



tiny steps

**An Exploration of Small Intervention Design in an Urban Element for Child-Friendly City
by Using Biophilic Approach**

Master's Thesis in Architecture, Master Programme of Architecture and Planning Beyond Sustainability
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Tiny Steps

An Exploration of Small Intervention Design in an Urban Element
for Child-Friendly City by Using Biophilic Approach

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CHALMERS
UNIVERSITY OF TECHNOLOGY

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***“Go open the door. Maybe there’s a
tree, or a wood, a garden,
or a magic city.”***

- The Door, Miroslav Golub

about



An architectural designer who is always fascinated by tiny things in life. Born and raised in Indonesia, has been in love with the world of arts, fashion, design, watercolor, cooking, and travel since her childhood. She enjoys working within the field of children, housing, environment, landscape design, social projects, fashion design, and content creation. She is inspired by both of her parents - who both are architects - to pursue a master degree in Chalmers University of Technology and become a professional architect.

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acknowledgments

Time flies a bit too fast in the past two years since I started studying at Chalmers. I would like to thank everyone that has been present in my journey: friends, teachers, parents, sister, EVERYONE! Thank you for giving the most positive energy, support, and experiences that I could ever wish for.

First of all, I would like to thank LPDP (Lembaga Pengelola Dana Pendidikan - Indonesia Endowment Fund for Education) for the honour to accept the full scholarship to study at Chalmers University of Technology and to make all of these experiences I have possible.

I would like to say thank you to Nils Björling as my supervisor and Joaquim Tarraso as my examiner, for the fantastic guidance, inspirational knowledge, and for always being supportive and helpful. Also, thank you to everyone who has participated in the survey and the study, especially Gitte Gustafsson, Praveena Jayasingh, Mania Teimouri, and experts from UNICEF (Callie, Shannon, Louise, and Reetta) for sharing your knowledge.

Studying at Chalmers and moving to Sweden have been the best decisions in my life. Despite how much I would love to stay in this school, it is about time for me to contribute more to the larger society and I cannot wait to do so, very very soon. I would like to present my Master's Thesis to you who believes in sustainability and cares so much about our future generations. I am hoping that this study will give a little bit of inspiration to the reader.

personal inspiration

Remembering my good childhood memory.

I always walked from home to my best friend's house to pick her up and walk together to our English home-courses every Wednesday afternoon. On my way, I touched a yellow parasite plant - "the noodle plant" - on the hedgerow of my neighbour's garden. Then in the next garden, I took some nectar from a red flower called Asoka. Then I walked through the slippery and muddy path in the middle of the ricefield. My best friend's house is located on the edge of that ricefield where there were a lot of taro plants. Every time we are about to go to the English class; we play "water on taro leaf" where a drop of water can be in its perfect spherical form and slide around the taro leaf in a very amusing way.

Looking back at those memories, I tried to reflect upon how this interaction I had with nature along with my journey. In a way, it helped me remember the spaces in the city. This experience has made me curious, whether the presence of nature really helps human to get a better sense of place and belonging. For me, it does, even until now. My curiosity grows as my interest towards the field of children, nature, and urban development also increased. I hope that children of today and of the future will still get the opportunity to experience nature in their everyday life. Hopefully, there will be more child-friendly built environments, which will create good childhood memory for them, as well as shape them into good well-being who nurture the nature for a sustainable world today and in the future.

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abstract

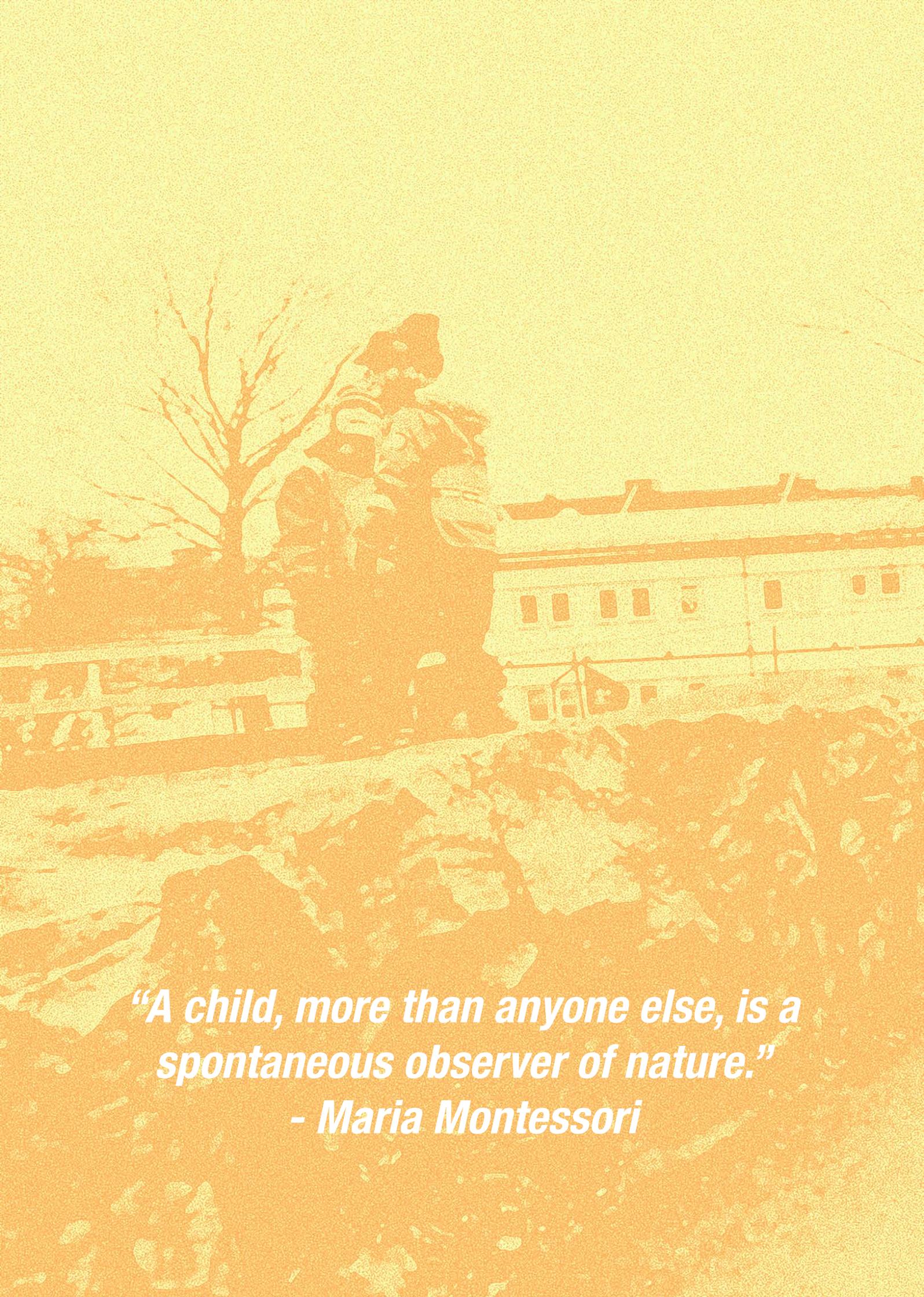
The inevitable fact that urbanisation is a global trend means that more people would live in a densely populated urban environment. As the world's population continues to grow, children - today and in the future - are taking approximately 20% of the total population globally. Despite their vulnerability and importance for our future, there is still a gap where they are often not prioritised in the city. More cities in the world are joining the initiative to create a Child-Friendly City which focuses on fulfilling child rights and preparing for a better future through child participation. At the same time, as cities need to grow to meet its demand for the growing population, it is crucial to think about nature and the environment as well.

Tiny Steps: An Exploration of Urban Element Design for Child-Friendly City by Using Biophilic Approach is a master thesis which discusses how can a small intervention in an urban element be designed to create a friendlier environment for children using child-friendly and biophilic design principles. This thesis wanted to test the combination of child-friendly city principles and biophilic approach to achieve a sustainable solution in the social and environmental field. The study takes place in Majorna, Gothenburg, Sweden, but it expands the inspirations from best practices around the globe to be involved both in the research and the design proposal by testing and processing them in a contextual manner which is suitable in the context of Gothenburg culturally and environmentally.

The method of this thesis is research by design process with a combination of literature studies, case studies, survey, dialogue and walking with parents and children, and explorative design process. The social participation studies include survey and dialogues with several stakeholders including parents, children, UNICEF, city architect, and the municipality in hopes to attain different perspectives from the users and decision-makers. Along with the participatory social process, mapping of the area was conducted to choose a focus critical urban element on site.

The proposal of the thesis is a pilot project proposal which aims to bridge the gap between top-down and bottom-up approach. It consists of three primary design phases along with a process of implementation proposal in Majorna that is utilised to test the biophilic approach for children in a small-scale design to larger scale design. At the end of the thesis, it will raise a discussion about how a small intervention can enhance children's walking experience in the city through stimulating interaction between human and nature. The thesis will hopefully be able to contribute to add a layer of knowledge towards sustainable future.

Keywords: child-friendly city, biophilic approach, urban element intervention, social participation method



“A child, more than anyone else, is a spontaneous observer of nature.”

- Maria Montessori

manifesto

As a summary of what this thesis will and will not do and discuss, this manifesto is a brief explanatory text of the content of this Master's Thesis.

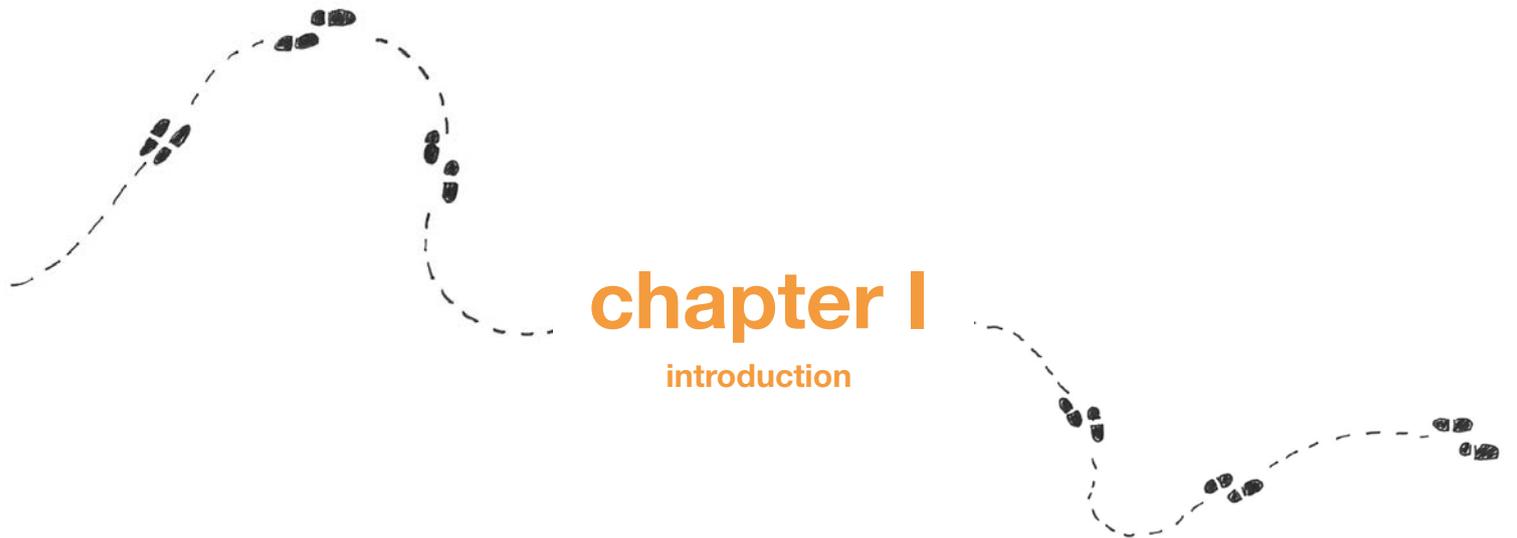
1. This thesis aims to explore within three main topics: child-friendly city, biophilic design, and urban element.
2. This thesis uses research by design method by combining several types of studies: survey, dialogue, design exploration and experimentation, observation and photo study, and literature study.
3. The exploration studies starts with a survey in Gothenburg and case studies from global inspiration.
4. The focused site of the design process is in Majorna, emphasizing in the area that is densely inhabited by families with children and area with a large number of schools.
5. Based on the study, the design proposal is focused on one urban element which is sidewalk and how the design can grow into larger scale - streetscape and public space.
6. As the main users of the design are children, this thesis concentrates on small-scale intervention which is sensible for children.
7. The design proposal is a conceptual landscape design with a combination of suggestion for regulation-planning and participatory approaches. The design will emphasize on the qualitative experience in the space and will not be discuss the construction details.
8. The design proposal is intended as a tool or a pilot project idea to test how can principles of biophilic approach be implemented to achieve child-friendly city.
9. A reflection about the design proposal discuss about the possibility to generate a network of small interventions within a bigger area to achieve a child-friendly city that is closer to nature.

reading guideline

Throughout this thesis, yellow boxes can be found within the text to identify the main message of each topic that is being discussed.

At some parts of the thesis, you will find two-page images which might require you to read in two-side view in a digital platform.

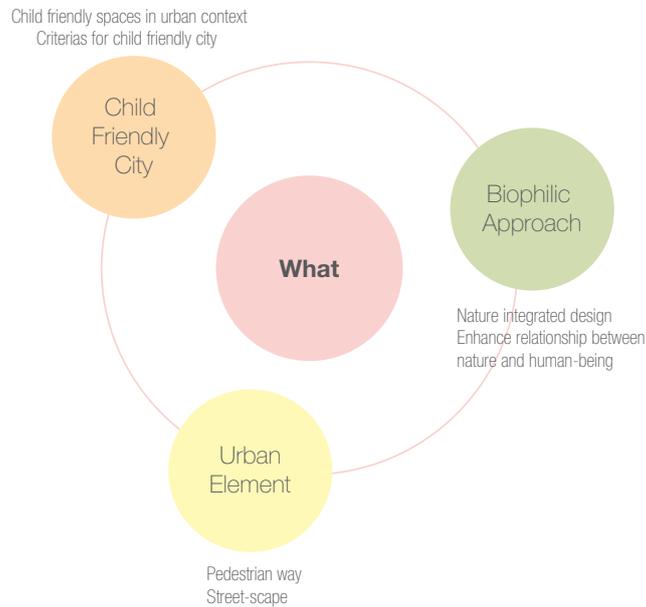
All images used in the thesis are marked with the owner of the pictures. Images which are owned by other than the author have obtained permissions from the owner.



chapter I

introduction

introduction



This master's thesis started with an investigation of the principles of creating a child-friendly environment using biophilic approach and the behaviour of children in the city. Using these theoretical bases, a design exploration is conducted which aims to make a design proposal of an urban element that is suitable for the context of the site. Even though the scope of the study is urban context, the design will be in small-scale intervention which is sensible for children.

Child-Friendly City (CFC)

Is a concept which was introduced by an initiative by UNICEF in Italy in 1996 which was aimed to make cities for everyone and to put children as a priority. This initiative defined numbers of criteria which has been studied as a point of departure for this thesis. More detailed discussion about Child-Friendly City will be presented in the next chapter.

Biophilic Approach

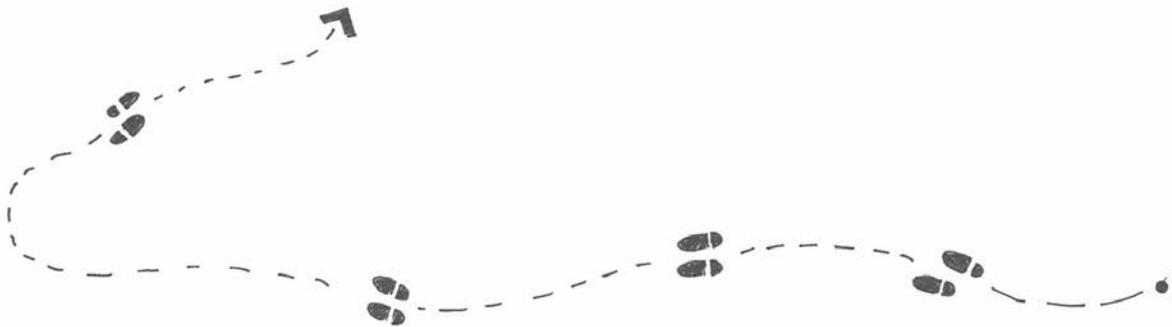
is an innovative concept of including nature in a design to create a close relationship between its user and nature and to avoid environmental degradation. The basic principle of this concept is to reconnect human and nature while being aware that human is a part of nature. Introducing nature in a realistic context can be done within architecture and urban design. Today, a city is a place where most human live as the impact of urbanization and densification. Therefore, the relationship between human (including children), the city and nature are important. The discourse is that if a biophilic design can be used as an approach to creating a better city – in this case: Child-Friendly City.

Urban Element

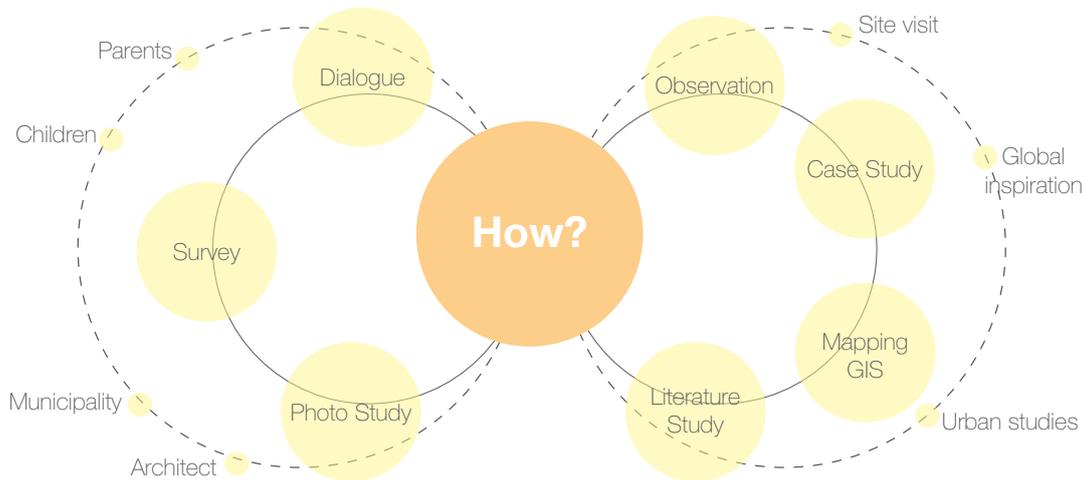
Refers to elements which form an urban fabric. There are five main urban elements: building, street, landscape, public space, and transport. Through observation and survey, this thesis investigates one urban element that is most critical to reach a child-friendly city. Furthermore, in this thesis, it will focus on the critical urban element on site for children during their walking experience in the city. Based on the findings during the research process, the proposal will start in a small-scale intervention in the sidewalk, and parking space then spread into the street scale and open space.

The specific research question in this thesis is:

How can we enhance children's walking experience in Majorna, Gothenburg through urban element design using biophilic approach for child friendly city?



method



Observation

Aim:

- Gather knowledge and build an understanding of the area which needs to be transformed with Child-Friendly City concept.

Case studies

Aim:

- Gather knowledge within a broader perspective about how a Child-Friendly City and biophilic concept can be applied in a built environment.
- Build an understanding of the suitable approaches of design process and how has it been done in other contexts.

Literature studies

Aim:

- Define the base theories for the programs – both research and design.
- Gather knowledge and understanding of the topic and define a focus for the goal which will be achieved by the research and design process.

Dialogues and survey

– with several stakeholders, including:

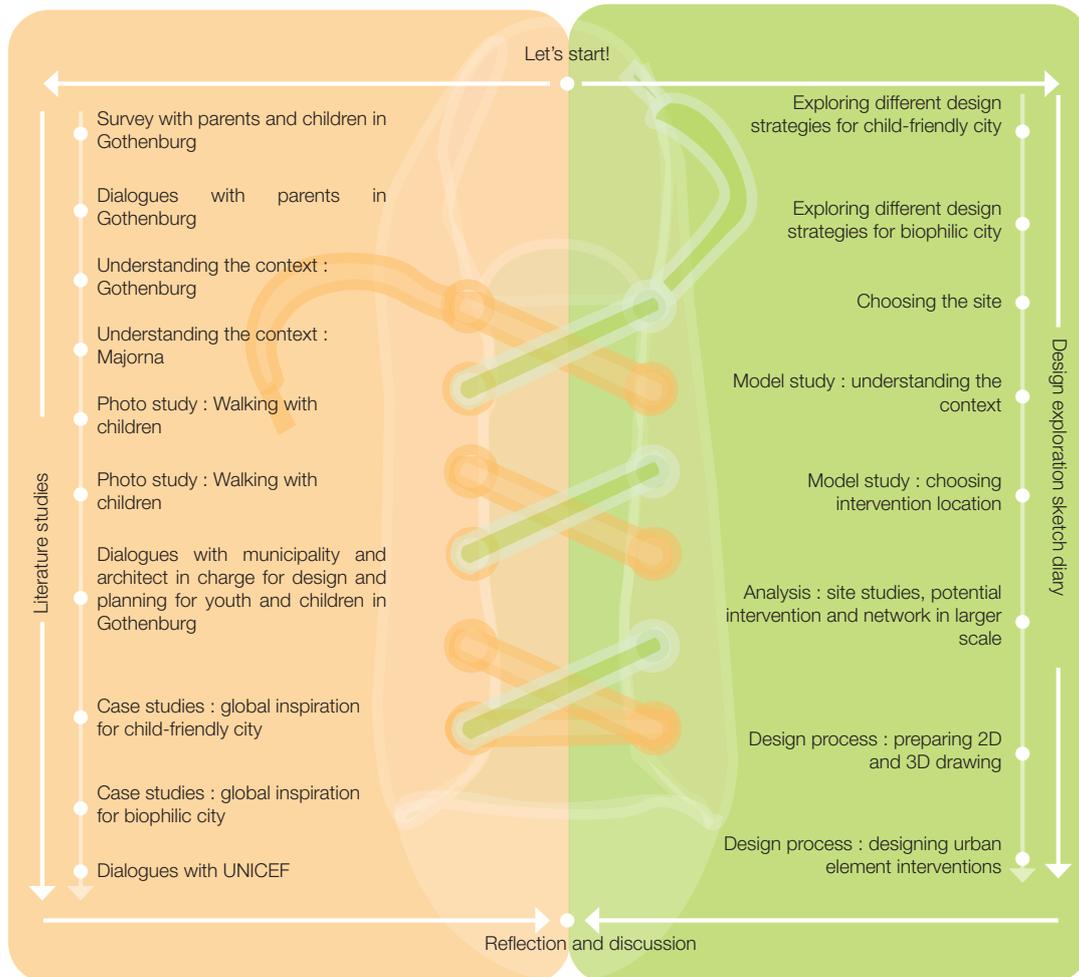
1. Expert in Architecture for Children and Youth in Gothenburg at Kultur i Väst
Aim: to learn more about designing for children, its challenges and what has been done in Gothenburg.
2. Parents and children living in Gothenburg
Aim: to gain understanding about their thoughts about the city today, and to understand what is missing and what does a city need to be friendlier to children.
3. Experts at UNICEF and Child-Friendly City initiative
Aim: to gain knowledge about child-friendly city initiative and the law-making and collaboration processes for pilot projects.

