ISLANDS IN THE STREET

A GREEN TRANSFORMATION OF
AARHUS STATION SQUARE

TITLE PAGE

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ABSTRACT

'Islands in the street' represents a co-existence of rather oxymoron aspects - mobility and green. The project challenges the traditional ways of designing mobility hubs, by proposing a green transformation of Aarhus Banegårdsplads through application of the 'Living Streets' concept. A greener and sociable mobility hub has been designed which combines the benefits associated with existence of both public realm in the form of green. This approach helps in addressing several issues at multiple levels ranging from human scale to global scale, and at a local level, responds to a +10-year scenario too. The new station square acts as a gateway to the city and flaunts a re-created image as the identity of city. Furthermore, showcases itself as an example, that it is possible to reinforce green spaces in a dense and compact urban setting, both locally and globally.

PREFACE

The project is aimed at redesigning Aarhus Banegårdsplads for a +10 year scenario, in collaboration with Aarhus Municipality. Four different themes namely 'Sustainable city', 'History and urban environment', 'Health and well-being' and 'Green city' have been presented by Aarhus Municipality for the redesign project. This specific project is based on the theme 'Green city'.

This project is an amalgamation of Urban design, mobility concepts, theoretical approaches and technical aspects of mobility; and the same have been explored to gain understanding about facts such as light rail, movement patterns of various mobility modes, especially pedestrians and bicyclists, and the complex concept of a transit hub. The knowledge gained from the aforementioned aspects have been applied in developing a design proposal that deals with reinforcement of green spaces into the heart of a dense city.

ACKNOWLEDGEMENT

This project group would like to thank the Supervisor Ditte Bendix Lanng and technical Supervisor Niels Agerholm for guidance, constructive criticism, ideas for planning mini workshops within the group and constant support throughout the project. The group would also like to thank Jens Rex, creative director of LabLand for supervising and questioning every step, while evolving with conceptual ideas during the design workshop. Furthermore, a big thanks to Aarhus Municipality and Simon Wind for the financial support and involving the study group in data collection for Bylivsindex.

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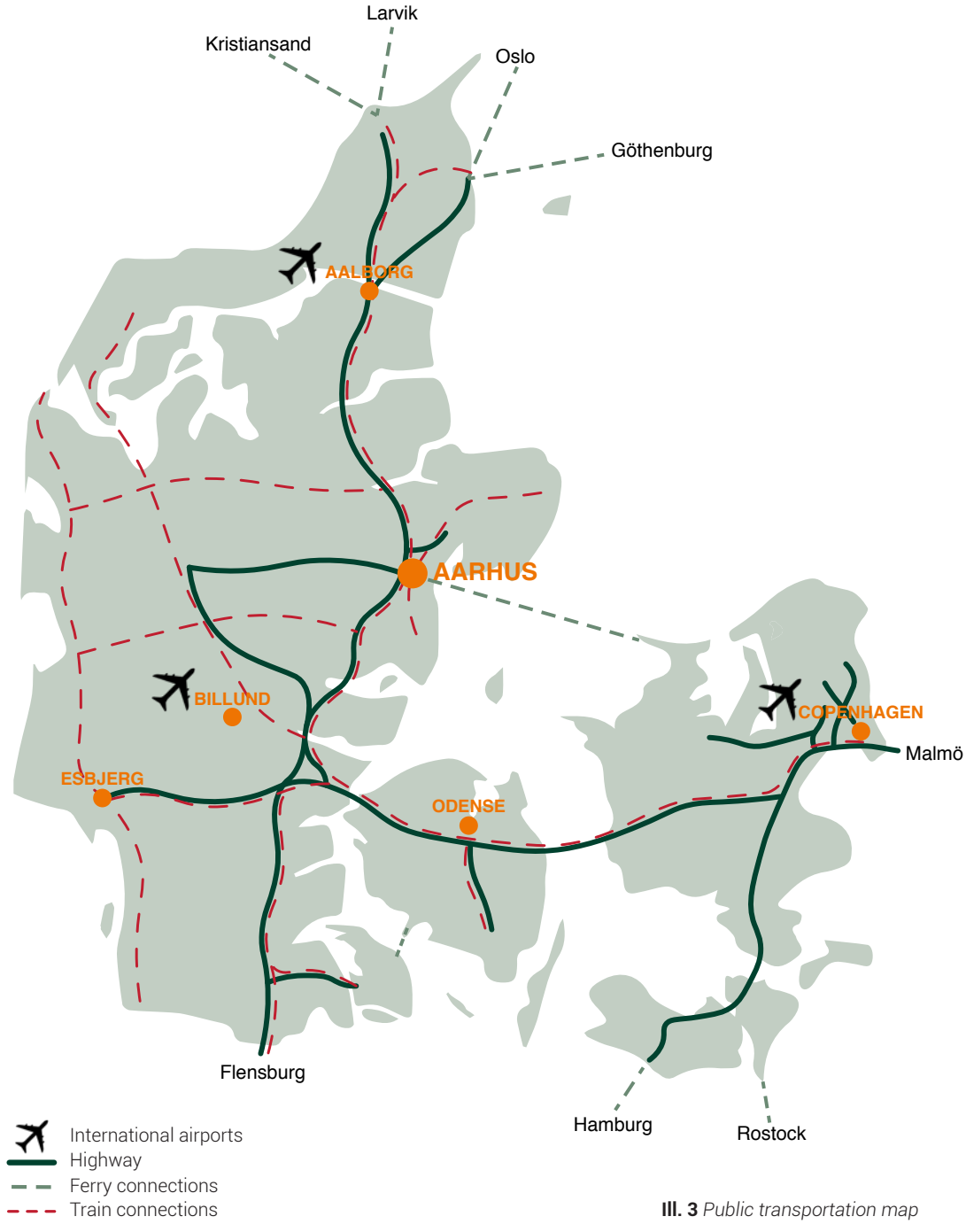


III. 3 *Public transportation map*

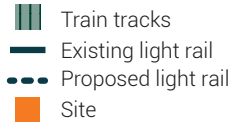
AARHUS

Welcome to Aarhus, Denmark's second largest city with 315,000 inhabitants in the city itself and 1.2 million people in the region of Aarhus Municipality (visitdenmark.com, n.d.) .Aarhus exudes culture through a variety of opportunities within the city, ranging from shopping streets to museums and festivals. Additionally, with 13% of Aarhus' citizens being students, the city also brands itself as the 'youngest' city of Denmark (ibid). Due to its strategic central location in Denmark, as seen on ill. 3, the city is well connected with the rest of the country as well as internationally through highways, railways, buses, ferries and airways, hereby radiating a mobility-oriented atmosphere.


Aarhus University
Botanical Garden
The Old Town Museum
Navitas
Aarhus Cathedral
Magasin
Aros
Godsbanen
Dokk1
Town hall
Shopping street
200m
100m
Bruun's Gallery
1:12 500
0
125
250
625 m

AARHUS BANEGÅRDSPLADS

The project site Aarhus Banegårdsplads, also known as the 'train station square', is located at the heart of Aarhus. As evident from the strategic context in ill. 4, the site is situated at the end of the train tracks, thus, giving an impression of it being a 'gateway' to the city for people arriving by train. The existing light rail tracks run in close proximity to the site and the proposed tracks will run through the square itself (Aarhus Municipality, 2014), enhancing the value of the site as a connectivity hub for both daily commuters and occasional tourists. Furthermore, the site is surrounded by a variety of activities which include a shopping mall and other shopping zones, historic and cultural buildings and workplaces. The illustration ill. 4 shows multiple important landmarks within a radius of 200 m from Aarhus Banegårdsplads, such as ARoS Museum, Town Hall, Bruun's Gallery and Shopping street, while most educational buildings such as Aarhus University and Navitas are located further away, yet in close relation to the light rail, hence making it a good connection to take advantage of.



Ill. 4 *Strategic context*


TOWN HALL
BUS STREET
SHOPPING STREET
TOWN HALL PARK
Park Allé
VOR FRUE CHURCH
Ryesgade
AARHUS CENTRAL FOOD MARKED
AARHUS BUSSTATION
Ny Banegårdsgade
Banegårdspladsen
Banegårdsgade
M.P. Bruuns Gade
AARHUS H STATION
BRUUNS GALLERI
1:2 500
0
25
50
125 m

Ill. 6 *Ryesgade (Larsen, 2006); Aarhus Street Food (OpdagDanmark, n.d.); Aarhus Town Hall (Baarsch, 2011); Bruuns Galleri (Aarhuslokalavisen.dk, 2019); Aarhus Busterminal (Laursen, n.d.)*

THE NEAR CONTEXT

From an in-depth study of the context of Banegårdspladsen, clearly, the site is strategically located in the heart of the city, with an approx. area of 8,5 hectares. Park Allé leads towards the Town Hall and its adjacent park, Ryesgade hosts the shopping Street of Aarhus with a bus station only a few hundred metres away and the Central Station transports people around Denmark. Furthermore, the site is close to cultural places such as Vor Frue church, Aarhus Central Food Market and Bruuns Galleri, Denmark's biggest city center. (VisitAarhus.dk, n.d.). As illustrated in ill. 5, all the major roads lead to Banegårdspladsen, which is an enclosed square with buildings surrounding it. This enclosed square is a place with multiple flows of pedestrians, bicyclists and vehicles, which move in different directions to head towards different places.

Ill. 5 *The near context*

INITIAL PROBLEM STATEMENT

How can this place become a liveable and attractive urban space while still performing as a mobility hub?

PRE-CONDITIONS

- Implement light rail, stage 2
- Facilitate the main pedestrian flows
- A minimum of kiss-and-ride facilities
- Integrate bike parking - minimum 500 spaces
- Space for two busses in each direction
- No car traffic across
- Accessibility and place for everyone

Quote from Aarhus Municipality (Wind, 2019)

METHODS

Ill. 7 *Method collage (Jesper, 2011)*

METHODS

A variety of methods have been used in this project see ill. 8. The Integrated Design Process has been used throughout the project as an iterative method. According to the same, the process consists of five phases namely Problem, Analysis, Sketching, Synthesis, Presentation, which are interlinked and interact with each other.

'Bylivsindex' has been used as one of the methods, which was introduced by Aarhus Municipality. This involved conducting studies and surveys to obtain information about pedestrians and bicyclists in Banegårdsplads through interviews, observations and countings throughout the day.

A two-day design workshop with Jens Rex from Labland Architects as external supervisor gave the group an inspiration to think outside the box and forced the group to produce an initial concept by the end of the workshop. Later in the process, several mini workshops were conducted within the group, which helped in understanding the mobilities on site, designing typologies, finalizing placement of various functions etc.

Additionally, literature review helped in gaining information from facts regarding light rail, buses etc. and mappings was used as a tool to illustrate different features and analysis of the site. Serial vision by Gordon Cullen, atmospheric observations associated with words and Legibility by Kevin Lynch were used to describe site specific details.

LEGIBILITY
- Lynch (1960)

THE TRAIN STATION SQUARE
- Bylivsindex (2019)

MAPPINGS

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THE INTEGRATED DESIGNPROCESS
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III. 8 *Methods*

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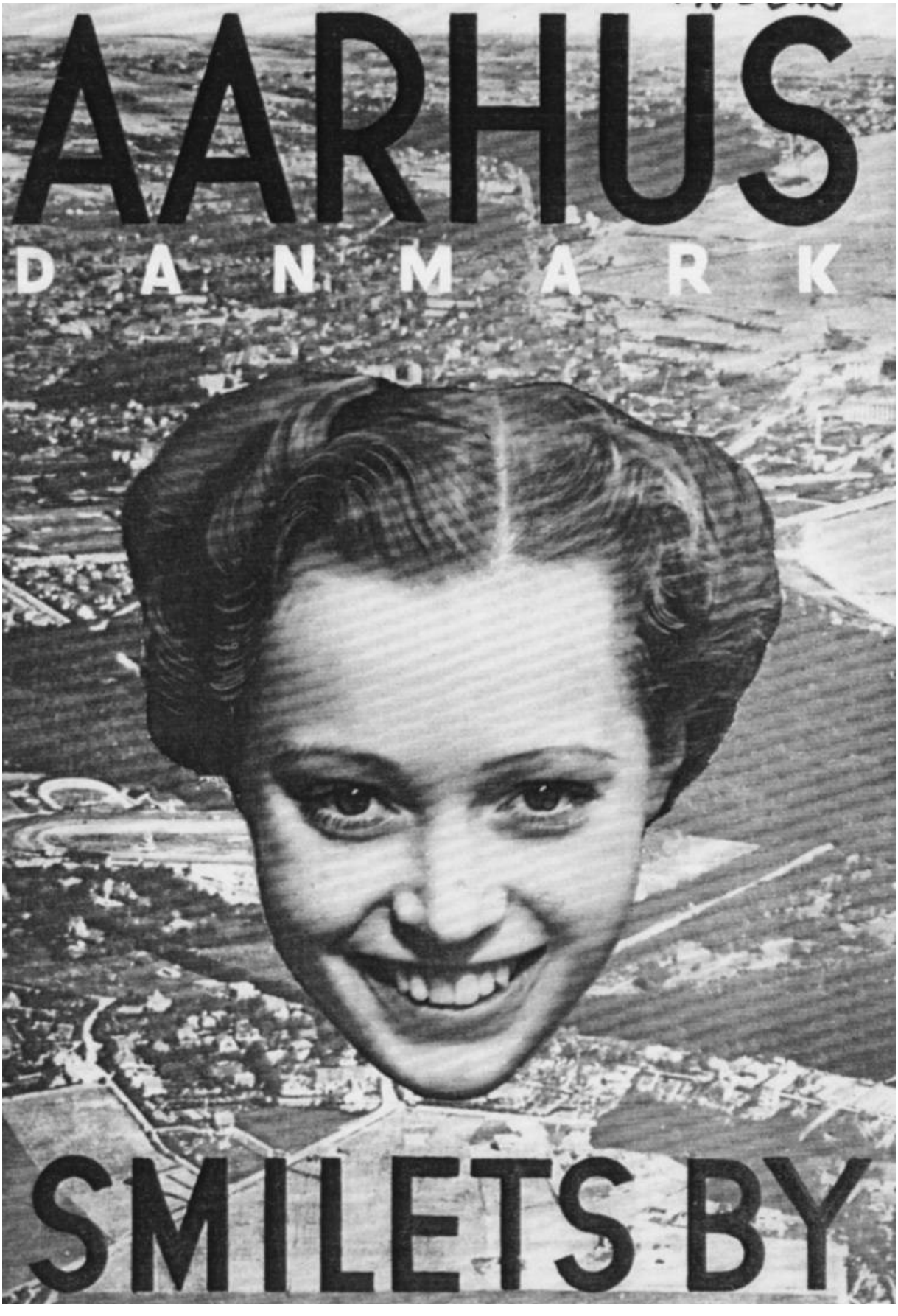
SITE ANALYSIS



Ill. 10 *Tourist brochure with the slogan "City of Smiles" from 1938 (Stiften.dk, 2018)*

THE HISTORY OF AARHUS

AARHUS THE CITY OF SMILES

Aarhus has always been one of Denmark's most important cities due to its proximity to the sea, which is also the reason for its origin around the year 770. Aarhus is also one of the oldest cities in Northern Europe and its very name dates back to the time when the city was called Aros which means 'river mouth' (VisitAarhus.dk, n.d.). In the 16th century, the city was a great borough which had been developed since the Viking age. The development of the harbor, followed by increase in workload of goods production led to making Aarhus the second largest city of Denmark. By the end of 19th century, due to predominant industrialization and population growth, there was an increase in demand for education. Thus, in 1928, Aarhus University was established which indicated a shift from goods production to production of knowledge and technology. Currently, the University is a big part of the city, as 25% of the city's inhabitants are within the age group of 20 to 29 years (Jessen, 2016, Aarhus Municipality, 2019).

Aarhus is popularly called 'The City of Smiles'. This slogan dates to 1938 when Jens Rothausen from Aarhus Tourist Association wanted to get a more positive way of branding the city (Stiften.dk, 2018). The slogan was abolished ten years later but no new slogan was able to catch attention as the old and traditional one 'The City of Smiles'. Even in the present times, the City Council still uses the slogan as a representation of a lively, informal but ambitious city full of optimism (Aarhus.dk, 2018).

"We have to avoid that Aarhus is perceived as a boring city. Aarhus must become popular. It is a real summer city and must also become a City of Smiles. We must smile and I am glad no one can rightly accuse myself of being grumpy."

Jens Rothausen 1938 (Stiften.dk, 2018, translated)

LET'S RETHINK

Aarhus is also a developing city with many plans for the future. A new super hospital, a taller skyline and a new tram system namely 'Light Rail' comprise some of the newest plans for the growing city. Aarhus has tripled in its size between 1954 and 2000 and presently the Municipality is expecting to observe 4000-5000 new citizens every year in the near future (Willacy, 2019). Presently, Aarhus Municipality comprises of about 350,000 inhabitants and in addition to this, it was stated in 2017 that approximately 64,000 commuted to Aarhus from what is known as Business Region Aarhus (Aarhus Kommune, 2019; Aarhus Kommune, 2017). Furthermore, the number of commuters is estimated to increase in the future because of Municipality's aim to create 2,000 new jobs each year. The aforementioned factors have resulted in expansion of the city, thus raising a need to densify the cores and outskirts of Aarhus while avoiding urban sprawl and unconnected areas. Overall, maintaining a sustainable thought in the planning of the city and involving citizens in the process of development to remember their legacy of 'City of Smiles' (Aarhus Kommune, 2017). In the process of city development, places for vehicle traffic are being down prioritized to make room for sociable urban spaces, as seen in ill. 11. These changes are all steps in becoming a greener and more livable city (Aarhus.dk, 2018).

2017 was a big year for Aarhus that invited a lot of international attention and a boost in tourism. Aarhus and its surrounding region became European Capital of Culture which lead to the possibility to invest in the city. With the theme 'Let's Rethink', the city has become a cultural laboratory trying to answer the question: "What do we wish to keep and what is it time to let go off when moving on to the future?" (Aarhus2017.dk, 2017). This big event has led to focus on cultural events and experiences, therefore boosting the culture of the city that could be continued in the future.

Åboulevarden past and present

Ryesgade past and present

Store Torv past and present

Bispetorv past and present

III. 11 *Mobility changes in Aarhus City (Wind, 2019)*

"I think what struck me first was the industrial part, especially on the waterfront. Then of course the art museum. I just love the art museum, it's really great. The rainbow walk upstairs is super cool. I also do like the old part even though I think the shopping area looks a bit like any other town in Denmark" *Selina 26 years, tourist from Germany*

"Aarhus has everything. Big city, beach, forest, history, culture, AGF (a soccer club) as well as young people and happy days." *Marius 29 years, raised in Aarhus*

MY CITY

"Aarhus is an amazing cultural city. In relation to its small size there are many functioning actions: Aarhus Concert Hall, Aros, Aarhus Festival and hospitality industry. Aarhus tries to be a greener city. They build taller buildings and develop public transportation, which makes the city more environment-friendly." *Per 64 years, citizen in Aarhus N*

MY CITY AARHUS

Aarhus is a city with focus on citizen involvement in the development of the city. Therefore, this project has asked the question: "What does Aarhus mean to you?" to visitors and citizens of the city. This way, it is possible to get an understanding of the identity that Aarhus Municipality wishes to create with respect to peoples' opinion on the same.

"I think that Aarhus is a creative, cultural and lively city with a lot of focus on art in all its forms (Aros, Godsbanen, Tubinehallerne). Furthermore, it is a cultural historical city with many relics of the past in shape of small houses and cozy streets (especially latinerkvarteret). The city has relatively many green areas and it is nice with a joined center where you reasonably easily can walk from one end to the other, but without getting to small. Aarhus is a developing city that grows in both area and population. Therefore, new developments are happening which can be annoying but at the same time, it is a sign of life and improvement."
Nina 26 years, raised in Aarhus

AARHUS

The big parks that are completely integrated to the city are nice. I liked the architecture, mainly the train station, the buildings around the park - the one with color glasses and inside the botanical garden."
Macarena 29 years, tourist from Uruguay

"Aarhus is a incredible cozy city, with a manageable centre contrary to Copenhagen. You can easily walk everywhere. The café life has evolved tremendously and more specialty shops appears which makes it a particularly exciting and attractive city. The city is close to the beach and it is nice with the new harborbath." *Bente 62 years, citizens in Aarhus N*

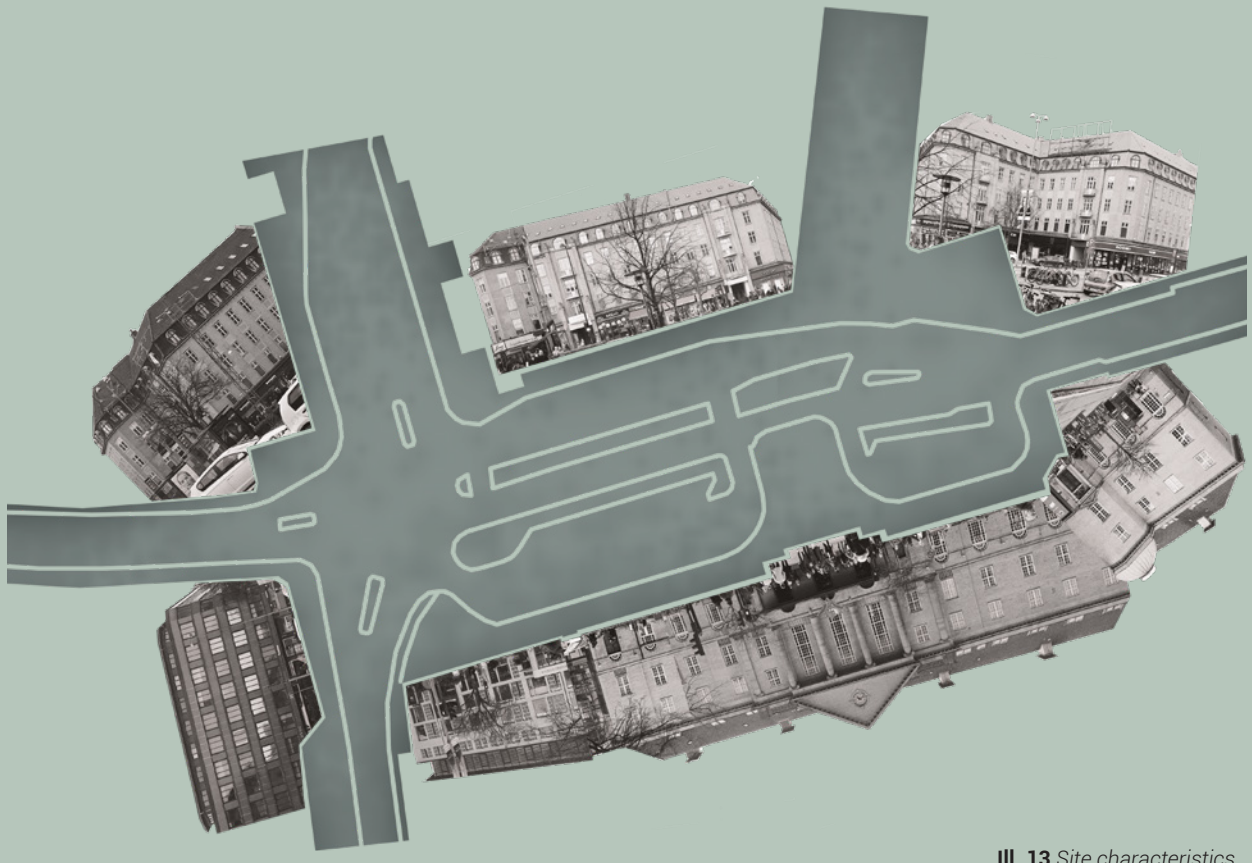
Ill. 12 *Aarhus train station square historical pictures (Aarhus billeder, n.d., a-f)*

AARHUS CENTRAL STATION

Aarhus H, commonly referred to as Aarhus' central station is located in the centre of the city. The original building was founded in 1862, the same year as every common Dane could travel freely. Consequently, Ryesgade was established as a street for crossing over to the central station. A few years later, in 1864, Aarhus' first trams pulled by horses arrived. However, due to the possibility to travel freely, the central station building had slowly outgrown its size. In 1884, the construction of the new station building was completed and located down at the rail tracks for the trains. Through its period, the tram was electrified in 1904, making it a public favorite instead of diligence, wagons pulled by horses. As the city expanded, the central station needed to be renovated. The current and 3th central station was constructed in 1929 and was a bigger project carefully built in close coherence and harmony with the surrounding buildings. All blocks were built in yellow hand cut bricks. Together with the prominent blocks and edges, the square is enclosed in such a way that it faces the newly founded road Park Allé, leading up to the City Hall, built in 1938-42 (Aarhus Stadsarkiv, 2017).

Around 1925, Banegårdspladsen was created. In the mid-1930s, the trams were slowly phased out and the Municipality introduced tram-buses, a cheaper and easier way to change routes. The last tram stopped functioning in 1971, but later there was still a discussion about introducing a more modern tram. The street Ryesgade, that used to transport people was converted into a shopping street in 1974 (Aarhus Stadsarkiv, 2017).

Currently, the central station is a busy and active place. Approximately 80,000 people, 1100 buses and 6900 cars pass by the station daily. Therefore, Banegårdspladsen is a massive transit hub in the middle of the city center (Aarhus Kommune, 2018; Wind, 2019). The areas surrounding Aarhus H have been subject to various development proposals in the past decades, giving the impression that it is of great interest for the municipality to evolve these areas. The proposals are large scale projects that are planning for new urban city quarters towards west and east for the station building. One project involves covering the railway cutting to the west to build a new city district on top (Møller, 2018). Many such ideas have been proposed for the centrally located area since the past few years, but none have been implemented yet.

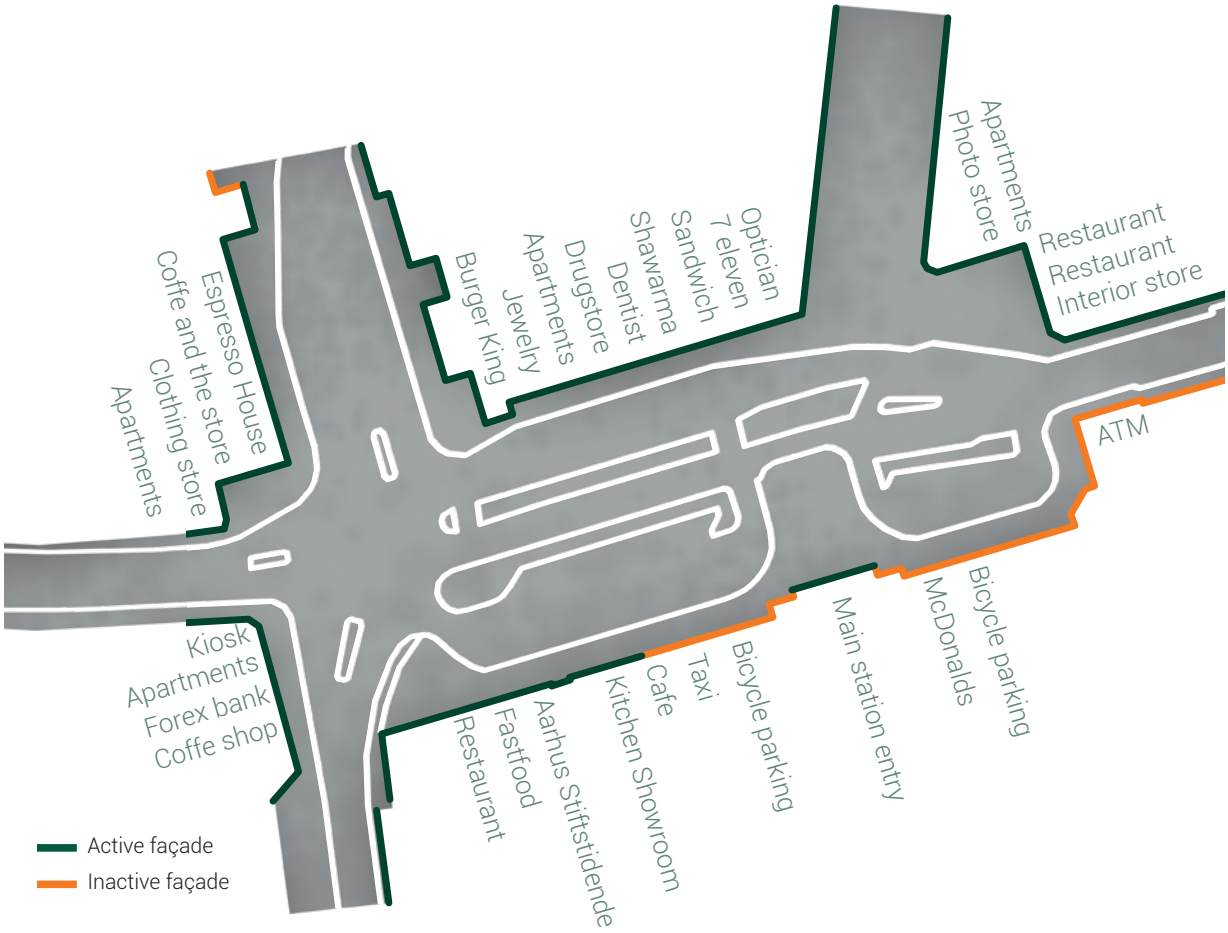


Ill. 13 *Site characteristics*

SITE CHARACTERISTICS

There are several elements that meet the eyes while approaching Banegårdspladsen. One of the most noticeable characteristics is the infrastructure itself which acts as a barrier, due to allocation of most of the space to vehicular roads. The flows within the site are controlled by traffic lighting system, thus determining when the site is accessible by the inhabitants of the area. This lays huge pressure on the traffic when the light turns green. As evident from the pictures, there is a lack of green spaces and trees in the square. Overall, there are 10 trees in the site along with a few hedges that divide the main street. Moreover, the green elements of the site do not remain green from Autumn through winters, due to which the space appears duller. In terms of topography, the site is plain without any obstacles and view blockages. A clear view of almost the whole site can be gained from any location within it, however, there is no specific feature in the site which people can use to orient themselves including buildings due to their similar façade styles.

