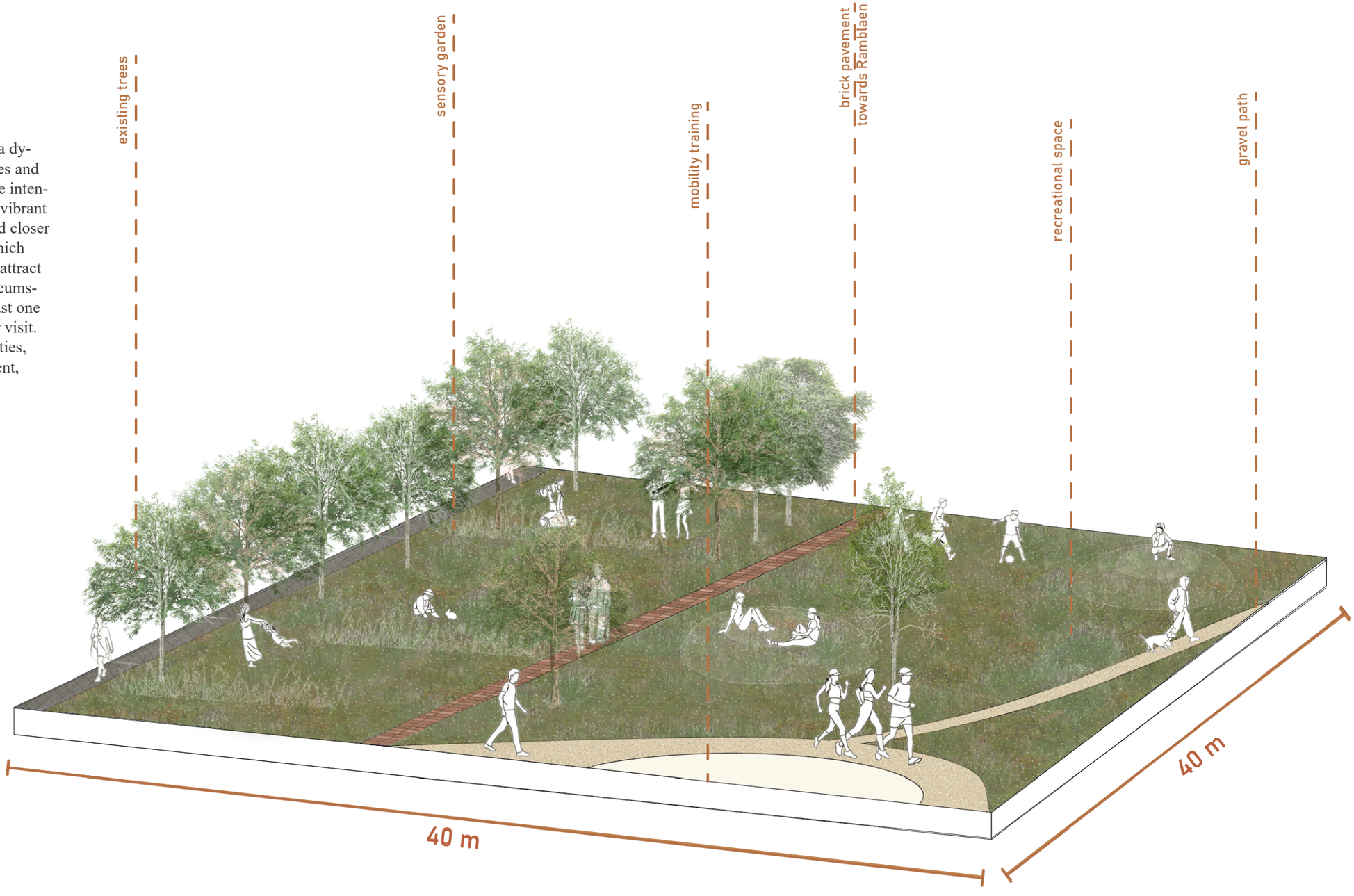
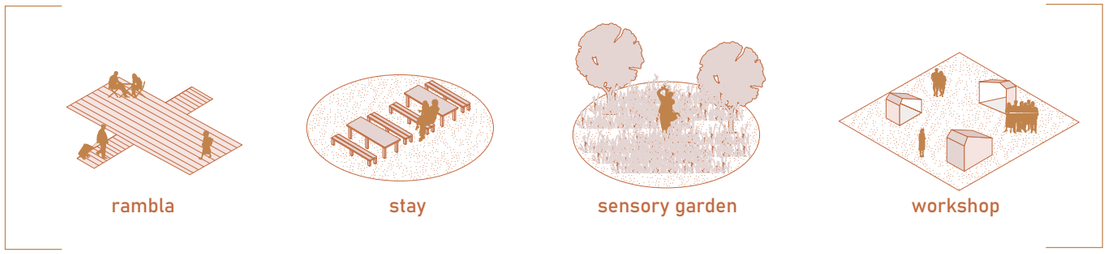
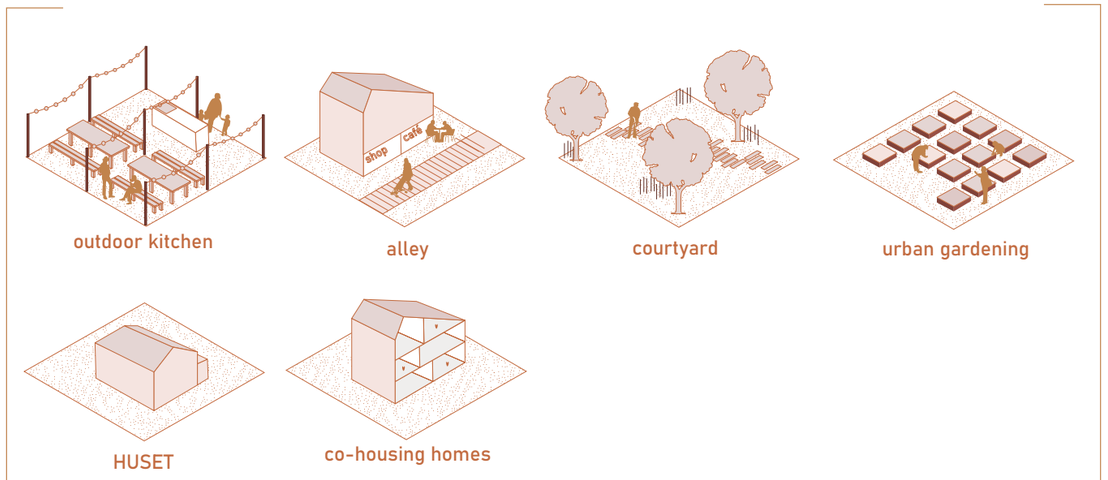


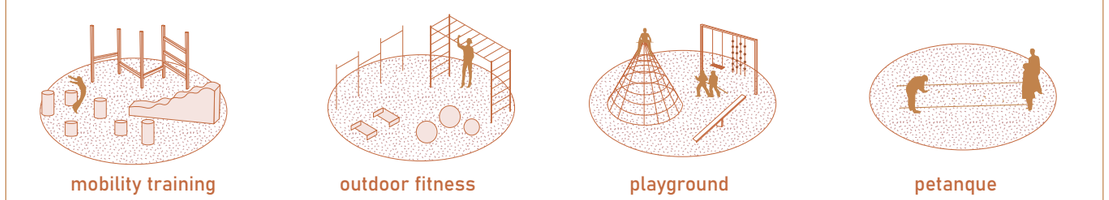
Illustration 62: Isometric view of Bibliotekshaven