Photo studies

Aim:

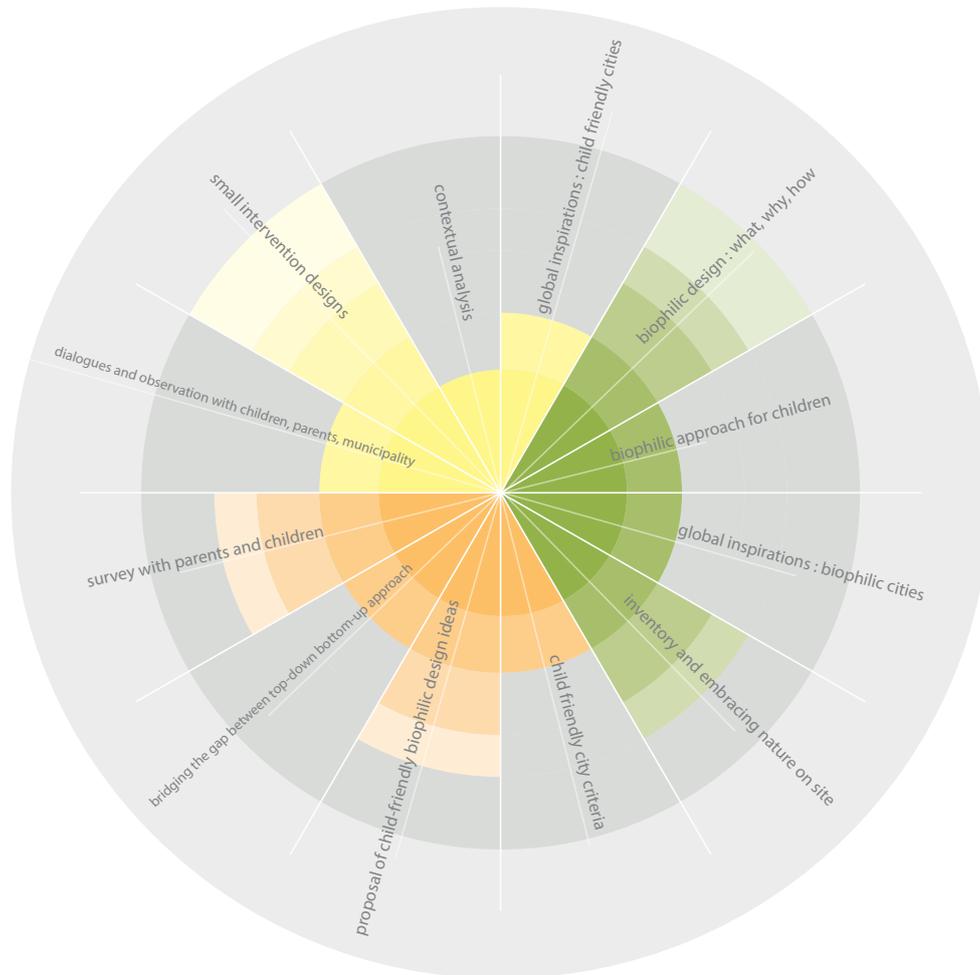
- Gather a visual information from real stakeholders such as parents and children about what do they see in the city, what do they like, where do they go, and how do they explore.
- Use one of the criteria and method of CFC which is social inclusion for children to take part in the decision-making process for design in the city – or in short: to listen to children's voices.

RESEARCH by DESIGN



The method used in this thesis is a combination of self-studies and participatory process where relevant stakeholders are involved in the process. The investigation method is using **qualitative method and approaches**.

thesis delimitation



This thesis discusses three main topics: child-friendly city, biophilic design, and urban element.

Child-Friendly City

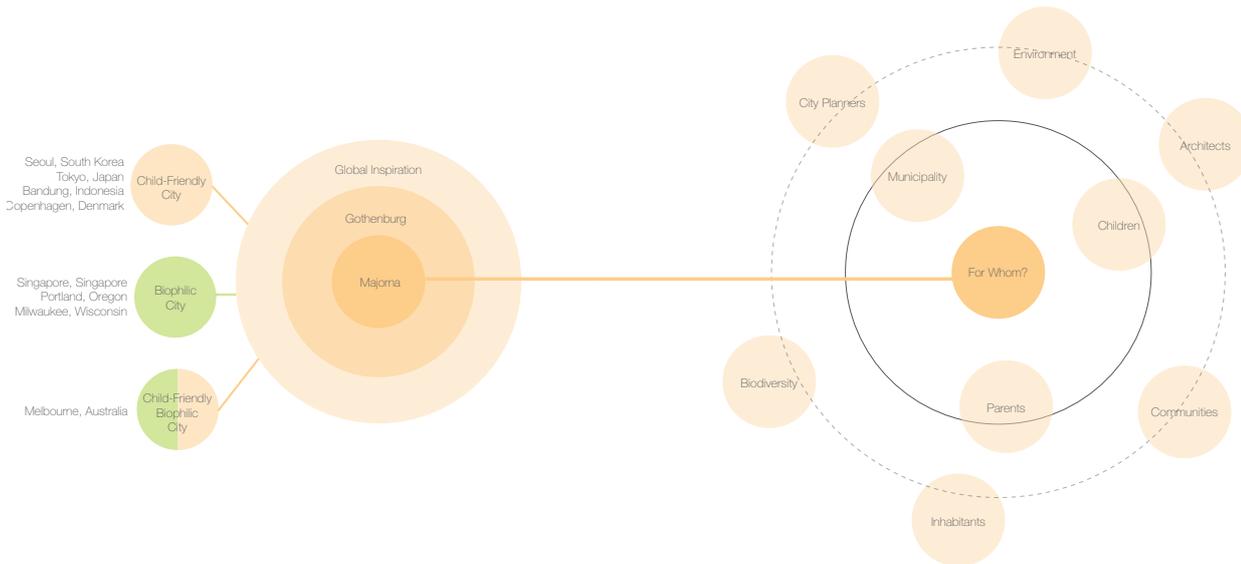
Under the first main topic, the thesis discusses the criteria of the child-friendly city, case studies from best practices around the globe, extracting the main value of child-friendly city and how has it been done in best practices around the world. The study will then inform the proposal, both for the design principles and design processes.

Biophilic Design

The thesis discusses the biophilic approach and the principles and how has it been done in biophilic cities around the world. The thesis also wants to propose a set of principles of biophilic approach which is specifically intended for children. Then, this approach is utilised as a tool to test a design intervention on site.

Urban Element

This thesis studies the urban element found in Majorna, Gothenburg, the challenges of the existing condition, and how can it be transformed. A design proposal of design intervention in urban element follows up the study. The design intervention proposal focuses on proposing a process and intervention design that hopefully can bridge the gap between top-down and bottom-up approach starting with small urban intervention to larger scale (sidewalk and parking space - street - open space).



where?

The research process starts on a bigger perspective, using global inspirations continued by narrowing down the research to the regional level where studies about Gothenburg city's vision and its development are being investigated in an in-depth process.

The research and design process then focused in Majorna, based on research of Gothenburg and survey. The study consists of analysis of the area by observation, site study and literature study continued by choosing one specific spot as a pilot project site for design intervention.

for whom?

This thesis is intended for a child-friendly area in Majorna. Hopefully, the result of the thesis will bring an inspiration and possibility of a ripple effect for bigger scope of Gothenburg for a more inclusive city in the future.

The main actor who will be involved in this study is children. Parents, municipality, and other experts within architecture and child-friendly topics are also included in the process. At the end of the process, hopefully this thesis will be useful for the community as a whole.

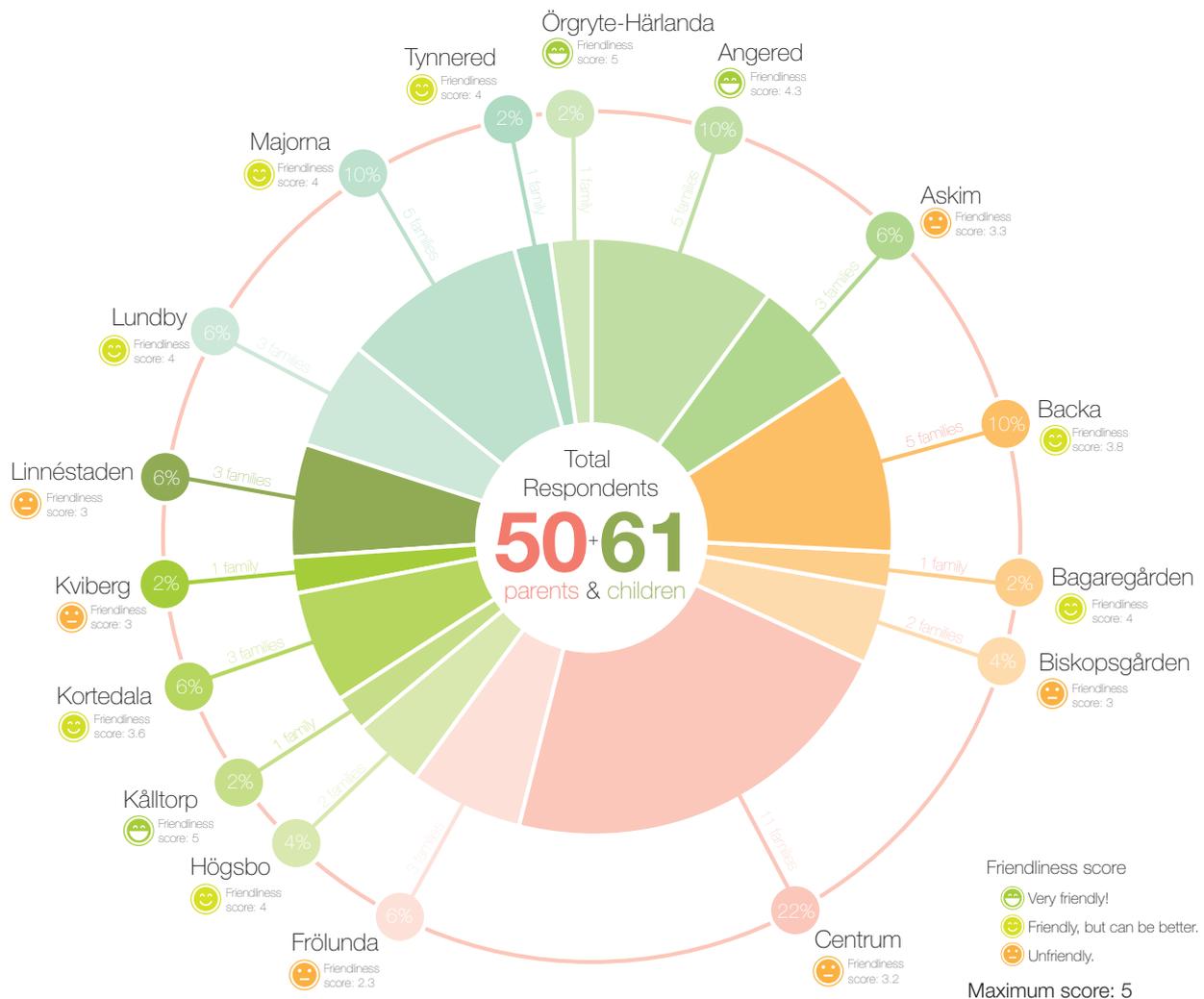


chapter II

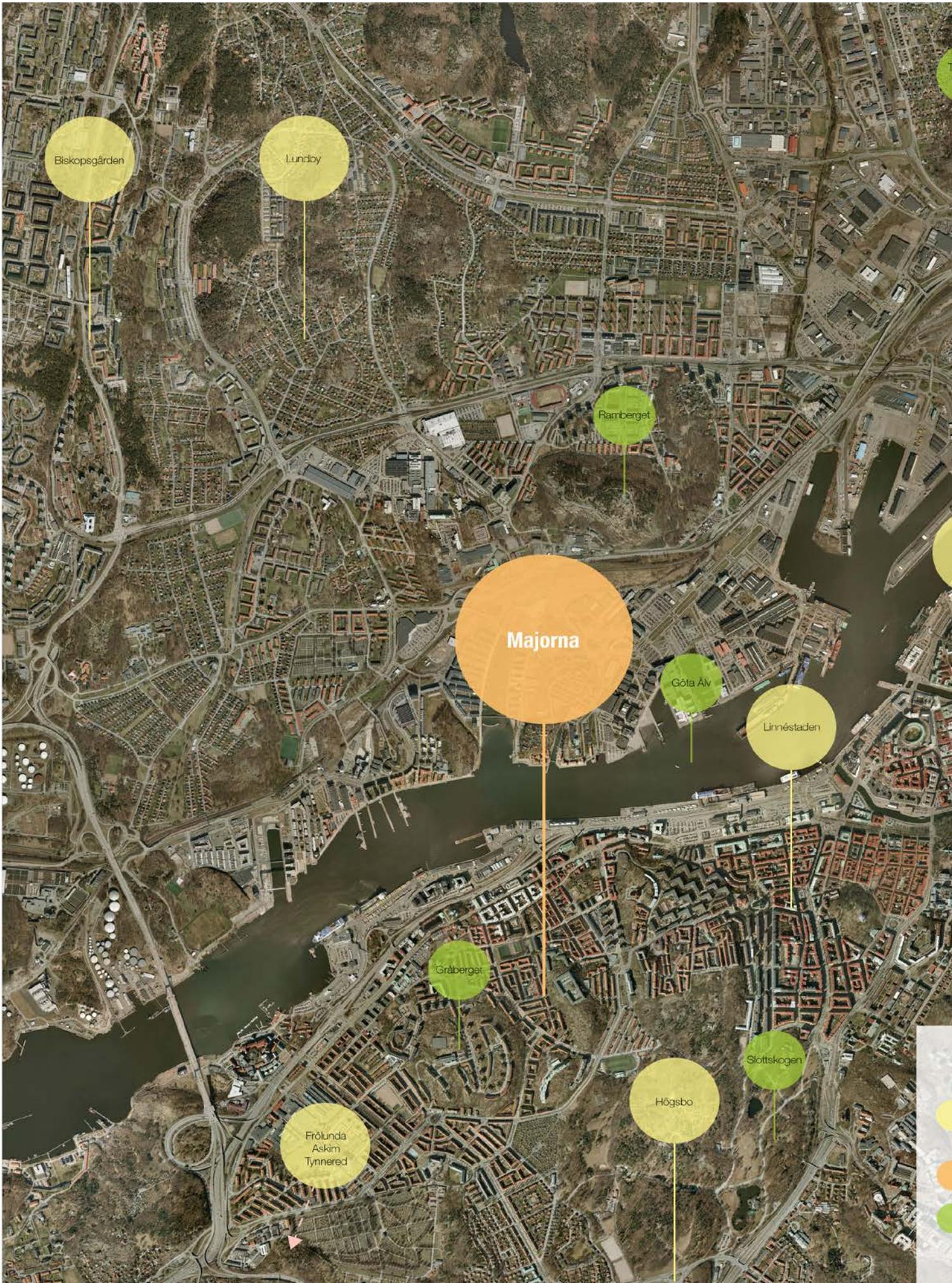
problem identification

the survey

A survey was conducted to gather an accurate understanding from parents and children about their opinion about the city today. With the total respondent of 50 parents and 61 children, the results show that the respondents think that an area is considered friendly for children for its availability of facilities such as playgrounds, schools, and safe neighbourhood with traffic separation.



The diagram above shows respondents' opinion about their neighborhood. Based on further dialogues, areas with lower score of friendliness were areas with low accessibility to playgrounds and schools, busy traffic, and high pollution. On the other hand, areas where the respondents think as a friendly environment for children are areas with traffic separation, close proximity to playground and school, and safe sidewalks.



Biskopsgården

Lundby

Ramberget

Majorna

Göta Älv

Linnéstaden

Gräberget

Frölunda
Askim
Tynnered

Högsbo

Slottskogen



Gothenburg has more than 560000 inhabitants in 2017 (Göteborgsbladet, 2017) and predicted that there will be

 **150,000**
new inhabitants by the year of **2035**

Among them, there will be **families and children**  from different backgrounds. (Göteborgs kommun, 2012)

Gothenburg is a city with  **varied topography and natural features.**

Nature can be found throughout the city creating unique relationship between green, blue, and gray structure. Some are well connected, some are **fragmented.**



Gothenburg has natural, cultural, and built heritage in its area. The main natural heritage in the city is the river : **Göta Älv**

While built heritage in Gothenburg can be found throughout the city with various landmarks with remaining traces from history.



Gothenburg is famous for its innovation in industry and development in technology. It is the home of Sweden's largest car company: Volvo, and other major companies such as SKF



Gothenburg has a high number of annual rainy days which is 163 rainy days/year.

(worldweatheronline.com,2018)
As the city is often cloudy and dark, Gothenburg people appreciates the sun very much everytime it is sunny.



Various species of flora are also found in Gothenburg from trees, shrubs, flowers, and mushrooms.



Rock formation can be found throughout the city, but most of them are transformed into built structure in the city, making nature seems fragmented and disconnected.



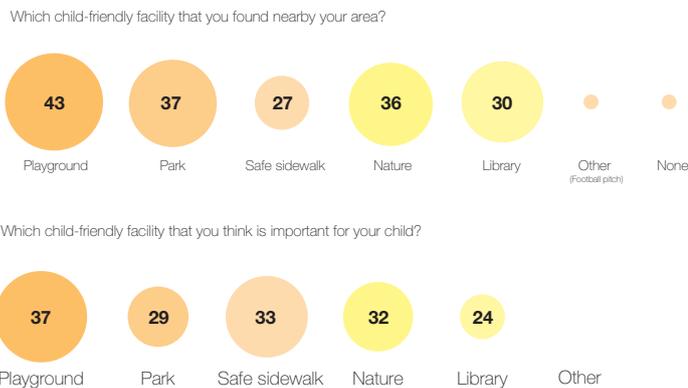
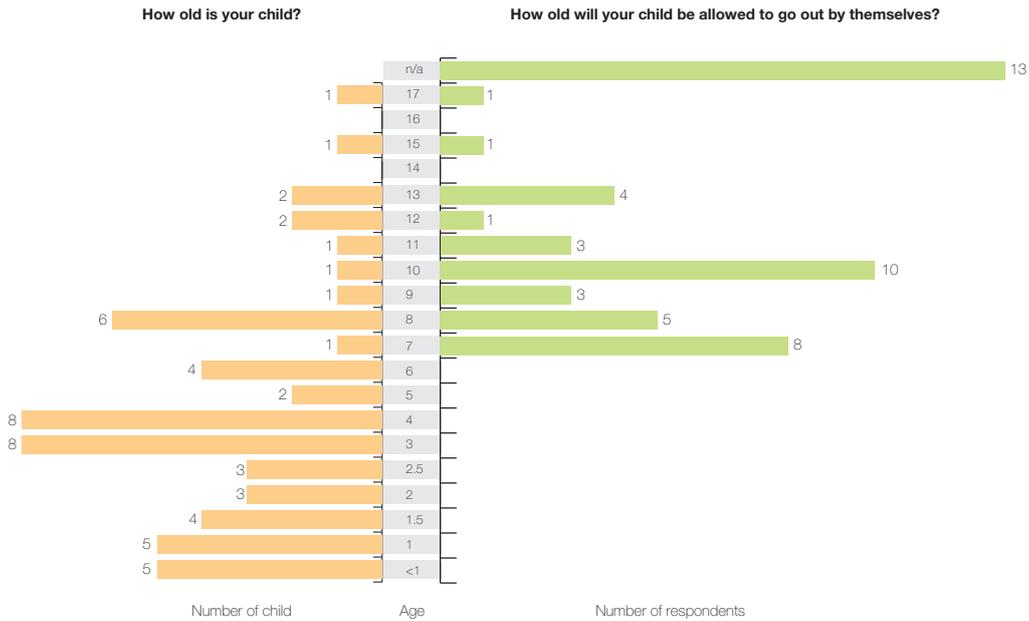
It has been reported that there are more than 18 different species of birds found in Gothenburg. Other small mammals squirel, hare, and deer are also found in the city. Insects are only found during spring and summer. (Artportalen.se, 2018)

The locations of survey respondents' living area. Survey was held with 111 respondents including children and parents in Gothenburg.

Majorna as the chosen focused site for the study.

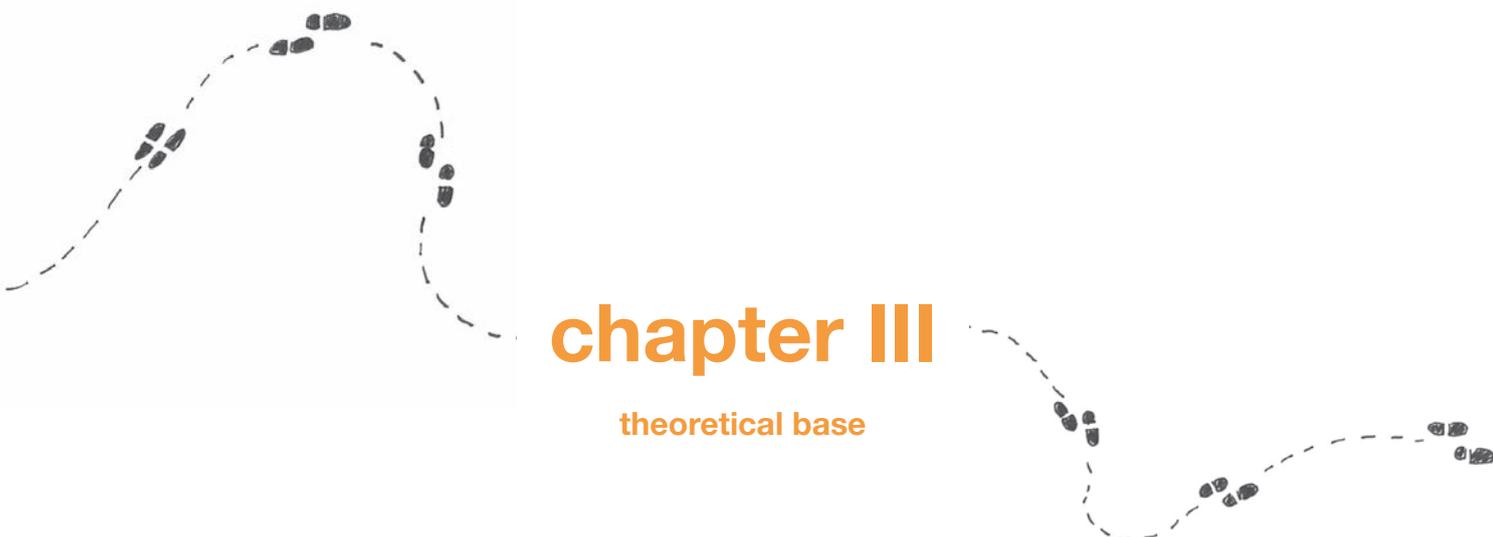
Areas in Gothenburg with prominent natural features.