Ill. 14 *Site characteristics photographed*



Ill. 15 *Functions of the site*

FUNCTIONS

The site is mainly a transit hub and the same is evident from the functions that surround it. There are cafés and take away food outlets surrounding the site which makes it convenient for users to access the shops quickly and move on to their next destination.

The area hosts mixed-use functions where retail is mostly situated at the ground level, and other functions such as housing, offices, shops etc. are placed on the higher levels. Thus, the buildings surrounding the square mostly host active frontages at the ground level, and these active frontages, especially of shops and cafés have been placed strategically to attract maximum customers, as shown in ill. 15.

The infrastructure within the site such as bus stops, kiss and ride facilities, taxi pick up spaces and car parking areas clearly reflect the function of the space. Another noticeable aspect is the division of spaces for vehicles, bicycles and pedestrians, where cars have been prioritized over bicycles and pedestrians. However, the provision of city bikes for rent, in a way, is an attempt to influence people to rethink their choice of transportation to and from the station.

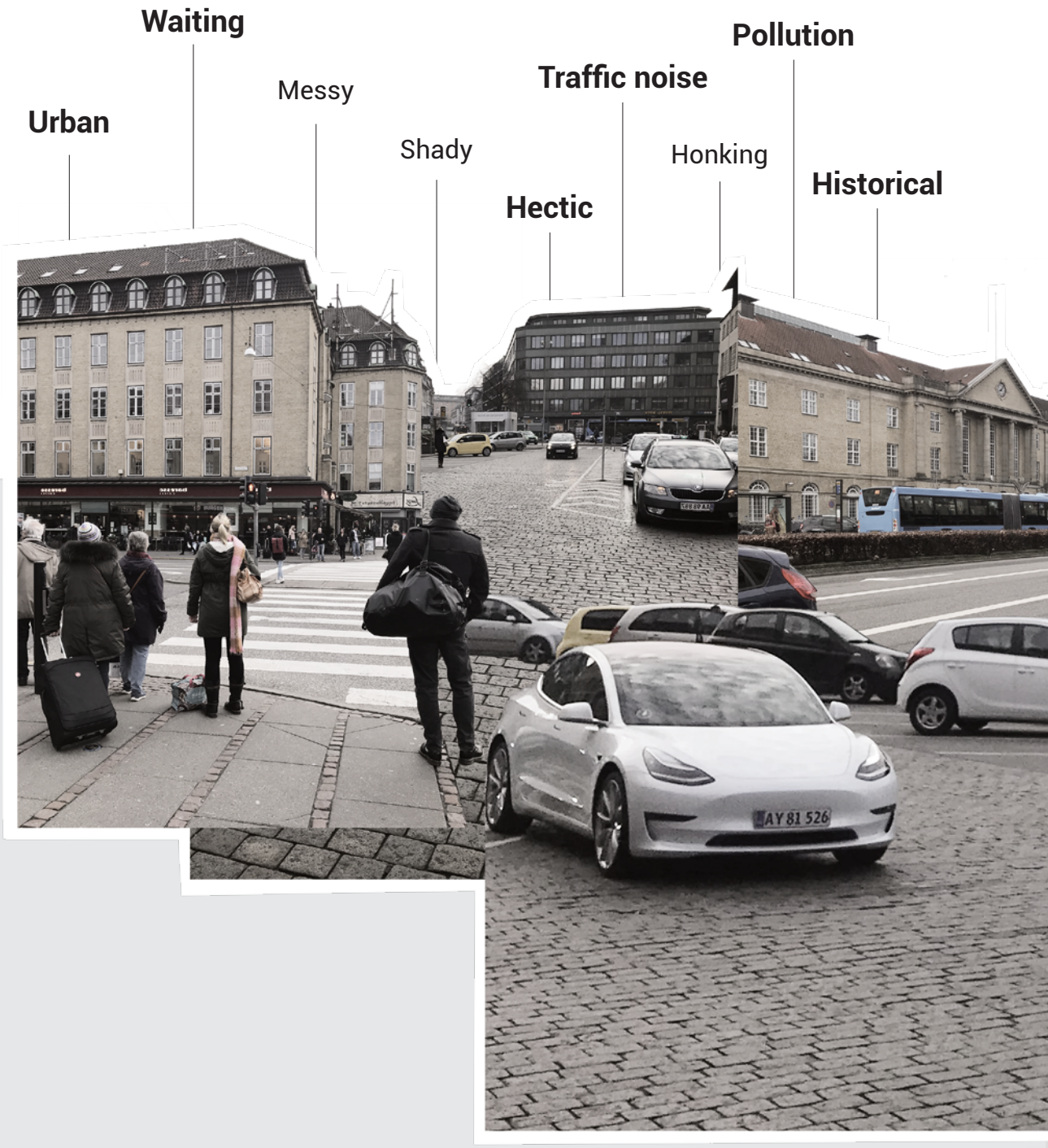
62% SPACE FOR VEHICULAR ROAD AND PARKING

36% SPACE FOR PEDESTRIANS

3% SPACE FOR BICYCLE PARKING
0% SPACE FOR BICYCLE LANES

MANY TO-GO OPTIONS

Ill. 16 *Functions of the square*



ATMOSPHERE

The atmosphere of the site encompasses many conflicting feelings. In the south, the site feels shady, windy, messy, polluted and cramped, while in the north, it is sunny, smells of food, provides an impressive view of the train station building and feels more open. A common characteristic between both north and south sides is the chaotic and hectic feeling due to vehicular domination throughout the site. The same is reflected through the confusing layout in the flat terrain too, due to the stacked bicycles, rows of taxis, which add to the chaotic experience.

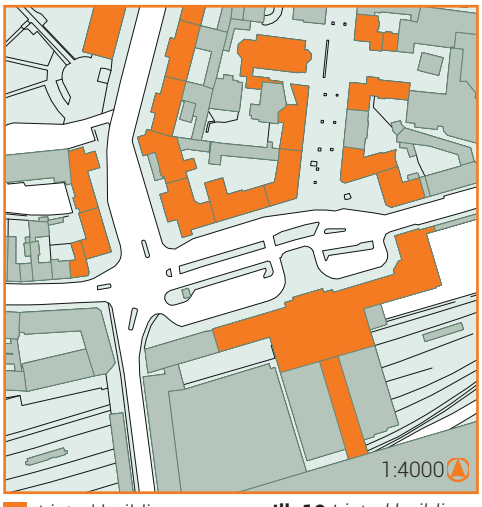
Ill. 17 *Atmosphere*

Ill. 18 *Existing flows*

MAPPING

EXISTING FLOWS

By observing the existing flows as illustrated in ill. 18, it is clear that the pedestrian movement is determined by the vehicular movement. Especially, the pedestrian flow in the crossing towards Ryesgade, the shopping street, is disturbed due to the major obstruction by the vehicular road. The provision of a median in the mid-road seems to attract pedestrians to jaywalk, but it may be noted that jaywalking is common in transit areas, especially in rush hour, thus overall leading to creation of chaos at Banegårdspladsen. Bicycles are neglected causing them to share the lane with vehicles therefore creating unsafe conditions. Furthermore bicycle parking is kept at a low minimum capacity causing messy clusters of parked bicycle in pedestrian areas.



Listed buildings

Ill. 19 *Listed buildings*

LISTED BUILDINGS

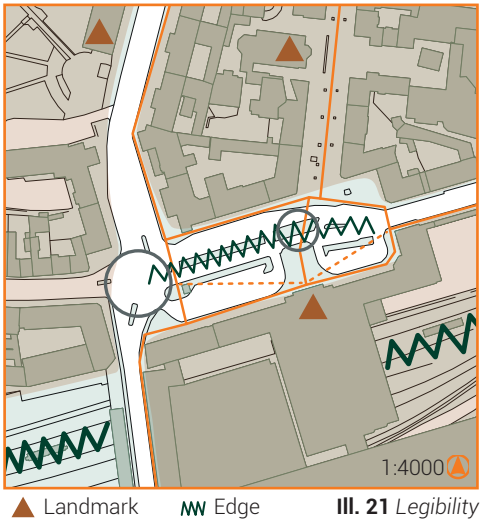
Aarhus city is rich in historically interesting buildings, also the station area has important historical buildings as seen on ill. 19. The buildings belong from a cultural history period which is important to the city. Many of them were established around the 1920s, when the third station was also constructed. The preserved buildings tell about a time when Aarhus was growing in both economic and population terms. The city recognizes the value of these buildings and thus wants to preserve and keep the architectural style alive, causing the buildings to be built in yellow bricks (Webgisaarhus, n.d.).

Shadow intensity

Ill. 20 *Microclimate*

MICROCLIMATE

Study of micro-climate of the site is important to understand the behavior of the site and peoples' feelings in the site through the different seasons of the year. The illustration ill. 20 represents the shadow intensity in the site during summer, winter and equinox. As shown, the intensity of shadow is relatively more in the south side than in the north side. Additionally, the central portion of the site receives most sunlight, thus, giving an opportunity to explore the potential of the space. See appendix C for further data about the microclimate depending on the season.



Landmark
Node
District
Edge
Path
Shortcut

Ill. 21 *Legibility*

LEGIBILITY

This map, as seen in ill. 21, reveals that the pedestrian paths have been pushed towards the edges of the site, while vehicular roads dominate the site and act as infrastructural barriers. The major road crossing towards the west and the pedestrian crossing between the Station and Ryesgade have been identified as nodes. These reveal that the nodes overlap with the major connections of the site. Notable landmarks in the site include the station building, the Town Hall and the Catholic church 'Vor Frue'.

"More green spaces, time-out spaces, enjoy the pulse of the city, it could be good that everything was not just centered around high rises and square meter prices"

"Art and architecture is missing on Banegårdspladsen."

"More bike parking spaces - pedestrians are forced out on the road, bikes take over the sidewalk."

TRAIN STATION SQUARE

"Sad place. Not bike-friendly, and it feels too unsafe when the bikes and the cars are being so close together."

"Could be nice with more green spaces, especially in the center, so there would be more spaces for children as well and spaces to sit at the pedestrian streets and at Banegårdspladsen."

III. 22 *Quotes from 'Bylivsindex' interviews (Bylivsindex, 2019)*

BYLIVSINDEX

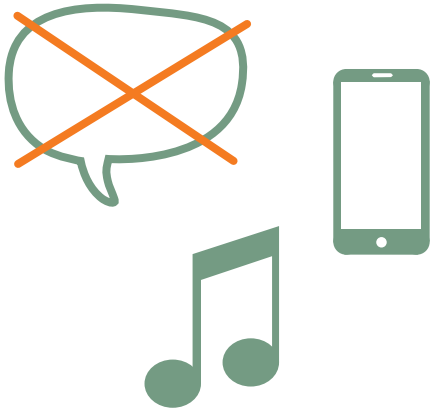
The collaboration with Aarhus Municipality has enabled the study to implement the 'Bylivsindex'. This analysis method focuses deriving data about mobility of cyclists and pedestrians through countings, observations and interviews. The fieldwork was conducted on a weekday from 7 to 9 am, 11 am to 1 pm and 3 pm to 5 pm by a total of 10 Urban Design Masters' students. See complete analysis in the addendum. (Bylivsindex, 2019)

The following main problematics were observed:

- Lack of green space in the urban city
- Abundance of traffic, which makes the square seem unsafe and crowded
- Lack of bicycle lanes and bicycle parking resulting in clusters of bicycles lying around
- Dominantly a space for mobility from A to B and lack of focus on the movement itself

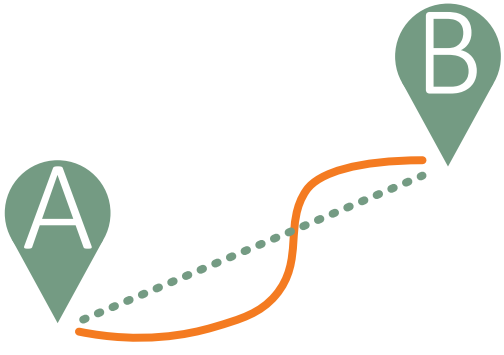
TARGET GROUPS

Banegårdspladsen is a diverse place, with a variety of users in terms of age groups and types. During the mid-day, the primary target group is elderly, whereas in the morning and afternoon, it is mainly young people and adults, thus, explaining the use of trains by students and workers for commuting to their place of work and school. Many people move alone or in pairs, and bigger groups are rarely seen. Minorities such as homeless can also be found in the square. (ibid)



BEHAVIOR

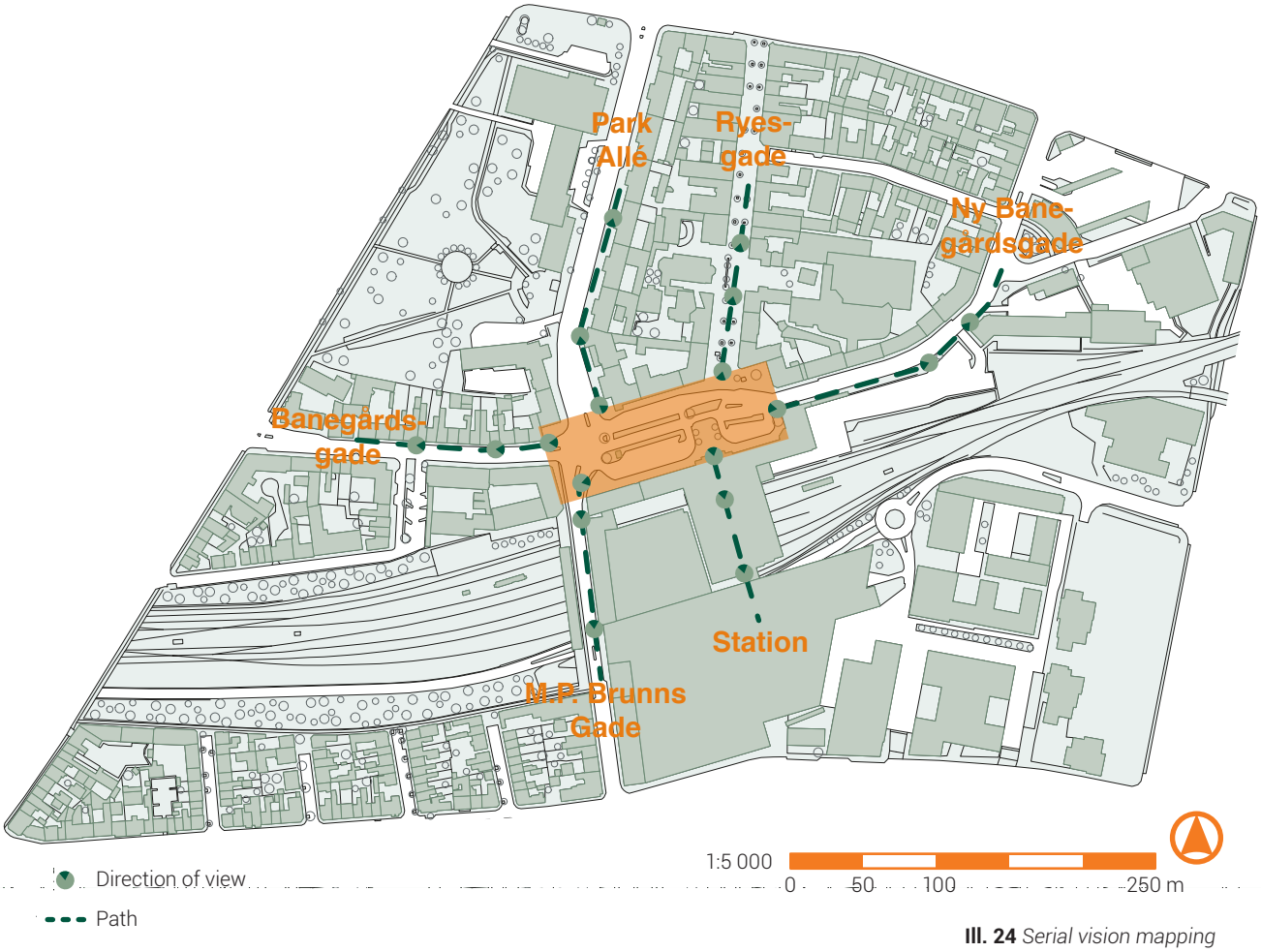
The transit experience that dominates in Banegårdspladsen can be easily observed from the behavior of pedestrians. Every shortcut saves a minute, due to which pedestrians often deviate from the dedicated paths and prefer the shortest route wherever possible. "Walking is dominant, but the cars have a lot of space" said one of the interviewees in relation to preferring shortcuts. Furthermore, people often act introvert by listening to music, looking at their phones and not always interacting or paying attention to traffic. (ibid)



III. 23 *Bylivsindex observations*

TRANSIT

The primary route on the square is between the entrance to the station and the shopping street Ryesgade. The square is mostly dominated by mobility related functions, therefore only short temporary stays can be seen in relation to waiting for buses or meeting up with people. Furthermore, there is a very unorganized flow of cyclists due to lack of bicycles lanes. There are limited free crossings due to presence of traffic lights which causes abruptions for pedestrians, bicycles, cars and buses, though the same have been optimized, to facilitate convenience for pedestrians. (ibid)



III. 24 *Serial vision mapping*

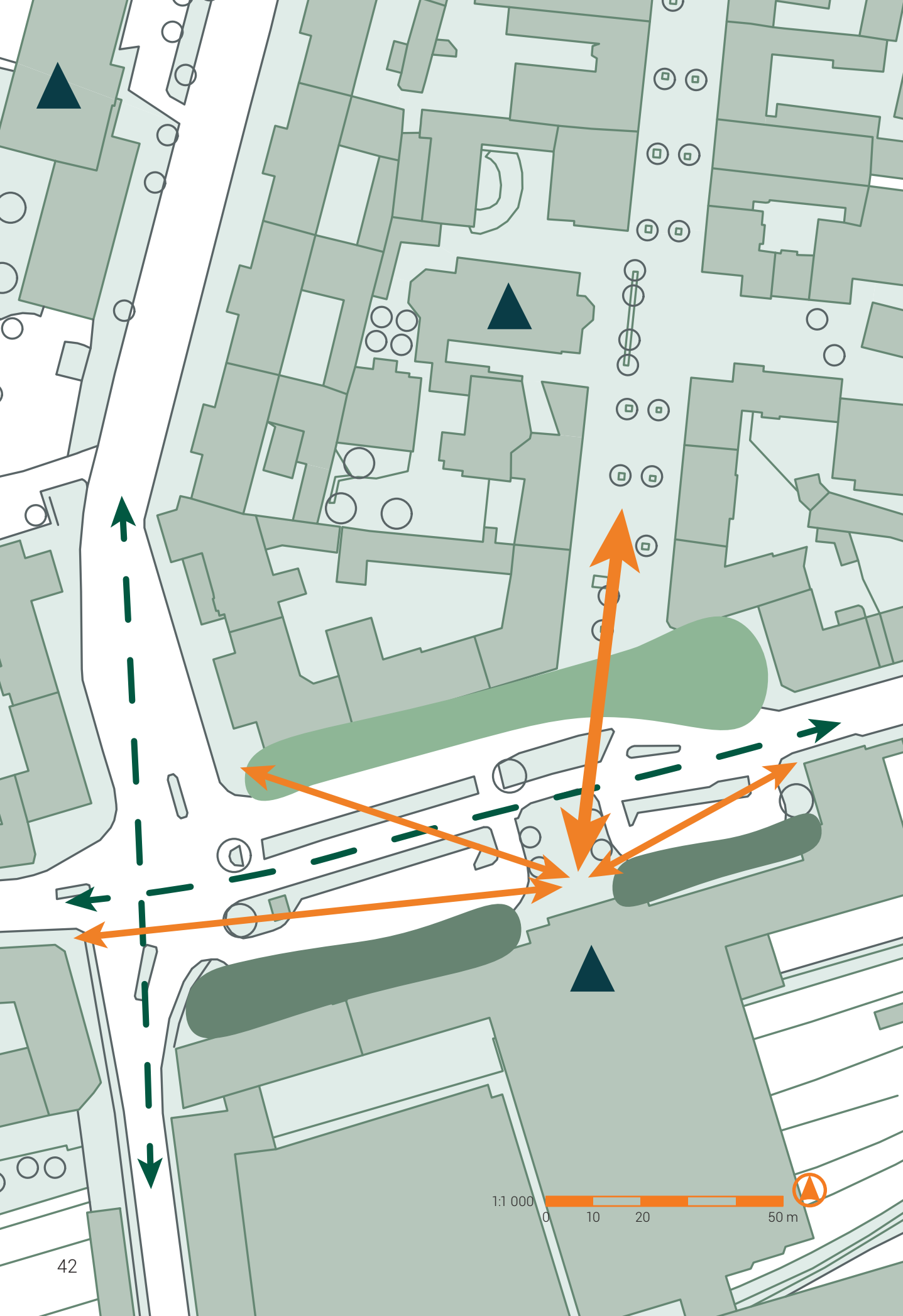
SERIAL VISION

Reading the site through serial vision, viewing the space through movement while approaching the site, helps in understanding the space and its surroundings along with the connectivity between streets. This is how one meets the site in its current form. It forms pre-notions about the space whether it is understandable or confusing, enclosed or exposed, green or grey.

Approaching Banegårdspladsen from Ryesgade allows one to see it from a distance, creating an overview of what to expect after arriving at the square and what to focus on when one is moving through the space. On the contrary, while approaching the site from Park Allé and Ny Banegårdsgade, there is no clarity as the focal point remains the same throughout the stretch, thus, making it difficult to gain an overview of what to expect on site. The same is because the buildings block the view, resulting in a surprising meeting with the site. M.P Bruuns Gade has the same problem, due to its focus directed towards the City Council. While approaching the site from Banegårdsgade, it gives a rather clear idea of the site due to its orientation with respect to the site. This approach gives view of most of the important elements of the site, for instance, the Train Station entrance and location of bus stops.

While exiting the Train Station, two of the doors emphasize some trees while the third one creates focus on the levelled circle. Moreover, there is a lack of signage on site, thus, creating confusion for the people exiting the station building.

Ill. 25 *Serial vision of entryways to Aarhus Banegårdsplads*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CONCLUSION ON ANALYSIS

Aarhus Banegårdsplads has been performing as a transit hub since the establishment of the Train Station and has been transforming with the changing times ever since. Over the years, the same has been gaining importance and thus, Aarhus Municipality has been taking initiatives for redevelopment of the area, especially through citizen involvement.

The strategic location of the project site in the heart of the city with important connections and landmarks in close proximity, that enhance the potential of the site to be redesigned to represent the city. Banegårdspladsen is clearly dominated by vehicular traffic and its infrastructure occupies almost 62% of the total area, while the bicycles have been neglected, resulting in unorganized bicycle parking and unsafe conditions. The same emphasizes the barriers in the site, while, in a way creating nodes for pedestrians and vehicles at the intersections, for instance, the crossing between the station and Ryesgade. The pedestrian movement patterns in the site are highly influenced by the vehicular traffic and the corresponding barriers, resulting in preference of taking shortcuts over following the designated routes.

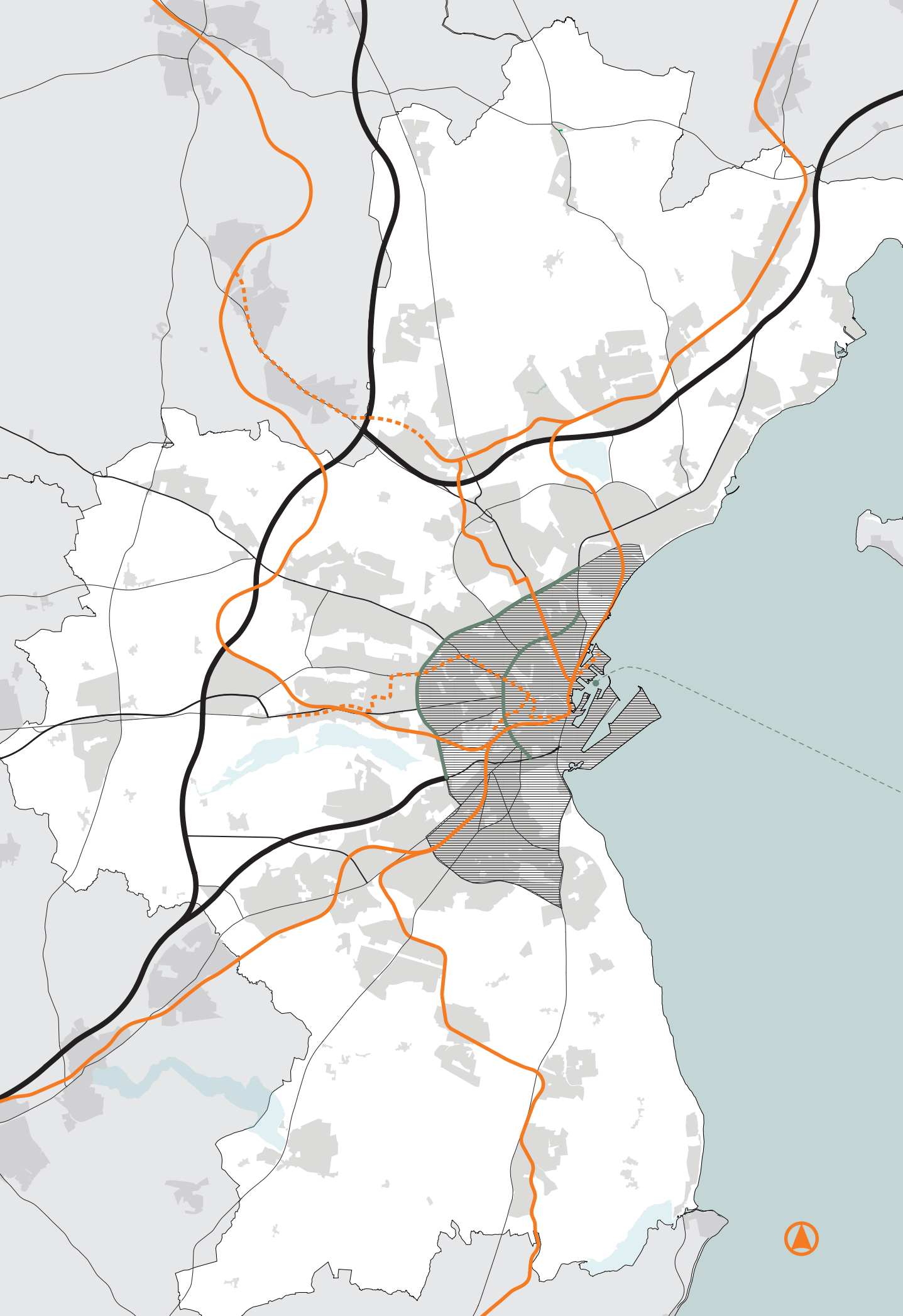
The atmosphere, functions and mobility flows in the site highlight the purpose of this very space as a transit hub that acts as a medium to take people from A to B and connects them to a wider network. Additionally, the lack of green and open spaces in the site is highly evident, which is disproportionate to the amount of roads. Therefore, it may be concluded that Banegårdsplads needs to be redesigned to enhance the user experience in the square as a space for more than A to B, and integrated with green and open spaces, in line with the demands of the city and its citizens.

- Potential connection
- Public transport connections
- Landmarks
- Outdoor area opportunity
- Potential for service

Ill. 26 *Opportunities and constraints*

Ill. 27 *Moving from A to B collage (Bagger, 2017)*

MOBILITY AS MORE THAN A TO B



THE MOBILITY SYSTEM

Urban mobility system has been evolving through time, marked by different eras based on the changing modes of transportation. The various eras of urban mobility include 'The Walking-Horsecar era' (1800s-1890s), 'The Transit era' (1890s- 1920s), 'The Automobile era' (1930s-1950s), 'The Freeway era' (1950s-2010s) and 'The Integrated Mobility era' (2010s onwards). It is evident from the different eras that the advancement in technology followed by increasing urbanization, population growth and rapid urban development has prioritized cars or other private vehicles over public transit and active mobilities. Due to haphazard transitions since 'The Automobile era', there has rather been a disconnect between the multiple modes and in the process, the very link with the spaces that host these transport systems have been forgotten (Rodrigue, 2017).

In the present times, the life of a contemporary urban dweller is being increasingly characterized by mobilities. Most people spend great amount of time 'on the move' in their everyday lives through cars, public transport, bicycles, walk or other modes. However, in the process of creation of mobility systems, the infrastructure itself is given less importance and is merely treated as a functional element. When mobility is considered, it is often the transportation mode that is prioritized, and the way people feel about the spaces utilized to get around the city is neglected. There is a need to understand that every mode, location, road, pathway, event, interaction that form city's mobility network, is part of the mobility system (Jensen, 2019; A guide to placemaking for mobility, 2016).

"Any shared or public space that a person passes through on their journey through the city is part of the mobility system"

A guide to placemaking for mobility (2016, p. 11)

Freeway
Ring roads
Train tracks + light rail
Future light rail
Ferry

Ill. 28 *Mobility plan, Aarhus (Aarhus Kommune, 2018)*

GLOBAL MOBILITY SCENARIO

Streets form integral part of the city and its network system, and thus are critical to urban transformation. For decades, cars have reigned over city's streets and it has been taken for granted that the primary purpose of streets is to move cars and other vehicles safely and efficiently. This pattern has led to building of car-dominated cities globally; the cities are being designed for moving traffic (Bain, 2012).

"The main issue is that the right to have access to every building in the city by private motorcar, in an age where everyone possesses such a vehicle, is actually the right to destroy the city."

Lewis Mumford, 1957 (ibid, p. 14)

Additionally, there has been a disconnect between urban designers and transportation planners, where on one hand, urban designers have always considered the increasing quantities of vehicles as a problem to the cities; on the other hand, transportation planners have viewed vehicle efficiency as an issue to be addressed in terms of traffic volumes, travel time, service levels and safety statistics. Especially, lately, the focus has been on making transportation system safer, easier and efficient. Due to this approach, most transit corridors are being designed with higher percentage of roads for cars and lower percentage of bicycle and pedestrian ways. Thus, most streets of cities, especially transit corridors and hubs, can be said to have transformed into 'machines' for traffic (ibid).