Bibliotekshaven

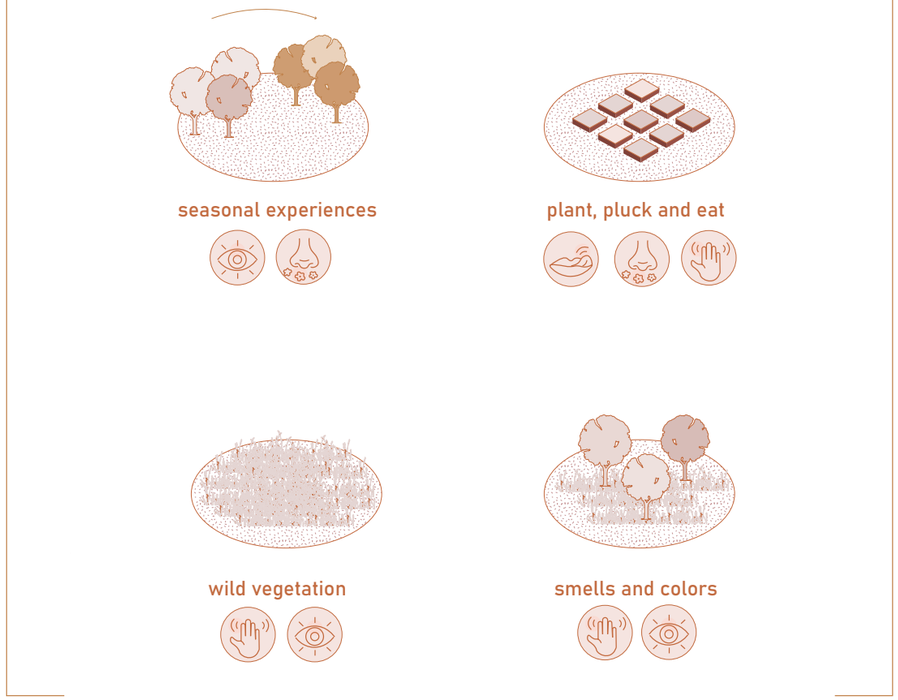


Nørrebro bofællesskab



Activitetshjørnet

Illustration 63: The different zones of Museumspladsen



planting principles

Illustration 64: Planting principles

Planting principle

Four planting principles have been worked on to activate the senses. The first is regarding the seasonal experiences; it implements different types of vegetation that ensure that the individual can smell when the flowers are blooming and see when the leaves on the trees are falling. These small details enrich the experience through the site, making the experience different. Another principle relates to taste senses along with smell and feeling senses, through the concept of the plant, pluck and eat, indicating that there will be implemented vegetation that can be eaten, e.g. berries, which can engage children in exploring the site. Then there is the principle of adding wild vegetation, smells, and colour to the site, promoting sensory stimulation, visually appealing, and creating an exciting environment to enjoy in the city.

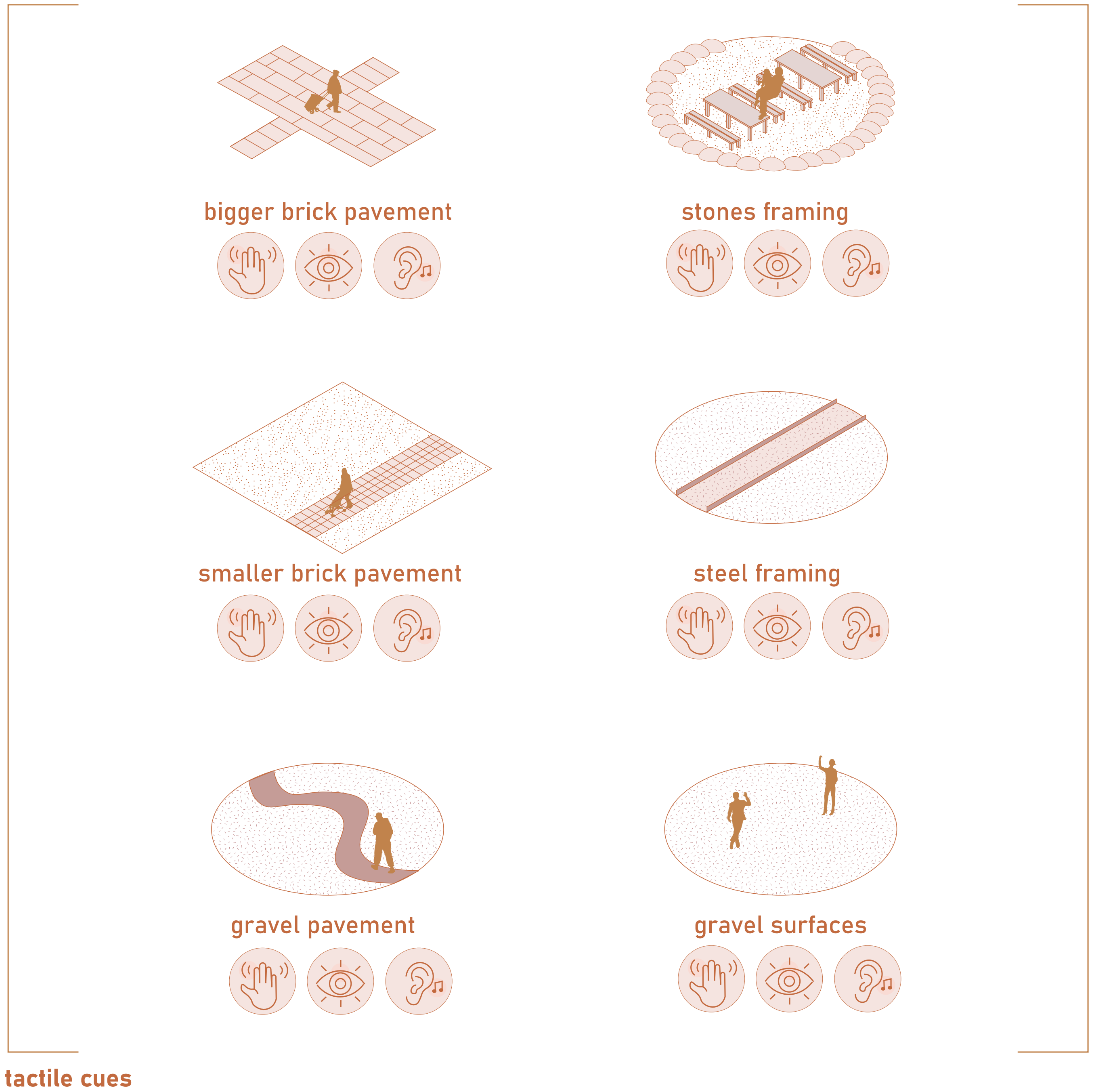


Illustration 65: The different tactile cues and elements used

Bibliotekshaven

Bibliotekshaven is the sensory garden that people are greeted by after arriving in the city and following the red pavement from Banegårdspladsen. The garden offers different experiences based on the path taken. The paths differentiates between gravel and brick pavement. Two of the paths have a gentle curve covered in gravel, and the third path is on the brick pavement. The paths with gravel invite for a more explorative experience but differentiate in activity level. The first path (see illustration 67) closest to Østergade leads the visitor towards the activity corner, where outdoor workout, petanque, playground and mobility training are provided.

The second path leads the visitor through a low pulse atmosphere surrounded by greenery and vegetation, where the senses get activated through an intervention placed around the garden that speaks to the visitor through text and raised dots of braille and notes an activity, e.g. smell the flowers here or listen to the birds in a specific direction. This intervention makes the visitors engage with the city through their senses. The last path leads the visitor towards Ramblaen and the workshop area.