Parents in Gothenburg mostly have the same opinion that Gothenburg is a good city for children and families for the availability of wheel-friendly transportation, good quality education, and availability of educative and attractive public places such as museum and parks. However, they are not sure about the city's safety in relation to heavy traffic, fast vehicles, and car density in most part of Gothenburg. Most of the respondents cannot decide when their child is allowed to go to school by themselves, while at the average, they are confident that their children will be ready at the age of 10.



“Sometimes it feels like Gothenburg is built more for cars than for human.”
- a respondent from the survey

The survey result also shows that most areas in Gothenburg has a good accessibility to playground as part of child friendly urban element. However, the availability of safe sidewalk is not equal yet in all areas in Gothenburg even though it is considered as one of the most important aspects for parents to let their children explore the city. Therefore, this thesis has decided to focus more on sidewalk along with the street as a point of departure.



chapter III

theoretical base

child-friendly city

about child-friendly city

The idea of fulfilling child rights and creating a living environment which is friendly for children was a starting point of the Child-Friendly City Initiative (CFCI) which was initiated by UNICEF and UN-Habitat in 1996. The initiative was established during the second UN Conference on Human Settlements (Habitat II). In this conference, it was declared that the well-being of children is the ultimate indicator of a healthy habitat, a democratic society, and good governance. (UNICEF, 2018)

The main goal is of the Child-Friendly City Initiative to realize children's rights in an increasingly urbanized and decentralized world. Putting children as the priority is the main action, and the implementation has been done in many different types of activities and events. The prior action of the initiative is to collaborate with local governments to develop an existing city towards a friendlier city for everyone, including the vulnerable. At the beginning of the initiative, UNICEF held several projects with different countries around the world and fund the projects in different scales and contexts. This type of action then developed into a more sustainable solution which is ensuring the communication of information to local government and

giving a guidance throughout the process for a larger impact in a long-term period rather than just funding one event or project with a shorter period and smaller impact.

By the time this thesis is written (April 2018), UNICEF launched a handbook which can be used throughout projects all around the world as a base to establish a child-friendly city. This material aims to guide the establishment of new Child-Friendly Cities as well as to strengthen, professionalize and streamline existing initiatives.

Based on the latest data from UNICEF (April 2018), there are five municipalities in Sweden that joined the pilot project towards Child-Friendly City which are Haninge kommun, Skellefteå kommun, Enköpings kommun, Karlskoga kommun, and Degerfors kommun. Each municipality has different theme and approaches but all aim to synergize the work of the government, communities, and private sector. In short: the pilot projects of Child-Friendly City Initiative in Sweden are focusing on bridging the gap between the top-down and bottom-up approach to find a solution towards child-related issue.

child-friendly city criteria

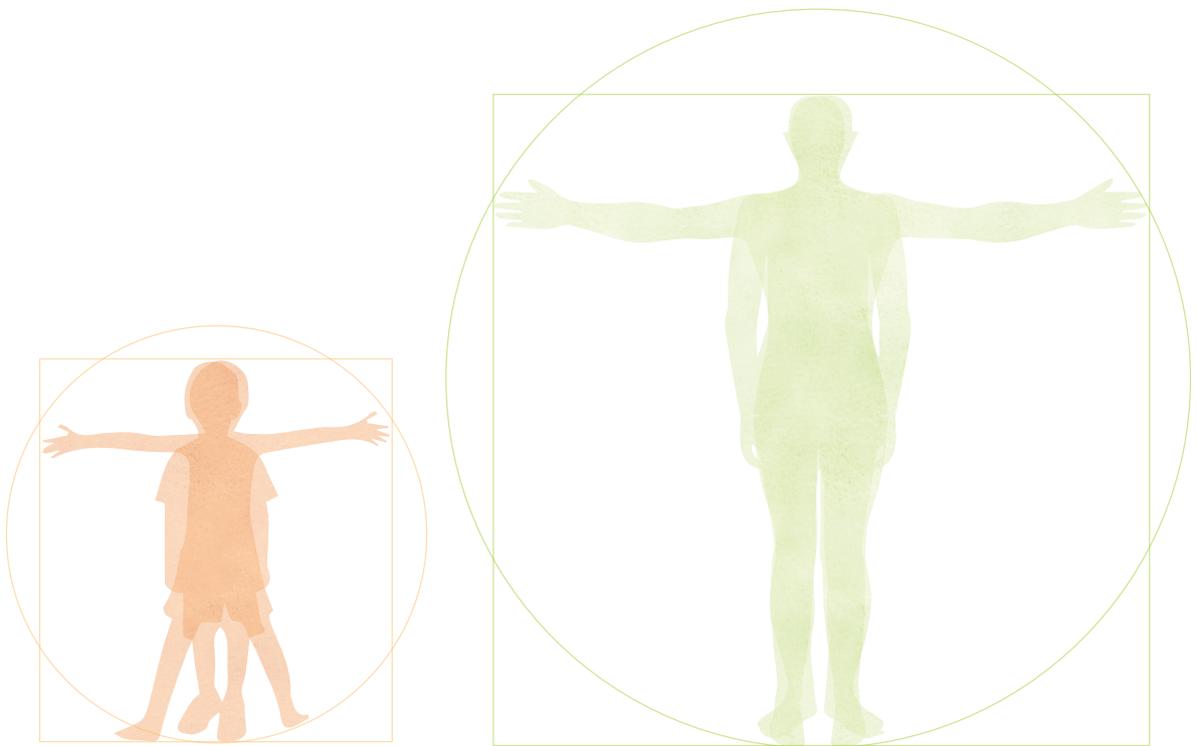
A Child-Friendly City (CFC) is a region, city, town that is fully committed to fulfilling children's right. This concept was introduced based upon the awareness that children's rights and voices are often neglected in the decision-making processes for city planning and design. Allowing children and youth to participate in the decision-making process is now being a crucial issue to create social sustainability and equality.

Based on the State of World Population 2007: Unleashing the Potential of Urban Growth document that was published by United Nations and the handbook of Child-Friendly City and Communities that was published by UNICEF, the criteria of a Child-Friendly City are:

- Influence decisions about their city
- Express their opinion on the city they want
- Participate in family, community and social life
- Receive basic services such as healthcare, education and shelter
- Drink safe water and have access to proper sanitation
- Be protected from exploitation, violence and abuse
- Walk safely in the streets on their own

- Meet friends and play
- Have green spaces for plants and animals
- Live in an unpolluted environment
- Participate in cultural and social events
- Be an equal citizen of their city with access to every service, regardless of ethnic origin, religion, income, gender or disability

(State of World Population 2007: Unleashing the Potential of Urban Growth, United Nations Population Fund (UNFPA), New York, 2007. 2 A World Fit for Children, United Nations General Assembly, S-27/2, 11 October 2002)



*Illustration of a child and an adult's scale and proportion.
Image courtesy of author, inspired by Leonardo Da Vinci's Vitruvian Man*

biophilic design

what is biophilic design?

Biophilic design is an innovative approach that emphasizes the necessity of maintaining, restoring, enhancing the beneficial experience of nature in the built environment (Kellert and Heerwagen, 2008).

Biophilic design is the deliberate attempt to translate an understanding of the inherent human affinity to affiliate with natural systems and processes – known as biophilia – into the design of the built environment (Wilson 1984, Kellert and Wilson, 1993)

A good biophilic design is not only allowing nature to be a prominent part of the design but also draws from influential perspectives and giving a positive impact to its user – in this case: socio-cultural norms and experiences for children. The biophilic design aims to create spaces that are inspirational, restorative, healthy, as well as integrated within the functionality of the place and the urban ecosystem to which it is applied.

why biophilic approach + child-friendly city?

Studies and researches have proven that the presence of nature in everyday lives is able to give positive impact to the users in terms of mind-body health, cognitive, psychological and physiological in varying degrees. Biophilic design can influence one's cognitive functionality and performance in regards to improving memory, creativity, and attention.

In the urban context, the presence of nature is potential to add economical, environmental, and social benefits. It is undoubtedly that reintroducing nature in the city can give environmental benefit such as better air quality, soil reinforcement, delaying water run-off, and mitigating flood. This relates closely to economical benefit where the value of the space increases for its good quality. It will also minimize the maintenance cost for environmental problem in the long period of time. Not to mention, application of excessive technologies will not be needed as much. Awareness of people who are longing for nature has also impact the property market to offer space with green with higher price. As a social benefit, community and inhabitants will have happier and healthier lives which leads to good cooperation and good social relationship.

Looking at the fact that cities become denser and future development of cities is always increasing, it is predicted that

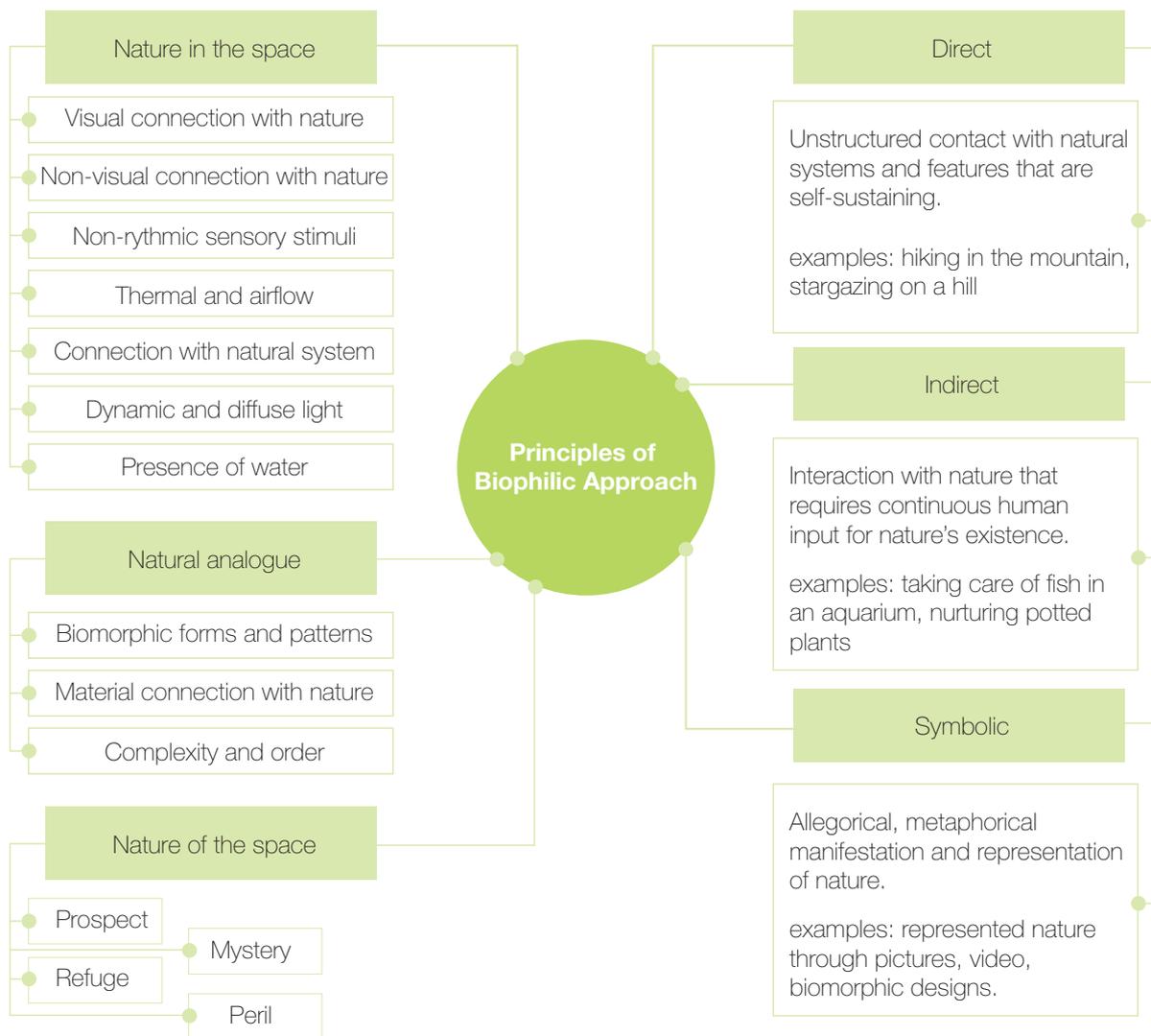
more families with children will live in an urban environment. Unfortunately, not all urban developments are balanced between the grey, blue and green structure. Therefore, there is a high chance that children in the future might experience low exposure to nature.

A sustainable future is a global goal which needs to be introduced at an early stage by creating awareness and understanding in children's mind. One of the essential notions of sustainability concept is the consciousness human is a part of nature. Therefore, the relationship between human and nature becomes essential where human should be aware of being responsible for the actions and consequences towards nature.

Living closely with nature is one way of creating this relationship. By introducing the nature in a city context for children, the awareness of living with nature and taking care of them can be planted at an early stage. Moreover, studies have proven that nature can give various positive impacts to a human being, including children, both for physical and mental health which is related to personal development and growth.

As children now are growing with abundant technology in their surrounding, there is a gap between a child and nature. Therefore, it is important to provide them with a safe space with abundant nature for them to play and meet their friends, while at the same time unconsciously - or consciously - learn that they are a social creature who is part of nature.

To conclude, the hypothesis of this study is that the importance of balanced sustainability is crucial. Creating a child-friendly city using biophilic approach hopefully can balance the social and environmental resilience, and at the same time contribute to the future of economic growth and sustainability.



Browning, W.D., Ryan, C.O., Clancy, J.O., 2014

(Kellert, 2005)

Biophilic approach can be implemented in many approaches and sizes: direct, indirect, symbolic, consciously, unconsciously, large, or small. It is not only limited to flora and fauna, but can also be weather-related elements such as rain, sun, wind, light, shadow, moon, stars, etc. It is crucial to understand the context and the pre-existing nature to nurture them and to stay true to its contextual environment condition. Biophilic approach not only is able to give a healthier environment, but also can give a sense of not being alone which relates to safety.

how?

Nature is multisensory, but studies shows that visual and hearing are the most prominent to be enjoyed from nature while smell, touch, and taste are secondary. Nature gives the sense of not being alone which leads to sense of safety. Nature in the city can be large or small and it should be easy to access physically and/or visually. Nature in the city can also be hidden but knowable; pre-existing or human designed (Beatley, 2017).

patterns of biophilic design

A relationship between nature and design in a biophilic design can be organized into three categories : nature in the space, natural analogues, and nature of the space (Browning, W.D., Ryan, C.O., Clancy, J.O.,2014). Based on this theory, biophilic design can be further categorized in 14 patterns. These patterns of biophilic design provide a framework of understanding to be applied as design strategies in the built environment.

The first category, "Nature in the Space" addresses the direct, tangible, physical presence of the nature in the space. While "Natural Analogues" emphasizes on the organic forms in a non-living and indirect representative of the nature. This could be implemented as color, object, material, shapes which found in nature and manifested in other form of artwork or design. The last category is "Nature of the Space" which focuses on the spatial configuration in the nature, including naturally created feeling and experience in the human well-being of space of nature. This last category is experienced through a deep (and often subconscious) thought of a human-being.

made by human and made by nature

The pattern of biophilic design concludes that biophilic design and approach can also be achieved through design which is made by human, made by nature, or combination of both.

which biophilic approach is suitable for children?

As children learn through play activities, the biophilic approach that is most suitable for children is the one that stimulates children to play and interact. The presence of nature should be able to intrigue children to be curious and adventurous. Biophilic approach should also be able to add a layer of safety.

The presence of nature can be a soft barrier and give a sense of not being alone. There are three approaches of biophilia for children that is proposed as a new layer of knowledge in this thesis which is explained on the next page.



Playing in the park is one of a way of stimulating good relationship between children and nature through direct interaction. Photo of a child playing with tree branch and water in Botaniska Trädgården, Gothenburg. Image courtesy of author.

biophilic approach for children

To achieve a significant result of enhancing relationship between children and nature, the principles of biophilia needs to be specified based on children's behavior, senses, and scales. The important note to be kept in mind when designing an intervention for children is that it needs to have a sense of fun and entertainment integrated in the design. These are the three principles of biophilic approach for children which will be used as a base for the design proposal of this thesis.

Direct interaction with nature



Example: splashing water in the lake, smelling flowers in the park, climbing a hill or a tree, chasing butterflies.

Taking care of nature



Example: playing with pets, taking care of potted plants, feeding fishes in the aquarium.

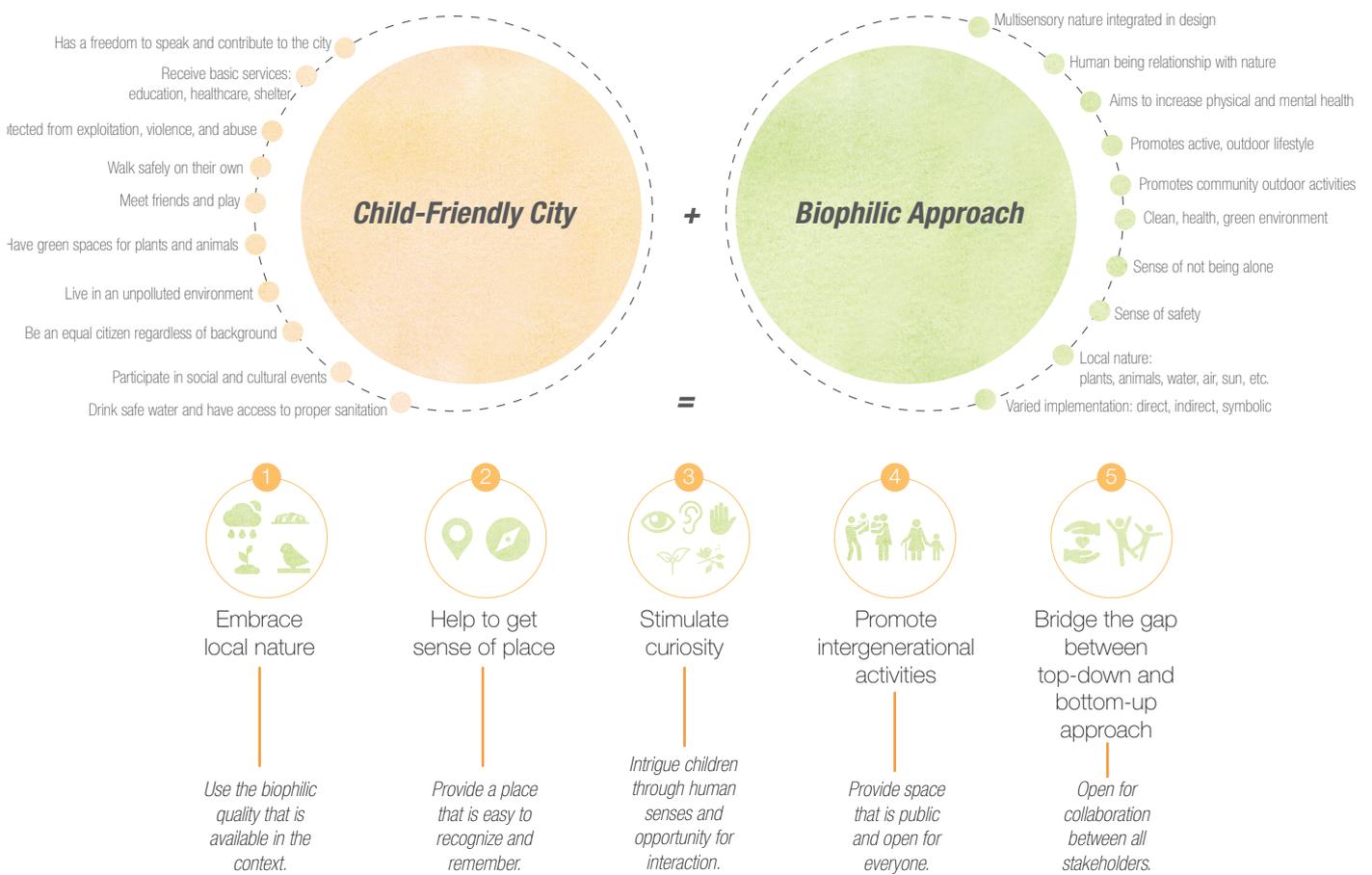
Living, learning and playing as part of nature



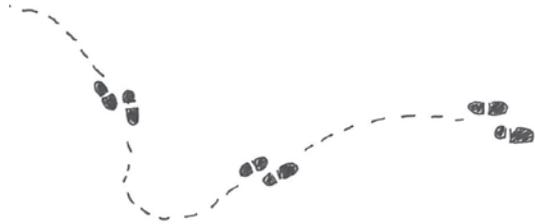
Example: play pretend as animals, mimicking animal's behavior, exploring and sensing natural habitats.

biophilic city + child-friendly city key principles

By combining Child-Friendly City criteria and Biophilic City principles, key principles of the approach are formulated to determine the design aims for the design proposal.