Globally, there are many cases where transit corridors and hubs host higher percentage of driveways for vehicles and lesser space or almost no space for pedestrians and bicycles, which have been leading to congestion and unsafe conditions for all kinds of commuters, especially pedestrians.

Mobility corridors and hubs form an important part of peoples' everyday lives, especially because of their ability to technically offer access and connections to a wider network. Yet, their routine design makes them anonymous elements in peoples' journeys. Such an approach has led to understatement of their potential to create a local character and identity. There has been a need for a shift in thinking, by going ahead of conventional ways of designing, by redefining city-car relationship, by designing for moving people and not for moving traffic. While in some places there has already been a gradual change in the scenario, for instance, in Copenhagen, other places are still way behind from this transformation (Bain, 2012).

Ill. 29 *Minimal space for pedestrians in Bengaluru, India (Rediff, 2013); Pedestrians and bicyclists share the road with cars and buses in Shanghai, China (Tai, 2004)*

1862

The first central station was built. Ryesgade was established to get to the central station.

1864

Diligence anno 1902. First arrived in Aarhus at 1864

1884

Aarhus expanded in inhabitants and workers leading to a renovation of the central station to handle the capacity thereby building the second central station.

1904

Trams at Banegårdspladsen, 1969. The trams was electrifed in 1904 and overtook the service from diligence.

1929

The third central station is build as a part of a bigger project concerning the surrounding blocks and the establishedment of Park Allé and these are now listed as heritage.

1971

Busses takes over from trams because they are more mobile and cheaper.

2017

Light rail was re-introduced in 2017. Phase two is already planned

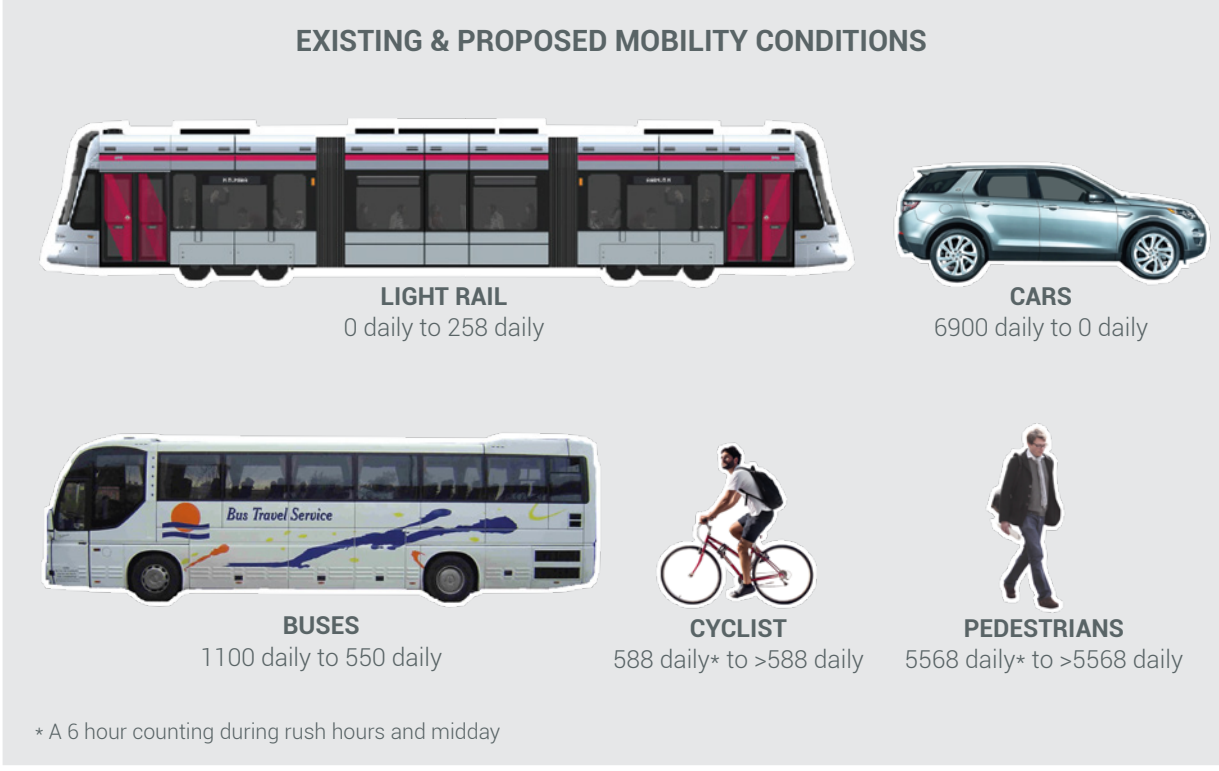
Ill. 30 *Historical mobility timeline of Banegårdspladsen (Aarhusbyarkiv n.d. a; Aarhusbyarkiv n.d. b; Vognstyrer n.d.; Aarhusbyarkiv n.d. c; TV2 Østjylland 2017; Jacobsen, L. n.d.; Evp n.d.)*

MOBILITY SCENARIO IN BANEGÅRDSPLADSEN

As shown in ill. 30, the historical timeline represents the evolution of train station and Banegårdspladsen since 1862. The same also highlights the shift in different modes of transportation from trams, buses to proposed light rail. It may be noted that with the growing population and urbanization, the importance of the train station has only elevated through the years. Therefore, Banegårdspladsen forms the most important mobility hub of Aarhus.

The evolution of Banegårdspladsen and its increasing importance has resulted in large number of people accessing the space through various modes. Presently, the mobility scenario at Banegårdspladsen, in a way, resembles the global scenario in terms of vehicular domination. As evident from ill. 16 majority of the site area is dominated by space for vehicular circulation and parking, which is approximately 62% and only 36% and 2% of the space have been dedicated for pedestrian and bicycle movement respectively. It can be said that the spaces provided for pedestrian and bicycle circulation are disproportionate with respect to the number of people who use those modes.

There is a need to derive a balance between the different modes of transportation, for better functioning of the space and improvement in the existing conditions. In that context, it is important to poses the question: "what do we wish to keep and what is it time to let go off when moving on to the future?" (Aarhus2017.dk, 2017). The Municipality has planned on implementing the Light Rail System, which helps in reducing the load of buses, curbing the car traffic and thus promoting active mobilities.



Ill. 31 *Existing & proposed mobility conditions, Banegårdspladsen: Light rail proposed (Midttrafik.dk, n.d.); Cars existing and proposed (Wind, 2019); Buses existing (Wind, 2019); Buses proposed (Appendix A); Cyclists and pedestrians existing (Bylivsindex, 2019)*

RETHINKING MOBILITIES

Mobility corridors and hubs are integral to the mobility network of cities, and they are usually occupied by large number of people. Yet, the conventional ways of considering and designing mobilities as a 'necessary evil' has resulted in improper prioritization of transport modes i.e. cities are being designed to suit the cars, while pedestrians and bicyclists are being given least preference (Bain, 2012; Jensen, 2019). Additionally, as Kevin Lynch said, travel can be a positive experience, since it can prove to be a prime mode of education, enhances people's individual reach and enlightens them along the move. Moreover, travel can become a pleasure in terms of human experience through observation of visual sequences and social interactions while on the move. Therefore, a shift in thinking is significant to understand that mobilities is more than A to B and mobility landscapes are more than just functional entities (Jensen, 2013; Jensen, 2019).

"Travel can be a positive experience; we need not consider it pure cost. In potential, the access system is a prime piece of educational equipment. It enlarges the individual's reach, but in addition the act of moving through the city can in itself be an enlightenment. Taking advantage of that possibility, especially for children, means opening up the transport system, making is safer and easier to use, providing guidebooks, treating it seriously as an educational opportunity. Travel can be a pleasure, if we pay attention to the human experience: the visual sequences, the opportunities to learn or to meet other people."

Kevin Lynch, 1981 (Jensen, 2013)

Clearly, mobility is more than just A to B, but what is the 'more than'? Tim Cresswell, a well-known human geographer and urbanist, states that mobility is about movement, meaning and practice. Firstly, 'movement' is a basic aspect that is concerned with the quantitative, statistical data about the mobility flows. This is the aspect that is generally taken into consideration by the government while designing mobilities. Secondly, the 'meaning' aspect is about understanding what movement means to both people doing it and people around them. This factor is often not well dealt with by the government, planners. Thirdly, 'practice' deals with understanding the experience of movement through particular spaces, which leads to designing more meaningful spaces (Mobility between movement, meaning and practice, Tim Cresswell, 2014).

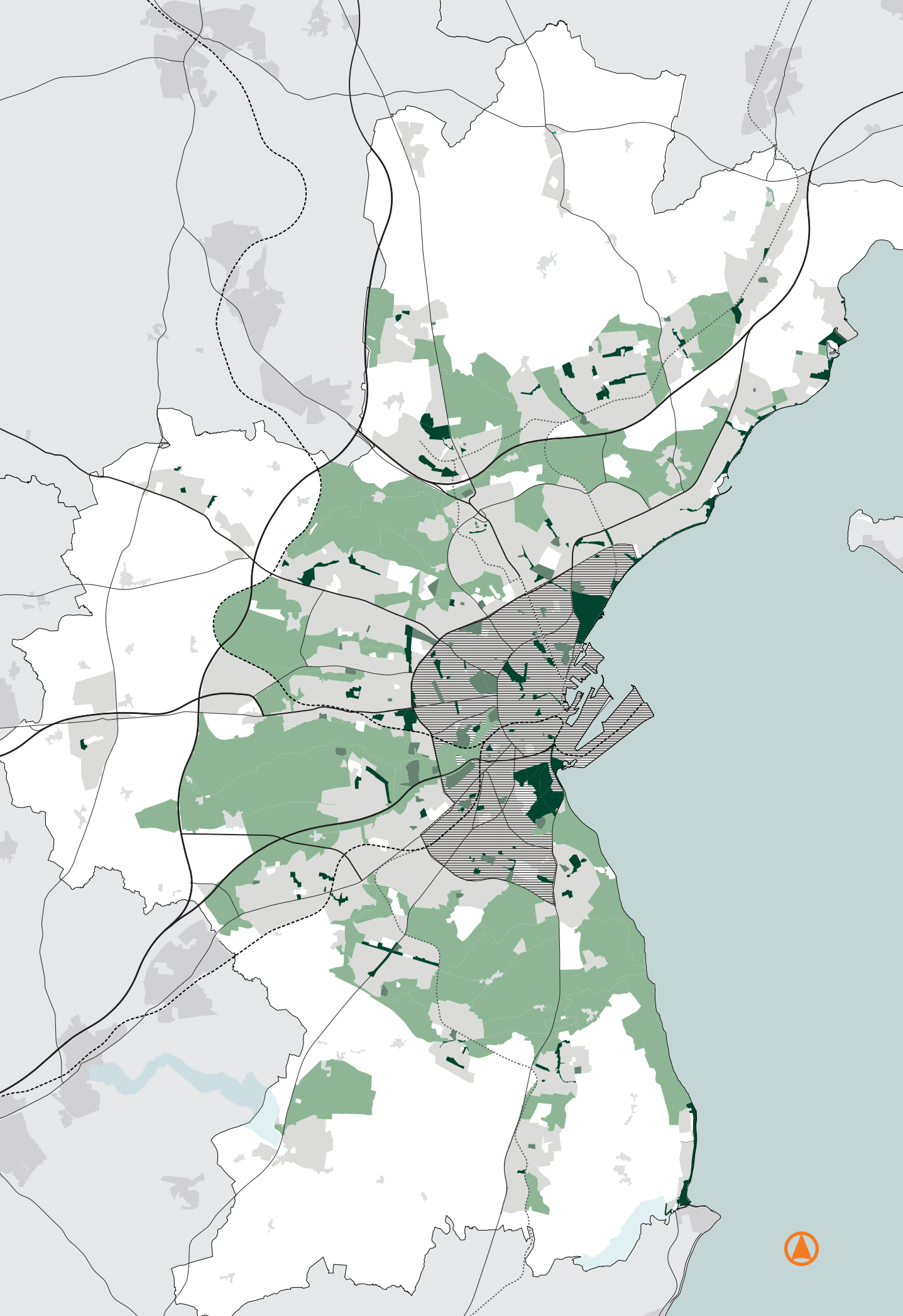
Overall, it can be said that mobility is primarily about people, thus, placing the needs of people first is a constant reminder that streets are not just thoroughfares, they are public spaces. Moreover, there are various potential tools to reactivate such spaces, introducing 'green' being one of the most effective. This sort of an approach towards mobility design ensures creation of more liveable, sustainable, resilient and people-oriented cities. Implementing the same in Banegårdsplads will help in addressing the wishes of Aarhus Municipality of creating an attractive and liveable urban space (The Living Streets Initiative, Los Angeles, 2012; Aarhus Kommune, 2017).

“WHAT DO WE WISH TO KEEP AND WHAT IS IT TIME TO LET GO OFF WHEN MOVING ON TO THE FUTURE?”

Aarhus 2017 - European Capital of Culture (Aarhus2017.dk, 2017)

THE GREEN CITY

Ill. 32 *Green city collage (Wikipedia, 2019)*



WHAT IS 'GREEN'?

To be able to work and design a "Green city" there is a need to first understand the meaning of green. Green is a multi-meaning word which could represent a mindset of sustainability or a color associated to health and relaxation, probably due to its relation to nature. In modern days, green is often an ambition for living a better, healthier life and protecting the earth, thus, it is often referred to as an opposite to the grey urban city (Farvernes Betydning, n.d.).

This project aims at creating a green space that complies with wishes and needs of Aarhus municipality. On behalf of the assigned green expert from Department of Green Spaces, Martin Højholt, the idea of a 'Green City' has been defined to include more nature in the urban city (Højholt, 2019). But what defines nature? If you ask a child the response may be a tree or a flower, an adult might say it is everything living. To be able to integrate nature into the design, there is a need to understand and define 'nature', because of it being a diverse and complex concept.

According to philosopher Hans Fink from Aarhus University, there are many scales of nature. His definition counts seven different representations; the untouched, the wild, the rural, the green, the physical, the earthly and the whole. His definitions range from theories about nature as everything that is not inflicted by human culture to everything in relation to the laws of physics. Amongst the various definitions by Fink, nature being the 'green' is the most relevant concept for this project. It defines nature as everything living, also the human controlled green such as a household plant and pets. Furthermore, it also concerns naturally produced materials that avoid mechanical and synthetic production methods (Fink, 2003).

In addition to the urban design field and the specific site of Aarhus Banegårdsplads, nature is also seen as something dense and compact. This definition relates to the possibility of nature to be able to stand out in a hectic cityscape, where a single pot on a balcony is not enough in relation to the busy city context. Also in regards to deriving solutions towards rapid urbanization, climate changes and loss of biodiversity, there is a need for bigger green elements to be implemented in the urban city.

City parks and green spaces

Local green landscape

Other green spaces e.g cemetary and allotment

Ill. 33 *Green spaces in Aarhus Commune (Aarhus Kommune, 2017)*

WHY GREEN?

The global population is rapidly increasing and people are moving closer together creating bigger cities. In a world where cities are becoming bigger and buildings are getting taller, nature is being limited to rural areas and parks. With the decline in nature, cities have become more polluted and have led to deterioration in liveability (Dr.dk, 2019).

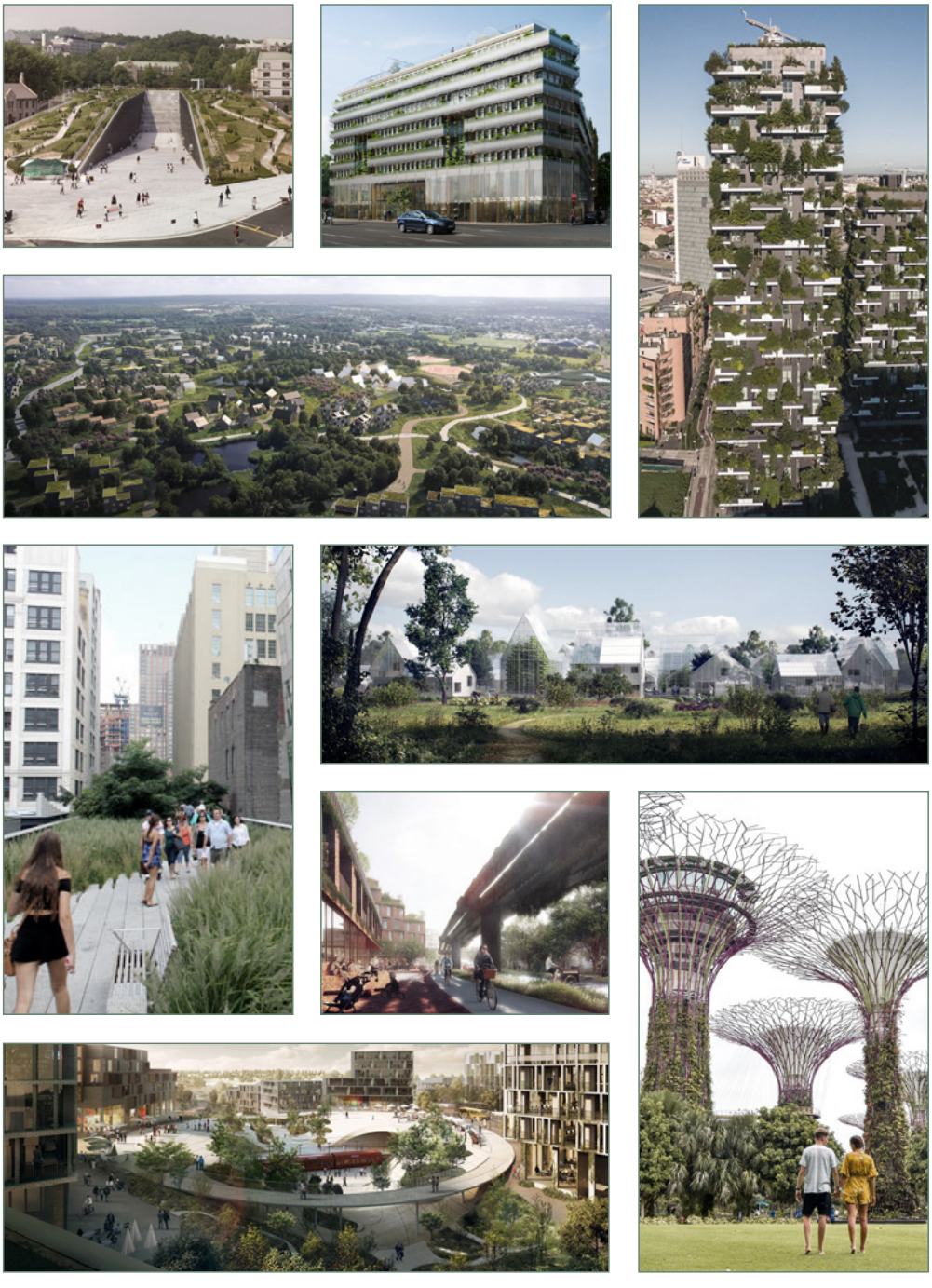
The population on earth is predicted to drastically rise by approximately 83 million people each year (Dr.dk, 2017). Therefore, we need to build cities that can handle the increasing population, rapid urbanization and urban sprawl, while still being liveable for humans and nature.

Locally, Aarhus has tripled in its size from 1954 to 2000 (Willacy, 2019). New green parks in the city of Aarhus have been down-prioritized because of economics and the need for building plots (Højholt, 2019). Consequently, ignoring the much needed values of green areas such as health benefits, lowering air and noise pollution, increasing biodiversity, the ability to hold back water and carbon-dioxide as well as promoting a more active lifestyle for the citizens. Despite these benefits, nature has not been integrated well enough in the planning of the city. Therefore, there is a need to question ourselves: how do we provide denser green areas in the cities while accommodating the growing population and contemporary climate problematics?

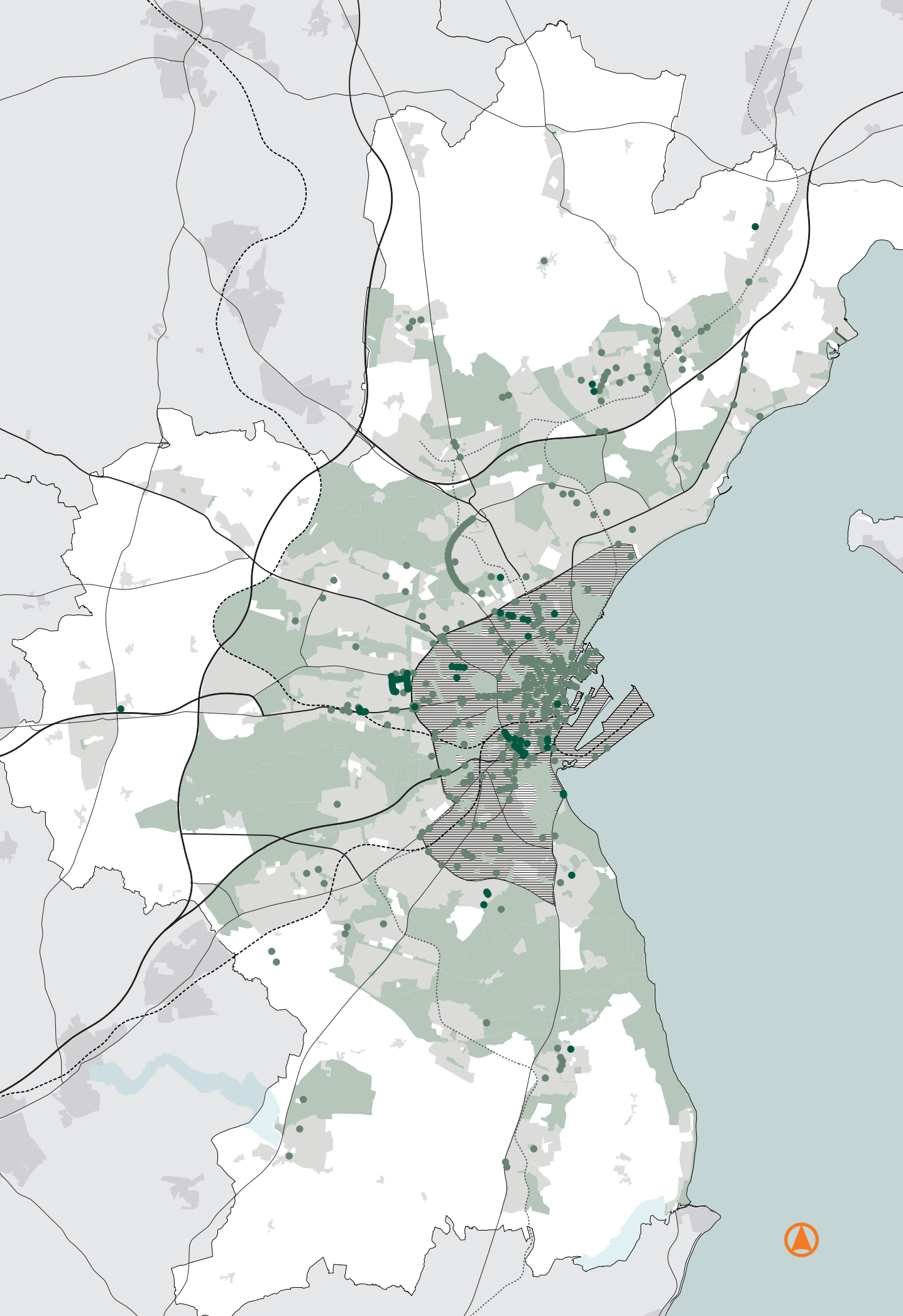
There is a need to integrate nature into cities in a different way than done before as the shown examples on ill. 34. Aarhus' city architect, Stephen Willacy's solution to the rapid urbanization is a more compact city that is well connected and coordinated. According to Willacy, parks could become more flexible, multi-functional and places for local stormwater treatment, streets could become greener, transportation modes could become more CO2 friendly and buildings could become a part of the ecological processes, hence, adding to a greater biodiversity. (Willacy, 2019)

Instead of nature being added as an independent element to promote liveability, it could be created in co-existence with the urban side of the city. This is where 'ecological urbanism' comes into play, which conjoins the knowledge and methods derived from both ecology and urbanism. Ecological urbanism, therefore, could be stated as a means of providing set of sensibilities and practices, to enhance our approach towards urban development (Mostafavi, 2016).

According to various urbanists, the so called 'ecological urbanism' approach can have multiple advantages at various scales - proving to be beneficial for the overall sustainable development at city and global levels as well as for humans and biodiversity. Additionally, Mostafavi says that this approach has the potential to respond to and transform multiple criteria that affect and shape cities, such as geography, orientation, weather, pollution, sound and smell. It could be summed up that it promotes a healthy lifestyle, since humans get to live in an urban setting integrated with the ecological aspects; reduces social segregation, as the green spaces might help improve social activity; and economic benefits. Moreover, it also addresses the biodiversity, which can continue to live undisturbed by the human intervention, due to the integration of ecology and urbanism. Overall, looking at urbanism through ecological lens, has the power to gradually change the way cities have been designed through time and result in more sustainable, adaptable, flexible and resilient cities (ibid).



Ill. 34 EWHA Womens University, South Korea (The Sawon, 2014); Ternes-Villiers, Paris (SLA, n.d.); Two high-rise towers covered by plants, Italy (Awad, 2018); Helsinge Garden City, Denmark (EFFEKT, 2018a); New York High Line park, America (Highways-USA, 2014); Regen Village, Netherlands (EFFEKT, 2018b); Transformation of the street Åboulevarden, Denmark (Tredje Natur, n.d. a); Giant vertical gardens, Singapore (Wanderers & warriors, 2018); A city working and merging with nature, Denmark (Tredje Natur. n.d. b)



A GREENER AARHUS

Aarhus brands itself as a vibrant urban city with beautiful nature nearby (Aarhus Kommune, 2018). But what if it could become a city where nature was not something nearby but a part of the lively urban environment? The city is planning to enhance its green and blue infrastructures to achieve a more liveable city. The strategy by Aarhus municipality involves the following rules (Aarhus Kommune, 2017).

GREEN STRATEGY FROM AARHUS MUNICIPALITY

- Holistic considerations about the use of streets and squares should include both traffic and functions such as activities and stay.
- Streets and squares should be designed in relation to the specific place and achieve livability through mobility, health and climate.
- Increase biodiversity for plants and animals by improving and developing new green spaces and corridors.
- To preserve big old trees and other plants - if not possible then to plant new trees.
- Add new trees in the city center.
- Handle stormwater locally and above ground to create additional value in recreational spaces.

(Aarhus Kommune, 2017)

Furthermore, Aarhus municipality is currently using a branding strategy to add 10.000 new trees in the commune and inclusion of citizens in the process. The trees are not only a part of beautification of the city, but also help against increasing temperatures, while accommodating the increasing rainwater run-off and creating better liveability for citizens, flora and fauna. The whole branding strategy gives an impression of a greener city, though the idea of planting that number of trees is not as realistic to achieve because of economy and maintenance. In total, 500 trees have been planted in two years. If this pace continues they will have planted only 2000 trees by 2025 instead of 10,000. Though this seems unrealistic, they have still managed to make people focus on the trees and a greener city, by including them in the process, by allowing them to wish for a place to plant a tree as seen on the map (Aarhus Kommune, 2019).

Aarhus green strategy revolves around trees, but there is also a general wish to create space in the streets to add plants and improve the biodiversity in the dense city. As they explain:"...to add green and blue to the grey" (Aarhus Kommune, 2017). Most of the strategy is about including green areas in new developments, creating more parks or greener squares. How about rethinking what a green space is and including nature into places that are not normally green?

Newly planted trees
Trees wished by citizens
Green spaces

Ill. 35 *Wished and planted trees in Aarhus Commune (Webkort Aarhus Kommune, 2019)*

CONNECTING MOBILITY AND GREEN

When trying to create a high livability in a dense city nature is one of the factors included. However there is often a lack of space to create new parks and squares because of existing and new buildings. There is a need to include nature in different typologies than parks and street vegetation, to be able to include it multiple spaces in the city and solve climate problems and a decreasing biodiversity. In Aarhus there is a huge potential in adding nature to the existing station square.

Many might say that a big transportation hub as the train station square and nature in form of a park are opposites, and that might be right in the eyes of the traditional way of building and planning that has happened for many years. But in a stressing hectic environment where traffic flows cover the area a calming green environment could help lowering the stress level, promote a healthy and active living, reduce the air and noise pollution from vehicles and make it feel like a safer space. The square could become a new typology "A green transportation hub", proving that nature can be implemented in a dense city even in spaces where there seem to be no left over space for plants. Creating a more livable city by creating coexistence of nature and mobility.

Aarhus Banegårdsplads is at the moment centered around traffic, but mobility is more than A to B, it is about the feeling of moving. Traffic is often related to something chaotic, stressful and something we have to do but does not necessary find a great pleasure in. Whereas nature is something people combine with pleasure, taking a stroll and enjoyment.Furthermore nature is something all can agree on has a positive value. There can be discussion about the species, shape and placement but the actual value is clear - house prices rise when buildings are located close to nature and many studies show different health benefits of being in nature. Therefore adding nature to a place where many different people meet, because of the connectivity to the city and country, seems suitable. A greener train station square will add nature to Aarhus as the municipality wishes, but also become a branding strategy to show developers, both in the city and on a larger scale, that nature can be implemented in tight urban spaces without removing the necessary functions.

"The city should not be designed so you could live the most efficient - but so you can thrive and feel at home."

(Aarhus Kommune, 2017, translated p. 33)

"The battle for space in the city just gets bigger and bigger. Urban spaces should be used for many different activities, so therefore, it is much more about being creative. To allow the space for nature to be integrated also in the spaces where it seems completely impossible."