Illustration 66: Keymap of Bibliotekshaven

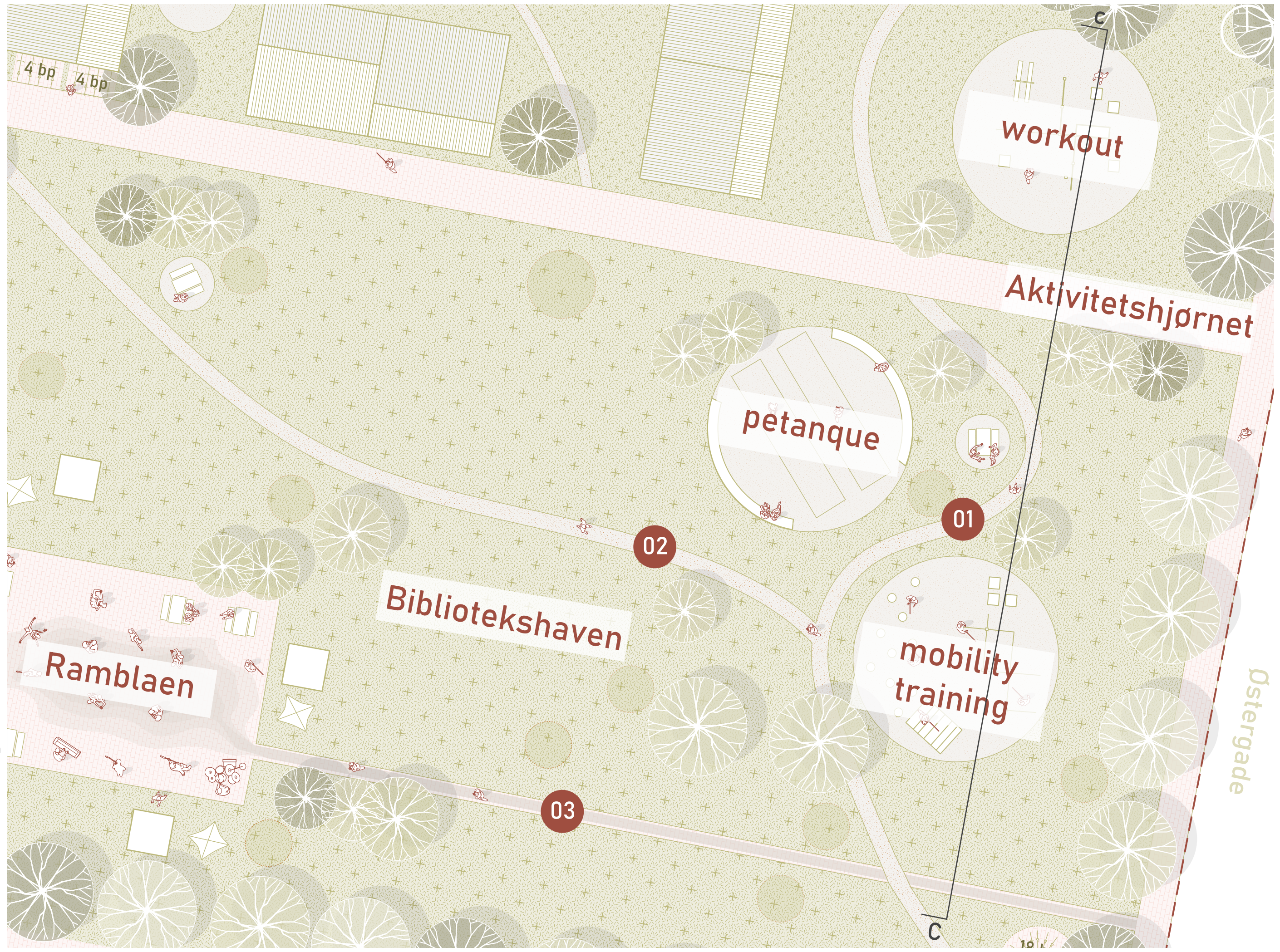


Illustration 67: Masterplan in 1:500 of Bibliotekshaven

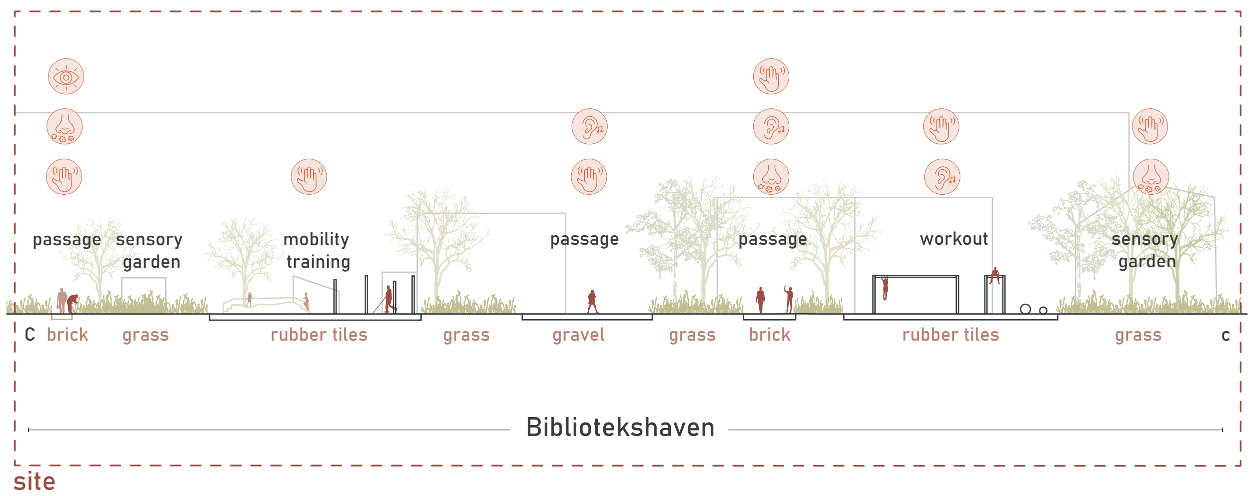


Illustration 68: Section in 1:500 of Bibliotekshaven

stay
plot
plot
stay
stay
basket weaving workshop
steel frames
2000 mm
plot
brick pavement in different shades
stay
plot
plot
Detail plan 1:125 Ramblaen
music workshop
tall vegetation

Illustration 69: Keymap of Ramblaen

Illustration 70: Detailplan in 1:125 of Ramblaen

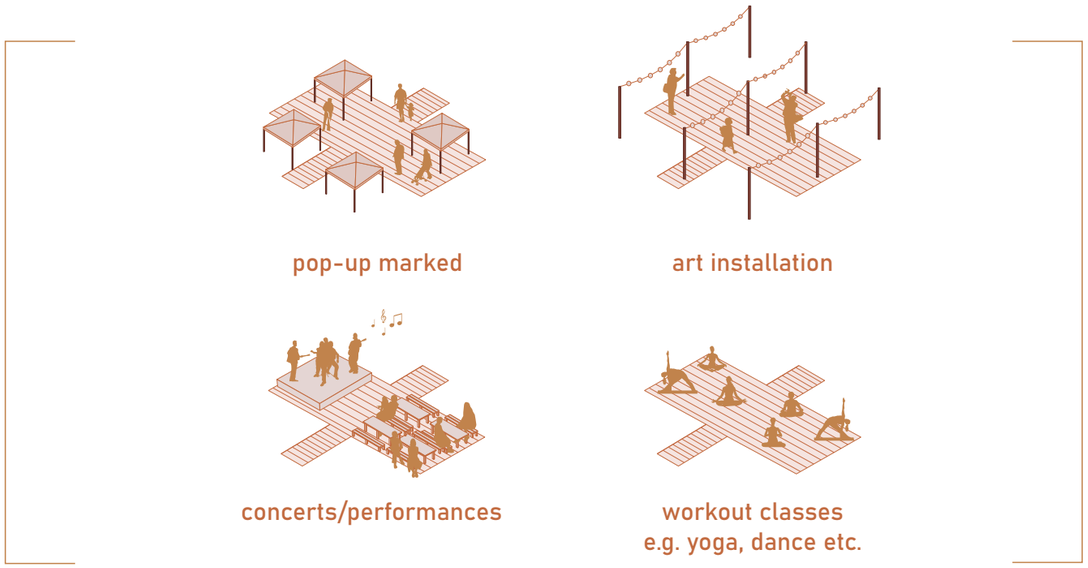


Illustration 71: The activities that can take place in Ramblaen, both temporary and all year activities