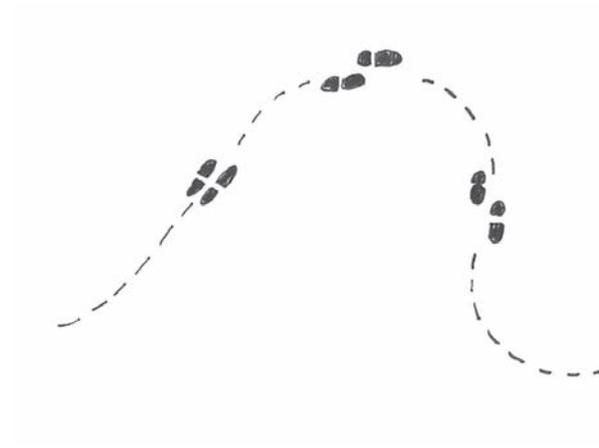


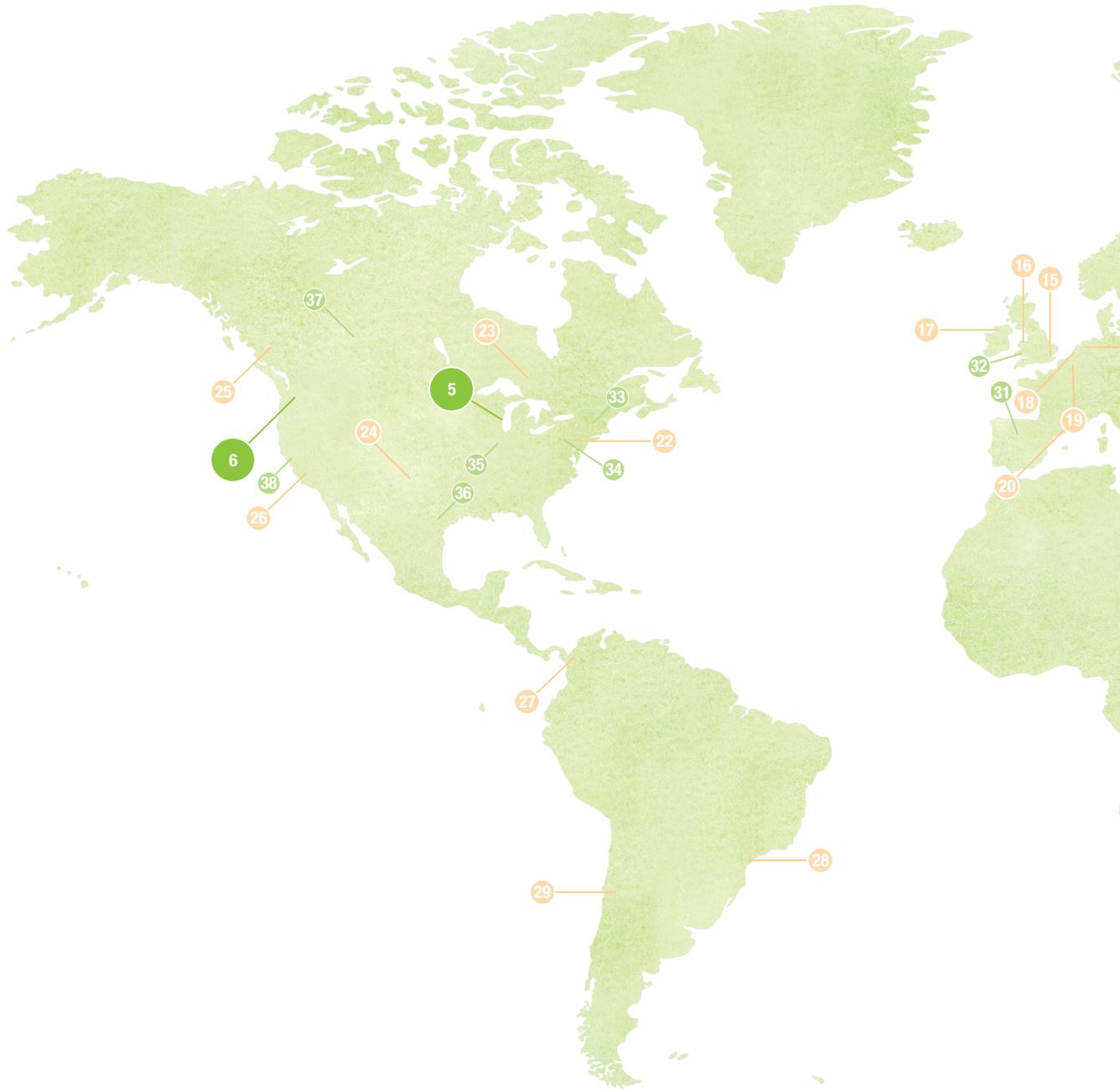
Child-friendly city criteria and biophilic city principle share some similarities where both emphasize on an active and healthy community building and interaction with nature. Therefore, the important conclusion is that biophilic city and child-friendly city can co-exist and biophilic approach is a suitable tool to create a child-friendly city. The key principles presented on the diagram above will be used to formulate design strategies on the next chapter.



chapter IV

case studies

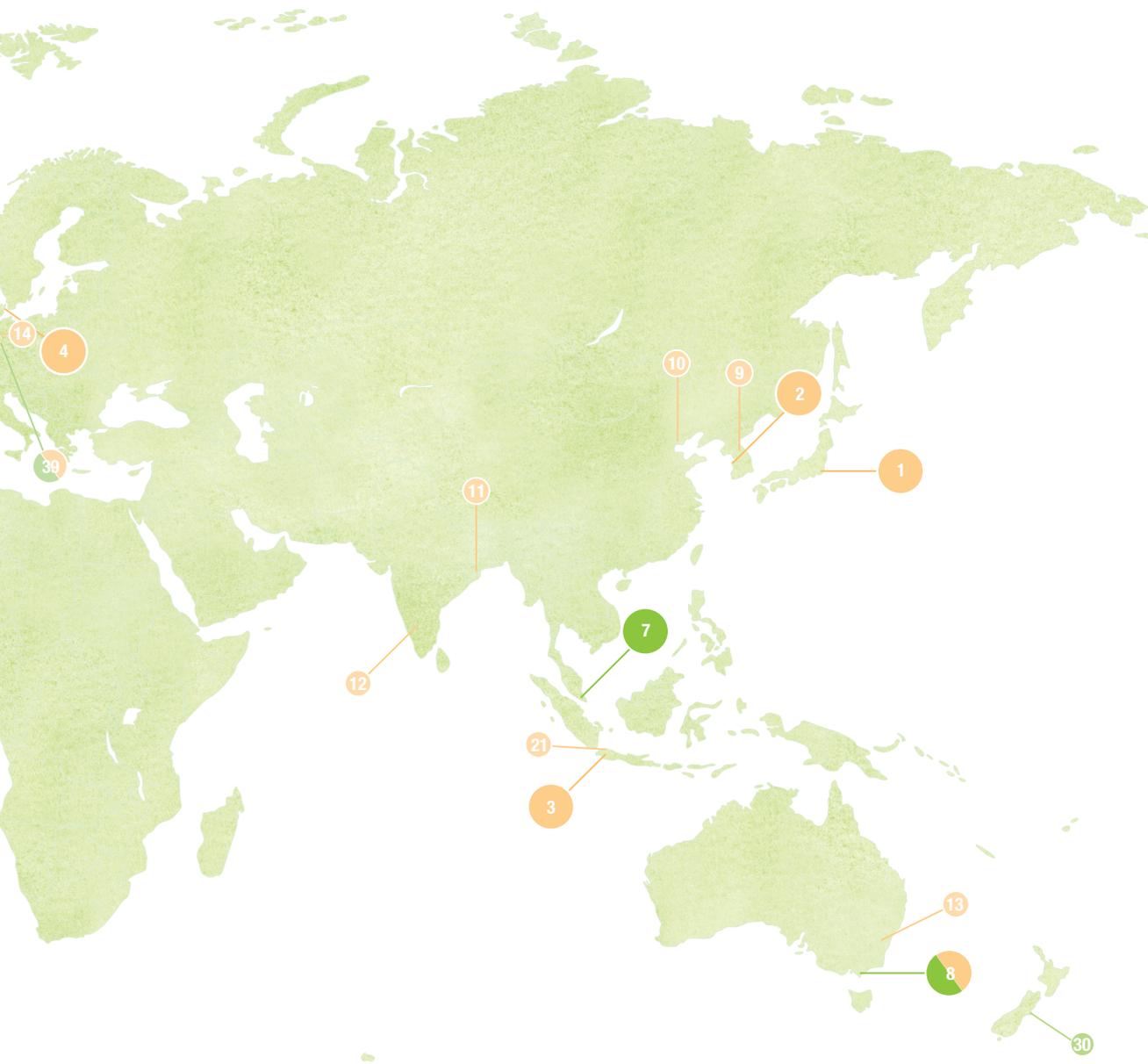




global inspiration

This chapter is intended for a case-study using the best practices around the world as inspirations. In each location, a brief explanatory text and pictures are presented. The study includes a world map of biophilic cities and child-friendly city, an understanding of how child-friendly city and biophilic city can be realised, and extracted main values of each case study.

- | | | |
|------------------------------|---------------------------------|----------------------------|
| 1. Tokyo, Japan | 8. Melbourne, Australia | 15. London, UK |
| 2. Seoul, South Korea | 9. Suwon, South Korea | 16. Leeds, UK |
| 3. Bandung, Indonesia | 10. Qian'an, China | 17. Belfast, UK |
| 4. Copenhagen, Denmark | 11. Bhubaneswar, India | 18. Rotterdam, Netherlands |
| 5. Milwaukee, Wisconsin, USA | 12. Various city mapping, India | 19. Ghent, Belgium |
| 6. Portland, Oregon, USA | 13. Sydney, Australia | 20. Barcelona, Spain |
| 7. Singapore | 14. Amsterdam, Netherlands | 21. Jakarta, Indonesia |



- 22. New York City, New York
- 23. Toronto, Canada
- 24. Boulder, Colorado, USA
- 25. Vancouver, Canada
- 26. Salinas, USA
- 27. Bogota, Colombia
- 28. Sao Paulo, Brazil

- 29. Santiago, Chile
- 30. Wellington, New Zealand
- 31. Vitoria Gasteiz, Spain
- 32. Birmingham, UK
- 33. Pittsburgh, PA, USA
- 34. St. Louis, Missouri, USA
- 35. Washington DC, USA

- 36. Austin, Texas, USA
- 37. Edmonton, Canada
- 38. San Francisco, CA, USA
- 39. Freiburg, Germany

source: <http://biophiliccities.org/> and Arup, 2017



Photos of child participation in the community activities and children using public facilities in Tokyo, Japan. The details on the manhole cover design has also helped children to be excited to walk and get a sense of place and direction. Image courtesy of Gede Resnadiasa.

Tokyo, Japan

In Tokyo and most cities in Japan, children are allowed to travel by themselves at a very early age. Starting at the age of 4, children are introduced to daily household activities. They are asked to help their parents to do very simple tasks such as buying milk at the closest shop. The housing typology in Japan are varied: apartments, detached house, row house, and town house. They share one similarity in most dwelling areas which is an active façade on the ground level. The government allows the community to have a small business in their homes. This policy helps the sense of community to grow starting in a small scope. By knowing their neighbour, parents feel safer, and they have fewer difficulties to trust their children to go out from their houses by themselves. As an addition to that, this strategy is also used to tackle the high depression rate for the ageing population in large cities. By having a lively neighbourhood, elderly would feel less lonely.

Moreover, in the neighbourhood scale, traditional Japanese communities who believe that nature is sacred tends to integrate nature in their houses by having a small garden or a backyard. In some areas in Japan, people are allowed to use the city open drainage system in front of their houses as a small stream to keep fishes like koi and carp. This approach has been used many years in traditional Japanese kitchen where the water flows into a part of the kitchen for washing the vegetables. Fishes like carps are taken care in this area to help clean the water. It is unfortunate that in the densified cities, this type of design is not applicable to be implemented in city's drain canals. In the rural areas where this drainage is still possible, it is considered as a very simple small intervention that can significantly give good impact both for the community and for the environment. The water is proven to be cleaner and fishes can live in a healthy environment as the water moves constantly. By having a communal stream to take care of fishes, community - including elderly, parents and children - would be able to have a bonding activity while taking care of the fishes together.

In a larger scale, most children are introduced to public transportation at the age of 4, and they are encouraged to independently commute from home to school at the average age of 5-7. Japanese government uses different strategies to achieve friendly spaces for children from a large scale decision making processes to small-scale interventions. Although Tokyo is highly populated and dense with infrastructure and buildings, sense of direction can be attained by landmarks such as building, statue, hill, and water. The Japanese government also pay attention to details of signages and colour code usage. Some small interventions in the city are intended for everyone, including children. This includes details such as public transportation exterior design, manhole cover, signage, and post-box designs. The design uses different kinds of arts that represent the area which is easily recognized.

Children are also encouraged to take part in many community's activities such as festivals and performances. It is common as well to allow children to participate in decision-making process. The latest important decision-making process with children is to decide the mascots and one of the children's activities in Tokyo Olympics 2020. This process involved all schools in Tokyo region.

Culture and traditions takes a big part of shaping a community and behavior, at the same time they contain strong value that affect the process of design and planning. The process of creating a child-friendly environment requires a comprehensive planning from the municipality to formulate policies prioritizing community life which aims to stimulate intergenerational activities. The planning and design process needs to cover both large scale (structural and policy planning) and small scale interventions.



Photos of Cheonggyecheon, Seoul. The photo expresses the balance between built environment and presence of nature as an impact from revitalizing an existing gray infrastructure. Image courtesy of Andy Fajar Handika.

Photo of Superkilen, Copenhagen. By transforming a street into a safe urban space, this area attracts youth to meet and actively move. Image courtesy of Gheorghe Maleca.

Seoul, South Korea

The new design for the water canal in Cheonggyecheon, Seoul, South Korea has successfully transformed a rigid grey infrastructure into a child-friendly inviting space where users – mostly families with children – are brought closer to nature as they can experience the presence of nature with their senses. The new designed space promotes closeness to the water, air, greenery, and small animals like insects and birds. Located in a dense urban context with high rise concrete buildings in its surrounding, this space becomes a green open space where communities can interact while at the same time nature is functioning as a filter in the grey environment.

The government in Seoul, South Korea has also established a regulation related to priority zones for children. Revitalization projects for sidewalks in the housing areas and areas within the close proximity to school have been a primary project in Seoul to

create a safer environment for children as the city grows rapidly.

Along with continuous city development process, South Korea is moving towards a digital-oriented country. Seoul is developing to be a smart city where all of the city's information is shared in open source apps and websites. This also includes child-friendly apps for maps, transportations, and safety.

Providing meeting space for families and community with various age range can stimulate back the sense of community that has been faded by the trend of individualism. An evaluation of the current pre-existing built environment is crucial to make a suitable decision to reuse the available built environment into better functioning places for the people. Taking advantage of the familiar technologies for children can also be a way of creating a better community through information sharing.

Copenhagen, Denmark

Copenhagen is a biker's paradise where bike and pedestrian priority zones can be found throughout the city. The city is also famous for its innovative design and art installation where creativity is embraced. The planning of the city has taken big steps to transform existing urban elements into lively spaces such as parks for families and bridges for bikers and pedestrians. As one of the prominent examples in Copenhagen, Superkilen is a drastic transformation of an existing urban element into a multi-cultural, multi-generational space for everyone to do exercise, to play, and to meet.

Another project such as Enghaveparken took another approach where nature and resilience are the priorities. The park is

designed to re-pond to flooding from heavy rainfall. The park has a feature of adaptive water management system and floodable spaces where it aims to use excessive rainwater to activate urban life. There are other projects that also have the same feature for water treatment such as adaptive cycle paths and sports field which can be turned into waterways and reservoirs.

The projects in Copenhagen approached the issue of sustainability as a whole: promote sustainable mobility, environmental resilience, and socially active lifestyle. The main note from this inspiration is that prioritizing is the main issue to be considered, and a careful decision based on the comprehensive analysis needs to be taken to make a large positive cause.



Photos of Bima Microlibrary and Alun-Alun Cicendo Bandung which express the lively social spaces as an impact of the design. Image courtesy of Ig. Aditya Kusuma, SHAU.

Bandung, Indonesia

Bandung is one of the most populated cities in the island of Java, Indonesia. Moreover, many children and youth live both in the central part and suburban area in Bandung. This city was considered as the busiest city in Indonesia with a large number of car users and high population and density.

There are some recent revitalisation projects in Bandung's public spaces. These projects aim to bring the neglected spaces to life and at the same time attract communities to visit and take care together. This issue is based on several factors. First, the drifting cultural trend from social communities to individualist communities. Second, lack of non-commercial meeting space in a very dense urban context. Third, numbers of neglected urban elements including squares, riverfront, sideways, and slum areas. The revitalisation projects are varied, but most of them aim for a welcoming and safe public space for children and youth.

The projects are initiated by the mayor, Ridwan Kamil, an architect who has a passion to build a better city for Indonesia. The revitalisation projects are planned in the areas where it has the most impact on people's quality of life. Two of the main pilot projects in the city of Bandung is to redesign the city square (Alun-Alun Bandung) and to revitalise Cikapundung River.

Alun-Alun Bandung which was a city square built during the Dutch colonial era was a prominent landmark of Bandung. Growing rapidly into a metropolitan city, this square was then neglected as people of today prefer to spend their time in shopping malls and commercial spaces. To bring back the lively city square, the idea of this project is to merge the heritage with the dynamic activities of the inhabitants. The city square is now transformed into a multifunctional square where people can have the possibilities to use it as a sports field, religious event space, and family park. This project aims to revitalise a public meeting space while at the same time to promote multi-generational activities where people can meet each other and have their active social life even better.

Next project that will be discussed is the revitalization of Sungai Cikapundung. Sungai Cikapundung used to be the most polluted river in Bandung. The fact that this river is located very close to a dense neighbourhood has carried out a deep concern of health issues and environmental issues. The project aims to clean the river and redesign it to be an open space for family recreation and educational space for the inhabitants. The project finally succeeded to achieve the aims and successfully created a better environment for the inhabitants by providing a clean park where children can jump into the water filtration ponds and learn about the filtration system. Some rafts and mini boats are provided in the river as well to promote an active society and attract visitors.

The interventions in Bandung are done mostly in an urban element level where public spaces are redesigned individually. The theme of each public space is different from one another, and they are not connected yet in an urban structure level. The design process paid attention to details such as signage, trash bins, and public transportation design. The city of Bandung received an award for a child-friendly city in Indonesia. However, inhabitants still think that this city is still not a safe place for children for its unhealthy social life where there is still the danger of crime and exposure to pollution, drugs, religious intimidation, and gender discrimination.

Revitalizing urban spaces into clean and healthy environment is crucial to promote child's growth, bring the community together as well as to regrow local economy. When designing for children and families, it is important to pay attention to intervention designs in large scale and small scale. Details matter in children's eyes as they help to recognize sense of place and direction.



Photos of biophilic interventions in Singapore; nature can be experienced all around with the presence of vegetation and water integrated in the modern built environment. Image courtesy of author.

Photos of integration of nature in the city of Melbourne. Image courtesy of Wenny Aulia.

Singapore

Singapore is a city-country with the strong ambition to be leading park-city in the world. As one of the busiest yet smallest country in South East Asia, all of the functions in the city are densified in a centralized area where continuous building construction is conducted. However, this country has set a high standard of sustainability which is named Green Mark and Singapore Green Building Council's Green Services Certification. The culture of being competitive and strive for the best has made Singapore one of the fastest developing city in Asia with various technology implementation.

Despite its small size, Singapore has put a significant effort to make it a biophilic city where every built environment needs to be balanced with nature or to be within close proximity to nature.

This applies to projects with diverse scales - from a city planning scale to building scale (housing, hospital, museum, etc.). As Singapore is a densely populated city with a tropical climate, communities in many parts of the city also build a common garden where they meet and take care of the plants throughout the year and then have an event to enjoy the harvested produce together.

Certification, competition, recognition, and regulation-making can be a driving force for a thorough development of a biophilic city. The implementation of biophilic design can be applied in a small-scale interventions to a large urban planning scale. Nature can also be a tool to bring the community closer.

Melbourne, Australia

The city of Melbourne started an initiative with a low-cost approach to biophilic intervention with simple green technology in an existing small-scale project. The method is to encourage inhabitants to co-build rain gardens in their backyards through competition and co-designing process. This was based on the problem faced in the city every year which is a high number of rainy days with an insufficient stormwater filtration system. This problem has affected the environment with water contamination and flooding. In the summer, Melbourne can be very dry and hot which leads to drought in several areas. The rain garden is also a solution to rejuvenate the groundwater as a preparation for the dry season.

The initiative of the rain garden project contains a comprehensive process where the communities are involved and educated about the implementation of this solution in their environment. The process also includes fun activities where communities can register their rain gardens and compete to win prizes. Based on

biophilicities.org, there are 8267 new rain gardens in the city of Melbourne.

Other than the rain garden initiative, Melbourne has planned some family-friendly activity parks which are integrated into the city. These parks are intended for families to spend their time exercising and relaxing in nature without going too far from the city. As mentioned before, summer in Melbourne can be scorching. Therefore, the availability of shades is critical. One can find trees utilised as shading and traffic separator almost in every street in Melbourne.

Communities involvement in the process of creating a biophilic and child-friendly city can stimulate sense of belonging and sense of community. Biophilic approach has proved to be suitable tool for both achieving social sustainability and environmental resilience.



Photos of biophilic interventions in Portland, Oregon. Nature is planned as part of the sidewalk design to create a safe and healthy walking experience. Image courtesy of Maria Jackie K. Hars.

Portland, Oregon, USA

Portland is famously known as one of the most environmentally conscious cities in the world for its abundant nature integrated into the city, high walkability, a high number of bike riders and pedestrian walkers, local food production, and large public parks. The biophilic approach has been a big part of the city's primary tool to create protected nature in the city while at the same time increase urban green space for water absorption and infiltration. Portland also applies an urban sprawl control called Urban Growth Boundary which aims to create a compact city and protect nature in the surrounding area of the city. Included in the large-sized parks are nature reserve areas such as Forest Park and Oaks Bottom Wildlife Refuge which not only act as recreational public parks but also natural habitats for biodiversity.

The city encourages the application of biophilic approaches not only in the urban planning level but also in the building level – both for new buildings and renovation projects. The concept

is to integrate a built environment with parks and greenery as much as possible and at the same time including technologies which help saving energy. One example in the urban design level is the intersection repair where citizens created an action to transform an intersection into public space for children and families. This strategy is mainly used in a densely populated neighbourhood where streets are often found as the only public space where people meet. This initiative aims to reclaim the space as a communal place for the people.

The vision of the city is to create a dense, walkable, sustainable city which is healthy, beautiful, and harmonious with the abundance of nature. What we can learn from Portland is that it needs a brave step to set a high and robust goal and then set up comprehensive strategies in small-scale to large-scale interventions and regulation making where all stakeholders are involved.

Milwaukee, Wisconsin, USA

The city of Milwaukee was famous for its active industrial area with high pollution because of the production activities. Since 2013, Milwaukee's government has been taking a brave step to change from cream city to green city by applying biophilic principles both at the planning level to changing lifestyle. The programs consist of reintroducing nature in the city and connecting it with the blue structure (three rivers and Lake Michigan). Some revitalisation projects are conducted in the inner harbour to create a green public space. Since its prominent local nature is the water, the aim is to create an eco-city that celebrates water and at the same time restores the land in hopes to reduce pollution from the industrial activity. Now, Milwaukee's inhabitants are attempting to move towards

sustainable lifestyle by implementing urban agriculture and community food production. Communities also started some initiatives with various strategies from ecology centres to home-grown food.

Biophilic city does not only stop in the planning and design level, but it continues forward to shift the culture and lifestyle to be closer to nature by promoting outdoor activities such as urban farming. By stimulating initiatives from the inhabitants, biophilic city can be achieved by bridging the gap between top-down and bottom-up approach. It might take a sacrifice to change the current lifestyle for a better cause, therefore, raising awareness through education and information sharing is crucial in the first step.

global inspiration: conclusion

Learning from how child-friendly city and biophilic city can be achieved from best practices around the globe, the important findings are listed below.

1. Creating a child-friendly city is a complex process where it needs to bridge the gap between top-down and bottom-up approach by involving all stakeholders: parents, children, teachers, municipality, decision-makers, architects, planners, politicians, etc.
2. Biophilic design principles can be used as one of the tools to create a child-friendly city, focusing more on introducing nature at an early stage in an urban context.
3. The child-friendly and biophilic approach need to be both applied in small-scale intervention and larger scale to create a comprehensive impact. However, details matter, especially in the eyes of children. Small-scale intervention can give an impact and impression to children.
4. One of the methods of creating a comprehensive solution in an urban context is by using multiple small interventions which create a network and connection from one to another. This way, it can create a positive ripple effect to a bigger context.
5. To achieve a child-friendly city, it is not enough just to stop at an intervention design. It needs to be balanced with regulation planning for all of the city inhabitants, especially for street/vehicle users.
6. Collaboration among all stakeholders is crucial to creating a significant result. International collaboration and/or with organizations such as UNICEF or UN-Habitat is also possible to give a layer of knowledge from different perspective and expertise in the process.
7. Local culture, climate, and local nature need to be considered to be part of the design principles to create a sustainable solution.
8. Sense of community can be stimulated by creating a child-friendly city with the biophilic approach. Therefore, providing a space not only for children but also for intergenerational activity is essential.