Vi bygger det væk (Dr.dk, 2019)


COOL
WITTE

LIVING STREETS

Ill. 36 *Theory collage (Allsup, n.d.)*

STREETS AS PUBLIC PLACES

Streets are more than just thoroughfares, they are spaces in themselves and mediums that connect people to places. This basic concept has been forgotten over the years through standardized ways of designing for cars. Mobility is thought of as an inevitable act to get somewhere, but there is a need to realize that movement is just one of the several roles that mobility infrastructures can play. This practice towards street and mobility design has created voids in various networks of cities. There are various reasons for reconsidering the street and mobility design: firstly, healthier streets lead to healthier people, as people would be encouraged to choose walking over cars, and would also get easier access to multiple modes of travel such as cycles and public transport; secondly, its better design would create quality open spaces that will compensate towards growing density of cities; thirdly, streets would present opportunities to contribute to the natural environment through greenery and its multiple benefits. Therefore, a shift in thinking about street and mobility design from the standpoint of transportation or traffic efficiency to a rather multi-use, spatial standpoint will contribute towards creating more attractive, active and liveable urban spaces and cities (Bain, 2012).

"If you plan cities for cars and traffic, you get cars and traffic. If you plan for people and places, you get people and places"

Fred Kent, 2005 (Bain, 2012, p.25)

Undoubtedly, it can be deduced that mobility is more than A to B and there is a need to fill the voids created due to conventional ways of designing mobility landscapes. There are several potential tools that can be used to enhance the streets and mobility infrastructures by viewing them as a network of spaces with an amalgamation of multiple uses and users, with unique spatial qualities and contexts. Certain ways could be reinforcing green pockets, transforming into shared spaces, introducing artistic and cultural elements, based on what best suits the context. One such potential tool for reviving streets and mobility infrastructures is the 'Living Streets' concept (ibid).

III. 37 *Existing conventional street at Banegårdspladsen in Aarhus*

LIVING STREETS

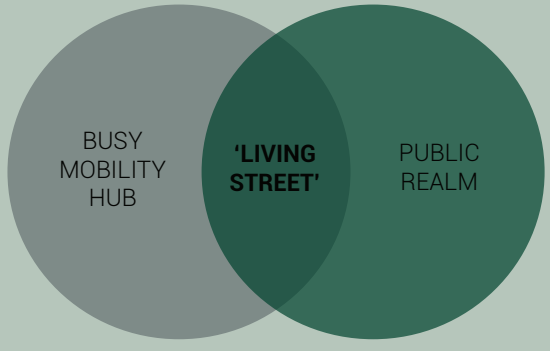
Living streets are streets for everyone, that are designed to offer safe and convenient access to all users ranging from pedestrians, bicyclists, motorists and transit riders of all age groups and abilities. Moreover, they are primarily designed through a human-centred approach i.e. by laying emphasis on moving people instead of moving traffic, to envision a healthier built environment and enhanced social, cultural and safety dimensions (The Living Streets Initiative, Los Angeles, 2012).

The 'Living Streets' way of designing mobility infrastructures enhances their sense of place through its placemaking principles. This gives many opportunities for people to enjoy these spaces through different experiences. It instils an identity and character that make people rather realize the importance and value of streets, mobility corridors and hubs, thus, making peoples' everyday journeys more pleasurable and memorable (Bain, 2012).

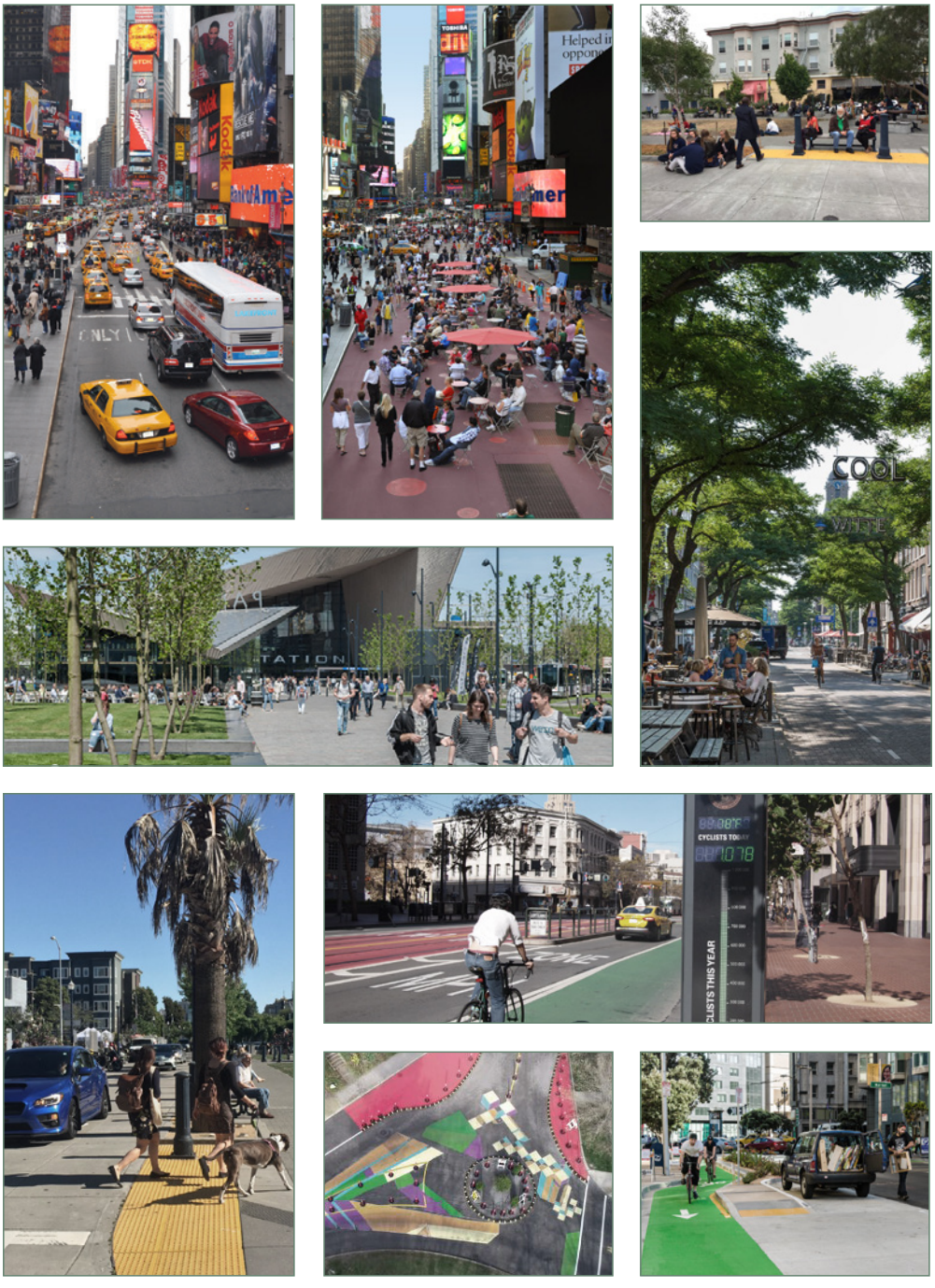
There is no specific design prescription for 'Living Streets'; there are various approaches to achieve the same such as greener streets, pedestrian-friendly streets, bicycle-oriented streets, vibrant community streets, as each one is unique and responds to its context. A living street in an urban area will be quite different from the one in a rural area, yet, in both cases the focus would be to create active, liveable spaces (What are complete streets?, 2015; Bain, 2012).

The concept of 'Living Streets' has been implemented in several streets globally, through a variety of approaches. Certain examples include the transformation of a part of Times square's vehicular space into a pedestrian plaza, Witte De Straat in Rotterdam, station square at Rotterdam Central station etc (ibid).

This project aims at realizing the potential of in-between spaces while on the move, as vital public spaces, thus, enhancing the experience for different categories of users by bringing social, cultural, transportation aspects together. Additionally, since streets are an active part of city's open space network and people form an active part of streets, transit corridors and hubs, reinforcing public realm into the busy mobility hub would be one of the most effective ways to achieve 'Living Street'.



Ill. 38 *A 'Living street' approach*



Ill. 39 *Time Square before, New York (National Street Service, n.d. a); Time Square after, New York (National Street Service, n.d. a); Living street, unknown (National Street Service, n.d. c); Witte De Straat, Rotterdam (Allsup, n.d.); Rotterdam Centraal Station (Living streets, n.d.); Living street, unknown (National Street Service, n.d. b); Living street, unknown (National Street Service, n.d. b); Lexington, America (Smart Growth America, n.d.); Living street, unknown (National Street Service, n.d. b)*

Ill. 40 *What makes a great place? (UTM, 2017)*

WHY PUBLIC REALM?

Rapid urbanization and densification of cities have led to lack of open and green spaces. Existence of such spaces in cities is essential for social interactions and enhance sustainability, safety, liveability of cities. Thus, there is a need to integrate open, sociable spaces to achieve a balance with the aforementioned global issues. Moreover, the voids created in the process of development of mobility infrastructures such as mobility corridors and hubs, have the potential to become public spaces and knit the urban fabric together.

Project for Public Spaces (PPS) has evaluated multiple public spaces around the world and has developed a place diagram, as shown in ill. 40, that represents the key attributes of a successful public place: sociability, uses & activities, comfort & image, access & linkages. According to them, public spaces must be easily accessible, they should offer meaningful activities to engage people, the space must be comfortable and have a good image, and finally, the public space must be socially inclusive where people, directly or indirectly, interact with each other and the space. Therefore, creating public realm in line with these key attributes will transform urban voids to active and liveable public spaces (What makes a successful place, n.d.).

A 'GREEN' PUBLIC REALM

Natural systems are seldom considered to be functions that require space in the streets. Landscaping in streets is viewed as an aesthetic plus, but the ecological standpoint of it is mostly forgotten. In fact, there is often a dichotomy perceived between urban setting of cities and natural setting of the countryside and are viewed as fundamentally opposed realms. However, with the depleting amount of natural systems as a result of urbanization and densification of cities, there is a need to re-envision cities by reconnecting the natural systems with urban areas (Bain, 2012).

The space constraint in cities has been eventually taking away the luxury of creating parks and dedicated green pockets. Therefore, there is a need to practice other typologies of reinforcing greenery into the cities such as street landscaping, green walls, green terraces etc. to contribute towards global ecological sustainability (Design Principle-Parks and Open Space, 2009).

Creating a 'green' public realm has multiple benefits associated with it at various levels. Firstly, access to open, sociable green spaces encourages physical activity and results in improvement of general health of people, reduced stress levels and depression, promotes healthier lifestyle. Secondly, a network of open and green spaces ranging from ecological reserves to small green pockets in dense urban environments contribute to enhancement of biodiversity and lead to better liveability for people. Lastly, Green spaces help address the global issues such as rising temperatures and sea levels, thus, contributing to global sustainability and energy efficiency (ibid).

THEORETICAL REFLECTION

Mobility is considered as an inevitable act and mobility landscapes are treated as mere functional elements. Additionally, streets, mobility corridors and hubs make up most of the open spaces in cities, forming an active part of city's open space network. Yet, their conventional design makes them an anonymous element in peoples' everyday lives. However, the fact that people form an active part of mobilities and mobility infrastructures and peoples' lives unfold while on the move through these entities has been forgotten over the years. Therefore, it is important to realize that mobility is more than A to B and streets, mobility corridors are more than just places to drive.

'Living Streets' concept is one of the successful ways of reviving rather utilitarian mobility corridors and hubs. This approach has the potential to bring life into dead urban spaces, primarily due to its human-centred approach. There are several ideas that can be implemented to achieve 'Living Streets'. One of the effective ways is reinforcement of public realm integrated with nature, through which the urban fabric of cities can be knit together at multiple levels.

Banegårdspladsen is a busy mobility hub in Aarhus, that hosts multiple modes of transport ranging from trains, buses, cars to bicycles and pedestrians. The evolution of Banegårdspladsen through the years has led to an overlap in the mentioned modes and has resulted in a hectic and chaotic space. Banegårdspladsen can be redesigned with the knowledge attained from 'Living Streets' concept by introducing public realm integrated with green. Combining the advantages of both public realm and green spaces addresses issues at multiple levels i.e. at human scale in terms of sociability as well as global scale in terms of urbanization, climate changes and ecological balance. This sort of an approach in redesigning Banegårdspladsen, which in a way, is in lines with 'ecological urbanism', will enhance the liveability and overall re-establish social and ecological links in the city. A design proposal stemming from this approach shall be described in the presentation chapter.

III. 41 *Design approach collage*

DESIGN APPROACH

Ill. 42 *Vision collage*

VISION

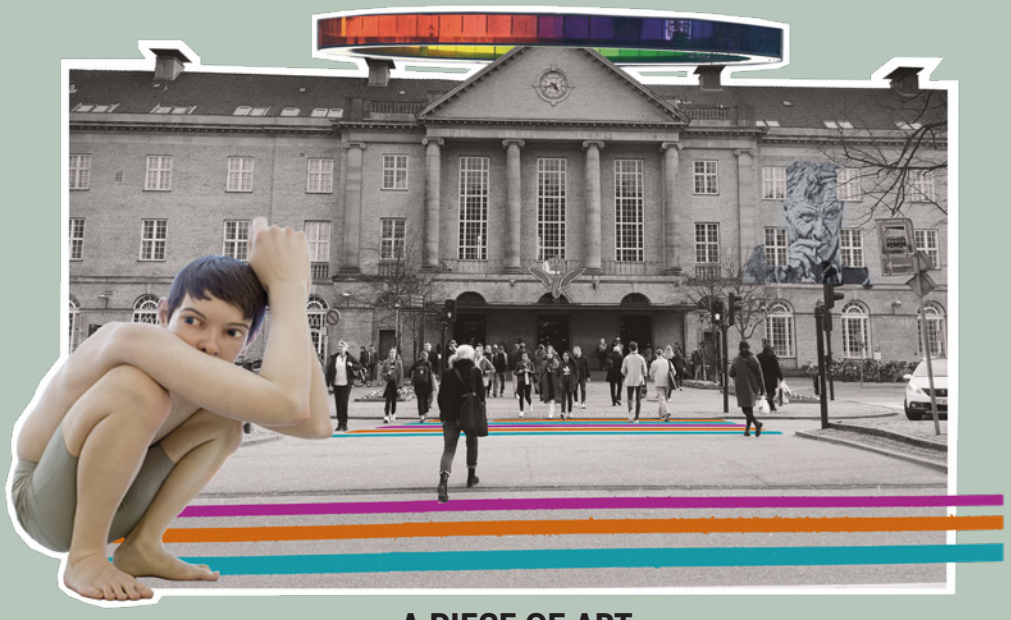
The vision is to challenge the conventional ways of designing mobility corridors and hubs by application of 'Living Streets' concept to shift from a traffic-oriented to people-oriented perspective. Furthermore, unearthing the potential of such spaces to re-create city's identity; establish interactions amongst people, between people and their surroundings; therefore, creating experiences that are worth the wait in peoples' daily journeys. This approach will contribute to enhancement of Banegårdspladsen in Aarhus and set a unique example for creating human-centred mobility landscapes.

WHAT CAN THIS

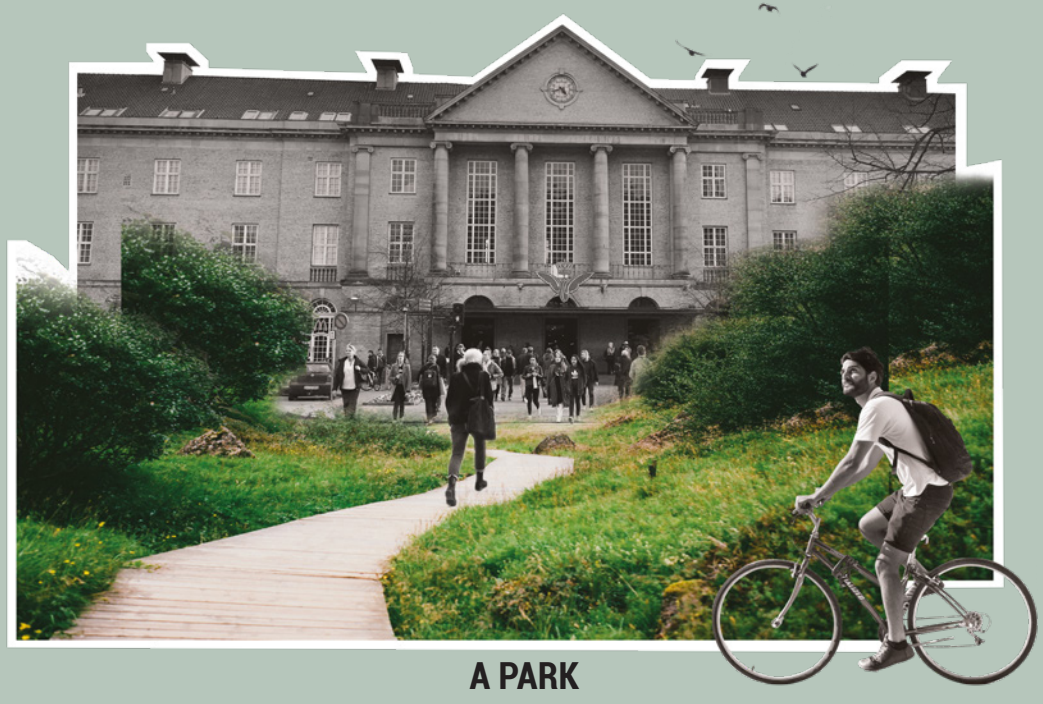
A SHARED SPACE

A LANDSCAPE

SPACE BECOME?



A PIECE OF ART



A PARK

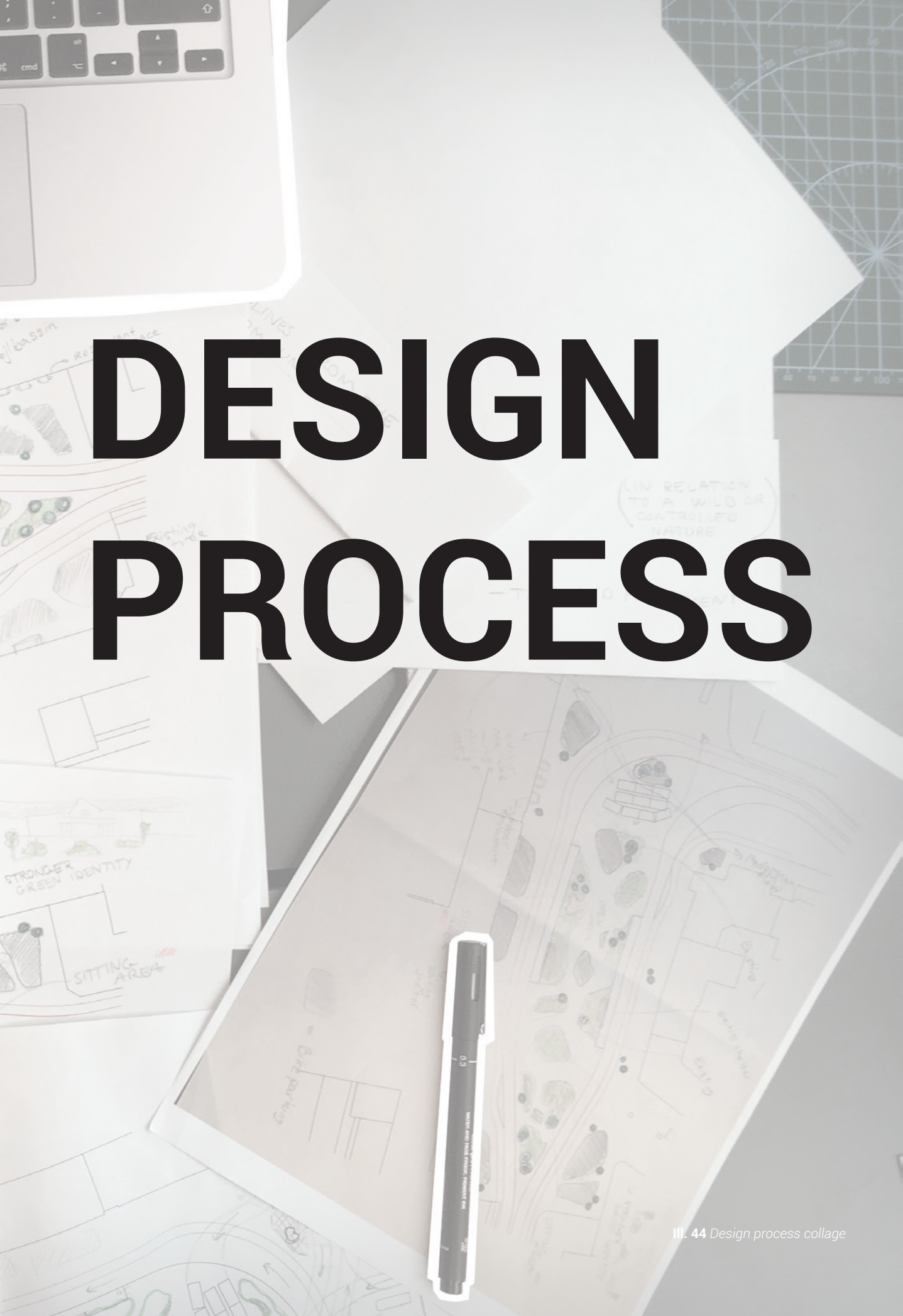
Ill. 43 *What can this space become?*

PROBLEM STATEMENT

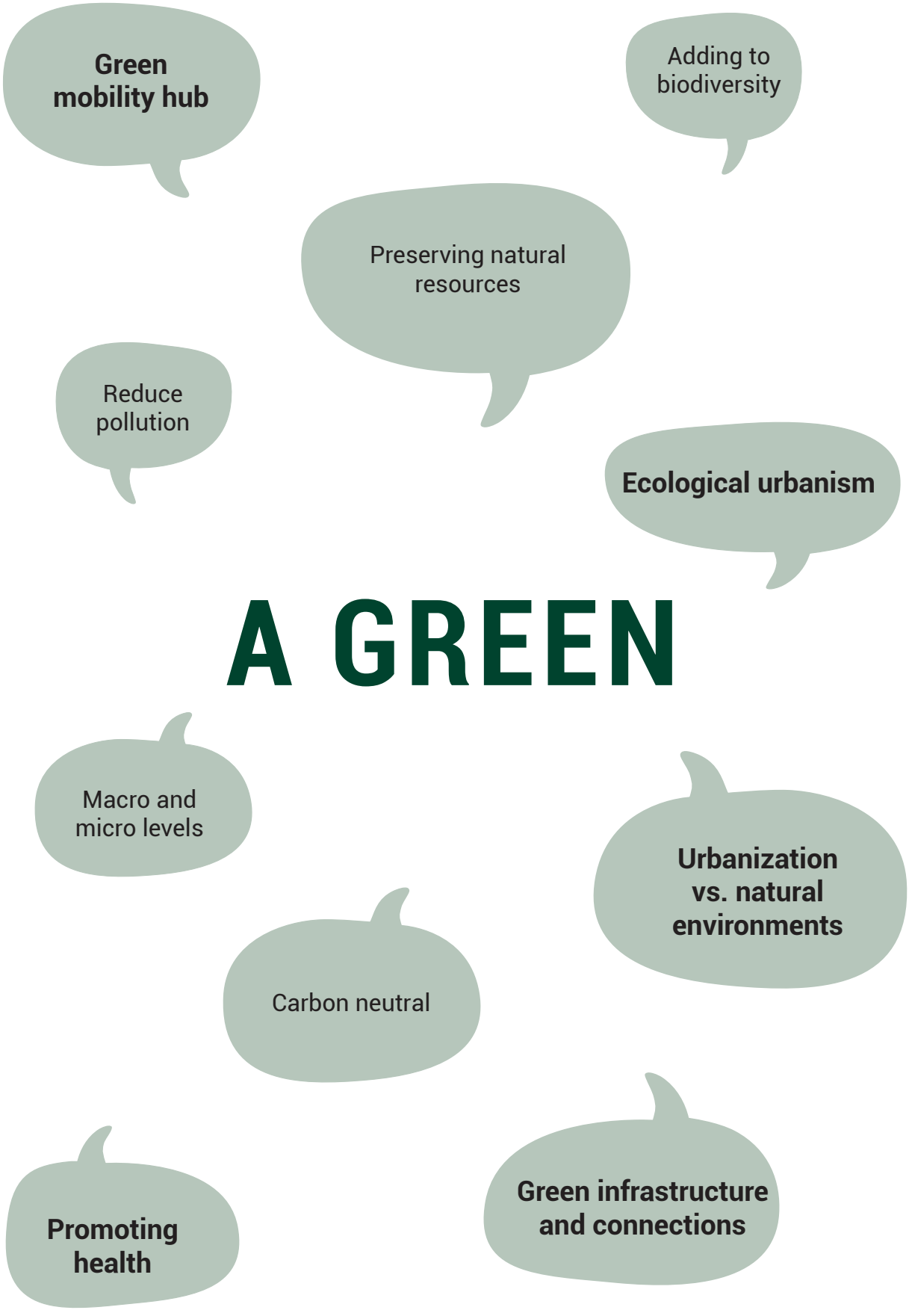
How can a compact and busy mobility hub be transformed from a mere traffic ‘machine' to an identity of the city and a pioneer for a sociable, greener city?

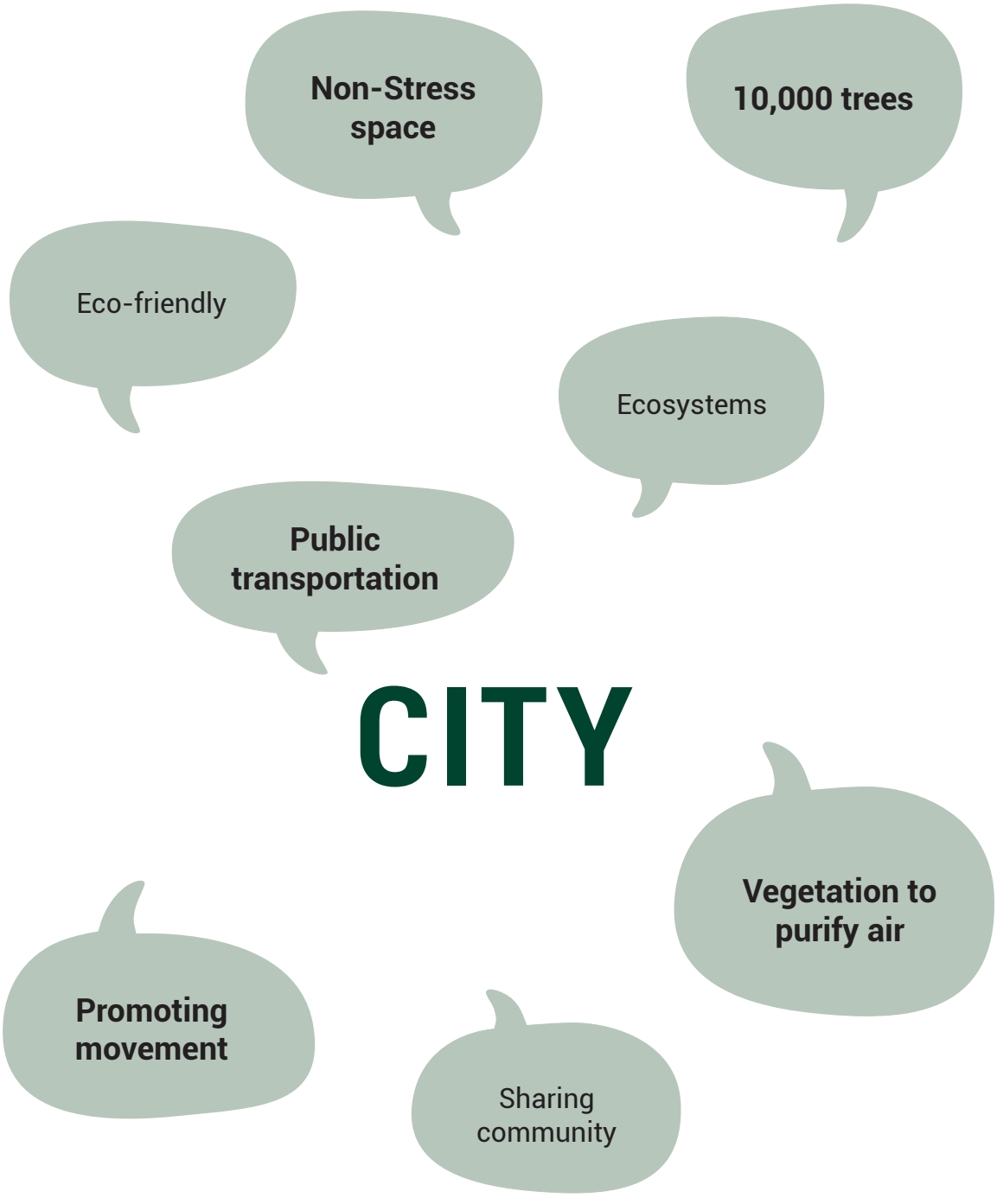

Waiting shelter
Pedestrian flow
Existing
Waiting shelter
Existing
Pedestrian flow

DESIGN PROCESS



Ill. 44 *Design process collage*


Green mobility hub
Adding to biodiversity
Preserving natural resources
Reduce pollution
Ecological urbanism
A GREEN
Macro and micro levels
Urbanization vs. natural environments
Carbon neutral
Green infrastructure and connections
Promoting health



Ill. 45 *A green city brainstorm*

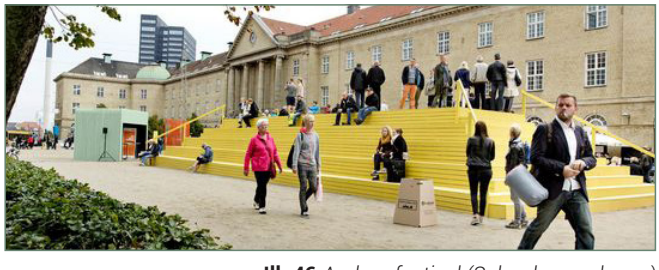
A GREEN CITY?

A green city can be defined and understood in many ways, as mentioned in the green chapter. Ill. 45 shows different perceptions about the same by class members during a discussion for choosing a theme to work with. For some 'green' meant forest, biodiversity or pocket parks while for others it meant carbon neutral or sustainable. To conclude on the definition of 'green city' for the project, there is a need to dig deeper into the specific site and explore the suitability of various definitions with respect to the site.