Ramblaen and the workshops

Ramblaen is located next to Bibliotekshaven and is surrounded by five smaller workshops: music, basket weaving, pottery, art, and bike workshops. The chosen functions for the workshops are all activities where the sight senses do not need to be dominating but more the sense of feeling. A quality that BVIP has is its ability to create stunning craftsmanship, and this is based on Anders from Blindesarbejde, who was weaving a chair during the interview. The idea behind having workshops was to provide a space led by visually impaired who could work in the workshops, where they could show their craftsmanship and be acknowledged for their skills by other residents and visitors, contributing to social recognition. As Ramblaen is a shared space with both temporary and permanent functions, it will provide a new experience every time it is visited. However, the unexpected aspect has been worked on by defining specific plots within Ramblaen and placing steel framings and a darker pattern in the brick pavement. The plot shows where a temporary function can be placed, ensuring that the path through Ramblaen will also be free from obstacles. The steel frames guide people who wish to pass by the area quickly, aiding the navigation if too many people exist. Lastly, the darker pattern in the brick pavement highlights a contrast in the pavement, indicating that the BVIP can go beyond the steel frames and be led towards an activity if wanted, as Ramblaen offers different activities, including stay.

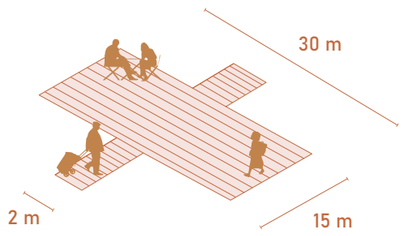


Illustration 72: The dimensions of Ramblaen

Nørregade Bofællesskab

Nørregade Bofællesskab is located in the northwestern corner of Museumspladsen and consists of 16 buildings, with different combinations of people varying from young families to younger and elderly individuals. Common for all residents is the wish to be part of a co-housing and engagement. Each house has at least one resident who is visually impaired, as it creates a more inclusive and diverse community and raises awareness of BVIP and the challenges they face. This can promote empathy, and if children in the co-housing grow up with people who are visually impaired, the children will be exposed to different needs and have a more accepting and inclusive mindset, which can have significant value for the next generation, being aware and including more BVIP.

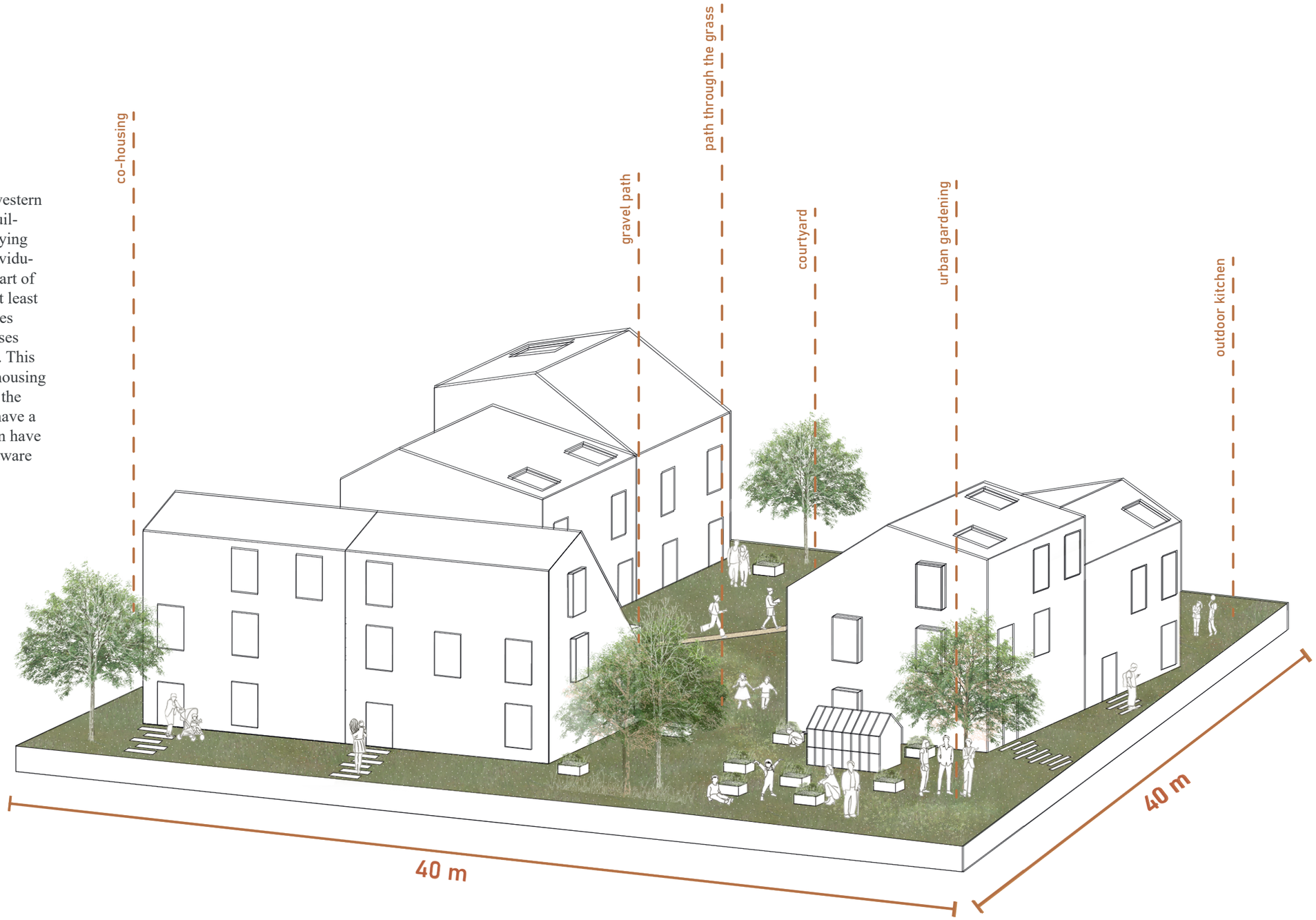
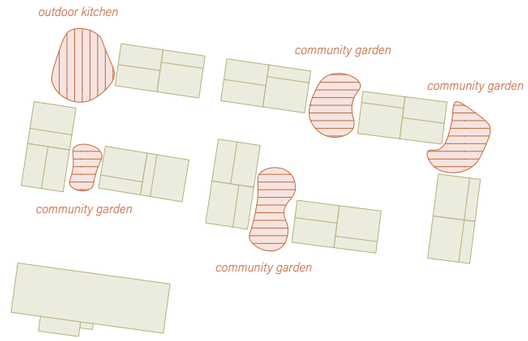
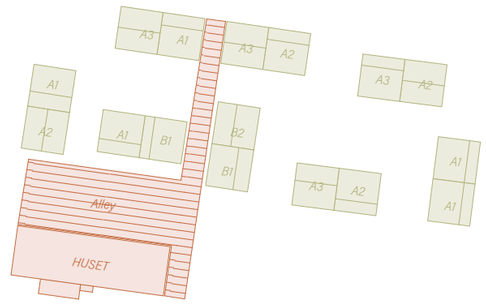