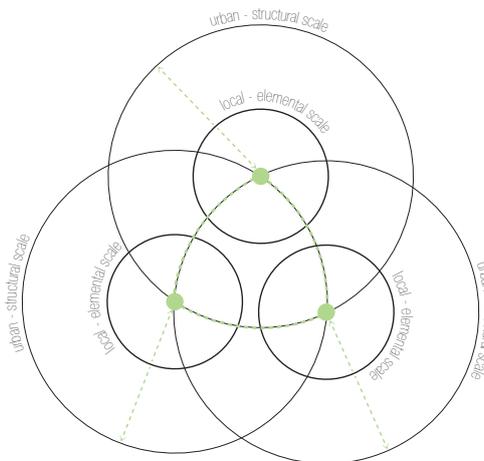


Diagram of possible ripple effect starting at a small point of urban element scale to larger impact in structural scale.



chapter V

site studies

zooming in : Gothenburg as a child-friendly city

The city of Gothenburg has its vision to be a city that is open for everyone. Urbanization and densification as a global trend in city development are also happening in Gothenburg, as its population is expected to grow with an additional 67000 inhabitants by 2025 and 150000 inhabitants by 2035 (Göteborgs kommun, 2012). Among these new inhabitants, Gothenburg will expect more children and families within seven years from now. This phenomenon will happen along with the fast development of several areas in Gothenburg which will provide various facilities including housing, hospital, park, shops, etc. The vision of Gothenburg to always integrate nature in the development also is a part of the consideration in the decision-making process for the field of planning and design.

implementations

The municipality of Gothenburg has set various efforts to achieve a good city environment for everyone to have a healthy, active, productive lives. Although it is not the main intention to fulfil the Child-Friendly City criteria as it has been mentioned in the UNICEF's initiative, some of the design approaches in the urban context of Gothenburg has prioritized families, children, elderly, and people with different abilities.

These approaches have been applied in large-scale planning and small-scale design strategies. As a prominent example, areas that are developed for family housings in Angered and Bergsjön has a separated traffic system where large and fast vehicles are not allowed to enter the housing area. This strategy has proven to be a successful strategy to create a safe living environment for all of the inhabitants. The municipality of Gothenburg also makes sure that every area will have equal access to public services such as health-care, schools, transportation, and open spaces. Even though the proximity of the public facilities and the density of the dwellings are varied, the availability of these services has fulfilled the need of the inhabitants of Gothenburg in general.

There are various small-scale design strategies which have been applied in the city of Gothenburg to create an inclusive environment for everyone. Based on the interview and survey, parents in Gothenburg feel satisfied with the transportation system where it covers the whole city and the suburbs area and is easily accessible for everyone. The planning for the bus and tram stops are suitable within walking distances, and the design of the vehicle is easy to be used by everyone, including people with wheelchair and parents with strollers. Moreover, parents in Gothenburg also appreciate that building codes in Sweden have regulated that all buildings must allow access for people with different abilities and must be wheel-accessible. This regulation helps parents in Gothenburg to access public places easily when they use strollers for their children. The regulation of providing open space within the walking radius of the inhabitants is also an important element in Gothenburg. According to the survey result, all parents in Gothenburg has good access to open spaces such as playground in the housing courtyard. However, access to nature is limited to parents living in denser areas closer to the city centre.

An observation in the city of Gothenburg has resulted in an intriguing finding where some of the child-friendly values were achieved in artistic forms. Some of them are not specifically intended for children but have a significant impression on children that eventually help them to get a better sense of direction. For example, city arts in several building walls in Gothenburg which were created during the Artscape movement in Gothenburg. A creative design for bike parking using a car form is also an example of small intervention which is interesting for children. Children have the tendencies to remember small things that they experience on their journey. Interesting façades with different textures when touched, various kind of trees and plants, and landmarks in Gothenburg have created a lively environment in children's mind and stimulated creativity at the same time.



Two children interacting with a bird in Körsvagen, Gothenburg. Image courtesy of author.

challenges

Planning and designing a child-friendly city is not an easy process anywhere in the world, including Gothenburg. The process is a complex unity of many considerations which is highly dependant on the context: geographical context, social and cultural context, economic conditions, and so on. It is also not a linear process. Instead, it is a loop where everything needs to be reevaluated and discussed thoroughly through the process.

The most challenging decision-making process in realizing a child-friendly city is the process of prioritizing. There are different functions in each area in the city where child-friendly factor does not always become the priority. For example, there are areas in the city centre that are intended for the active economic sector with no facilities for children. Although families come to this area for shopping, careful parental supervision for children is highly needed as there are too many crowds, busy streets, and pollution.

There is also a challenge of cooperation between school, parents, and politicians where it requires a high amount of time and process while at the same it needs a continuous loop to gain trust from each other. Communication with children is also important as children received information differently. Worth to note that every child is different. A friendly approach to allow children to take part in the planning and design process is essential. For example, by using music, movies, and games, children would understand better about the discussed topic. Then, comes the challenge of interpreting the children's and youth's voices gained from the participatory processes to be implemented into reality. Keeping the promises is the expectation of children, and they are eager to see their ideas become true.

Next challenge is about the rapid increase of inhabitants and its balance in relation to education facility. The number of schools in Gothenburg is continuously increased to meet the need of the inhabitants. One of the main concern about education services is the proximity of the school to home. The location of the school takes a large part of parent's consideration which leads to a way of life and everyday habits of travelling from home to school and back. As the population grows fast, however, not all family can choose to which pre-school they want their kids to go to. Many of the cases are related to full pre-schools within proximity that affects children to go to schools with further distances, causing the need of travel by motorized vehicle, which leads to the car-dependent lifestyle at the early age.

As a general challenge, Gothenburg is famous as the city of cars in Sweden. The interest in owning a private car is still increasing. However, the government attempts always to improve the public transportation system. There is a challenge to raise awareness towards sustainable mobility in all layers of community.

“Sometimes it feels like Gothenburg is built more for cars than for human.”
- a respondent from the survey



“A kid-friendly city is a city where you would want to raise a child, a place that is safe, that has good schools, and where people are involved in the community.” - Tim Cline

the dialogue

As part of the research method, several dialogues were conducted with experts in architecture for children and youth, UNICEF, and parents living in Gothenburg.

A dialogue with Mania Teimouri (architecture consultant for children and youth, Kultur i Väst) resulted in a very fruitful discussion about how Gothenburg has changed in the past 20 years which inevitably gave impact in children's life and behavior. The changes both happened in the culture and the use of existing spaces. For example, children nowadays have tendencies to spend their time with modern gadgets and less time outdoors with friends compared to a few years back. Another example is the change in spaces such as inner courtyards for family housing where they used to be semi-private space, and now most of them became privatized. This created perception for children to understand that a courtyard is a safe place, while the sidewalk is an unsafe place. There is no transition where children are introduced to be aware of the safety of the area.

There is no in-depth research yet about the reason why parents in Gothenburg starts to be more protective of their children. However, based on the dialogue, some parents felt that there is a shift in the community in Gothenburg about multi-cultural communities. They argued that as the population grows faster than before, some adjustment in the city planning and regulation becomes necessary. The growing population requires a stronger safety reinforcement to avoid the possible safety risk. While this change happens quickly, there are not so many big decision and design transformation in the city that can be made as they would require a significant amount of time and funding.

In the past years, Gothenburg municipality along with Kultur i Väst, Västra Götaland Regionen also have made significant efforts to improve Gothenburg as a welcoming and friendly city for everyone, including children and youth. The focus of the initiative is to open an opportunity for children and youth's voices to be heard by including them in the decision making and

design strategies. By involving the children, the decision-making process is no longer just a top-down process but rather bridge the gap between top-down and bottom-up process.

These processes have been done for several projects such as research, planning for open spaces, playground and park for children, and design schools. The key to the participatory process with children is to ask a relevant question at the suitable phase of the project itself. For example, at the beginning of the introductory participatory process with children, the questions should be general and related to their everyday life. While at the design phase, children can take part to answer more specific and concrete question.

Designing and planning with children and youth is a learning process for both sides (municipality, experts, researchers, architects, planners and children, parents, teachers). Based on these learning processes which has been done in several projects in Västra Götaland Regionen, some similarities becomes the red thread of the process. Listed below are the key findings from the participatory process of designing with children.

Another important finding based on observation, interview, and dialogues with parents in Gothenburg is that Gothenburg used to be a city where community lives is a trust-based community lifestyle. Although it has been an uncomfortable truth, the fact that communities are shifting from the trust-based value is inevitable. There have been some insecurities felt in the community after several cases that happened in Gothenburg, Sweden, and even Europe in the past ten years. Although it might not have given a direct impact and cannot be generalized, this phenomenon might have changed how people feel, think, and behave in their environment. The sense of community is continuously decreasing as people are driving towards a more individualistic lifestyle where they would feel more secure.

key findings

- Children like to take part in workshops. However, this comes with a responsibility for the experts to keep their promises and to make their ideas real. Children keep their expectations and hopes in their heart.
- Decision-makers need to reevaluate and return to the users after the project is completed. It is crucial to make a circular communication between stakeholders including children, parents, and teachers to establish trust between stakeholders in the long-term process.
- By keeping the communication and process circular, there will be a sense of belonging which stimulates the children to take care of the space created and at the same time growing the sense of cooperation and community between children.
- Children like to be close to adult to feel safe, but not over-protected. They like to play where they are visible to their parents but at the same time having the freedom to play and explore. They also would like to meet other children and parents. Children love to show themselves and always curious to know more.
- Children like to get a little sense of danger. A study also argued that bit of sense of danger is needed for child's development for stimulating awareness and readiness. They would feel curious, and they will learn to be braver. When they do, they love to show it to their friends and parents.
- Children and parents' thoughts and opinions about the city and the needs in the city are often similar. Their main concerns in the city today are about safety, availability of spaces to play, and possibilities to meet friends and other parents.
- When asked about their wishes in the city, children always wish for something that they have seen before. For example, they wish for theme parks, water parks, a zoo, or big parks with fun playgrounds in the city. This finding raises a discussion of design innovation that is possibly needed in the city to make it friendlier to children and at the same time give a positive impact to children's self-development.

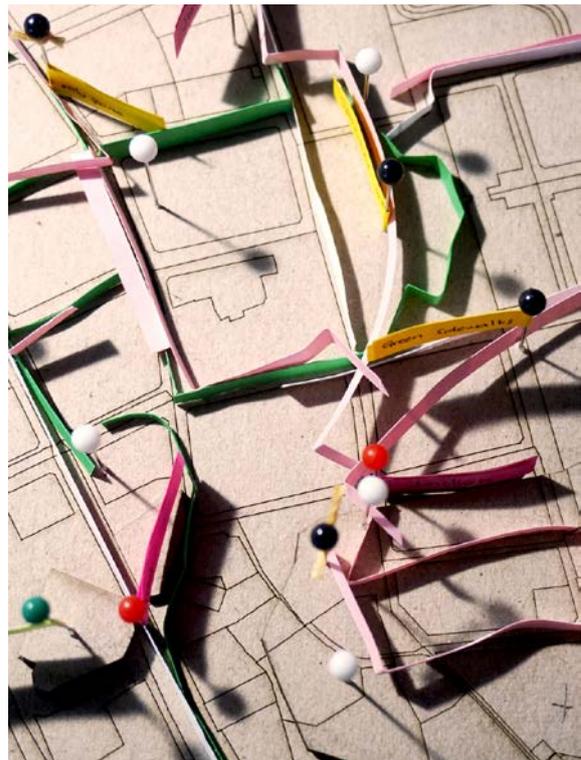
A child cannot wish for something they have not seen or known before. Therefore, it is important to establish a good example of a good built environment, for a good and memorable childhood.

zooming in: Majorna, Gothenburg

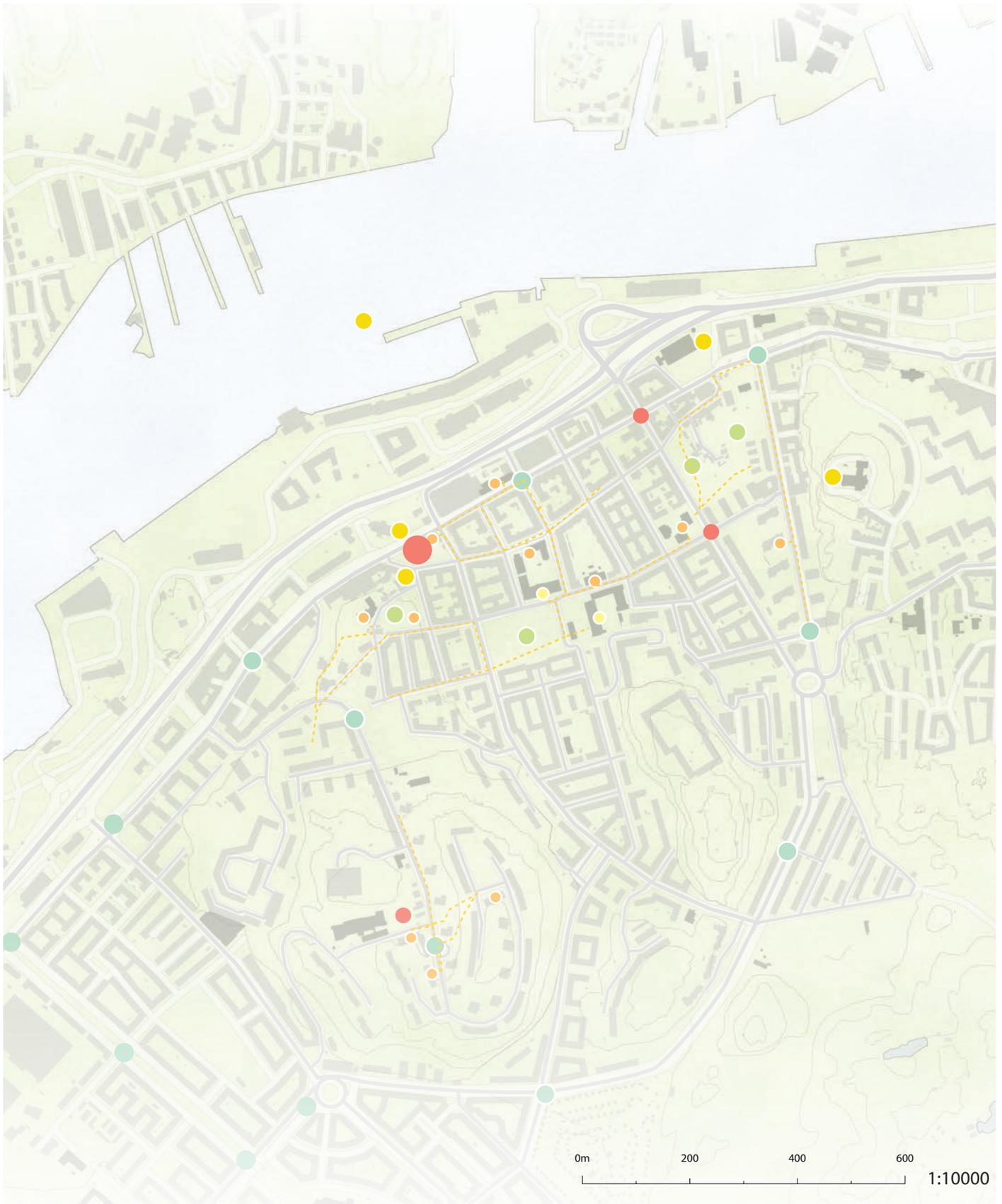
Based on the survey, observation, and dialogues on site, Majorna has fulfilled some of the Child-Friendly City criterias such as accessibility and availability of services (healthcare, education, playground) and participate in social and cultural events. Children participation in decision making process in Gothenburg, in general, has also been established through different types of events with collaboration with schools and communities.

An observation that involves walking with children in Majorna has given a significant understanding of the place and the challenges. Majorna is a part of Gothenburg with dense areas of family housings, a large number of children, and pre-schools. Streets in Majorna are easy to recognize for adults, but not always for children. Many landmarks can be found and seen within various ranges and heights for its sloping topography. This is a potential in Majorna to be an excellent place to prepare children to be aware of the neighbourhood and to get a good sense of direction. Children with the height of approximately 120-140cm can already recognize these landmarks, but not the ones who are shorter. They have the tendency to look down more than look in a far distance.

In term of children's walking behaviour in Majorna, it shows the same finding where children are choosing safer sidewalk where they are familiar with, and they choose a way where they can find their destination which can be a playground, or nature (green patches, small park, etc.). However, this does not apply to all of the cases. As streets in Majorna are well defined with dense buildings and traffic, not all children have a choice to walk by themselves. In the denser area of Majorna such as Ällmannavägen and Karl Johansgatan, children have to be extra protected when walking in the areas where they do not have options to go exploring independently.



A model study for Majorna



- Preschool
- Public school
- Tram/bus stop
- Landmark
- Public playground
- Critical - Potential Spot for Interventions

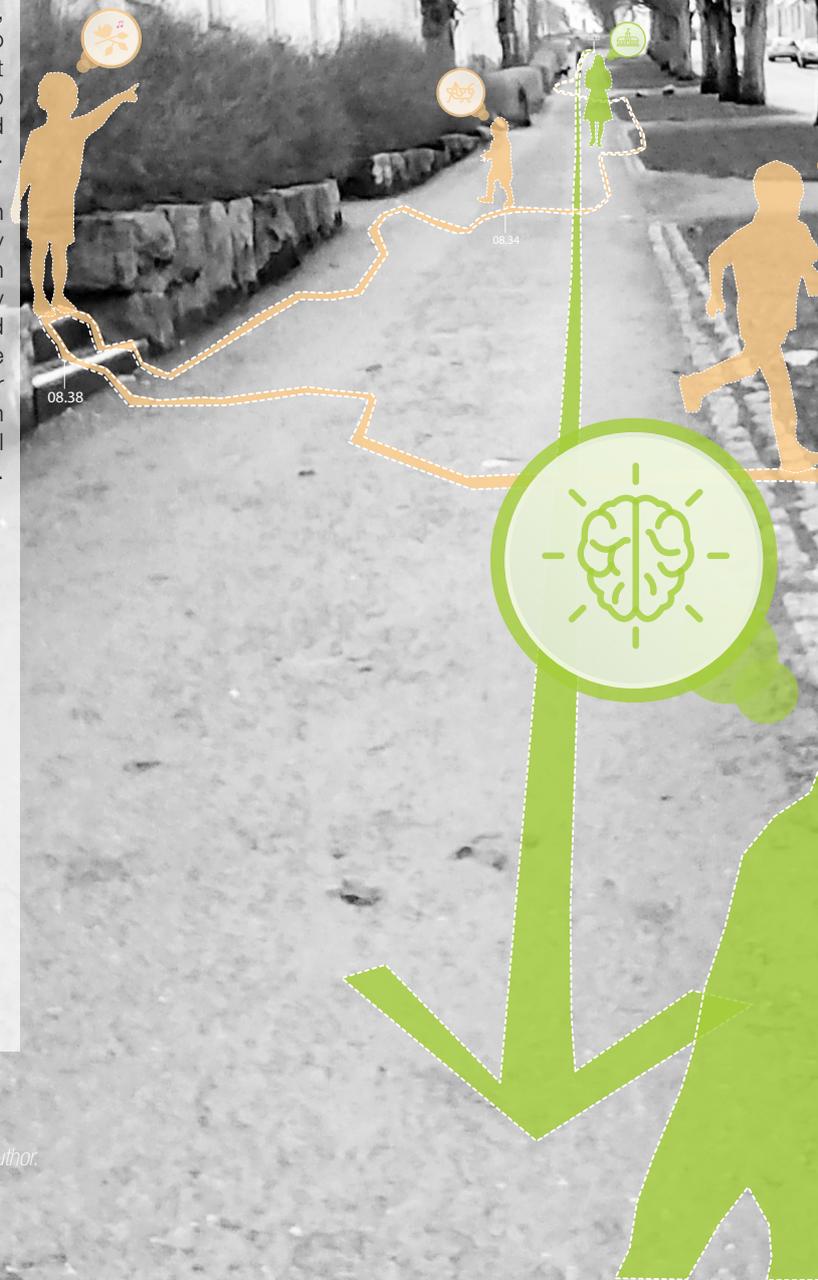
- highway
- pedestrian/
cyclist only
- route to/from home to/from school

children in the city

Children perceive the environment differently than adults, and to add to that, every child is different. Therefore, a design intervention in the city for children cannot be the same in every place. Every design needs to be contextual and specific for each place with its child culture. Metaphorically said, designing and planning for child culture should avoid the cookie-cutter approach.

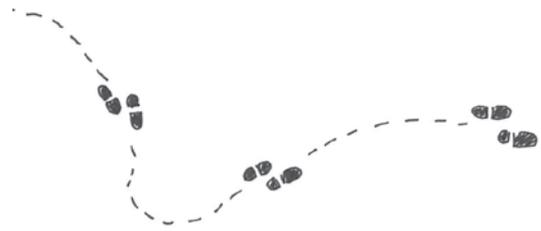
Most spaces in Gothenburg is well defined with each urban element forming spaces in the city - including streets, sidewalks, buildings parks, and so on. However, children perceive the built environment with their eyes as a merged adventurous playground where they would often pick an unusual way to their destination, rather to go on conventional routes which adults would likely to choose. This means that even though streets are made to connect places, children would not always use spaces on the street to get to their destination. In short, users decide how they would use the spaces regardless of the well-defined built environment.

The motivation behind why children often walk off the beaten paths is simple yet often neglected. First and most importantly is about safety. Children have a similar point of view with an adult where they feel unsafe on the sidewalks with busy streets and heavy traffic where they are not able to play and explore freely. Another reason is that most children share the similar characteristic where they are bundled with wonder and curiosity. They see what adults perceive as distraction fun and adventurous. They are easily fascinated by small items they find and create their world in their imagination.



chapter VI

site analysis



Regional site analysis: Majorna

The site analysis starts with regional scale in Majorna to find a specific test site for the pilot project location continued by focused site analysis.

In 2017, total population in Gothenburg is

556640

people

In 2017, total population of children in Gothenburg is

114573 children
= 20.58%

of Gothenburg's total population.

Majorna is a densely populated area in Gothenburg that has been part of the city since

1868

and still developing today - making its area rich with culture and heritage.

In 2017, there are

10101
children lives in Majorna.
= 8.9%

of Gothenburg's total children population.

(Göteborgsbladet, 2017)



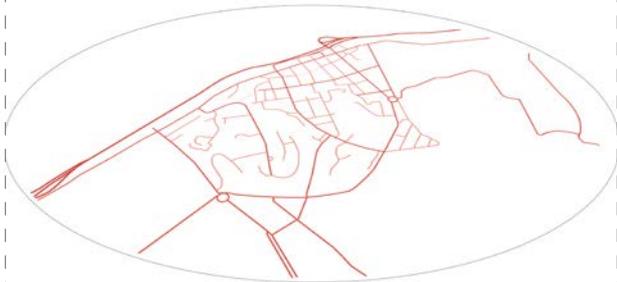
Source: maps.google.com, access date 1 May 2018

Regional site analysis: Majorna



Natural and built features

-  Open green space
-  Landmarks
-  Göta Älv
-  Nature nearby Majorna



Street

highway

pedestrian/
cyclist only

Some part in Majorna has already established a regulation for pedestrian-cyclist priority street. However, some street are prioritizing motorized vehicle with only a little attention to non-motorized vehicle and pedestrians.