OUT IN THE WORLD

There are many inspirational projects across the world related to green and transit hubs. Firstly, Aarhus Festival, see ill. 46, is one such inspiration, which hosts contemporary transformations of places in 1:1 scale to observe peoples' interactions with the elements. Secondly, Nørreport Station, see ill. 47, is a good reference to understand mobility flows while designing in a busy and crowded place. Thirdly, Teshima Art Museum, see ill. 48, shows how built spaces can be a contrast to nature and make them highlight each other. Finally, Karen Blixen Square, see ill. 49, reflects on integration of public space with necessary functional elements such as bicycle parking. Therefore, these projects help in developing a better understanding about designing within the current context.

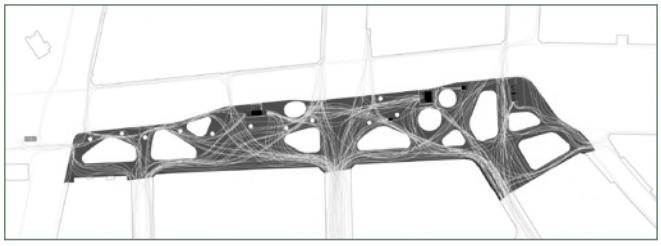
Aarhus Festival, Aarhus
Temporary activities and human scale transformations focusing on urban spaces and the life of the city



Ill. 46 *Aarhus festival (Schonherr n.d., a-c)*

Nørreport Station, Copenhagen

Bicycle parking and mobility flow at transit hub



Ill. 47 *Nørreport station (COBE n.d., a-d)*

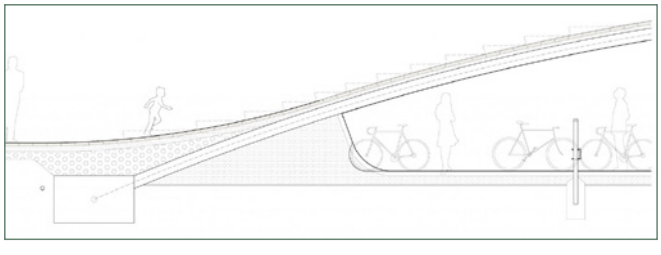
Teshima art museum, Japan

Contrasting built spaces highlighting nature

Ill. 48 *Teshima art museum, Japan (ArchDaily, 2011; Benesse Art Site Naoshima, n.d.; Baan, 2010)*

Karen Blixen Square, Copenhagen

Public square with bicycle parking



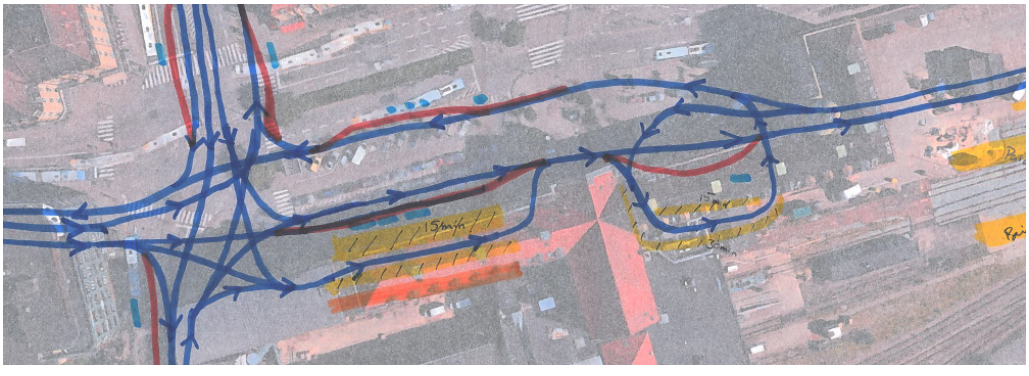
Ill. 49 *Karen Blixen Square, Copenhagen (COBE n.d., e-g)*

EVOLUTION OF CONCEPT

A two-day concept development workshop was conducted by Jens Rex, Creative Director of Lab-Land Architects for initiating the design process. This involved looking for inspiration related to the project theme and sketching ideas for the same. The technical aspects of mobility were taken into consideration along with the 'Green City' theme from the very beginning of the concept development.

INITIAL PHASE

Initially, the traffic flows derived from site analysis and the proposed light rail route by the municipality were superimposed to observe the usage patterns and identify unused spaces in the square that could be used for design intervention, inspired by the concept illustration of Nørreport Station by COBE as seen on the previous page (COBE, n.d., a-d).



Ill. 50 *Existing flow lines*

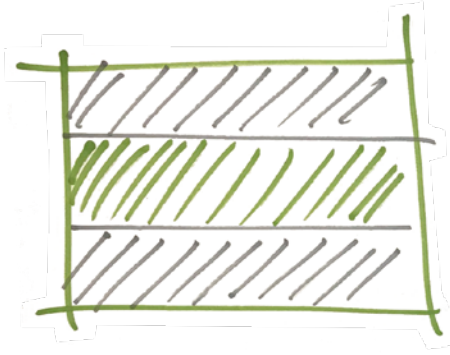
Ill. 51 *Future plan for Banegårdspladsen from Aarhus Municipality (Aarhus Kommune, 2014)*

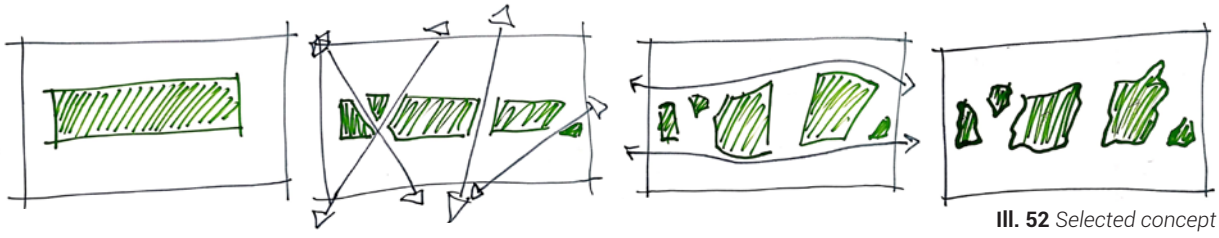
CONCEPT DEVELOPMENT

Development of the concept focused on the interaction between green spaces and the square, and how this combination could enhance peoples' experience while moving through the square. With the inspiration from Nørreport Station and the idea of major connections in mind, various sketches were produced for subdivision of transit and green spaces in the square, yet retaining the connections. The options were developed with varying proportions of green and urban spaces; while some options prioritized flows and urban spaces, the others prioritized green spaces. See pictures on the next spread.

SELECTED CONCEPT

Amongst the various options for division of green and transit areas in the square, the best suited option was to create a bulk green space in the centre surrounded by transit, to create better experience in a compact space. The idea behind the concept was inspired from the poem 'no man is an island' which expresses that human beings do badly when isolated from others and need to be part of a community in order to thrive. In this concept, people interact with each other, with mobilities and with nature. Additionally, various design elements such as mirrors and contrasting entities were also looked at to understand how they can enhance the green in a dense space. Furthermore, the concept focused on using the green as a safe space at the center of the square. With a focus on pedestrian connections, possible options for green islands were also partly tested.





Ill. 52 *Selected concept*

Creating a dense green area as a safe space to avoid chaos from traffic.

Creating linear pedestrian paths for better flow.

Separating the bus road and light rail for easy crossing of pedestrians.

Enhancing the natural feeling by creating organic shapes.

Social islands

Central Parkstation

Central Station Park

Park'in traffic

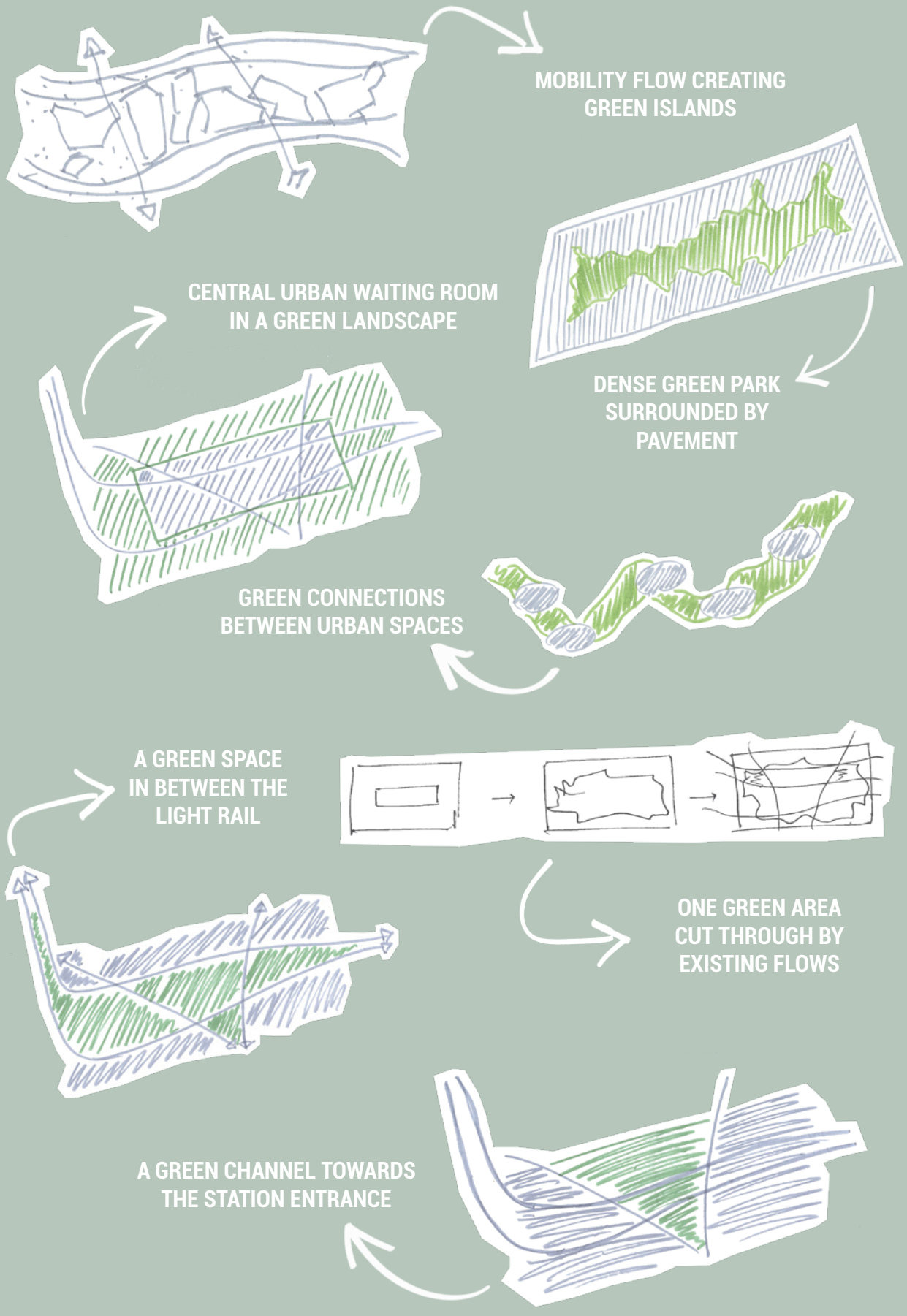
WHAT SHOULD THE TITLE BE?

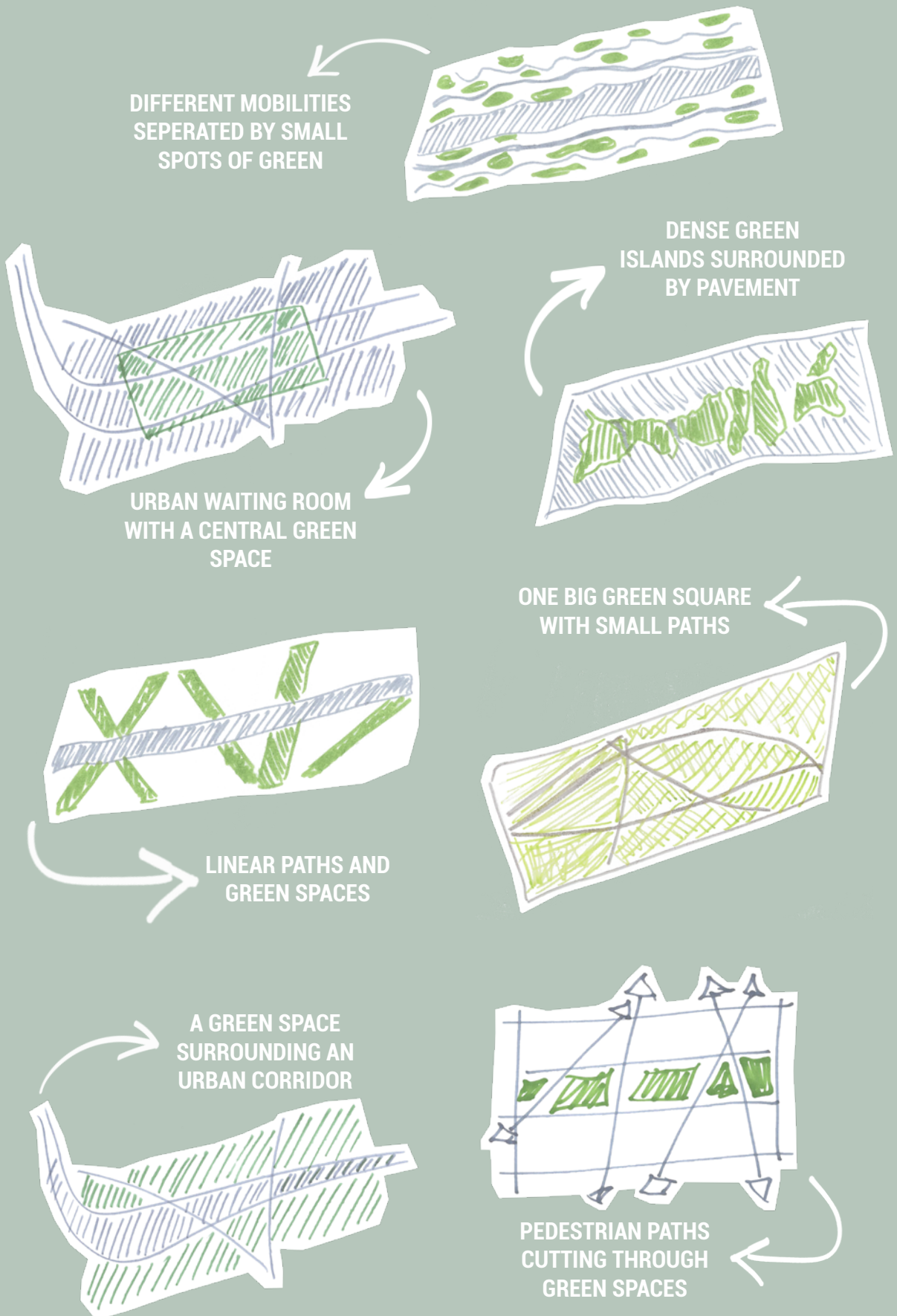
... in a sea of traffic

No man is an island

Green mobility hub

A bump in the road

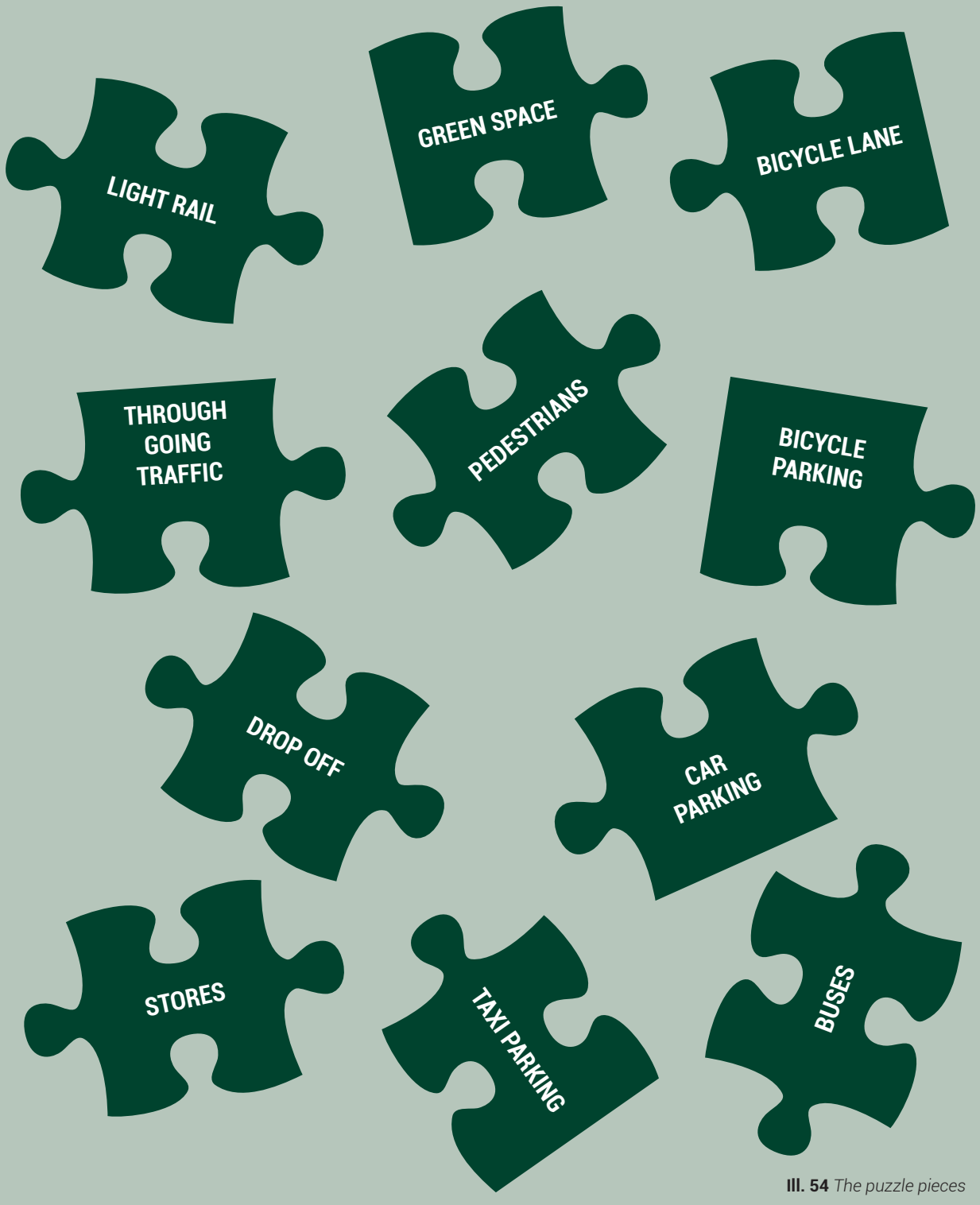

MOBILITY FLOW CREATING
GREEN ISLANDS
DENSE GREEN PARK
SURROUNDED BY
PAVEMENT
GREEN CONNECTIONS
BETWEEN URBAN SPACES
CENTRAL URBAN WAITING ROOM
IN A GREEN LANDSCAPE
A GREEN SPACE
IN BETWEEN THE
LIGHT RAIL
ONE GREEN AREA
CUT THROUGH BY
EXISTING FLOWS
A GREEN CHANNEL TOWARDS
THE STATION ENTRANCE



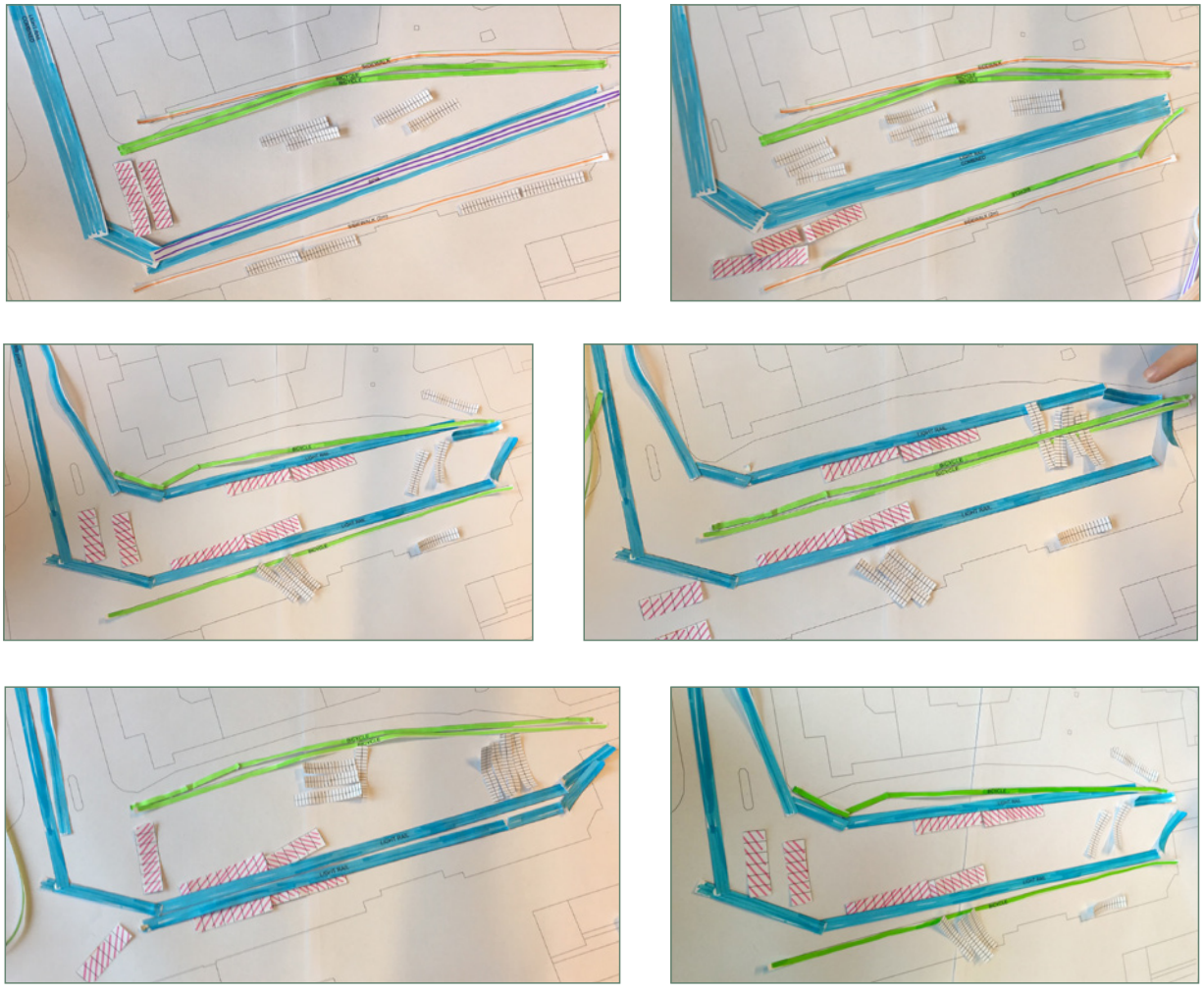
III. 53 *Concept development*

IT IS A PUZZLE

There were many fragments that needed to be finalized based on the preconditions list laid down by Aarhus Municipality. As designers, it is necessary to comprehend the same and realize them into the design. Thus, a puzzle workshop was planned to fit every fragment into the design and determine how the concept could be implemented in line with the preconditions list.



Ill. 54 *The puzzle pieces*



Ill. 55 *Puzzle workshop*

PUZZLE WORKSHOP

Provision of green space in the centre surrounded by transit corridors worked well conceptually. However, the same needed to be tested to scale, to ensure its possibility. The project site appeared as a puzzle with multiple functions as its pieces. Fitting the light rail tracks, bus lanes, car parking, kiss and ride facilities, bicycle lanes, bicycle parking, pedestrian paths and space for green into one square was a challenge. Therefore, various 'pieces' of the puzzle were cut out based on their required space and moved around to gain a better understanding of the area occupied by the various functions, thus, determining the space that can be dedicated for the green. The needed spaces and sizes for the light rail was found in the document "Letbaner på strækninger" (Fischer et al, 2016) while the turning radius was determined from the minimum value for a 15-meter-long bus (Vejdirektoratet, 2016). With the initial idea of still setting aside space for parking, the necessary amount was determined through observations and calculations as presented in appendix B. It was subsequently decided to discard parking and prioritize kiss and ride facilities, as the observations revealed that this was the most common and necessary function. Optimizing bicycle parking for better use of space, was tested, see appendix B.

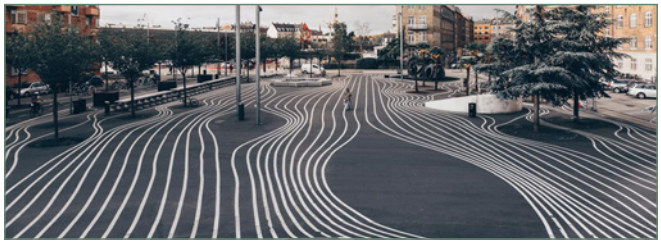
This workshop was conducted in parallel with the concept development and influenced the choice of using the light rail tracks as the border for the green safe space at the center of the site. The final puzzle layout enables the conceptual idea of a central green pedestrian space to be realized and at the same time allows for further detailing of the functions.

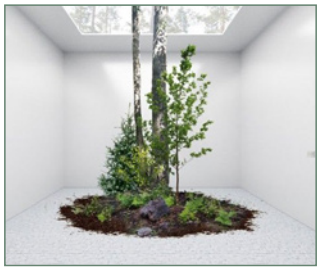
A GREEN DESIGN

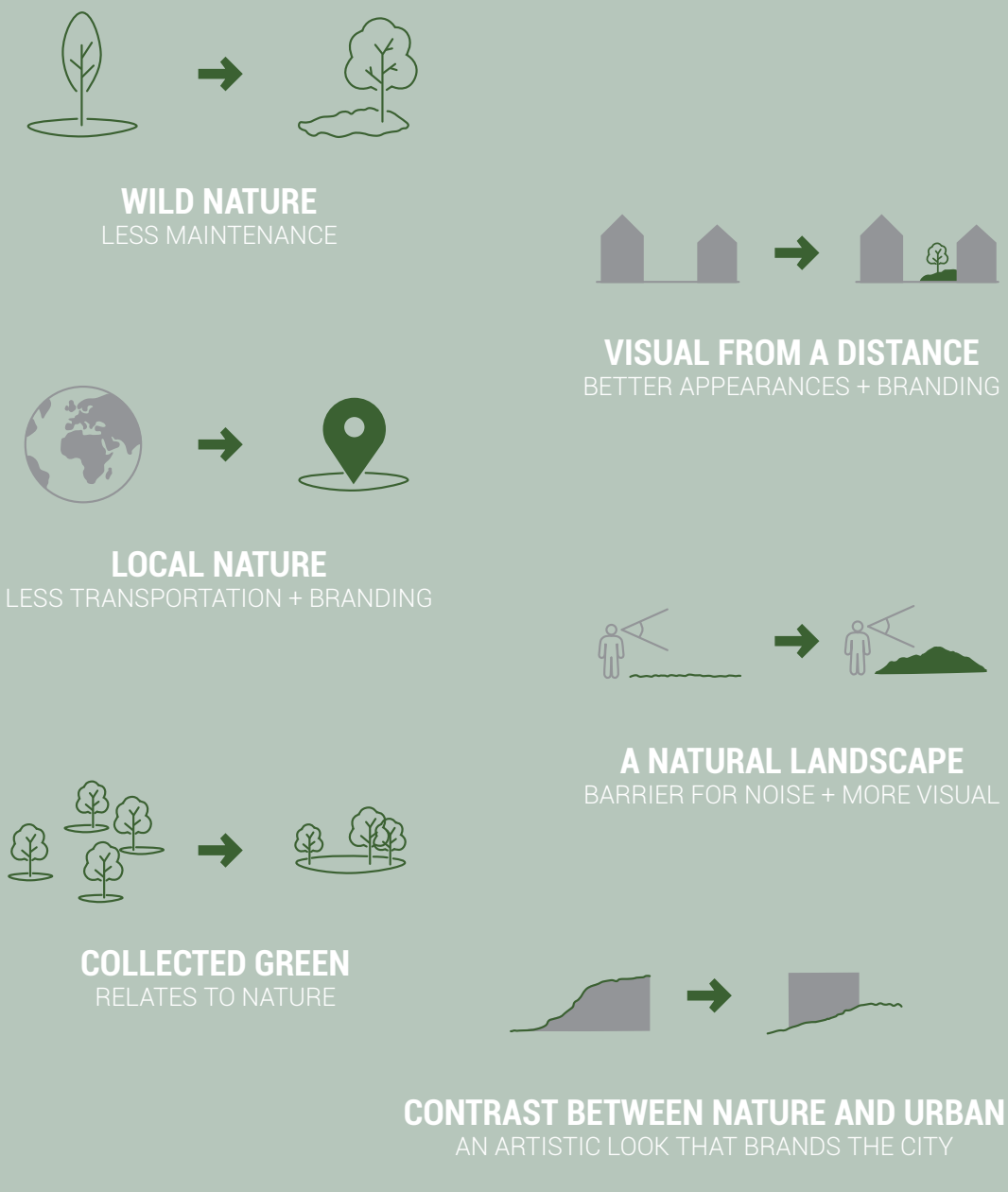
The color green represents nature and is said to have healing effects on people. In an intense mobility hub such as Banegårdspladsen, provision of green shall calm people from their busy and hectic life, allow them to unleash their minds from work and stress, and enjoy the green nature while moving towards their destinations. However, reinforcing nature into a dense and compact space can be quite challenging. Therefore, the design needs to use ways to integrate nature in a manner that enhances nature in a dense space. Some of the ways to implement the same can be to create contrasts between the green and built environments, using organic and geometric shapes, using contrasting materials, textures and colors. Additionally, design elements such as mirrors can be used to reflect nature, thus, enhancing the quantitative feeling of green. Inspiration has been drawn from various projects implemented in the same lines across the globe, as shown in ill. 56.