Illustration 75: Masterplan in 1:500 of Nørregade Bofællesskab



outdoor kitchen area and community garden spaces offer the residentials to interact with each other



Nørregade Bofællesskab has 16 co-houses, a community house inside of HUSET and semi public functions offered in the Alley

the Alley invites visitors towards Nørregade Bofællesskab, making it an area for visitors to interact with BVIP residents

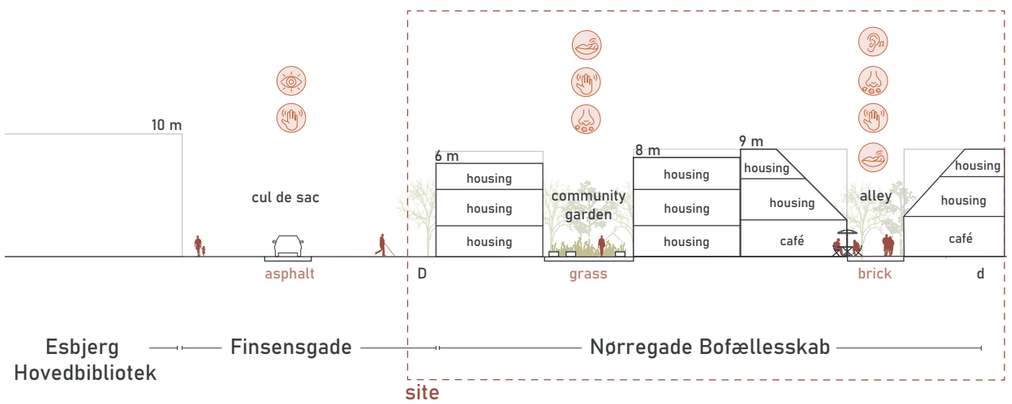
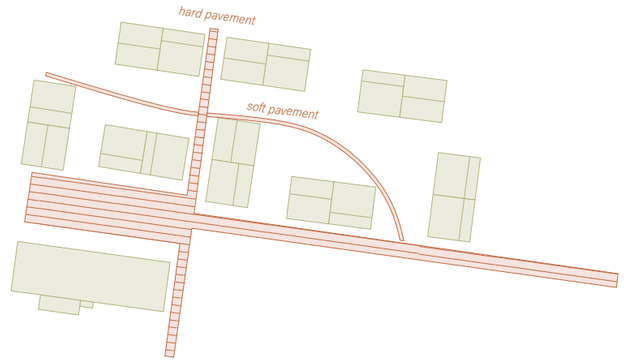
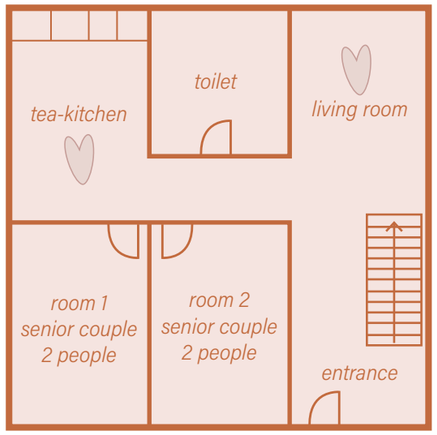


Illustration 76: Section BB in 1:500 of Banegårdspladsen

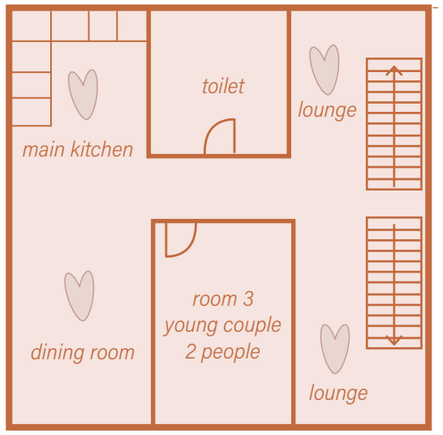


there are both soft and hard pavements accessible from different directions in a housing community, which offers residents and visitors the freedom to choose their pace and how they want to experience Nørregade Bofællesskab

Illustration 77: Overview of Nørregade Bofællesskab regarding flow and spaces for interactions



ground floor



first floor

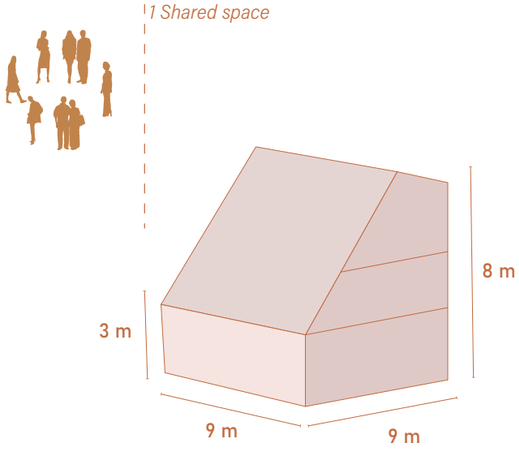
all homes have one shared space on each floors that each resident can use. This is the residents common space, and it consists of a kitchen, dining, living room, and a lounge area

each resident have their own space, but ideally, the residents would want to use the common space the most, as it provides space for interaction between the people living under the same roof

second floor

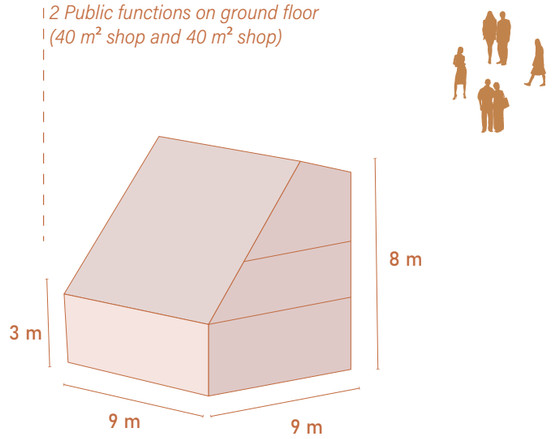
A1 co-housing consists of:

2 Young couples (4 people)
4 Young individuals (4 people)
1 Shared space



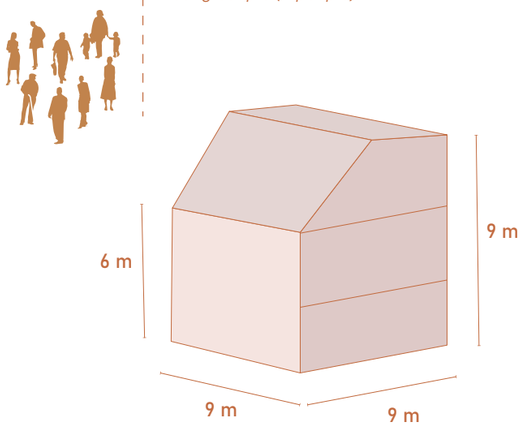
B1 co-housing consists of:

2 Young couples (4 people)
2 Young individuals (2 people)
2 Public functions on ground floor
(40 m² shop and 40 m² shop)



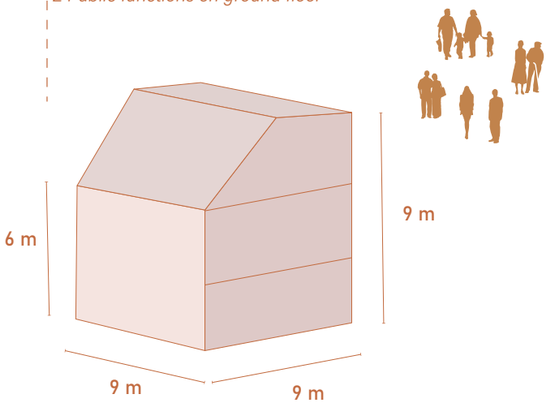
A2 co-housing consists of:

1 Small family (4 people)
2 Senior couples (4 people)
1 Young couple (2 people)



B2 co-housing consists of:

1 Small family (4 people)
2 Senior individuals (2 people)
2 Young individuals (2 people)
2 Public functions on ground floor



A3 co-housing consists of:

1 Small family (4 people)
2 Senior couples (4 people)
1 Young couple (2 people)

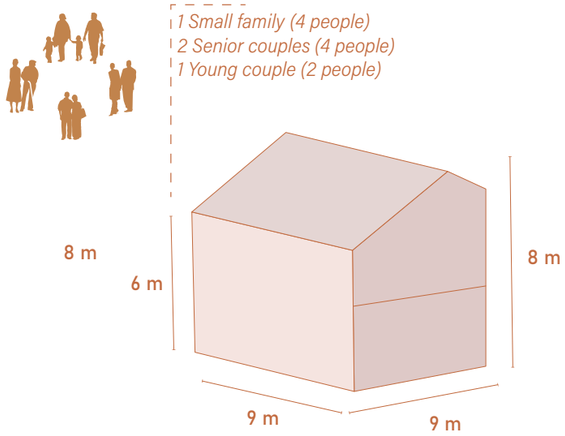


Illustration 78: Conceptual floorplan of building A2 and the communal spaces

Illustration 79: Overview of Nørregade Bofællesskab's housing

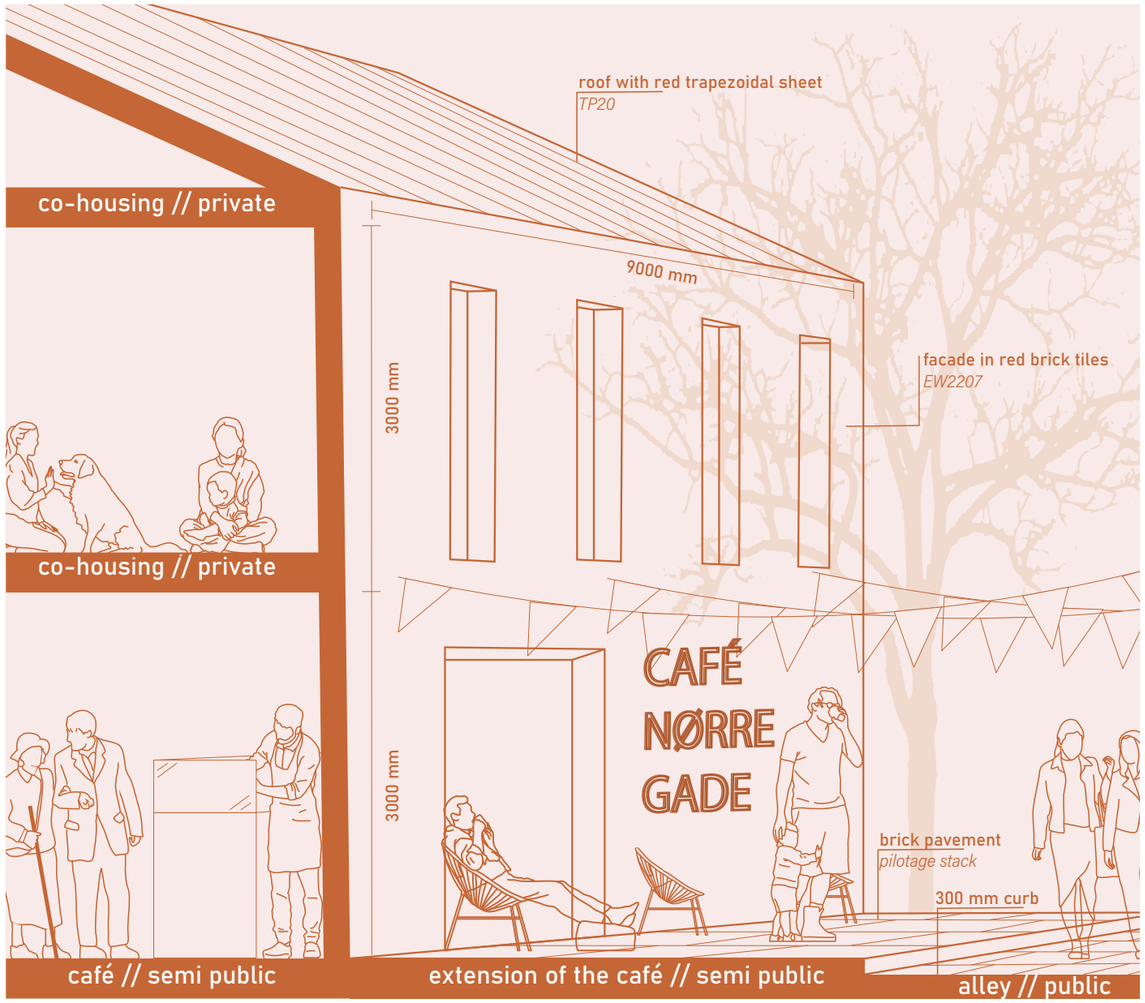


Illustration 80: Section in 1:50 of the Alley

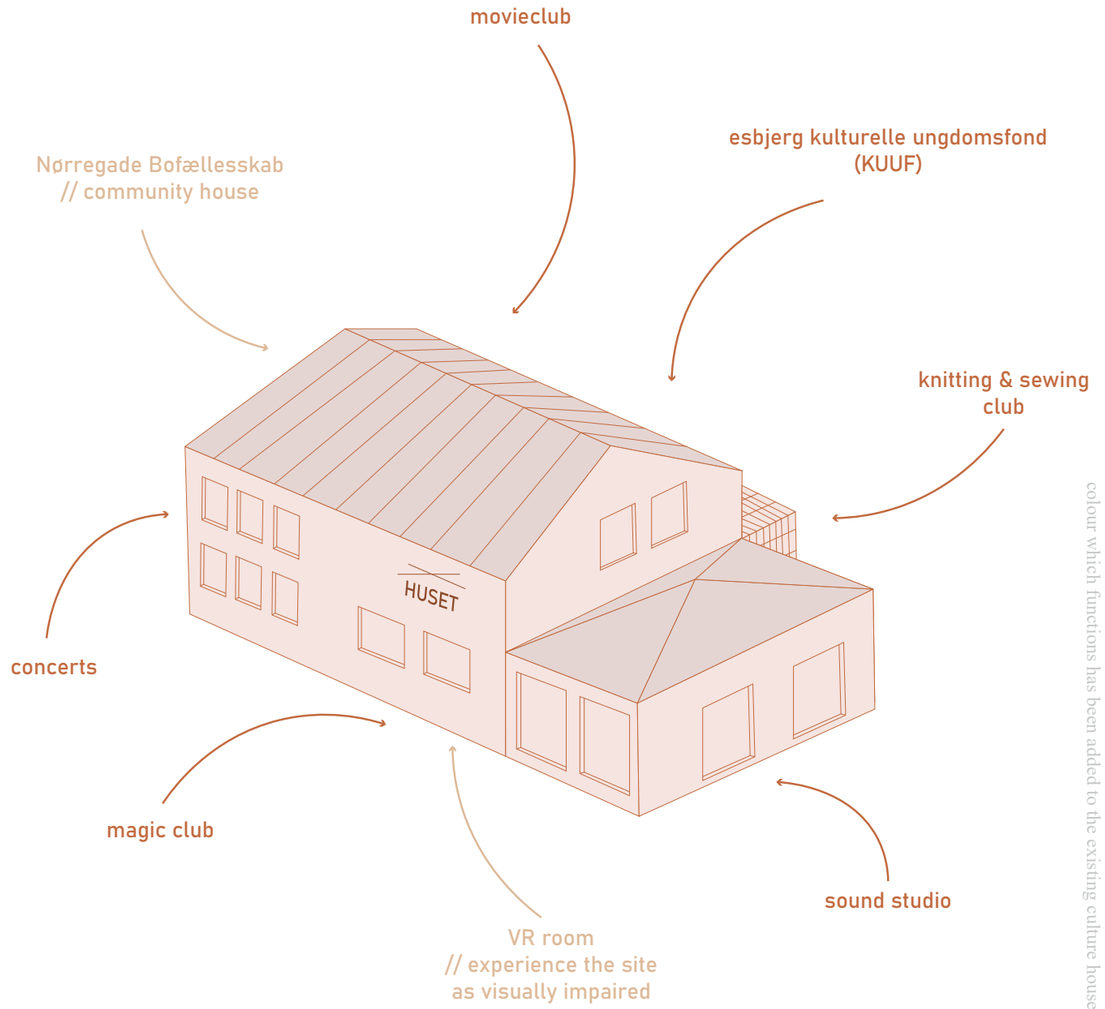


Illustration 82: Overview of HUSET's functions, highlighting in a brighter colour which functions has been added to the existing culture house

Alley

In the middle of Nørregade Bofællesskab is a small passage called the Alley, which has the same characteristics as a side street. It is part of the transition between the private zone to the public zone.The length of the Alley is 18 metres and consists of inviting ground floor frontages with open facades to a café and shopping opportunities that extend out of the building, both physically but also through smell. Newly backed goods and the smell of coffee adds to the experience of the alley. The Alley can attract people from Ramblaen and people passing by from Sverigesgade. Even though the Alley is not located in the centre of Museumspladsen, it still would attract people to come, as the Alley is placed further away from the central area, the risk of overcrowding is alleviated. A sense of cosiness can be achieved as the surrounding environment is calm, making people in the Alley linger for longer.

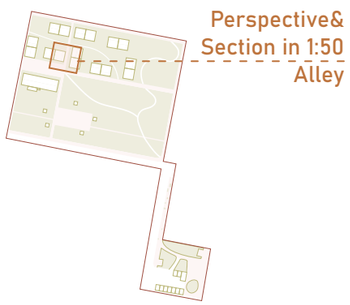


Illustration 81: Keyplan of the Alley

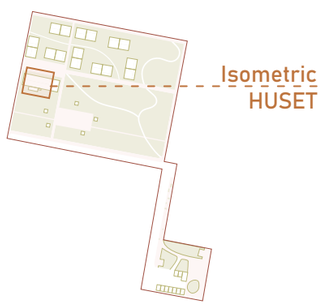


Illustration 83: Keyplan of HUSET

HUSET

HUSET is an existing cultural centre located on the western side of Museum Square. It offers various activities. Many of HUSET's existing functions are kept so that the cultural centre's users can attract more people into the project area. Additionally, two new functions have been added to the cultural centre, Nørregade Bofællesskab's community house, where residents can meet and hold meetings or have a greater self, and a VR room has also been added. The idea with VR was to allow non-impaired people to experience Banegårdspladsen and Museumspladsen from a different perspective, specifically from the point of view of a BVIP. This quality can be accessed with the help of modern technology and will be an eye-opener for many. It fits in with one of the project's strategies, awareness.

EPILOUGE

This chapter consists of the project's conclusion and reflection, a list of the sources, images, and illustrations used and shown throughout the report.

Conclusion

Esbjerg+ is a unique urban design proposal that fosters an inclusive environment, catering to the needs of all individuals, including those with visual impairments. By integrating and addressing the challenges faced by BVIP, the design not only promotes inclusivity but also enhances the city's value by creating a welcoming and safe environment for all.
A significant problem identified during the project's development is loneliness among visually impaired. Many experience exclusion in the urban space due to the lack of accessibility and considerations of the target group. The project offsprings from the ideas of universal design, an ongoing movement and design philosophy, and the concept of recognition in the city. Both seek to make accessible and usable public spaces for everyone, regardless of their physical abilities. This fits into Esbjerg's context as a city that strives to be inclusive.The concept of recognition is an essential tool for this project, as it is about valuing and seeing everybody as equal members of society. The private recognition can be seen