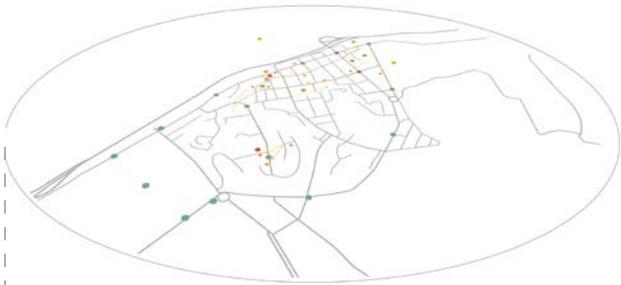
People of Majorna consider the area still need improvement for pedestrian safety.

The regulation for pedestrian-cyclist priority can be expanded to critical spaces such as Allmannavägen.

Buildings and people

Majorna is a densely populated area which was established in 1868 and still continue developing until now. The buildings in Majorna are mixed between housing, commercial, public building, governmental building, and some industrial warehouses and offices along the waterfront. The style of the buildings are mixed between old-style Swedish wooden houses and modern buildings. There are several important heritage sites in Majorna as part of the history of Gothenburg.

There are 63794 people living in the area of Majorna-Linne today. There are diverse population from different backgrounds and ages.



Public Facilities

- Preschool
- Public school
- Tram/bus stop
- Landmark
- Public playground
- Critical - Potential Spot



Many schools are located in this area within short walking distance to housing areas.



Public facilities, healthcare, and good lively neighborhood are found in Majorna.



A part of Allmannavägen has established a non-motorized vehicle and pedestrian priority street. This is a potential to be extended as the street is a connecting street to many schools.



Playgrounds are found throughout Majorna. Some are open for public and some are located in schools and privatised housing courtyards.



Pilot Project Site

- Selected critical space for pilot project site (Allmannavägen / John E. Olsson Plats)
- Critical sites for future intervention

The pilot project site is selected as it is the entry point of several schools and family housing in Majorna where it has the critical problem which is no sidewalk and lack of safety in mobility.

the focused site

The focused site as a starting point of intervention is a critical space in Majorna which is specifically located in Ällmannavägen/Karl Johansgata. It also includes a fort park John E. Olsson Plats.

Explained below is a simple SWOT analysis about the site.

Strength

- Strategic location for its proximity, availability, and accessibility to water, nature, public facilities and to the city center.
- Different types of nature can be found (rocks, vegetation, birds), especially in the hidden park.
- The area is part of the heritage site in Majorna (John E. Olssons Plats).
- The park has a good visual connection to landmarks which brings good sense of place.

Weakness

- No sidewalk on the street (separation just represented by lines on asphalt).
- No characterization / speed limit / warning on the street even though it is close to several schools.
- The park is not used optimally as the entrances are hidden by parking spaces.
- Large number of car parking spaces.

Opportunity

- Many family housings and schools in the surrounding.
- The usage rate of parking spaces in this area is under 90% daily.
- The street has light traffic compared to the main streets and connected to other streets in grid configuration (making it easy to redirect).
- Awareness towards sustainability lifestyle is increasing, especially in Sweden.

Threat

- Car dependency trend is still increasing.
- The priority of the city development might not put children on the top list yet.
- The issue of heritage and children might not be the top priority today.



Source: maps.google.com, access date 1 May 2018

Focused site analysis: Allmannavägen - John E. Olsson Plats

Street, parking space and safety



Cars are dominating the street even though this is not a very active street. Mostly cars come and park, and then the driver left for quite a long time.



There are more than 800 parking spaces in Majorna. In Allmannavägen, there are 14 parking spaces with the usage rate under 90% everyday. There is no sidewalk on the site, only a line.



There are junctions with slope without a safe street crossing even though there are a lot of children around as the area is surrounded by pre-schools.



Pedestrian detour is possible through John E. Olsson plats but the entrance is hidden by the parking spaces and the cars.

Overview of the site



John E. Olsson plats with unique mix of natural and built heritage. On the top of the park, one can observe the surrounding landmarks: Eriksberg, Karl Johans Kyrka, Sjömanstornet, Masthuggskyrkan



Karl Johan Kyrka is the closest landmark as part of Majorna's built heritage. The existing built environment in Majorna in general is a good tool to create sense of place and belonging.



Karl Johans Förskola is located right beside the John E. Olsson plats. This school has a back entrance. However, there is no safe sidewalk on the entry side. The school itself has a mixed curriculum of indoor and outdoor education.



There are signs of the past on the street, proven by the broken asphalt where one can observe that it used to be cobblestone street.



Olssonska house which is located right across the entrance of John E. Olsson Plats is the house of John E. Olsson and part of protected heritage building in Gothenburg.

Biophilic quality on site



Presence of rocks in the city of Gothenburg is prominent, although it is often found fragmented by the urban infrastructure.



As the site is an open-air with minimum shading on the top part of the park, one can enjoy the sky both night and day.



John E. Olsson plats has a part where it is very exposed to the sky and the sun, making it very potential for meeting place for people in Gothenburg.



Also, it is a potential that there is a possibility of stargazing and watching the moon during clear night sky and earth hour.



Presence of water is part of biophilic quality on site as Gothenburg has high number of annual rainy days.

Listed below are the flora and fauna found on site.

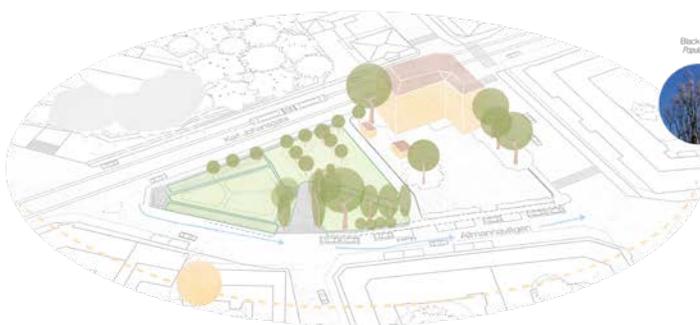
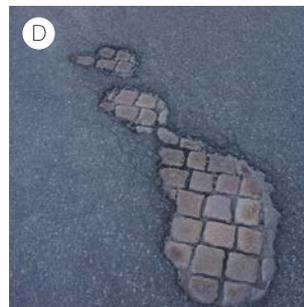


Image courtesy of author, Ivan Sjögren, and Click Howell

built heritage

The heritage of the Allmannavägen can still be found. The park is named after a ship captain from Gothenburg: John E. Olsson plats whose house is located on this street as well. Some broken asphalt proved that the street was used to be cobblestone street.

The John E. Olsson plats has a good visual access to other landmarks such as Karl Johanskyrka, Eriksberg, and Sjömanstornet. In Allmannavägen, one can also have a good visual access to Masthuggskyrkan. This means that the place has a good potential to introduce sense of place and direction to children.



1. Karl Johan 50 Preschool
 2. John E. Olsson Plats (Park)
 3. Family housing
 4. Olssonska Gården (Heritage building)
 5. Karl Johanskyrka (Church)
 6. Mixed use building (Baguette shop and housing)
- A. Unsafe street (no sidewalk)
 - B. On-street parking spaces
 - C. Hidden entrance and disconnected nature
 - D. Asphalt / Cobblestone street
 - E. Junction



street and the parking space

The street in this area is well connected because of its urban structure. The main street, Karl Johans gata is the busy street with tram tracks, while Allmannavägen is more relaxed and not very active. However, there is no separation between pedestrian and cars, and sidewalks are not safe. In this street, children do not have a choice to wander off the path because of its lack of safety. Parents hold their children's hand at most times. The parking spaces in this street is not 100% used at all times. Their locations are blocking the access towards the entrance of John Olsson plats.



- — Tram tracks
- — Streets for motorized vehicles
- No sidewalk available (only lines)
- Parking spaces
- Junction



Karl Johansgate

Allmannavägen



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nature



Nature can be found in this area, although some are disconnected. The main natural features are rocks, trees, birds, and the weather as it is very open. The slightly tilted street allows water to flow naturally from the main street to Allmannavägen when it rains. The John Olsson Plats itself is shaped like a fort or ship. The top part of the park is very open with minimum shades, making it possible to enjoy the sun and the view towards Eriksberg and Göta Älv. Not so many activities can be found in this park, but there are some biophilic qualities can be found. The interesting finding is that there are baby's pacifiers hanging on the trees. No further informations are available in regards to this.



Fauna on site

common raven, eurasian blue tit, common gull, treecreeper, fieldfare, eurasian wren, common house martin, eastern gray squirrel (rare).

Flora on site

white poplar tree, black polar tree, white mahogany cherry tree, dewberry shrub, daisy, yellow wild flower.





chapter VII

proposal

design strategies

These design strategies are formulated base on the knowledge building from the previous chapters including the site analysis and biophilic design principles for children. The design strategy is context specific for the pilot project site.



keeping, embracing, and enhancing nature on site

All of the natural features on site are kept and embraced. The design will add more qualities with local vegetation, rocks, water, and weather features as prominent resources.



creating series of small interventions and experiences

The design proposal consists of small interventions which create sense of safety, playfulness, and sequences of different experiences with integration with nature for better walking experience.



respecting the context: built and natural heritage

As the site has heritage value, the design wants to respect the existing built and natural heritage both in the site, and its surrounding.

design phases



Phase I The Parklet and The Sidewalk

As a start, the proposal of phase I consists of evaluation of an unsafe sidewalk and a transformation of 2 parking spaces into a parklet.



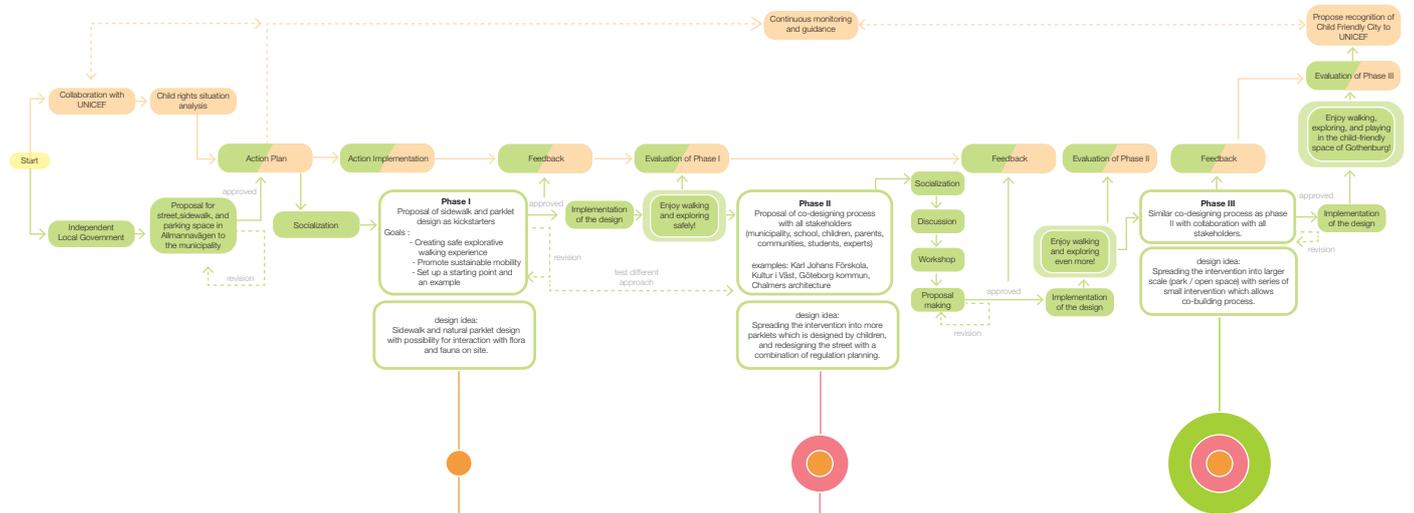
Phase II The Street

The second phase consists of proposal of transformation of the street along with the child participation process in other parking spaces on the street. The process involves co-designing process with communities.



Phase III The Park

As the final phase, the intervention spread to the park where the implementation of biophilic approach will be maximized. The process has a possibility for co-designing and co-building with communities. The proposed design for phase III is a sample of design suggestion.

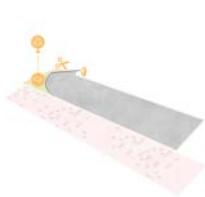


phase 1 : the parklet and the sidewalk

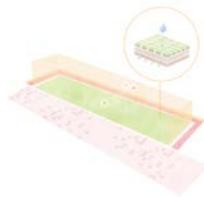
Parklet is a typology of a small pocket park as a result of reclaimed parking space into a public space that is pedestrian-friendly. Parklets are often used to promote safe walking experience and also to enhance the building function in front of the street. In this first phase of the design proposal, a parklet which is intended to give an explorative and safe walking experience for children. The parklet integrates nature to support children's behavior of exploring the city which is built upon curiosity and adventure.



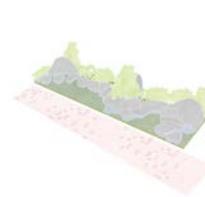
Evaluating parking spaces



Nature for water absorption



Adding bioretention layers



Designing a parklet with nature as a tool to create safety and explorative walking experience.

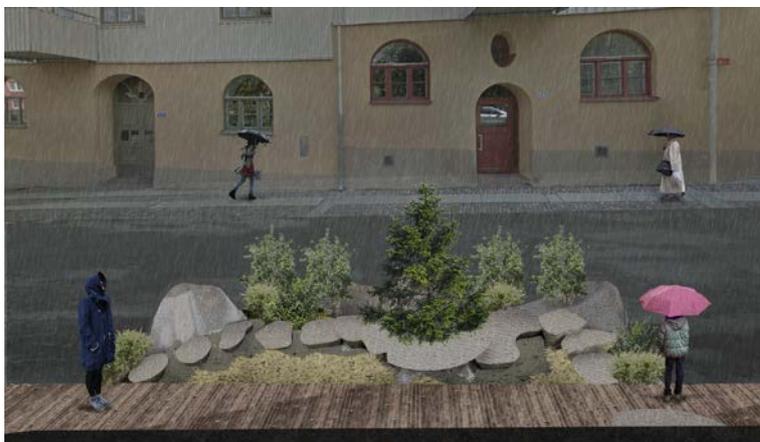


Majorna

May 2018



20°C



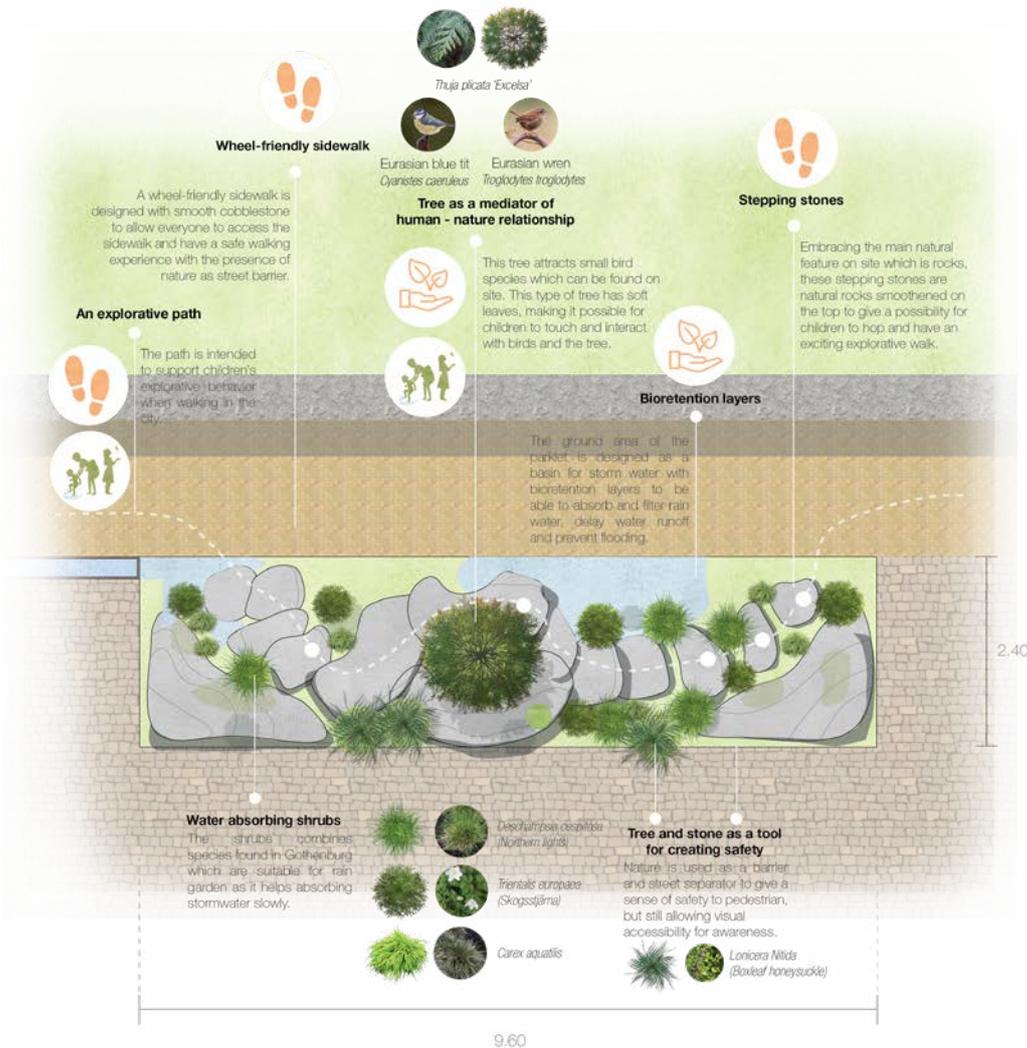
Majorna

May 2018



15°C

implementing the research result
of walking behavior of children
by promoting explorative walking behavior



Parklet Plan Scale 1:100

phase 2 : the street

In phase 2, the design intervention spreads to the street of Allmannavägen. The proposal consists of 3 sub-topics.

1. Transform the street back into cobblestone street.

This proposal wants to bring back the feeling from the past and respect the built heritage on site. At the same time, by returning to cobblestone street, there will be a different feeling while passing through this street. It will invite people to walk as it is cozier, and it will affect car users to drive slowly or even choose a different street.

2. Transform more parking spaces into bike parking space and parklets designed by children.

By having one parklet at phase 1, children would know what a parklet is. In this phase, children are invited to participate to imagine how a parklet should be designed if they were to given the freedom to create. At the same time, a discussion and workshop with children are designed to re-imagine the street and the park and how an urban space should be in the eyes of children.

3. Regulation planning in two different scenarios based on time.

There are two scenarios that are proposed in this phase.

The first scenario is when the street allows the car to pass when children are most likely to be home or to be with their parents (19.00 - 07.00).

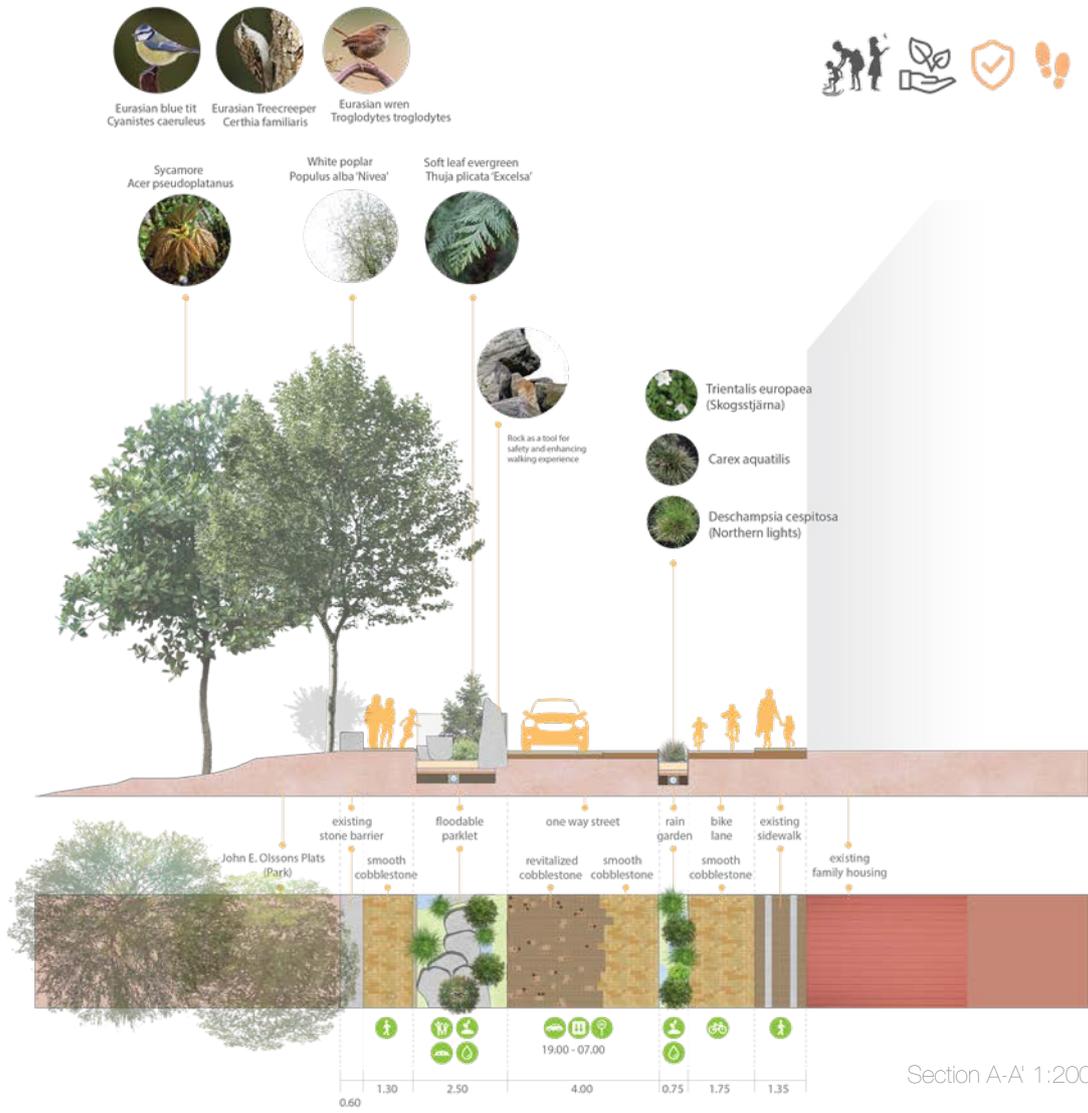
The second scenario is between school time (07.00-19.00) where only pedestrian and bikers are allowed to pass this street.

The illustration is explained in the next pages.