Ill. 56 Mirror house, UK (Saatchi art, n.d.); Superkilen, Denmark (visitcopenhagen, n.d.); Bonsai for spring, unknown (Tutik, n.d); Casa Verne (Muñoz, 2017); Indoor riverbed, Denmark (Quddus, 2014); Art installation 'Repair', Venice (Gardiner, 2019); A new garden, Brussels (Iconic Landscapes, 2008); Nature as art, Canada (Chino, 2013); Teshima Art Museum, Japan (Baan, 2011); UCCA Dune Art Museum, China (Quingshan, 2018); Design with plants, unknown (Berger, n.d.)

HOW CAN NATURE BE ENHANCED IN A DENSE SPACE?



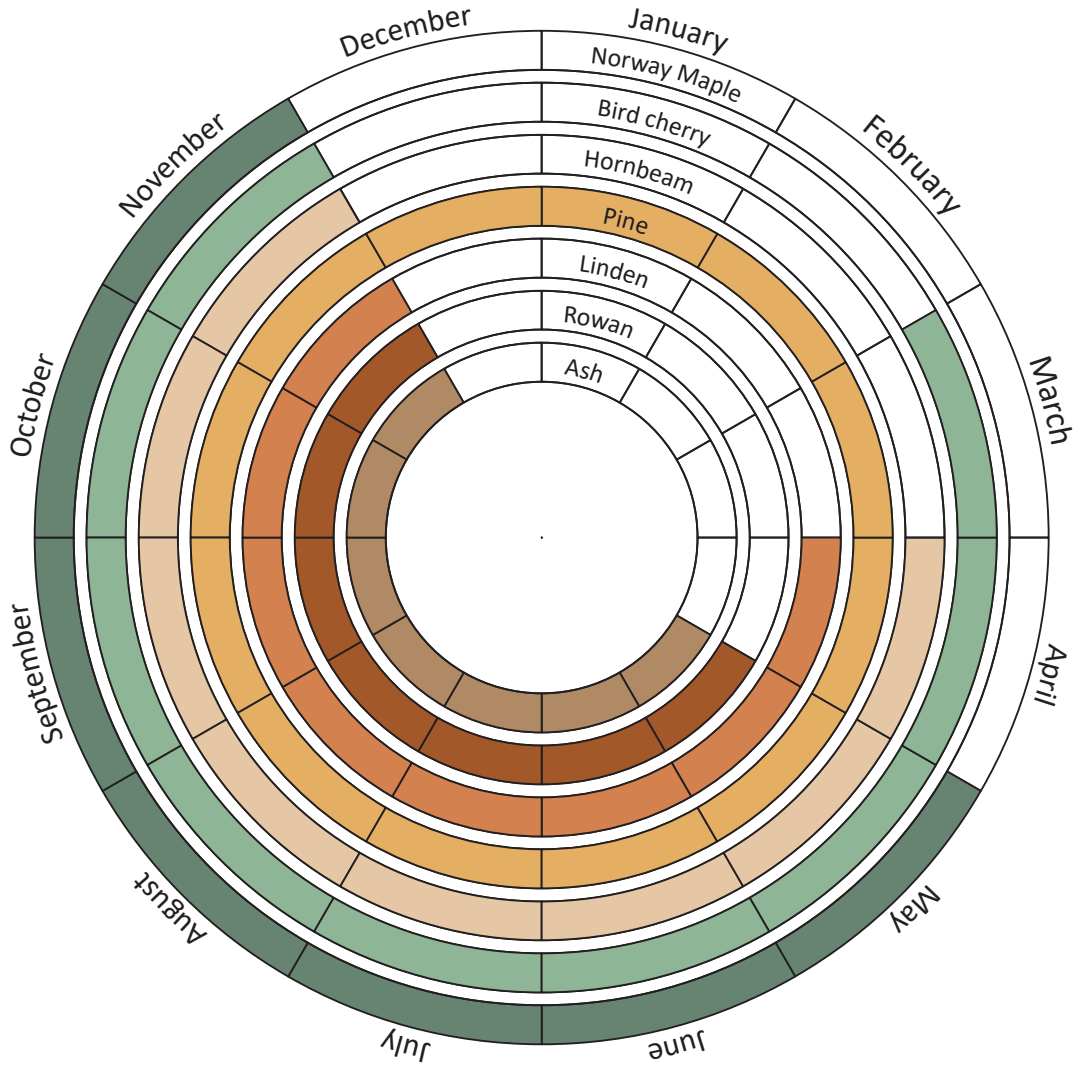




Ill. 57 *Green design parameters*

GREEN DESIGN PARAMETERS

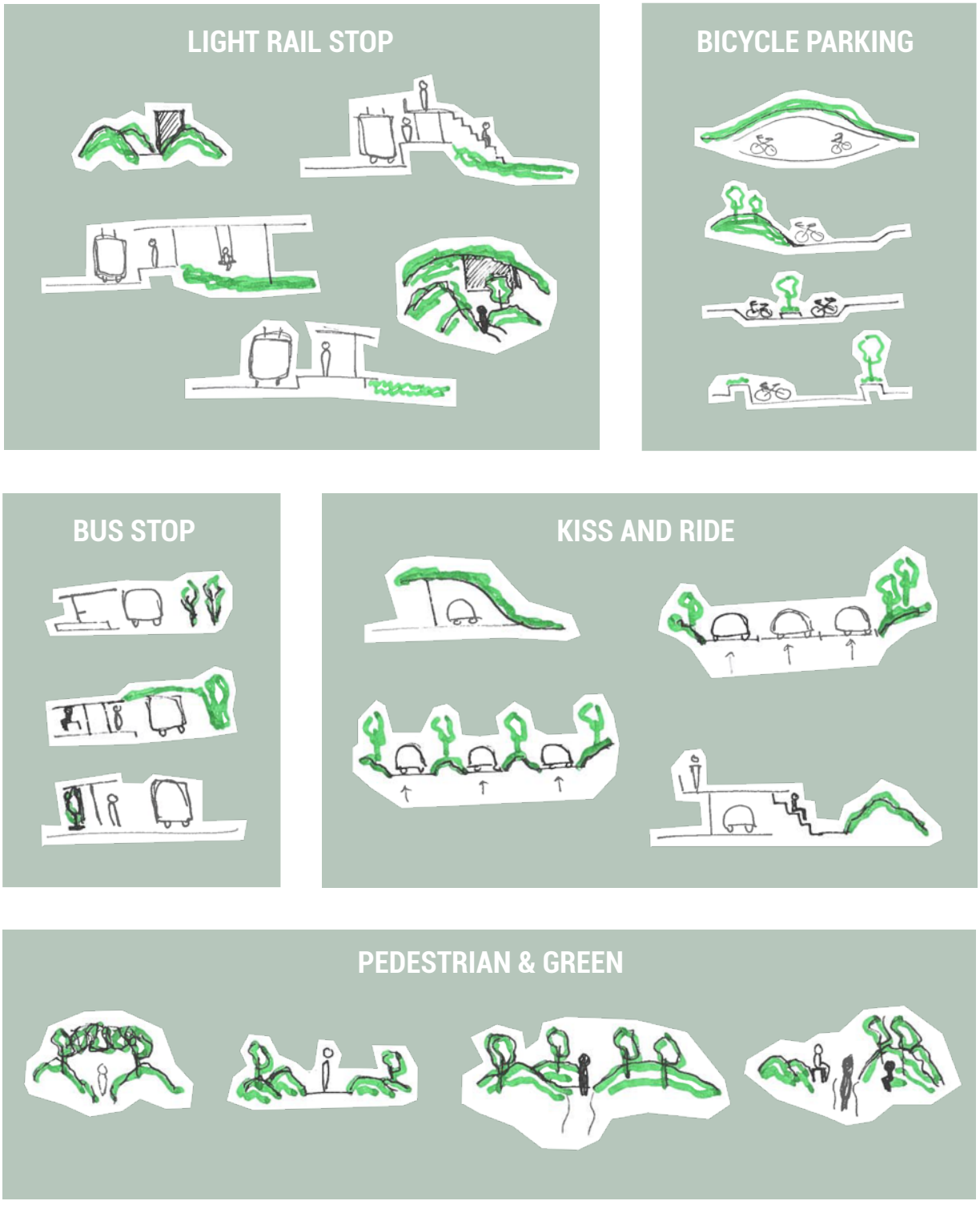
The challenges of introducing bulk green in dense spaces and the corresponding inspiration projects have paved way to the development of 'Green design parameters' to address the aforementioned challenge in the design. As illustrated in ill.57 the 'Green design parameters' focus on creating a feeling of bulk nature in a dense space, thus using wild and local nature, which also require less maintenance, transportation and contribute to branding respectively. Furthermore, creating a natural landscape instead of flat green surfaces to enhance the green spaces and visual appeal, from both within the site and a distance. Finally, creating a contrast between natural and urban environments in an artistic way, such that they highlight each other. These parameters have acted as a decision tool throughout the further design process in designing green spaces.



Ill. 58 *Blooming period of trees (Braner, 2010)*

THE CHOICE OF NATURE

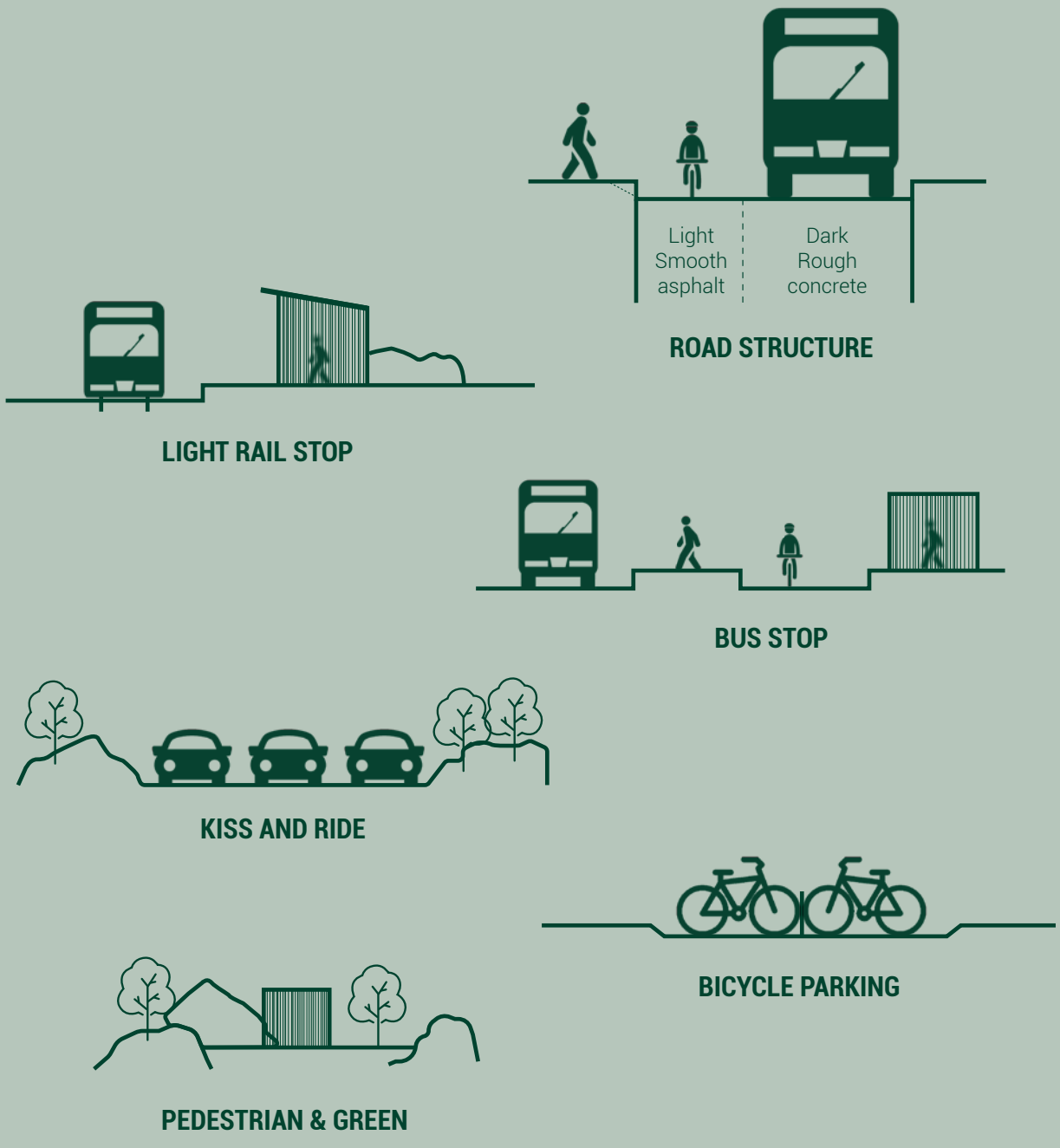
Different trees bloom and defoliate at different times during the year. The illustration ill. 58 shows seven different types of trees, that bloom at varying times for varying periods. The kinds of trees to be used on the site have been chosen such that there is always a presence of greenery on site, even during autumn and winter. This consideration assures the designed site to be as green as possible throughout the year, especially with respect to northern weather. Furthermore, the tree species have been chosen from the nature found in the forest surrounding Aarhus, to relate to the green context of the city, thereby bringing the forest into the urban area.



Ill. 59 *Typology development*

MAKING TYPOLOGIES

Later in the design process, further detailing of the design was done through a typology workshop within the group, which focused on investigating how people meet either with the green or urban environment. The green design parameters were combined with mobility-related functions and various typologies were experimented through sections. The suitable environments were determined for each of the functions and various ways for integration of those functions with their respective environments were visualized as shown in ill. 59.



Ill. 60 *Final typologies*

FINAL TYPOLOGIES

Finally, based on the suitability of the proposed typologies for various functions in relation to the site and design idea, the final typologies were chosen. As represented in ill. 60, the final typologies respect the key aspects of design such as ensuring natural environment for pedestrians, highlighting nature and built spaces, promoting wayfinding, creating safe transit spaces and convenient bicycle parking zones.

MODEL TESTING

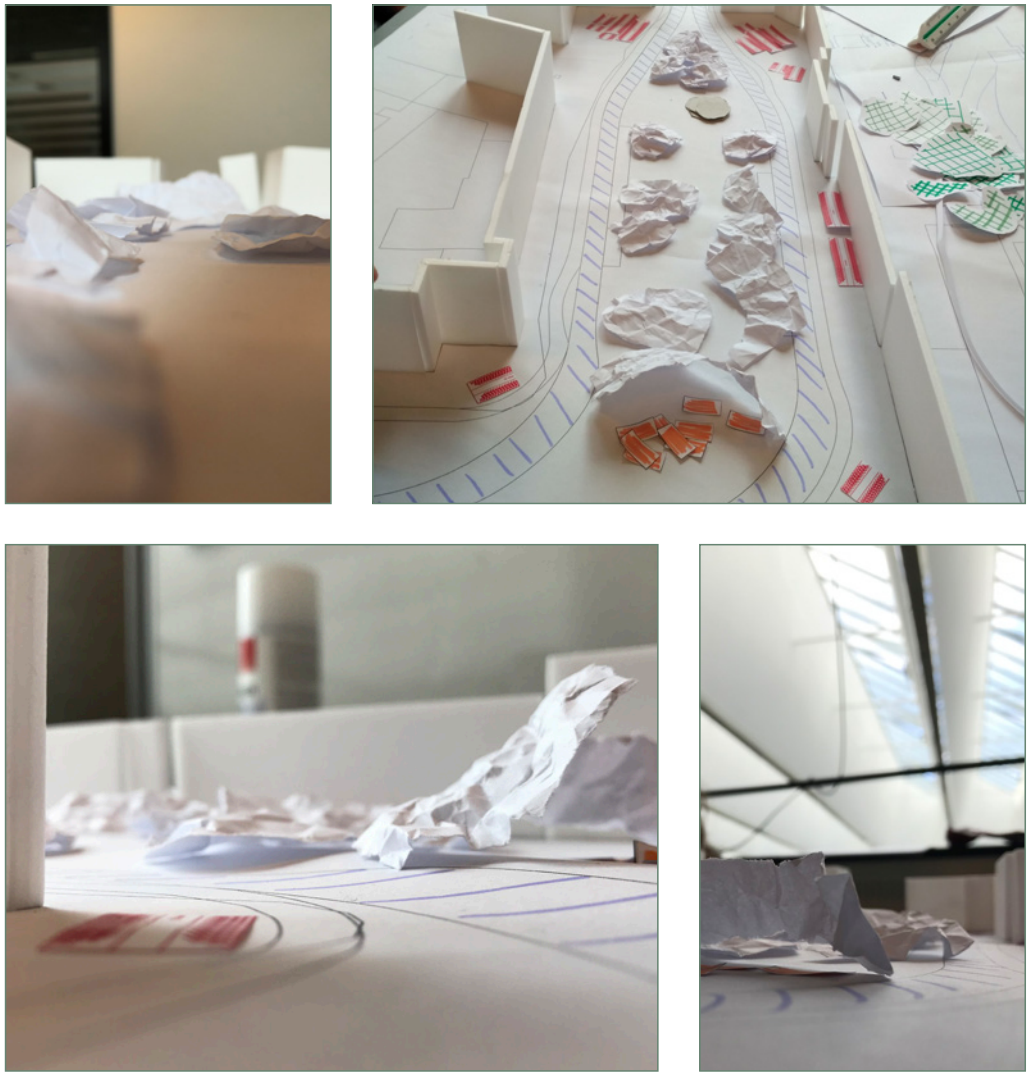
The aim of this group workshop was to design the green islands of the safe zone, around the main pedestrian connections. The same was taken forward in the form of a physical model to understand the space in a spatial manner, due to the complexity of dealing with topography in 2D. Firstly, green islands were tested as flat surfaces and then with levels. This made it clear that contoured landscape for green islands is more effective than the flat green surfaces to create an impression of a natural environment. Further, bicycle parking was also tested with respect to changing shapes of green.

INITIAL TEST WITH 2D SHAPES

Ill. 61 *2D model testing*

However, this method proved to be useful only to some extent, as creating contoured landscape to certain scale was complex and was disproportionate with respect to the human scale. Therefore, the importance of people being able to gain an overall view of the square due to mobility-related functions was realized, which in turn helped in deriving heights for the green landscaped contours. Further, contours were worked on digitally.

FURTHER TESTING WITH 3D SHAPES



Ill. 62 *3D model testing*

OPTION TESTING

The process of testing different options resulted in many ideas for enhancing nature through its shapes. Rounded squares, geometric and organic shapes were tested to assimilate the feeling of nature. Moreover, the relation of the green spaces with the site itself, analysis and context are important to consider. Size is also a matter of concern, because the same needs to relate to the in-between places, movement of pedestrians and mobility.

ENHANCING NATURE THROUGH SHAPE

Ill. 63 *Nature shapes*

OPTIONS FOR PLACEMENT AND SHAPE OF NATURE

GREEN ISLANDS WITH BICYCLE PARKING IN CENTER

MANY VERY SMALL ISLANDS IN A WEB OF PATHS

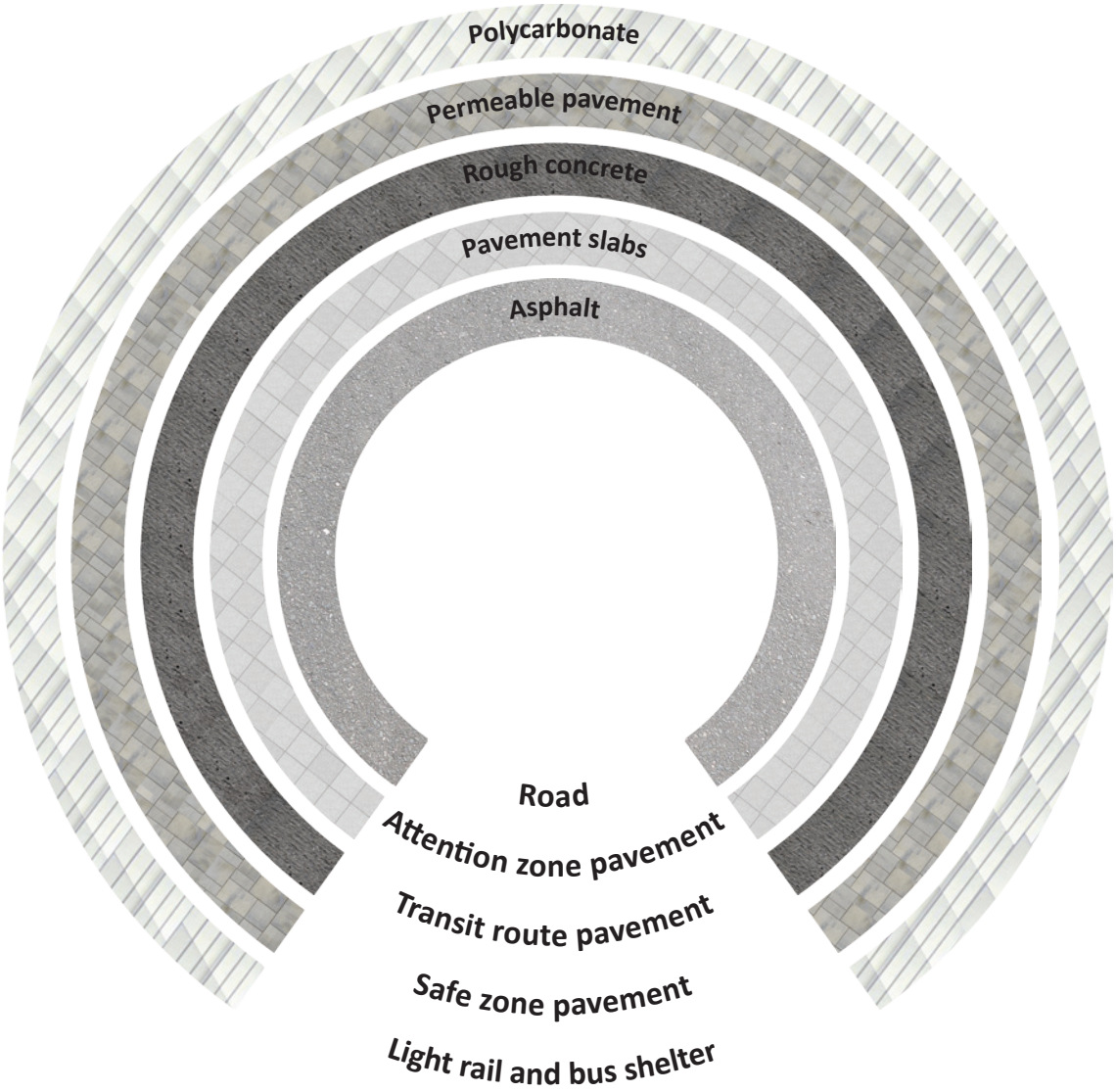
BREAKING THE MAIN PEDESTRIAN PATH IN TWO WITH POND

MAIN PEDESTRIAN PATH AND CENTRAL SQUARE BETWEEN PLATFORMS

BIGGER GREEN CLUSTERS WITH NARROW PATHS

GREEN CENTERPIECE WITH POND FOR RAINWATER

III. 64 *Option testing*

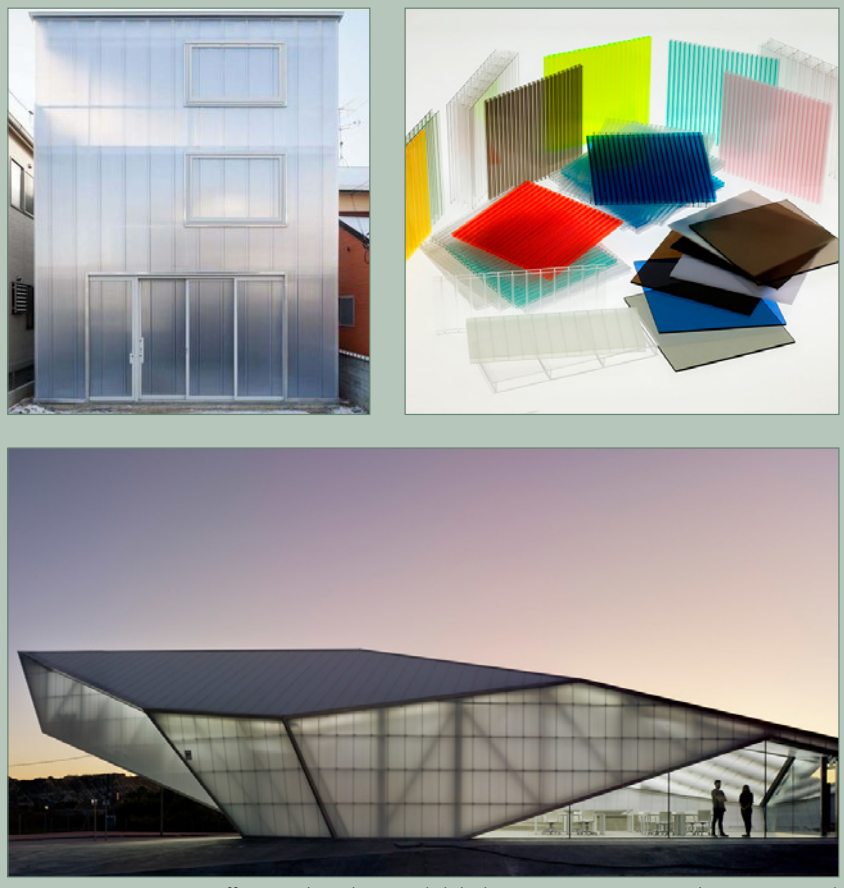


Ill. 65 *Materials (Ireport360, 2018; 123rf, n.d. a; 123rf, n.d. b; York building, n.d.; Eplast, n.d.)*

DIGGING DEEPER

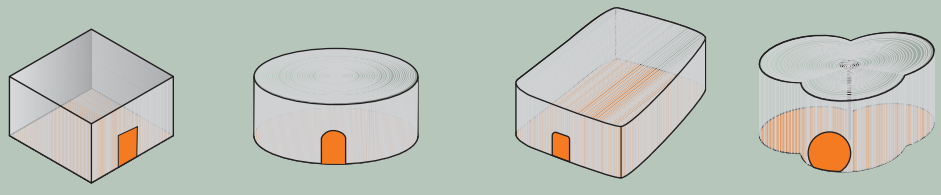
The choice of materials for pavements and built spaces play an important role in the design of mobility hubs. Different zones of the design have been allocated with different pavement materials based on their function. Asphalt has been used for the minimal amount of roads within the site that are mainly used for kiss and ride facilities. The 'attention zone' of the design comprises of a combination of three materials- normal pavement slabs with drain channels for the pedestrian areas, smooth-finished concrete for the bicycle lanes and rough concrete for the transit routes i.e. light rail and bus lane, to prevent cyclists from the adjacent bicycle lane from entering the transit route areas. Furthermore, permeable pavement has been proposed for the 'safe zone' of the design to enable rainwater management for the site locally. Finally, polycarbonate has been chosen as the material for bus and light rail shelters to promote wayfinding for pedestrians and address one of the key design aspects of maintaining a contrast with nature in a way that enhance each other.

A WORLD OF POLYCARBONATE



Ill. 66 *Polycarbonate (Global source, 2019; AGC, n.d.; Frutos, 2018)*

BUS AND LIGHTRAIL SHELTER SHAPE TESTING



Ill. 67 *Shelter shape testing*

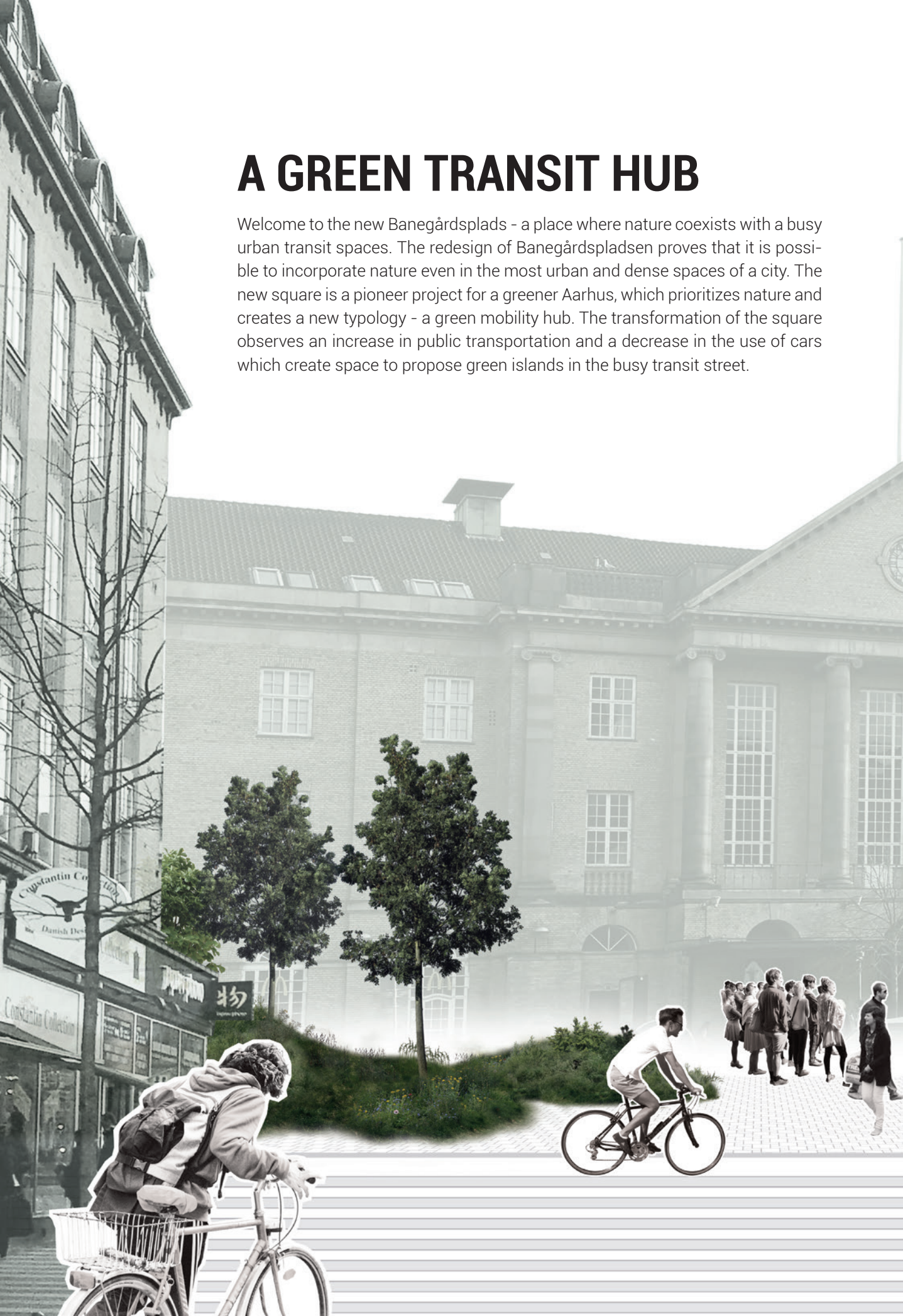
The development of shelters for buses and light rail focused on trying different shapes, playing with polycarbonate as a material to make them a contrast with nature and integrate light into the design. Due to the material, the various shapes would create different effects of light based on the angle of approach. Making the shelters as a contrast to the nature would make them more noticeable while moving through the site, guiding people towards them and thereby giving clarity to where the waiting areas are. The roof is an important element; as the observations showed people wait or take shelter under the station roof, before going to the bus, especially during rains. The same has become a junction for people, thus, creating chaos in small places, e.g. at the entry to the station. By integrating this thought into the design, the chaos can be avoided, and movement of pedestrians can become smoother.