in the residential area, Nørregade Bofællesskab in Museumspladsen, where BVIP and sighted people of different ages, combining young families with younger and elderly individuals lives. Social recognition is found in semi-public and public spaces, where residents and visitors can interact and gain more awareness of the challenges and qualities that visually impaired faces. This is possible throughout the site through activities such as the mobility training and workshop areas. Lastly, the recognition of rights can be found in the accessibility and mobility throughout Esbjerg+, providing equal access and experiences from the station towards Banegårdspladsen and further towards Museumspladsen. The right of everybody to move about in public areas and participate in the events and spaces provided is offered by the recognition of rights.

Esbjerg+ is not just a design proposal, but a solution that addresses the challenges faced by BVIP. It creates environments that encourage interaction, socialisation, and inclusivity, thereby reducing loneliness and fostering a greater awareness of the community's diversity. This proposal is a step towards a more inclusive and vibrant Esbjerg.

Reflection

Esbjerg+ is a unique urban design proposal that fosters an inclusive environment, catering to the needs of all individuals, including those with visual impairments.

Vision plays an important role when orienting in the city by providing visual cues, landmarks, and spatial information; however, as people live longer, more are experiencing health problems such as vision loss or reduced vision. Becoming visually impaired can be a significant loss and, for many, a taboo. As the city does not see this group of people, many are excluded from participating in the city, which raises loneliness among people who are visually impaired. The design proposal, Esbjerg+, aims to transform Banegårdspladsen and Museumspladsen into new urban spaces in Esbjerg and address being visually impaired to normalise it, making it part of life, and make sure everybody can access the city on equal terms.

The project operates with the problem statement: *How can sensory urbanism foster inclusivity within urban spaces in Esbjerg, recognising visual impairment to create inviting environments where people of varying abilities can participate and engage in the urban environment?* It looks into sensory urbanism and inclusivity as tools to invite people of BVIP into the city and participate, reducing loneliness among BVIP and raising awareness of becoming visually impaired. The following text will shed light on some of the challenges I experienced throughout the project.

Recognition

The concept of recognition is a theory that I have interpreted. The original theory is a social and philosophical approach that provides a framework of conditions to make people feel validated in society. At the same time, I have interpreted it and used it in an urban design context. The disadvantage is that recognition theory can be abstract and complex, making it challenging to translate philosophical principles into concrete design solutions. Besides that, it can be challenging to evaluate whether the approach reaches the goal of creating an inclusive environment. The private recognition has a bigger chance of reaching the aspect of inclusivity and reducing loneliness, as it revolves around Nørregade Bofællesskab, which is a co-housing area, and residents who choose to live in co-housing wish to be part of a community. However, social recognition might be challenging to reach and evaluate, as well as the recognition of rights; this is because the site does not ensure that it is inclusive just because there have been strategies and thoughts regarding inclusivity in the planning. It's also about the people who use Esbjerg+ daily who affect how the site is experienced. Though there have been implemented functions and activities that are thought to raise awareness of BVIP, there might be a risk of people not picking it up, making Esbjerg+ a new area that aims to be inclusive but fails to raise awareness of BVIP in the public spaces.