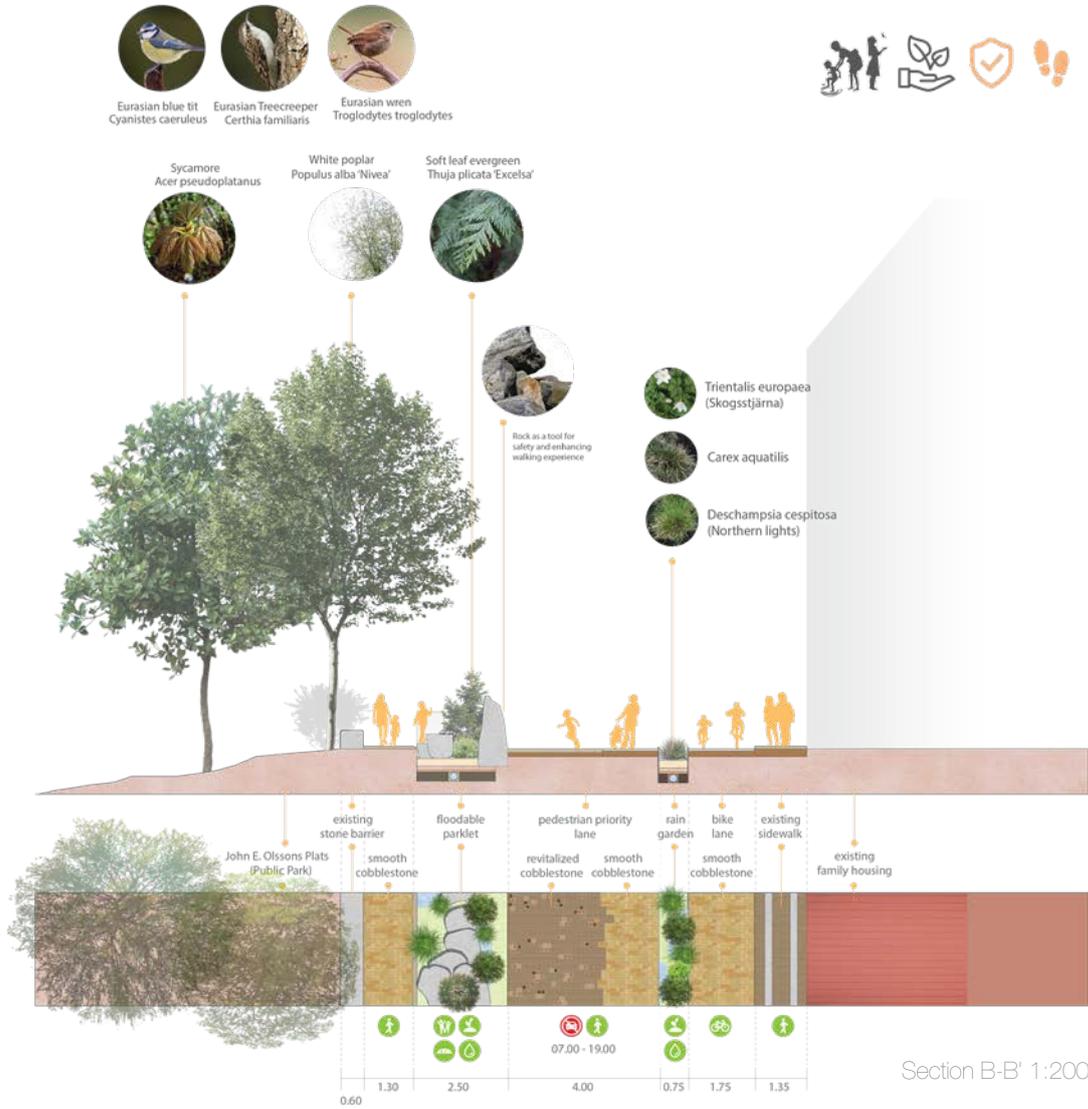
scenario 1

one way street : 19.00 - 07.00



scenario 2

pedestrian priority zone : 07.00 - 19.00



phase 3 : the park

In phase 3, the design intervention spreads to a larger scale which is the park. The design is developed to enhance the walking experience through an explorative activity. The thought behind the design is to apply as much biophilic approach as possible, by also taking into account the curious behaviour of a child. The design is based on the biophilic approach for children principles and emphasize more on the design that stimulates direct interaction with nature, and living, learning and playing as part of nature.

There is a possibility for co-designing and co-building in this phase which is connected to the process flowchart first part of the design proposal. Therefore, the design in this phase act as a suggestion of the possible biophilic intervention design.

The design proposal in this phase consists of sequences of small intervention which creates a playful walking experience. In details, the proposal will be discussed in 4 different group of interventions:

1. The main entrance
2. The sundial and the lookout
3. The secret entrance
4. The dewberry willow loops and the nest

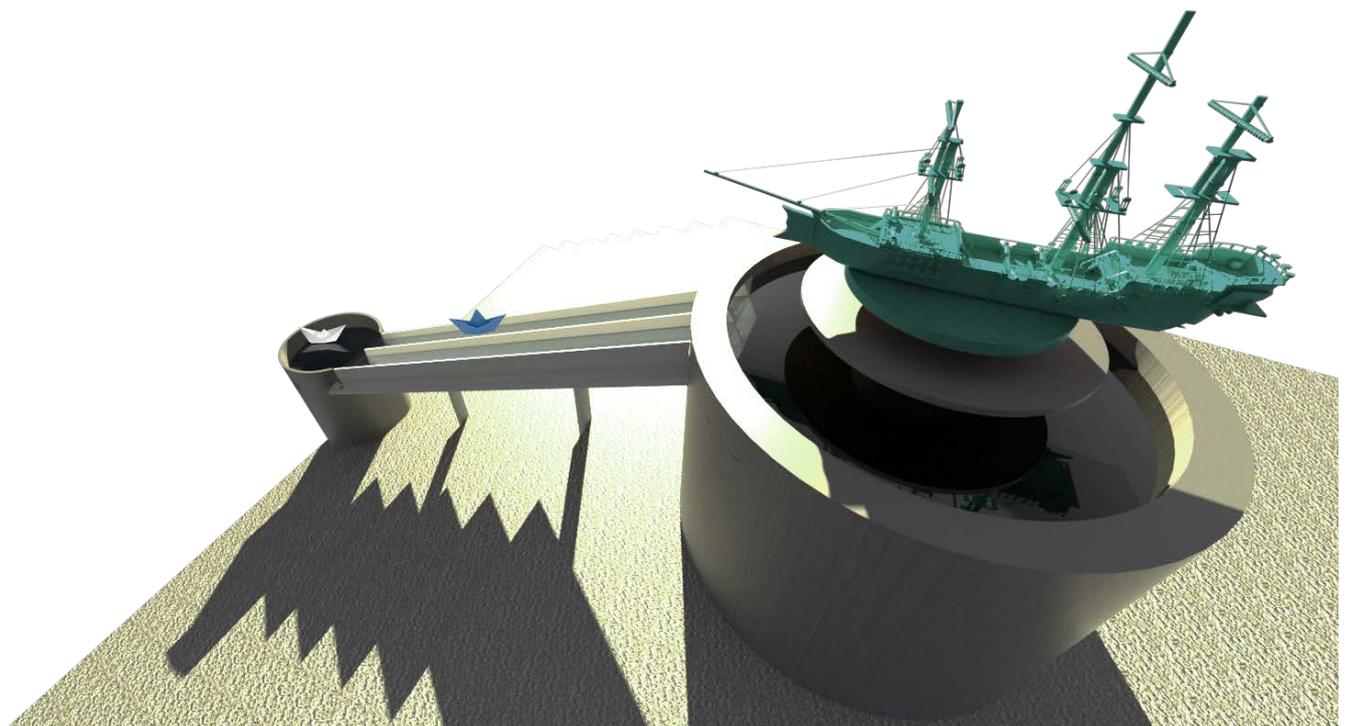
As the site has a prominent quality of built and natural heritage, the intervention designs are intended to be subtle and delicate, attempting to blend in the context.



0m 20 40 60 1:1000

the main entrance John E. Olsson's ship

The existing main entrance to the John E. Olsson plats is hidden by the parking spaces right in front of the main staircases. Staying true to the concept of mixing biophilic approach and child-friendly city, the entrance is designed as a playful water railing which also allows children to play together with adults with the presence of water. As this is the main entrance design, it is also important to highlight the heritage of the site. A sculpture of Olsson's ship is placed on the top of the railing pool to give a sense of place and at the same time respecting the history of John E. Olsson as a ship captain in Gothenburg. It is placed in a way that it will attract children to be curious and play with paper boat race in the water stream.





John E. Cleaver Plaza

John E. Cleaver Plaza

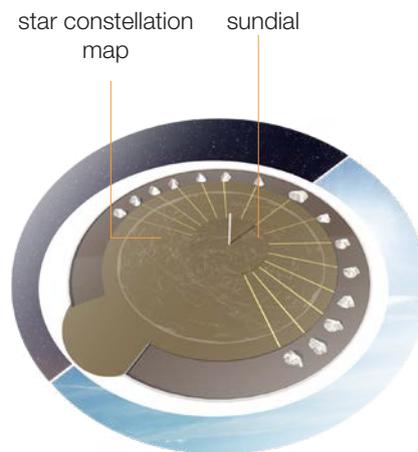
the sundial

The top area of the park is exposed to the sun and the sky. Therefore, this is a perfect location for children to interact and learn about shadow, time, and cardinal direction. A sundial is designed as the center of the park, inviting the user to stand in the middle and use their shadow to point the time. The sundial design also has a carving of star constellation with luminous surface.

At the edge of the park, a viewing point is enhanced by adding stone plates on the top carved with information of the surrounding landmarks.

The sundial can be used both at day and night. The park can be a campsite for children during earth hour day, where lights are turned off in the city, and although it might not be that many, children can see the stars in the city while the star constellation map on the sundial shines with glimmering soft reflection from the moon.

This will also give a possibility for suggestion for event such as camp-night in the city during earth day and earth hour when the lights in the surrounding are turned off.

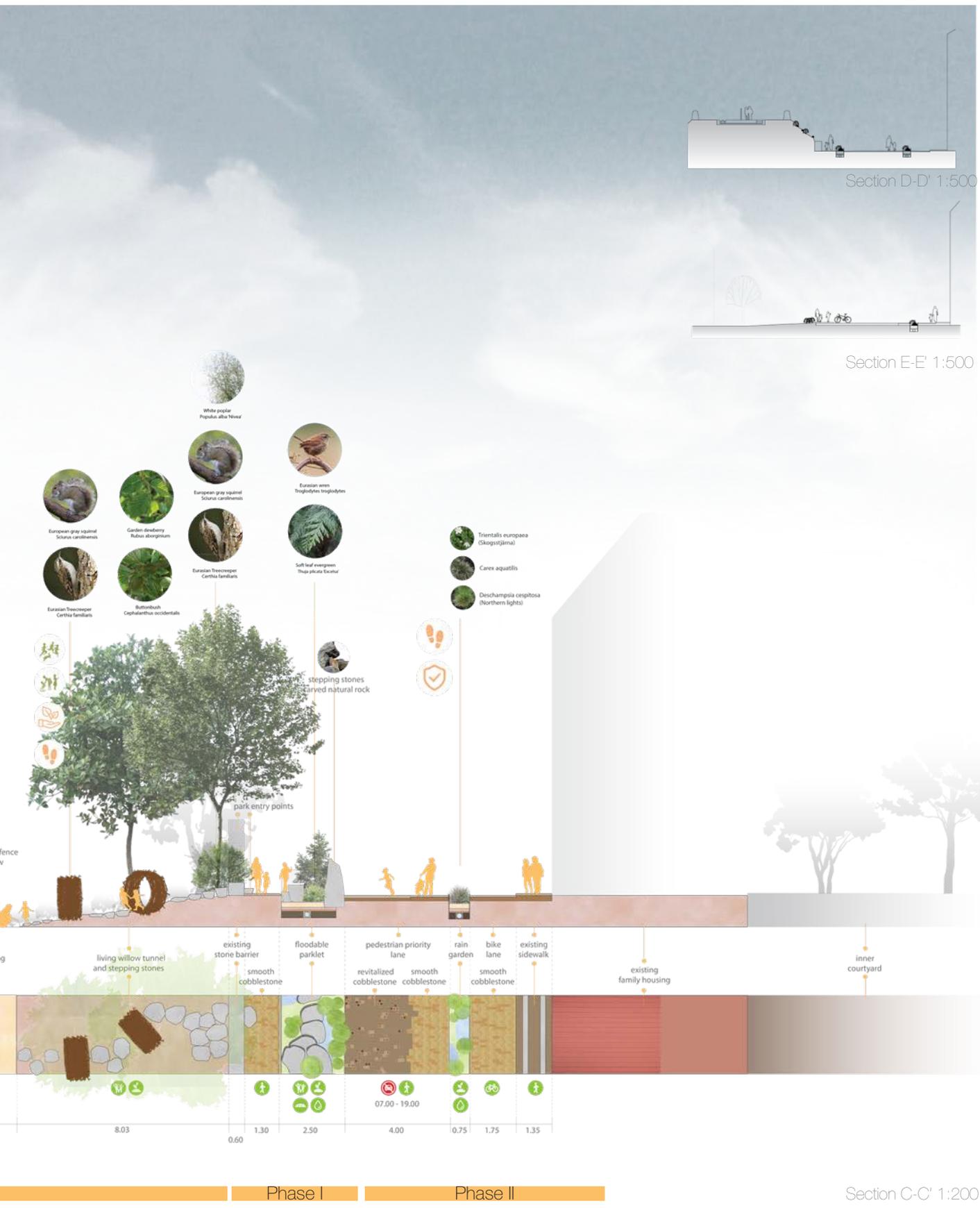


the secret entrance

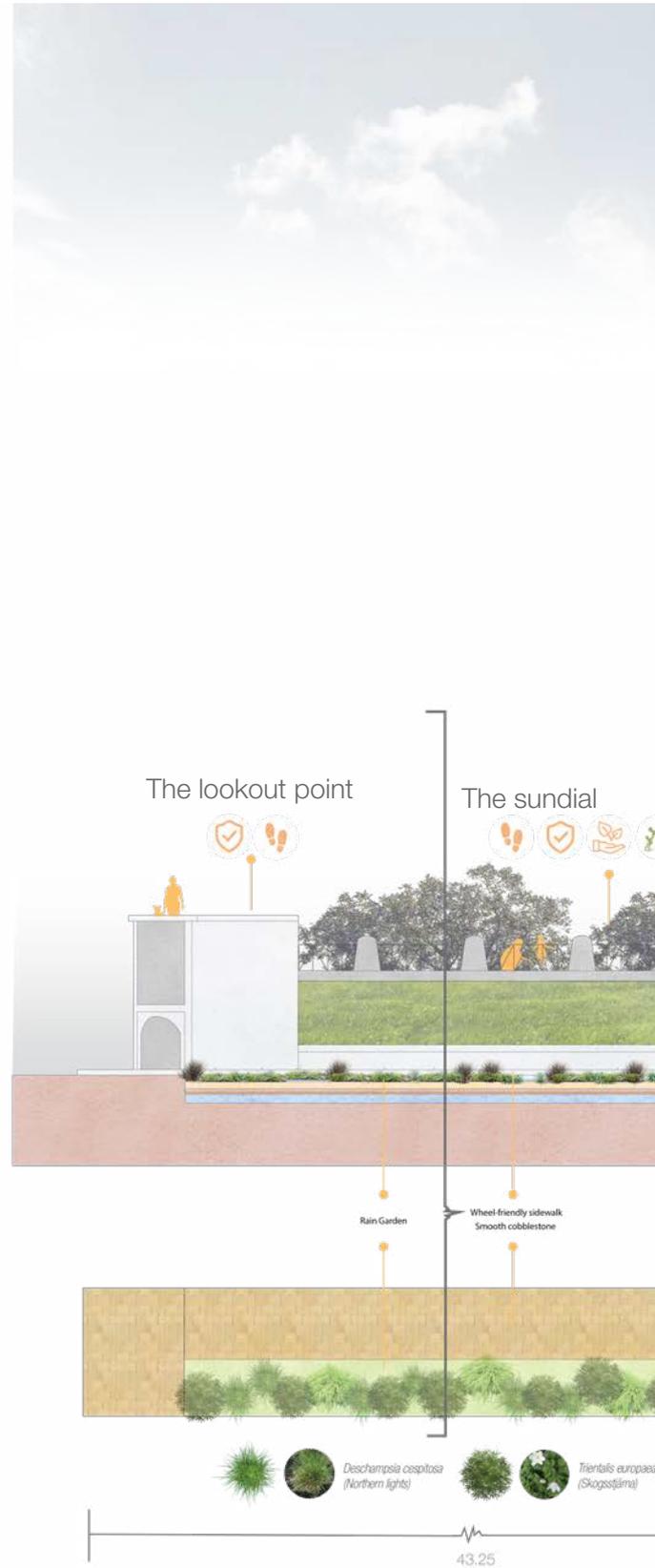
The site has a quality of a hidden park in the dense city. The charm of the park is a potential of stimulating curiosity in children's mind. The design is keeping the quality of the park to be like a hidden treasure. The suggested secret entrance is an extension of the parklet intervention where the stepping stones continue to guide children to enter the park through a journey of discovery with abundant nature. Children and adult then have the possibility to wander off the straight street and have a more exciting walking experience instead. The sequence of the secret entrance is explained in the illustration on the next page.



Phase III



This existing fort-shaped park has an end of a lookout point where one can observe surrounding areas and Gothenburg's landmarks. Additional informative carved stones on the park edge will help visitor to be informed about Majorna and landmarks which can be seen from this spot, as well as giving children an introduction of sense of place of the area.





Fieldfare
Turdus pilaris



Eurasian blue tit
Cyanistes caeruleus



Eurasian Treecreeper
Certhia familiaris



Eurasian weasel
Troglodytes troglodytes



European gray squirrel
Sciurus carolinensis



Daisy
Asteraceae



Black poplar
Populus nigra



Black poplar
Populus nigra



White poplar
Populus alba 'Nivea'



Sycamore
Acer pseudoplatanus



Garden dinkberry
Rubus idaeorum



Buttonbush
Cephalanthus occidentalis



Playful Entrance - Railing
John E. Olsson's Ship

Floodable Parklet
with explorative stepping stones



Carex aquatilis

14.75

9.60

Section D-D' 1:200

the dewberry willow loops and the giant nest

When one continue following the stepping stones, they will find willow loops to explore. The willow loops is made of the twigs find on site, and arranged in the shape of a loop which allows the user to get a sense of sanctuary and protection, as a symbol that human is part of nature. These loops will give a different experience through a spatial quality formed by natural feature. A crawling plant species will be planted close to the loop to grow on the loop, making it larger and greener in time.

The journey continues to the garden with many mahogany cherry trees with white flowers. In the middle, one can find a giant nest where they can play pretend as animals in the nest. This is a type of biophilic approach which allows direct interaction and at the same time symbolic interaction through pretend play.