THE NEW STATION SQUARE

Ill. 68 *Presentation collage*

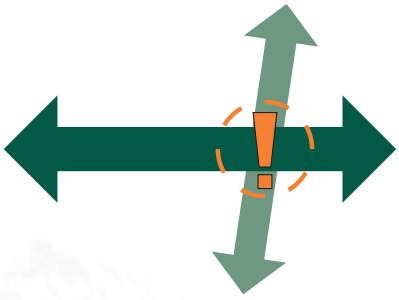
A GREEN TRANSIT HUB

Welcome to the new Banegårdsplads - a place where nature coexists with a busy urban transit spaces. The redesign of Banegårdspladsen proves that it is possible to incorporate nature even in the most urban and dense spaces of a city. The new square is a pioneer project for a greener Aarhus, which prioritizes nature and creates a new typology - a green mobility hub. The transformation of the square observes an increase in public transportation and a decrease in the use of cars which create space to propose green islands in the busy transit street.



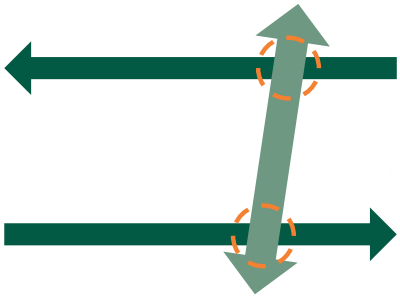
Ill. 69 *Ryesgade render.*

CONCEPT



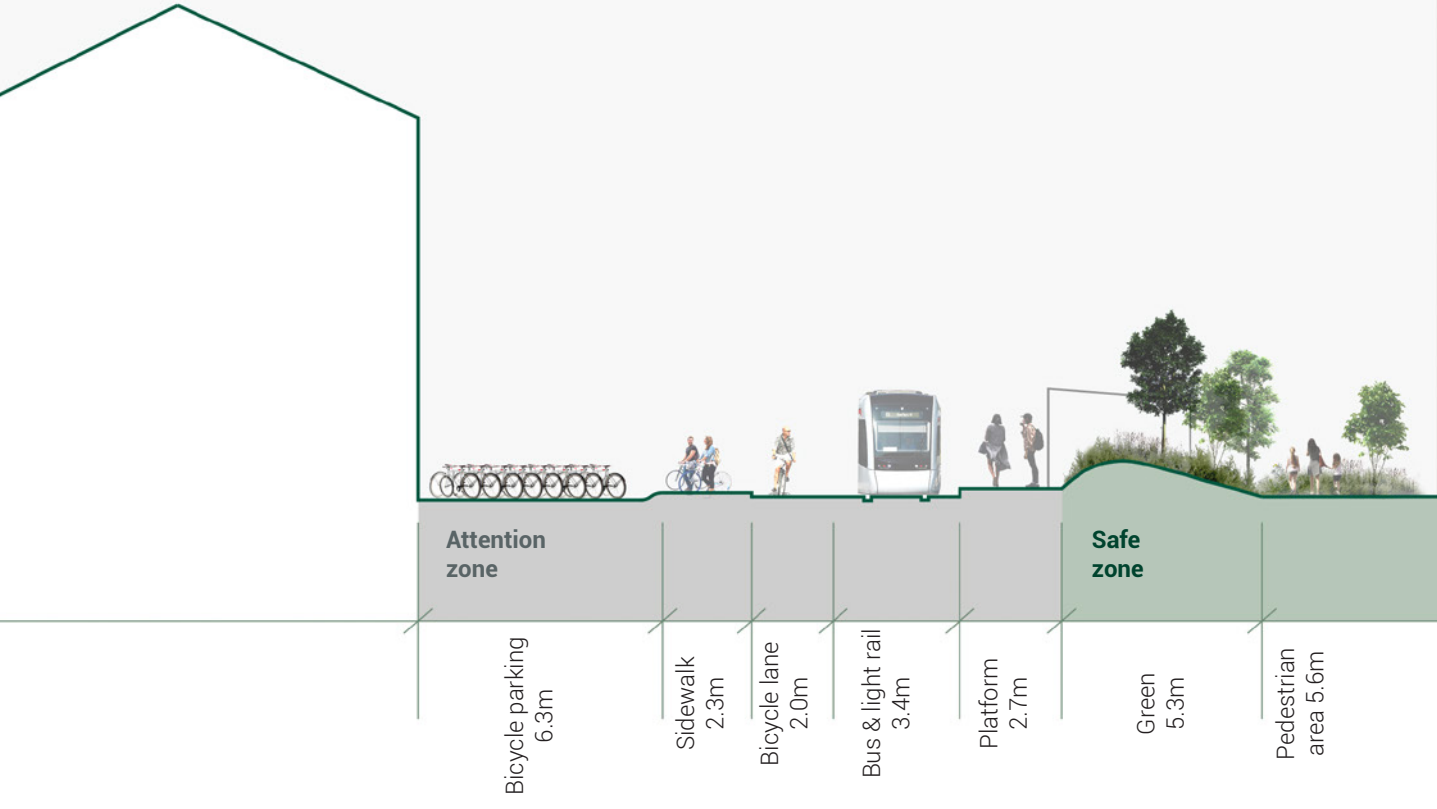
THE MAJOR NODE

The existing transit situation consists of a major node where vehicles and pedestrians come across each other, thus, breaking their corresponding flows.

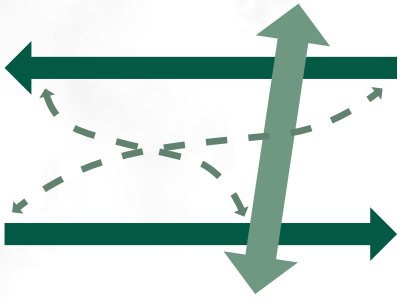


SEPARATING THE NODE

By separating the vehicle road and limiting the use of it, a safer and more convenient crossing is created, where pedestrians cross the traffic only paying attention towards one direction at a time.

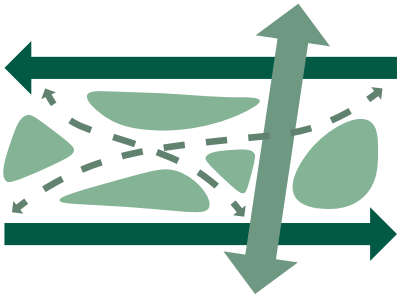


Ill. 70 *Final concept*



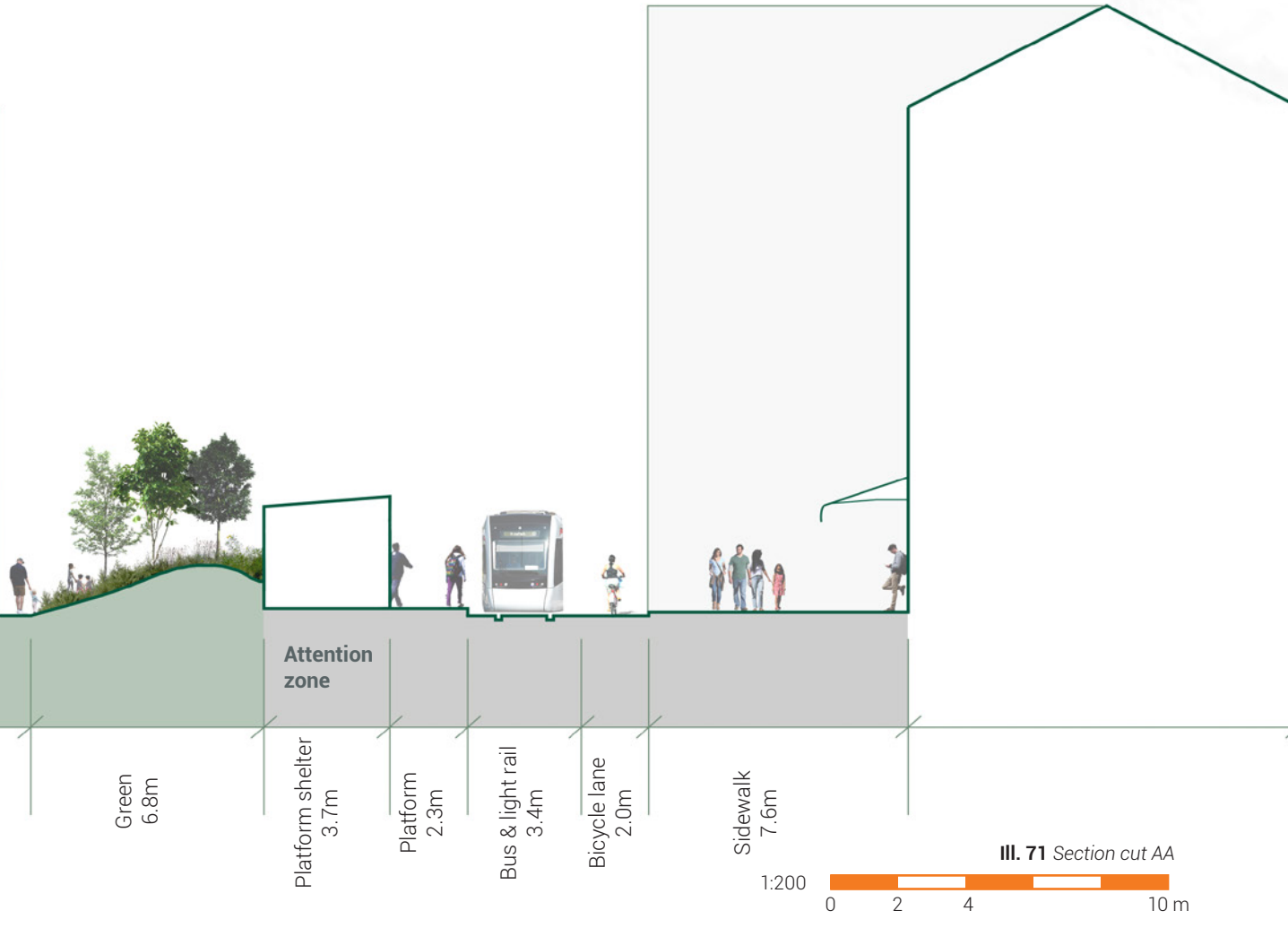
PEDESTRIAN SHORTCUTS

Pedestrian paths corresponding to the shortcuts taken by pedestrians in the current scenario have been created, for convenient movement of the pedestrians and to avoid unsafe situations as seen at the site presently.



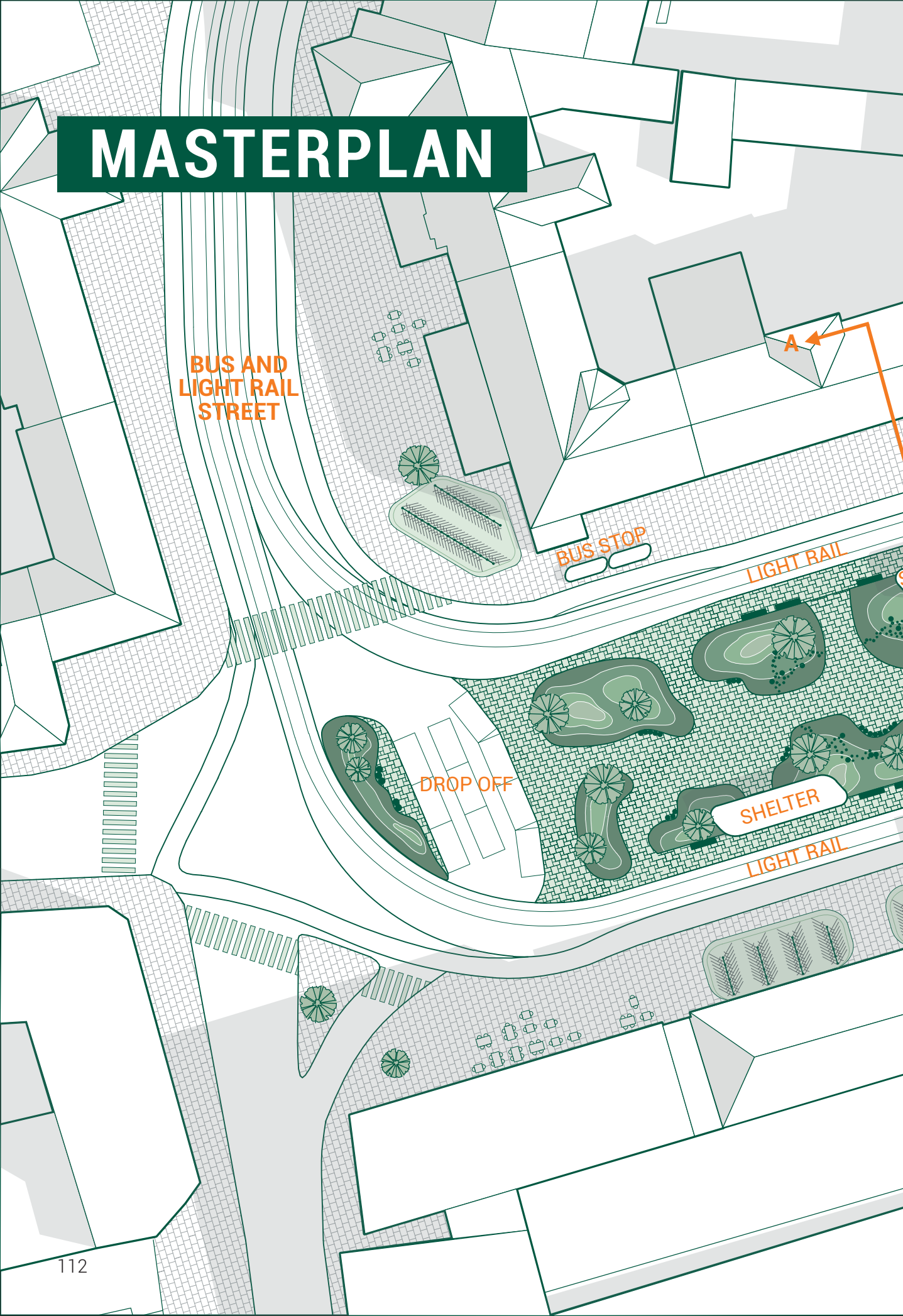
THE GREEN SPACES

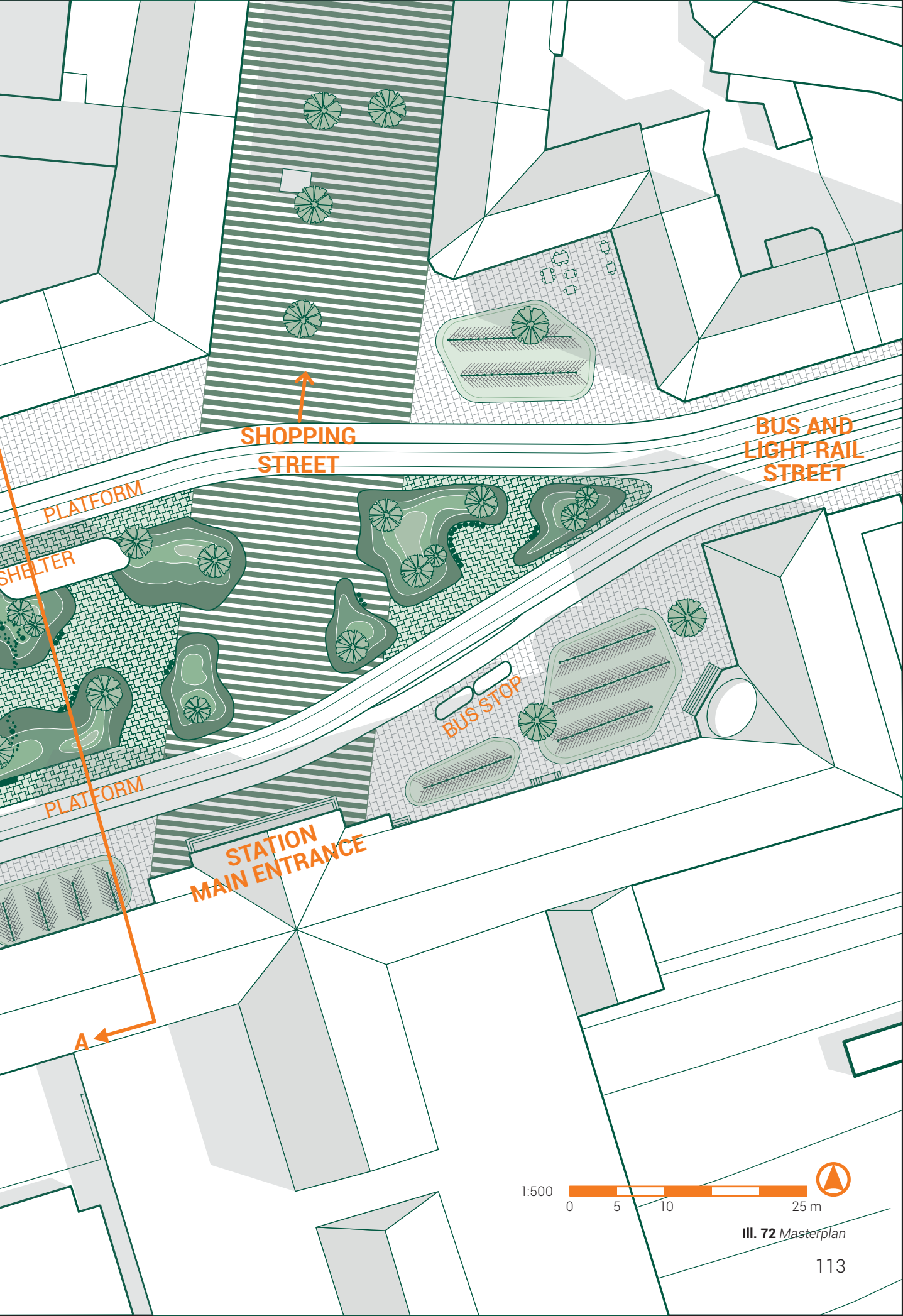
The proposed pedestrian flow lines allow creation of green islands in co-existence with the busy transit street, thus, reflecting the possibility of incorporating nature in dense urban areas.



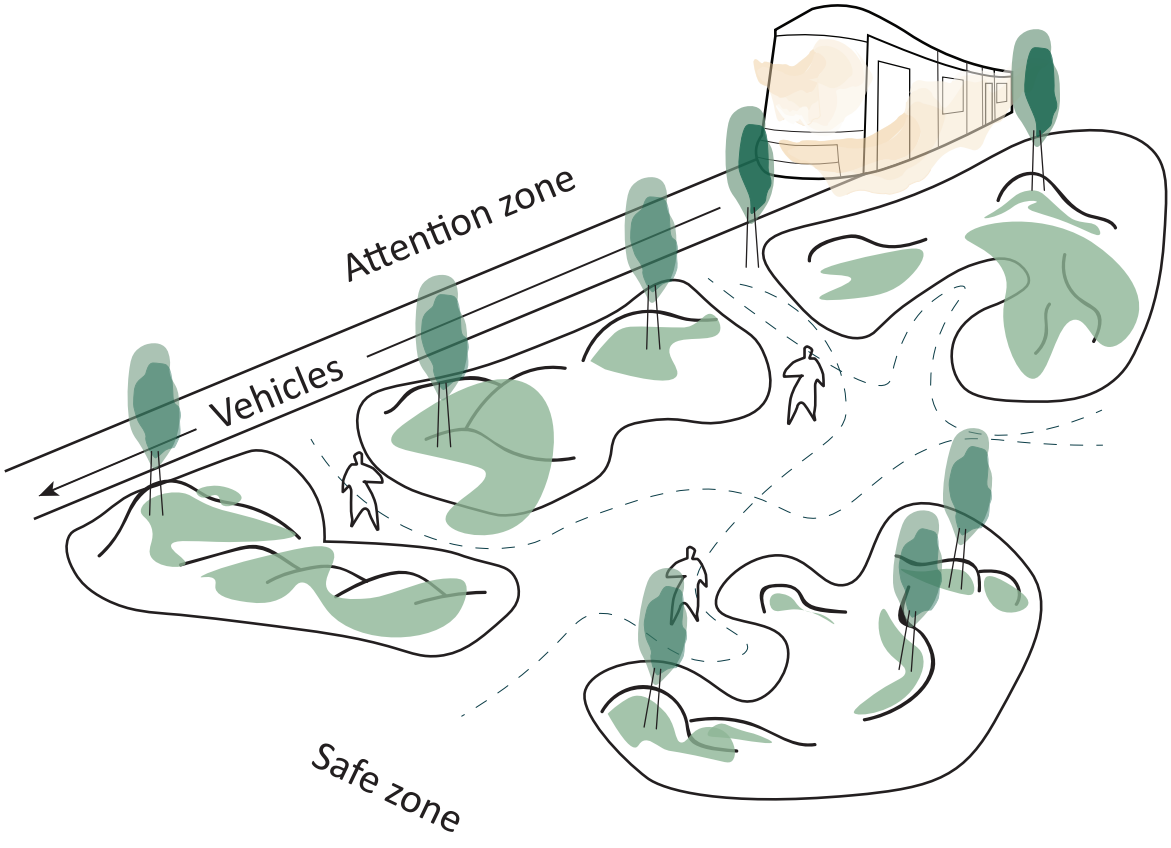
Ill. 71 *Section cut AA*

MASTERPLAN


BUS AND
LIGHT RAIL
STREET
A
BUS STOP
LIGHT RAIL
DROP OFF
SHELTER
LIGHT RAIL



Ill. 72 *Masterplan*

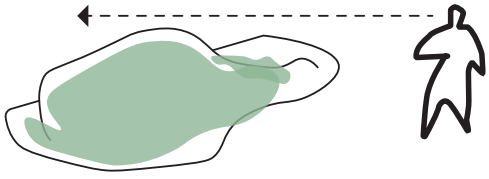


Ill. 73 *The main green mobility principle*

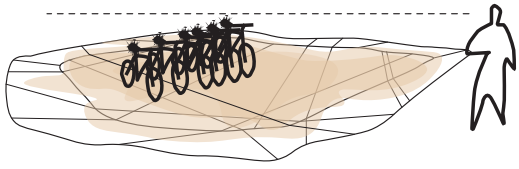
GREEN MOBILITY PRINCIPLES

The main principle is to create a safe transit environment, while integrating nature to grow in a dense urban area. This is achieved by creating a clear flow for vehicles, cyclists, pedestrians in an urban setting and creating pedestrian flows, waiting areas and meeting spaces in a calming natural environment. More principles have been created to highlight nature and ensure a good transit environment, as seen on ill. 74.

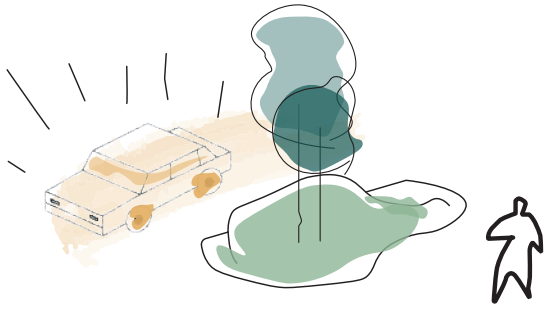
ELEVATED GREEN PROVIDES MORE SQUARE METERS OF NATURE



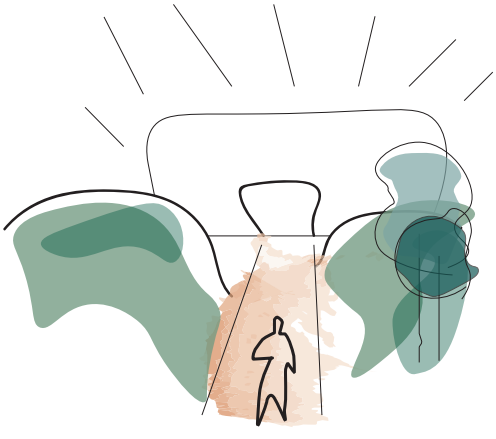
ELEVATIONS IN A HEIGHT THAT STILL ALLOWS VISUAL OVERVIEW OF TRANSIT FUNCTIONS



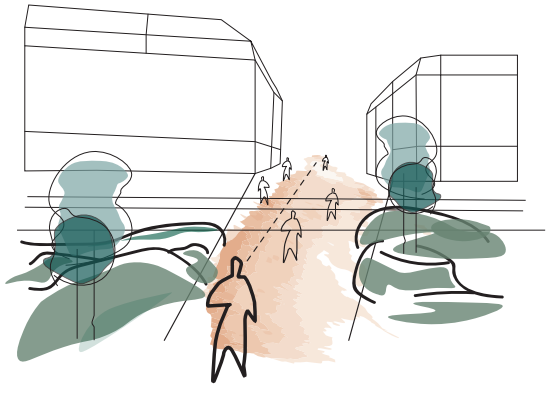
LOWERED BICYCLE PARKING CREATING DESIGNATED PARKING AREAS THAT AVOIDS THE FIELD OF VIEW