One of the problems I experienced during the research regarding natural and built-in tactile cues in the city was that many don't know what the tactile cues symbolise, increasing the risk of guiding lines being covered, making the navigation for visually impaired difficult, another element that could be added to Esbjerg+ would be informative signage that explains how the visually impaired use these elements that the city provides.

The benefits of integrating recognition theory into the project are that it is functional and aesthetically pleasing and promotes social justice and community and individual well-being. The interpretation of the philosophical theory into a practical context can result in innovative and meaningful urban spaces that enrich the lives of all the city's residents. Furthermore, the interpretation of the theory guides the creation of an urban space where all citizens have equal access to the city's space and resources and where no one is excluded or discriminated against. This involves a conscious approach to designing safe and accessible spaces.

Designing for the visually impaired

One of the challenges of designing for the visually impaired was to design for other people's needs. I believe that as a designer, I should have the ability to understand the target group and their needs and provide design solutions that consider their needs. However, when integrating tactile cues and guiding lines in the shared spaces, I had many thoughts regarding the experience from a visually impaired perspective. Because I could only evaluate the design of the space and the placement of the tactile elements from my point of view, as I am designing for the visually impaired, I want to make sure that the intentions and thoughts towards the target group are archived.

Dansk Blindesamfund referred to their webpage, TIBS (Tilgængelighed for Blinde og Svagsynede, n.d.) which provides guidelines for designing for the visually impaired, which I used during the sketching phase. However, the guideline does not explain the experiences that are felt, and I want to design spaces where the target group feels safe to navigate independently. This could be achieved with the help of people with visual impairment, but it would require a 1:1 model for the group to experience and then reply to the experience. Perhaps with the help of technology, it would be possible to experience Esbjerg+ through VR.

Working alone

Usually, we work in groups at Aalborg University. However, I chose to work alone on this master's thesis, which has been exciting but challenging. While I enjoyed delving down and working intensely with my design proposal, I was missing the group aspect of discussing and generating multiple design suggestions during the sketching phase. While I did have pin-ups and meetings with other students discussing my project, being in a group was different.

When talking to others about the project, I would receive a different number of critiques than I would have been in a group. Though I learnt how to work alone with a design proposal from start to end and structure my time, I believe that my master thesis could have benefitted in a group setting, as there were a lot of aspects to consider and take accountability for. Time management and prioritising assignments were also essential because it is possible to solve various assignments by dividing them among group members in group settings. However, when working alone, I had to acknowledge that I could not do everything, but I had to prioritise my time wisely and focus on simplicity. Perhaps the design would have been more experiential than I had proposed if I had worked in a group.

However, there are many lessons that I can take with me, and I believe that the design proposal Esbjerg+ fosters inclusivity within urban spaces in Esbjerg through sensory urbanism, recognising visual impairment's needs and challenges to create inviting environments where people of varying abilities can participate and engage in the urban environment

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List of illustrations

Mapping of Esbjerg is provided by Spatial Suite, accessed as Sweco Architects intern
2d humans and trees are from Sweco Architects CAD landscape architecture library
Trees cutout are from Meye https://meye.dk/info/
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Materials used in axso (illustration 54, 62 and 74) are from Architextures https://architextures.org/textures/808
Braille font has been downloaded from https://www.cufonfonts.com/font/braille-cc0

APPENDIX

This is the report's last section, and it provides the knowledge I have gained from interviewing and meeting experts who all have visual impairments.

Appendix 01: Interview with Anders from Blindes Arbejde

Throughout the project it was possible to talk to different people with visual impairments, which contributed to insight knowledge towards the challenges in which visually impaired people experience. The following text is just a segment of the conversation that I've had with Anders from Blindes arbejde. The interview has been roughly translated from danish to english.

Informations: Anders is in his 40's, he has a family with wife and children, he discovered he was visually impaired in his 20's

C: What do you feel has changed the most in your everyday life after you found out you were visually impaired?

A: Before I lost my sight, I had a driving license and I had learned to surf, but I wasn't allowed to do that afterwards. It took me 10 years before I wanted to use a cane to walk around in public. I definitely feel that recognition of one's disability is an issue, when people lose their hearing it's more normal because it's normal, more people get it as you get older so it's less of a taboo, but I lost my sight in my 20s, so I had a hard time identifying myself as blind. But it was a huge liberation as soon as I identified myself even as visually impaired. Nowadays, there are aids such as an iPhone that can help me around.

C: How do you behave in the urban space if you run into something unexpected?

A: I'm not very good at following directions, so it's more intuitive. I walk across parks crookedly, but if I come across something unexpected it makes me a little frustrated because I don't know what to expect. I depend on my iphone's gps, but there was one time where I ended up on some kind of highway where I was walking next to cars, it was really uncomfortable, but it can happen. Shared spaces are not something that I like either, because the same problem occurs and it makes me feel unsafe.

C: Do you feel that loneliness is a big thing among the people with visual impairment?

A: Yes, it is difficult to participate in activities, because we are often overlooked. But there are also many who do not accept that they are blind, so it might be difficult to become part of society because they do not use their aids. I think it is important that they come along and are part of society.

Appendix 02: Meeting Dansk Blindesamfund

The following text consists of quotes from two people from Dansk Blindesamfund. As the meeting lasted for two hours, I have choosen to show relevant quotes from the conversation, along with a list of questions, that I prepared prior the meeting. The notes from the meeting has been roughly translated from danish to english.

Informations: Both in their late 60's, has families and aim for better conditions for people with visual impairment

J&T: When we follow guidelines, we prefer them to be straight lines instead of curved

J&T: We do not use a companion and the same route. You can get a mobility helper who will help you form a route. Often the route is divided into smaller routes, where you stop up and check whether you are on the right path. But one's own skills to navigate are diminished by technology. Unexpected situations can occur, and technology cannot help with that every time

J&T: The cane is your best friend, otherwise there are fellow citizens and the mobile phone to tell you where you are in the city. Young people are worse at walking around the city. they are very dependent on their technology and are not bold

J&T: People often sigh when the blind make demands, there are around 50,000 people without sight, and out of all those people there are actually only 250 who have a guide dog

T: Mindmap is something you create yourself, it is not something you can carry on because people notice different things. There are landmarks that you can keep an eye on

J: Fixed points along the way are something I make use of, I don't have a whole map in my head where I think "okay let me go 8 steps forward and I've arrived", no I use fixed points where I can recognize small details from the tactility or the sounds around

J&T: The microclimate is also something that affects our walk. The sun helps with orientation because it accentuates the contrast and provides shade. When it rains, we don't go out that often, if there is heavy rain it can be difficult to navigate because of the sounds. The sounds act as a blanket that dampens the echo

Appendix 03: Meeting Dansk Blindesamfund questions

The questions that I prepared prior the meeting with J&T

01: How do you navigate in the city. Are there specific routes that you use and which elements of the public space are important to you?

02: Are there special places in Copenhagen with good guiding lines and vice versa where in the city you think there are bad guidelines?

03: How have you previously worked with the blind in the urban space and is there anything you would do differently?

04: What challenges do you see for the blind in today's urban environment and how can they be addressed through design?

05: how can the public space support blind people in developing a mental map of their surroundings?

06: Do you experience challenges in green areas and parks, if so which ones have you come across?

07: When you visit a new area, which elements do you focus on the most?

08: Does the microclimate affect your navigation? e.g. if there is a very sunny day or if there is a lot of rain?