Loop from existing willow type twigs found on site



Garden dewberry *Rhus abortivum*



Plants that attracts fauna found in the surrounding

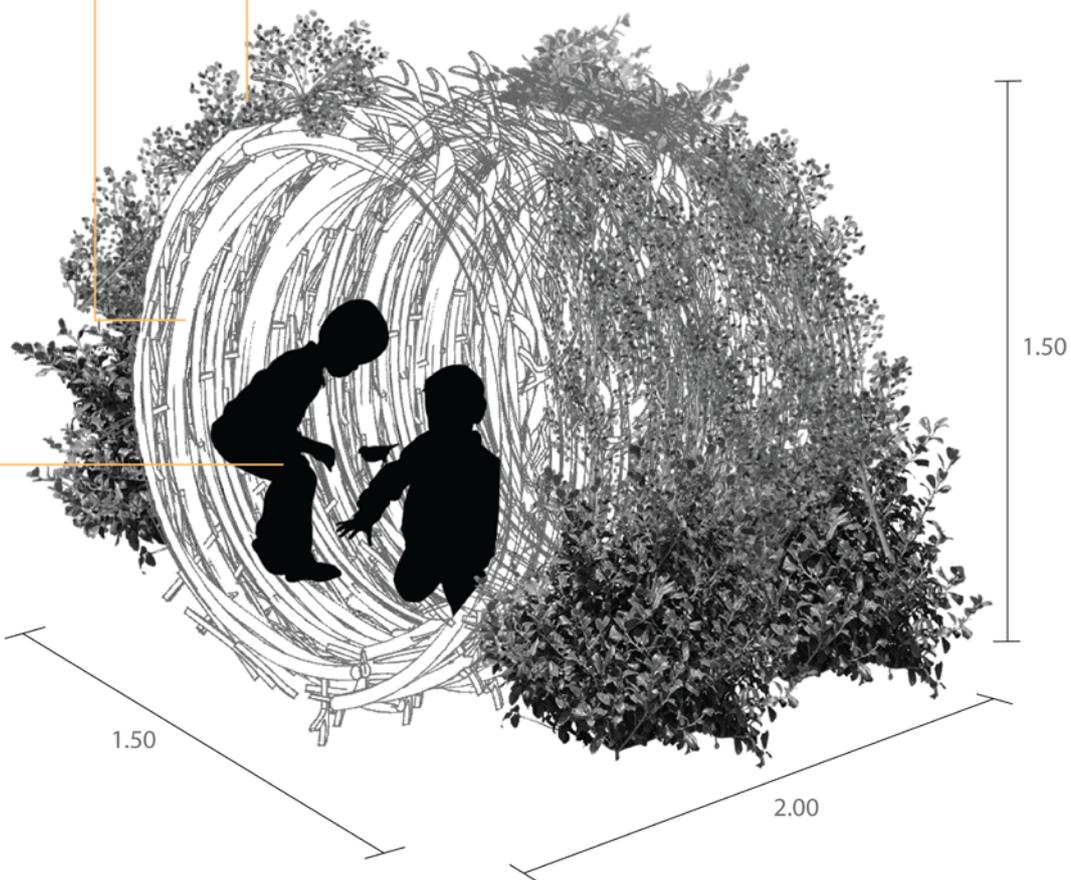
Eurasian wren *Troglodytes troglodytes*



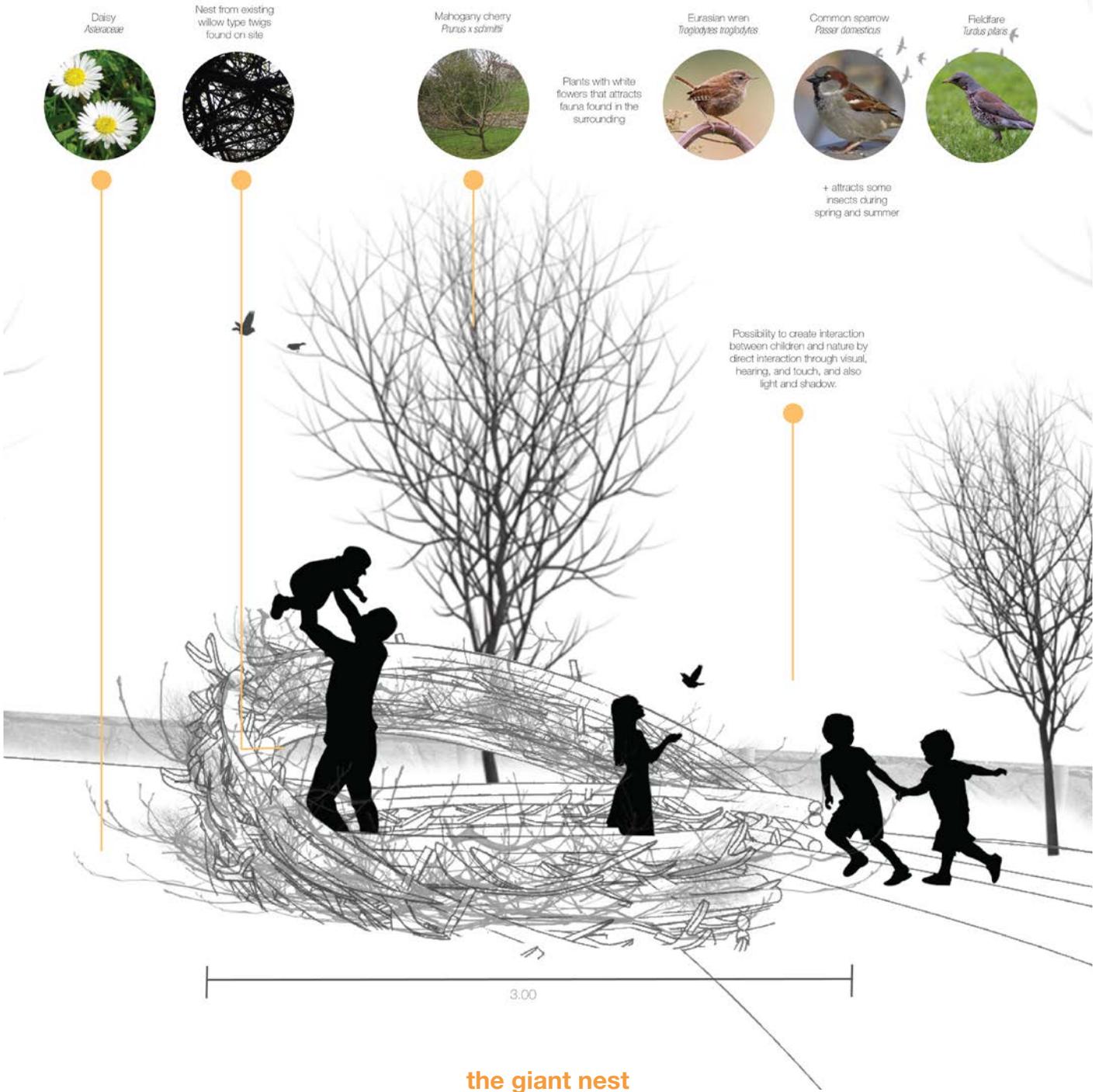
Common sparrow *Passer domesticus*

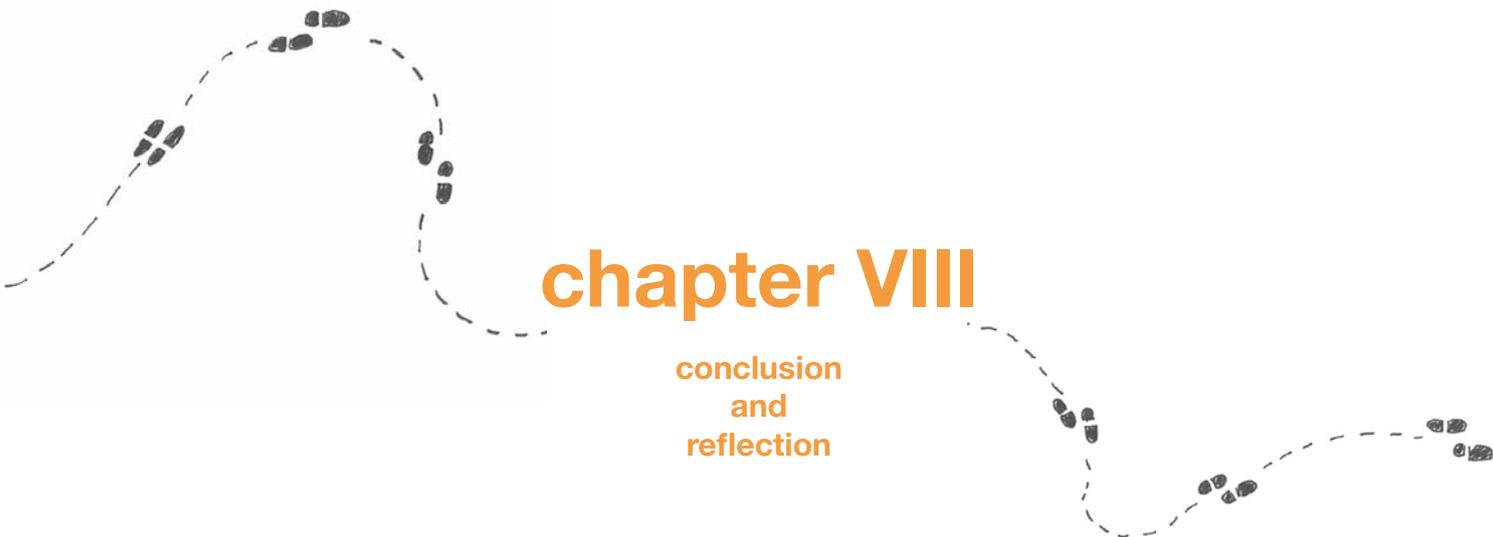


European gray squirrel *Sciurus carolinensis*



the dewberry willow loop





chapter VIII

conclusion
and
reflection

conclusion

The thesis resulted in a conclusion where biophilic approach can be used as a tool to achieve child-friendly city through design interventions that enhance the walking experience of a child in the city. In its principle, the biophilic approach can be made through man-made design, made by nature, or combination of both. As the user of the proposal is focused on children, the biophilic approach proposed is specifically adjusted for children which consists of 3 patterns: direct interaction with nature, taking care of nature and playing, learning, living as part of nature. Then, the proposal of the implementation process and the design were developed by the principles of biophilic approach for children.

The design proposal is divided into 3 phases where the logic starts with the small intervention in the most critical urban element based on the survey and the dialogues which are the sidewalk and the parking space. Then, it grows to larger scale which is the street and the park. All of the design proposals were based on strategies that are contextual and site-specific. These phases were proposed based on the discussion of in which order should the urban element be transformed? The list below explains the conclusion of the possible impact of each phase.



Phase I The Parklet and The Sidewalk

- + Fulfill child rights by creating safe walking experience
- + Invite people to walk and raise awareness of sustainable mobility
- + Support children's walking behavior which is part of their learning by living with nature
- + Promote children's curiosity and the habit of learning by exploring



Phase II The Street

- + Fulfill child rights to walk and play safely everywhere.
- + Raise awareness of all street users including car-users
- + Gain trust by collaboration with all stakeholders
- + Stimulate sense of place and belonging
- + Respect heritage on site
- + Fulfill child rights to be heard and contribute to the city development.



Phase III The Park

- + Give series of different experiences through relationship between children and nature
- + Stimulate sense of place and direction
- + Promote active lifestyle for all layers of community in the city
- + Enhance relationship between human and nature through biophilic experience and learning experience using nature as the prominent tool.

Worth to note the proposal can only be significant if there is a collaboration among all stakeholders, which means bridging the gap between top-down and bottom-up approach is crucial. The motivation is that it needs a holistic awareness of creating a better living environment, at the same time, social participation is one of the primary notions of creating a good city. The idea of the child-friendly city and biophilic approach can be a tool to fulfil children's rights, as well as preparing for a better future by starting at an early age of our next generation.

The thesis hopefully will give a layer of knowledge by combining the two principles which are biophilic approach and child-friendly city. One should be aware that both are tightly connected and dependant to the contexts, therefore, the main ideas or the principles can be used anywhere, but the implementation should consider its context of culture, environment, social, time, etc.

The thesis argues that by starting with a very small decision and intervention, it can lead to larger possibilities of changes. The interventions can eventually build a network on a city scale and can be an inspiration to many other places and contexts. Not only that these interventions will contribute to a better built environment, but it will also stimulate active outdoor events such as second-hand outdoor markets, Christmas market, scavenger hunt, etc. The possibility of a stronger sense of community is increasing.

As an example of impact calculation, transforming two parking spaces for cars into one parklet with biophilic features can be a starting point of reintroducing a place into a better environment for all. With the average street passer of 300 daily, this parklet can give an impact to their safety and provide an exciting explorative walking experience. In the parklet itself, space can be used by more than ten children at one time. In Majorna, there are more than 800 parking spaces. If the usage rate of these parking spaces is under 90%, then 10% of the parking spaces can be transformed into other child-friendly spaces. If only 80 out of 800 parking spaces were transformed into parklets, there would be 40 parklets that will benefit more than 1000 street passers daily. The concept of the parklet itself can be varied in terms of functions and program. It can also be an extension of the commercial building, a resting space, etc.

The thesis can also lead to a process of evaluation, as part of the learning process in the sustainable development of a city. This thesis wanted to introduce a method of work that might be applicable to cities or projects in many scales that are looking for something new to do but wanted to take careful tiny steps towards its goal rather taking a big step at a time.

Reflecting on the design proposal, there are some possible positive effects:

- + increasing interest to walk
- + decreasing car dependency rate
- + children's independence and self-development
- + increasing awareness of taking care of nature through a daily walk
- + children's affectionate, loving and caring personality in their growth
- + bridge the gap between the top-down and bottom-up approach
- + good collaboration between all stakeholders
- + create a child-friendly community that is living close to nature

Despite the possible positive impacts, as an additional objective perspective, the proposal clearly will need a lot of extra effort from all stakeholders. For example, a feasibility study from the economic perspective will be needed, and changing lifestyle from car-dependent society to sustainable mobility society (e.g. walking, cycling).

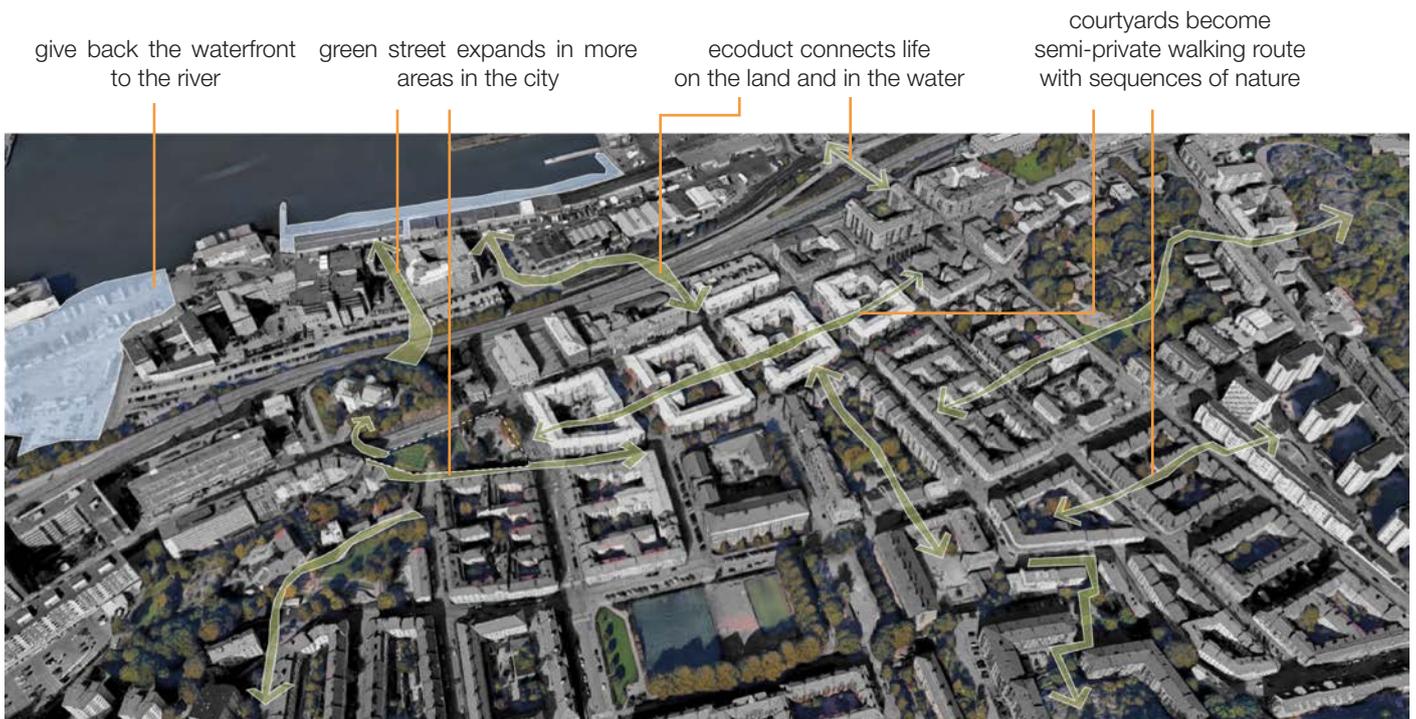
Sense of community can be stimulated through socially inclusive events and activities. The proposal also wanted to promote nature-integrated activity in people's lives. As an example, camp night during earth hour can be an exciting day where inhabitants can finally camp inside the city and enjoy the night sky, the stars, and the moon.

The pedestrian priority street can also be used as a street for seasonal community marketplace (julmarknad - Christmas market, loppis - secondhand market, etc.).

These ideas will hopefully bring communities together and let children meet and grow with friends in real life rather than spending too much time in the cyberspace.



There is more potential for nature in Gothenburg to be integrated into the built environment to achieve child-friendly biophilic cities. While the proposal of this thesis is focused on the process and small interventions, more ideas in larger scale are stimulated. The primary idea of combining child-friendly and biophilic principles can be implemented in various large-scale interventions explained in the illustration below.



Base image source: google maps. Retrieved 19 May 2018.

Despite being a waterfront city, man-made interventions have dominated the waterfront area of Gothenburg. What if we try to integrate the river even more in the waterfront area?

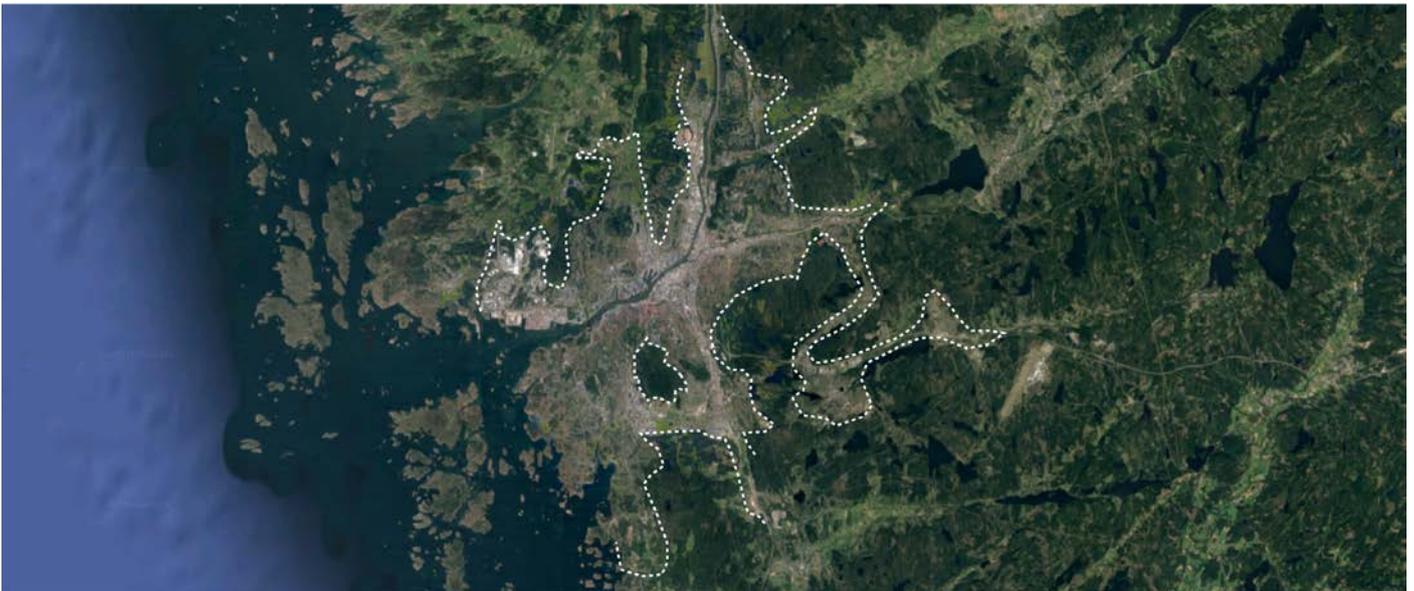
Perhaps the kickstarter of small intervention in Allmannavägen can be a catalyst to other streets to be green streets?

What if man-made biophilic intervention gives a way for biodiversities to grow, and animals to migrate? Can we live together in harmony with nature, then?

And maybe, by stimulating a sense of community, courtyards are no longer needed to be privatised. Instead, it can be a way of reconnect-ing the city where an alternative pedestrian way is made. It is an opportunity of regaining Gothenburg as a trust-based society, where chil-dren are prioritised and given the safe way with abundant nature everywhere they go.

Today, only 3% of the whole area of Sweden is inhabited. As large as 97% of Sweden's area is still in its natural state. This means Sweden can be the candle of hope for the world where environment and nature are prioritised. What if we can control the urban sprawl starting in Gothenburg with a green border where man-made interventions in nature are limited, nature-integrated development is stimulated, and natural growth of biodiversities is promoted.

The concept of the green border in Sweden can be an idea where we are taking a preventive action of environmental degradation for sus-tainable future. This might be a way of mitigating climate change in the urban planning level.



Base image source: google maps. Retrieved 19 May 2018.

These ideas clearly state that both small-scale and large-scale intervention needs a thorough process where policy-making processes require integration and circular communication with inhabitants. One can provide space and regulation, but we can learn from children - that users' ways of thinking are unpredictable. By being conscious about where we stand in the world today and the challenges we are facing, there is a hope of creating a better living environment if it starts in the mind and heart where awareness is planted at an early age, to every layer of community.

reflection

The author learned that this proposal would not be possible to implement without the collaboration between local government, communities, school, and especially parents and children. The issue of the child-friendly city is a very complex problem where prioritizing is the primary challenge. Introducing something new that requires sacrifices can be a difficult challenge, but looking at the long-term perspective, building a child-friendly city will bring more positive impacts in all sustainability aspects.

In relation to the proposal of the process of implementation, the author reflected that there is a need to discuss the process further where all stakeholders meet. The proposed phase could be in a different order based on feasibility study or priority in the city of Gothenburg today. The author also learned that since this thesis does not discuss the economic aspect, there is a number of possibilities that this thesis can be further developed, so it will be more convincing especially to the local government and the communities that the proposal will bring more benefit to the context.

For the limited time and knowledge in the local language, the author felt that the thesis would have been more successful if there is a possibility to collaborate with children in further discussion and workshops. The author wished for a possibility to collaborate with local teachers or other architecture students who speak Swedish if the thesis would be developed further for a professional and/or academic use.

To conclude, the author emphasizes that everything starts with a small initiative. We can learn from children's way of learning and explore, by experimenting with small objects. Taking careful steps to prepare for the future of the children is essential, as every experience will be recorded in the children's minds as childhood memories. The action is starting by enhancing children's walking experience in the city, in hopes of a ripple effect where the next generation will be more aware of sustainable lifestyle towards a sustainable future.

The author wishes that this thesis can be an inspiration and the process can be a Kickstarter for Gothenburg towards a child-friendly city where nature is embraced, sustainable lifestyle is promoted, and child rights are fulfilled.

One tiny step at a time.

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Appendix : Thesis Process

Re-imagining the urban space using model-making technique.



Spreading survey through social media to parents in Gothenburg (some are spreaded by dialogues with parents in Gothenburg)



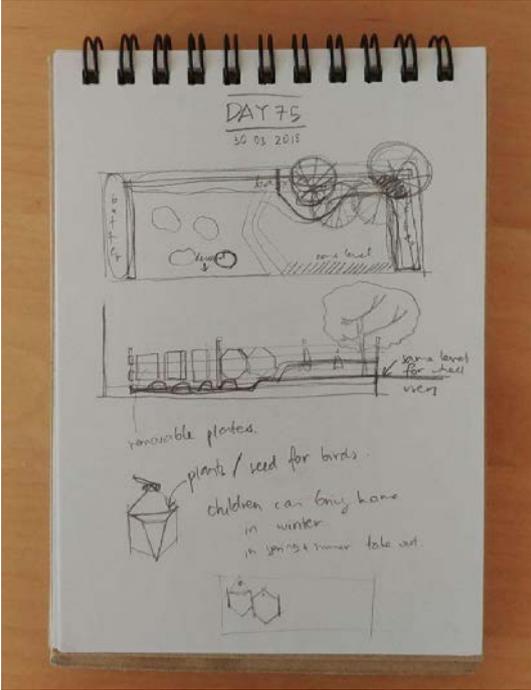
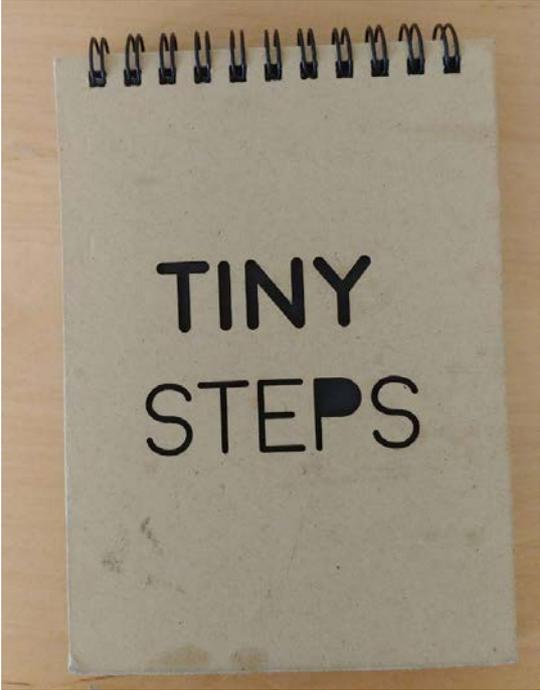
QR Code to the survey



English

Swedish

My daily thesis diary



My thesis wall



Walking with parents and children in Majorna



Learning about species and nature in Göteborg Botaniska Trädgården while looking for the names of the species on site by matching pictures and names.



Walking with children to pre-school and trying to understand their behavior.



Final Poster Layout

tinysteps

...approach to children

...approach to children

These determinants

Global inspirations; Case studies

"Every child is different, but often their wishes are the same: to play, to go to school, to meet their friends safely everywhere in the city." - **Maite Romero**

The survey

OR code to the survey

Design strategies

Regional site analysis: Mágina

Focused site analysis: Albornoz - John E. Olsson Plaza

Statistical fact sheet

In 2002, there were 1.9 billion children in the world - 20% of the world population.

More children will live in the city.

Parents, in particular in metropolitan areas, are important to introduce nature + city through combining public approach and child-friendly city principles.

In 2017, total population in Germany is 556640.

In 2017, total population of children in Göttingen is 114573 (20.58%).

Mágina is a densely populated area in Göttingen that has been part of the city since 1868.

In 2017, there are 10101 children born in Göttingen - 8.9% of Göttingen's total population.

Phase I: The Park

Phase II: The Street

Phase III: The Park

The sunset

The sunset entrance

The giant nest

The dewberry willow bridge

Expanding the child-friendly digital interventions

Göttingen as a Child-Friendly Digital City

Exhibition panels



**Ljusgården, Chalmers University of Technology
May 28th, 2018**



CHALMERS
UNIVERSITY OF TECHNOLOGY

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