ELEVATED ISLANDS THAT PREVENT BAD VIEWS AND NOISE POLLUTION WHILE ALLOWING NEW NOSIS SUCH AS BIRD PEEPS



TRANSIT SHELTERS THAT STANDS OUT IN THE GREEN LANDSCAPE

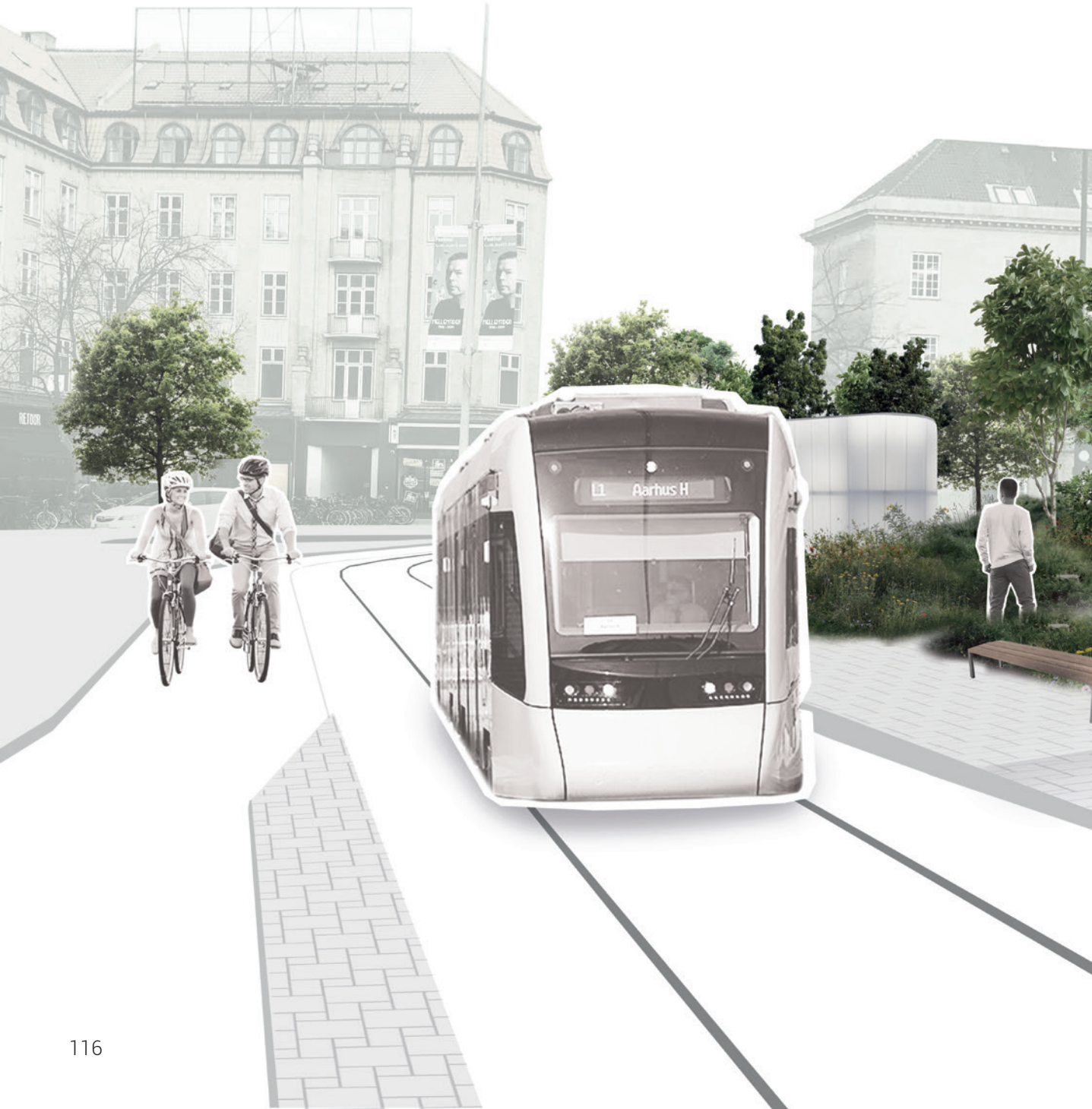


ASSURING A GOOD PEDESTRIAN FLOW SURROUNDED BY A SAFE GREEN ENVIRONMENT

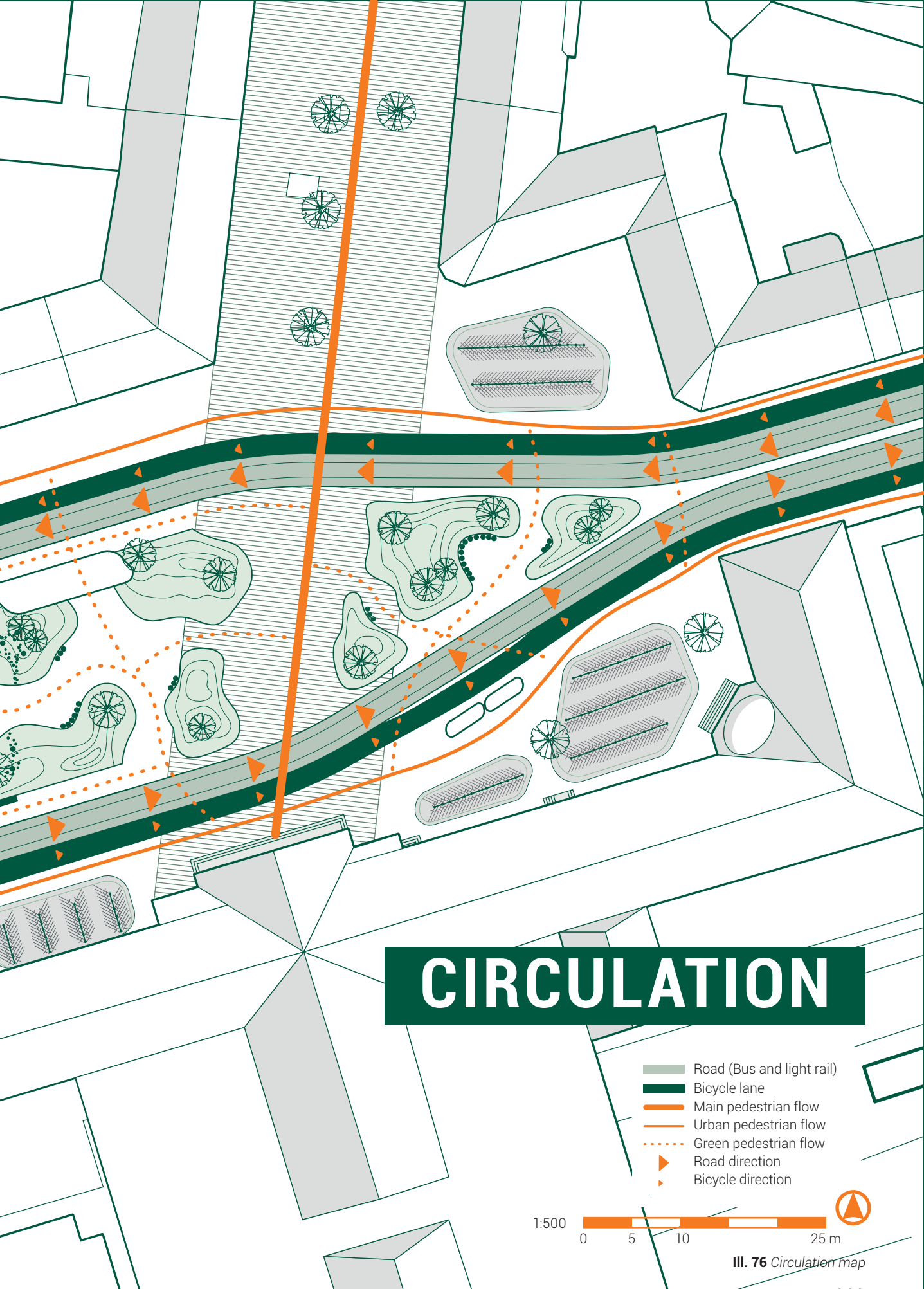
Ill. 74 *Green sub-principles*

A DIVIDED ROAD STRUCTURE

Separating the public transportation lanes based on their direction of flow, allows a safer and easier infrastructure, which results in a more fluid flow of both pedestrians and vehicles. This proves to be efficient with the future amount of vehicles that would pass through the site in the future, as calculated in appendix A, which is 7-11 vehicles per 10 minutes. With this sort of division in vehicular and pedestrian space, a green 'safe zone' is created in the centre of the square, where pedestrians can feel calm and do not have to be alert of the traffic. The urban edge of the square consists of bicycle parking and the seperated road structure with a for buses and light rails, a bicycle lane and a pedestrian path.



Ill. 75 *Road structure render*



Ill. 76 *Circulation map*

POST ANALYSIS

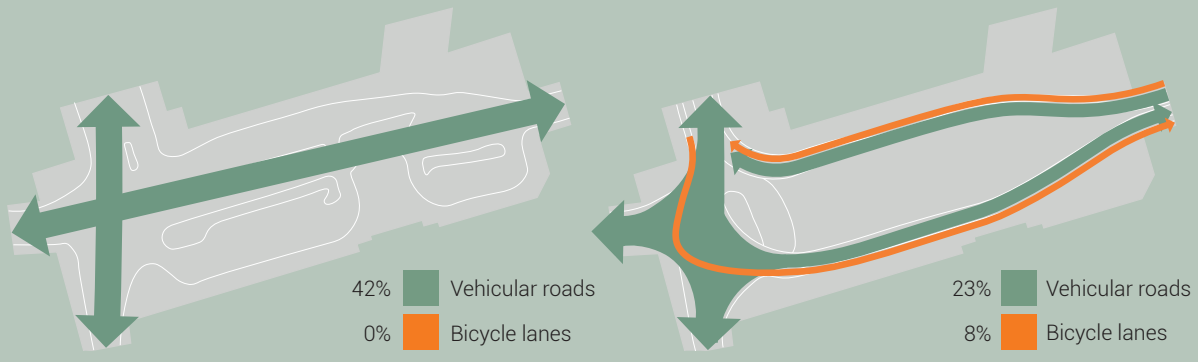
Limited space in the square with an area of 8547 sq.m., makes it necessary to prioritize the very function of the space. Down prioritizing the cars has resulted in a better flexibility. Additionally, the functions have been limited to mobility-oriented ones such as bicycle parking, bus and light rail shelters, so as to provide maximum space for green islands, hence focusing on creating enhanced user experience. The functions of the surrounding buildings have been retained. In the following analysis, existing and proposed conditions highlight the priorities of the design proposal with respect to the existing scenario.

EXISTING CONDITIONS

PROPOSED CONDITIONS

ROADS

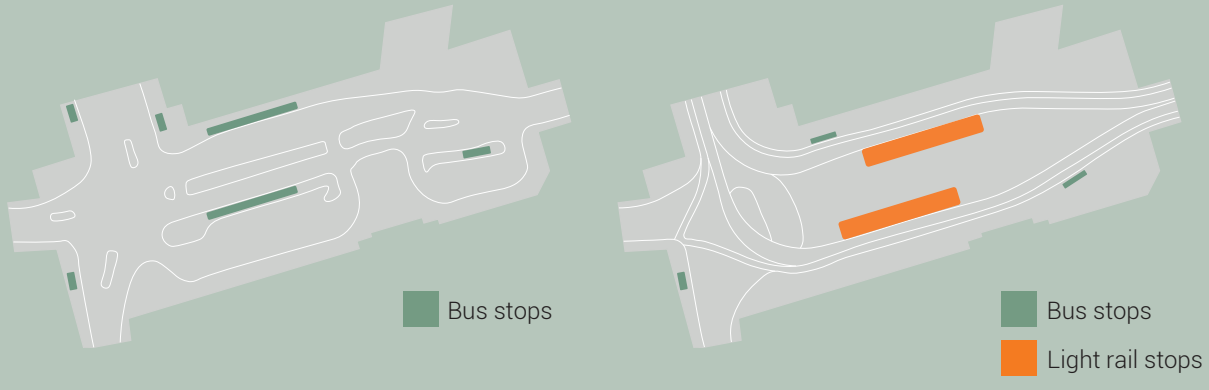
Today, 6900 cars cross the square daily. The roads have been optimized by removing cars and merging the light rail and bus lanes into one. It also results in providing space for a dedicated bicycle lane, making a safer environment for cyclists, instead of having to share the lane with heavy vehicles.



III. 77 *Road conditions*

BUS AND LIGHT RAIL STOPS

1100 buses pass through the square daily, which demand multiple bus stops. The proposed changes include a light rail taking over parts of the bus routes, therefore resulting in halved number of buses. The light rail platforms are located centrally in the square for easy access and visibility.



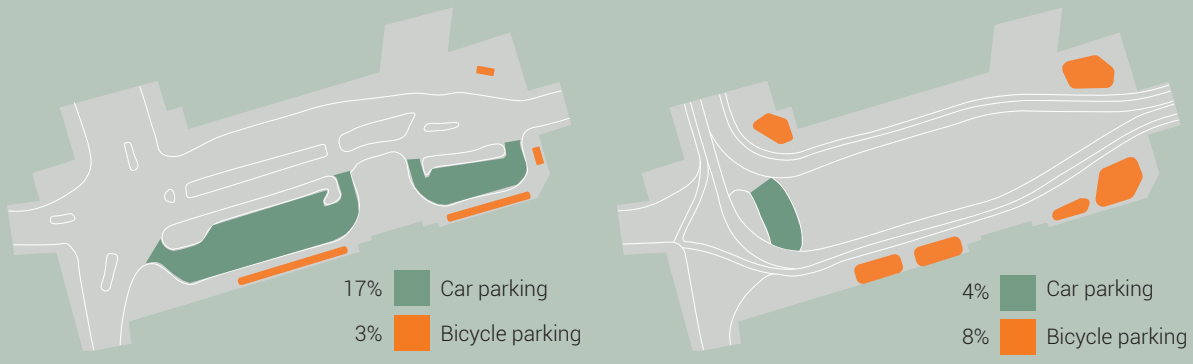
III. 78 *Bus and light rail stops*

EXISTING CONDITIONS

PROPOSED CONDITIONS

PARKING

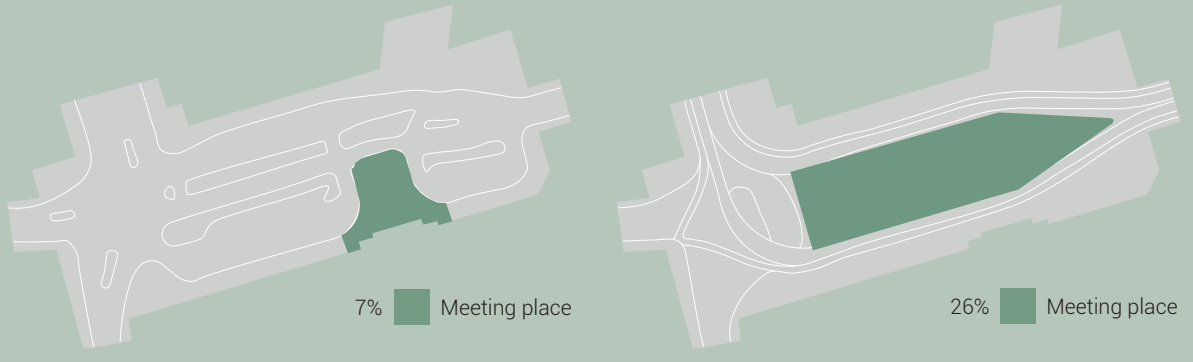
Currently, car parking takes up 17% of the area, while the proposal consists of a minor drop off area. Also, current bicycle parking is limited which leads to messy clusters. The proposed bicycle parking have designated areas located for easy access, with space for 617 bicycles.



Ill. 79 *Parking conditions*

MEETING PLACES

Today, a small square is located right outside the station. The functions are mainly transit, waiting for people and smoking. In the proposed design, the square has been increased in size and shifted from the entrance, which also creates a better access to the station.



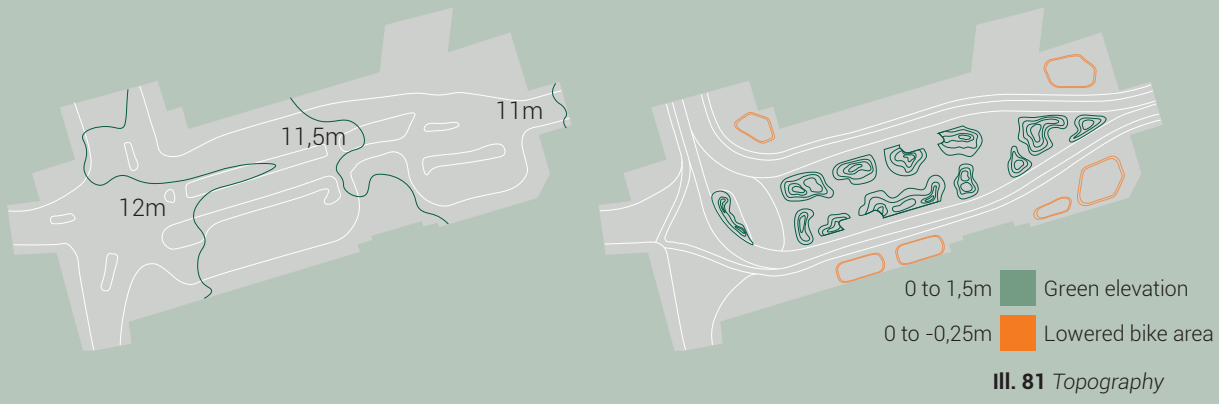
Ill. 80 *Meeting places*

EXISTING CONDITIONS

PROPOSED CONDITIONS

TOPOGRAPHY

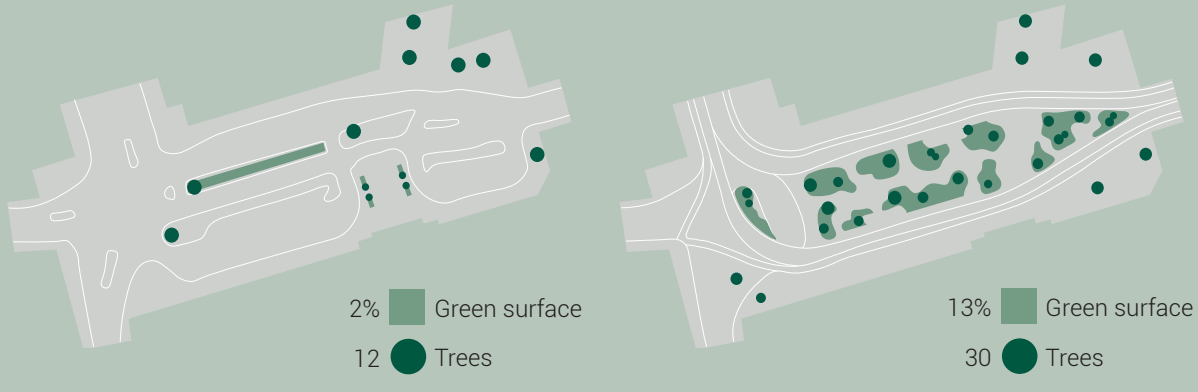
A flat urban landscape is changed into a contoured green environment allowing more plants to grow on lesser space, creating a natural looking environment and securing plants from being trampled on. Bicycle parking have been lowered for clarity on their location.



III. 81 *Topography*

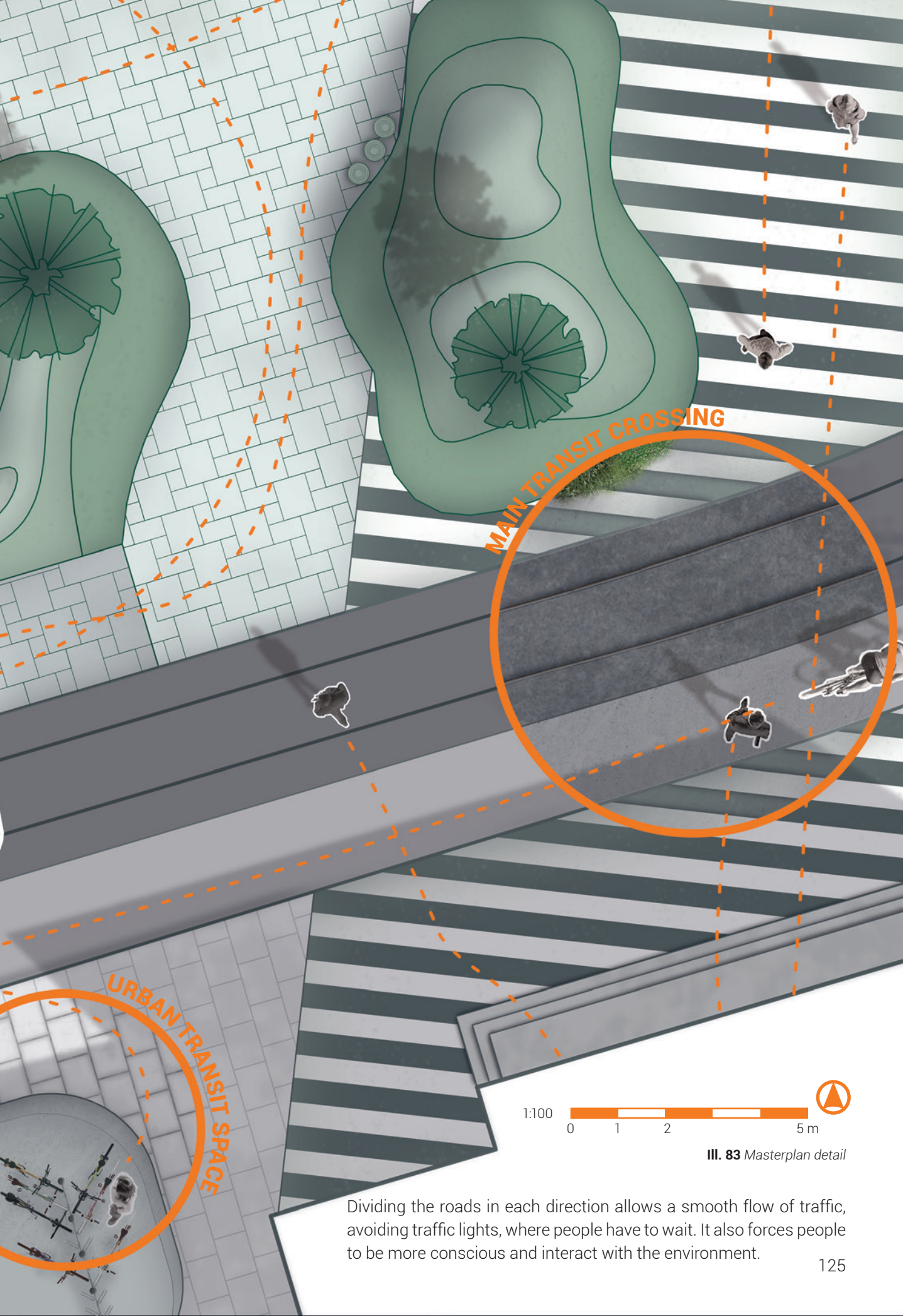
GREEN

Presently, there is very limited green on the square, while in the proposal, nature plays a huge role in representing the identity of the square. A dense green area with hills and trees has been created in a rather compact square, creating a greater visual impact of nature.



III. 82 *Green*

MASTERPLAN DETAIL



Ill. 83 *Masterplan detail*

Dividing the roads in each direction allows a smooth flow of traffic, avoiding traffic lights, where people have to wait. It also forces people to be more conscious and interact with the environment.

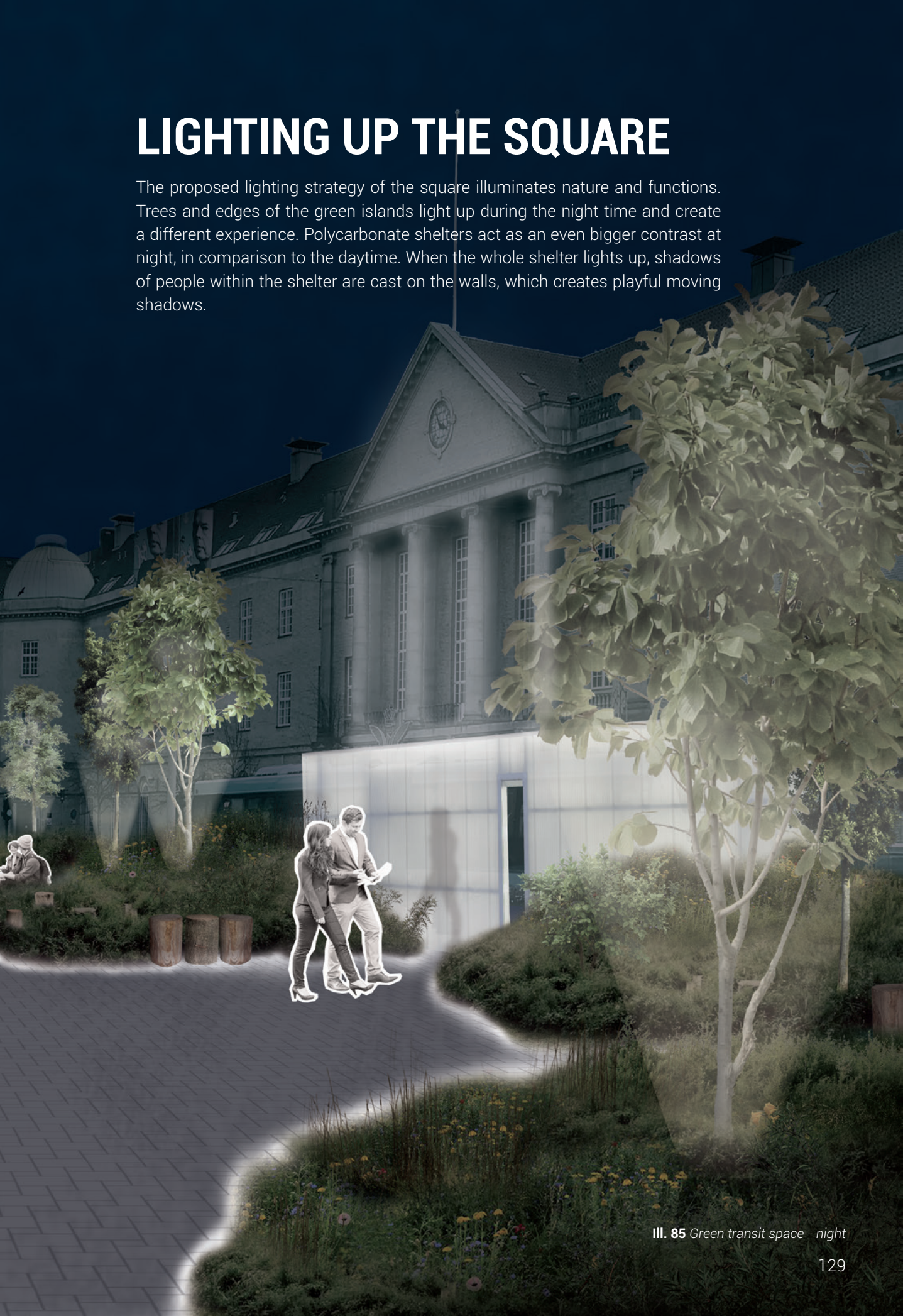
GREENER CONNECTIONS

In the 'safe zone' of the square, a park like atmosphere has been created. Room for transit, stay and areas to explore nature through stepping stones while waiting for the bus, light rail or train have been created. Waiting shelters composed of polycarbonate, highlight important infrastructural functions such a light rail and bus stops, and also create an artistic relation to the nature that reflect Aarhus focus on art.

Ill. 84 *Green transit space - day*

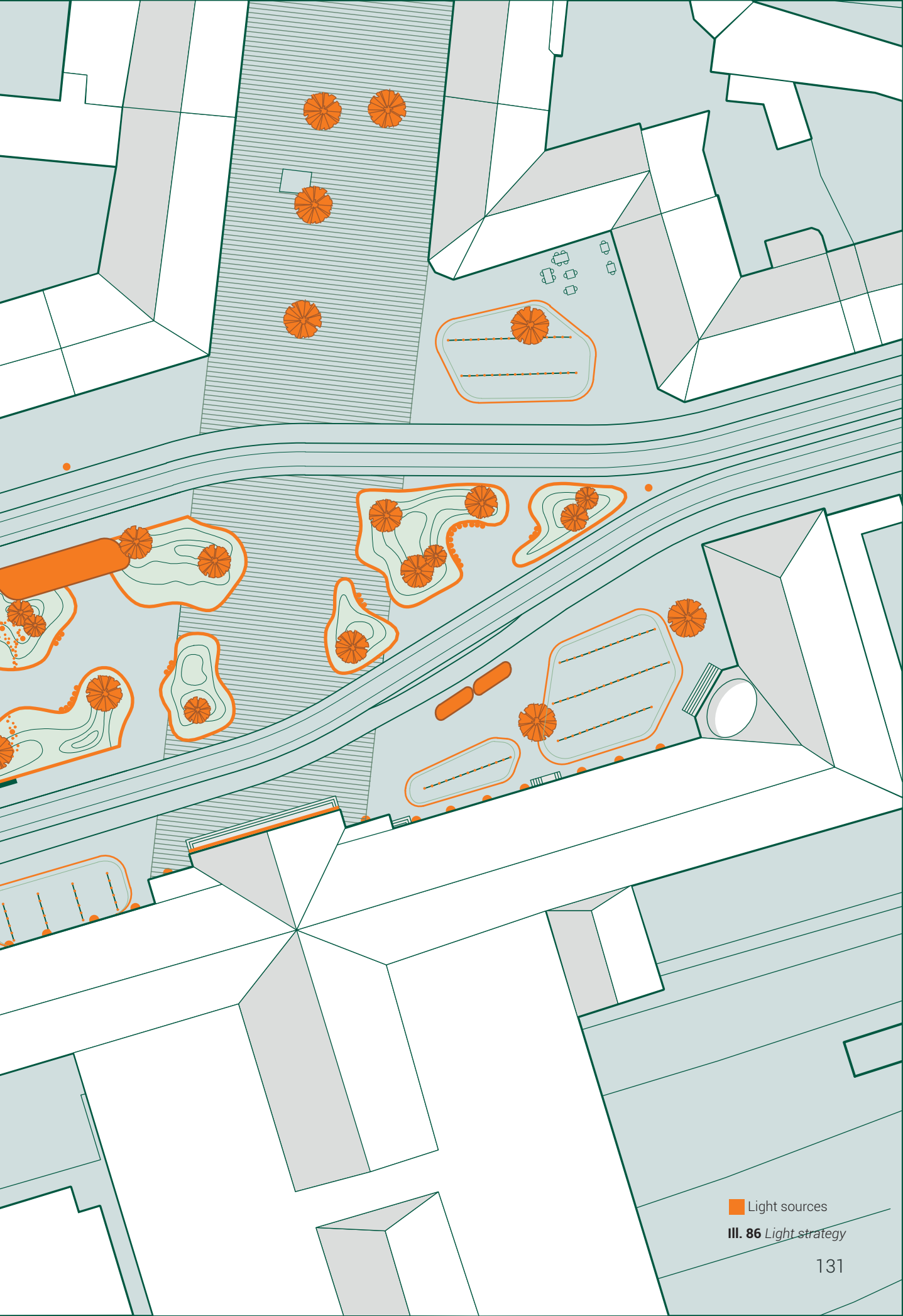
LIGHTING UP THE SQUARE

The proposed lighting strategy of the square illuminates nature and functions. Trees and edges of the green islands light up during the night time and create a different experience. Polycarbonate shelters act as an even bigger contrast at night, in comparison to the daytime. When the whole shelter lights up, shadows of people within the shelter are cast on the walls, which creates playful moving shadows.



Ill. 85 *Green transit space - night*

LIGHTING STRATEGY



Ill. 86 *Light strategy*

EPILOGUE

CONCLUSION

Rapid urbanization and population growth have led to increase in the demand for cars over the years. For decades, cars have reigned over city's streets and it has been presumed that the very purpose of the streets is to move vehicles in a safe and efficient manner, which has influenced the pattern of city development towards a car-oriented perspective. Same is the case with Aarhus Banegårdsplads, where vehicular roads dominate the mobility hub, with minimal space allocated to bicyclists and pedestrians. Therefore, it can be said that Banegårdspladsen performs only as a functional element. Through the study of mobility scenario locally and globally, it has been realized that mobility is more than A to B, and that there is a need to go ahead of traditional ways of designing them. It has been deduced that mobility is primarily about people, and streets, mobility corridors and hubs are more than just thoroughfares. This is where the 'Living Streets' concept comes into play, which emphasizes that streets are public spaces in themselves and thus, making streets for everyone and not predominantly for one kind of user.

The project aims at challenging the conventional ways of designing mobility landscapes by applying the 'Living Streets' concept and exploring the potential of such spaces to re-create the city's identity. Therefore, the redesign of Aarhus Banegårdsplads revolves around introducing public realm in the form of green, to combine the benefits associated with both aspects, thus, addressing issues at multiple scales ranging from a human scale in health and sociability terms to a global scale in terms of urbanization and ecological imbalance. This sort of an approach towards designing ensures creation of more liveable, sustainable, resilient and people-oriented space.

In further detail, the various aspects such as mobility, flows and green have been worked on simultaneously for better integration, since they are interlinked and interdependent. Thus, explaining the creation of green islands in the street through a 'safe zone' and 'attention zone' in the square. The detailing of green spaces in the 'safe zone' use wild and local nature, in a contoured manner to give an impression of co-existence of nature in a busy urban setting. Moreover, the 'attention zone' address various modes such as light rail, buses, bicycles and pedestrians carefully, for instance, through attention to pavement strategy. Overall, the design proposal enhances the experience of the mobility hub users, brands the city, and sets an example for the world as a pioneer project of a greener and sociable mobility hub.

REFLECTION

The project is associated with the redesign of a mobility hub with the theme 'Green City'. Although these aspects are usually perceived to be opposite, their amalgamation enables the exploration of creating a co-existence between urban and nature. There might be many interesting outcomes for such a combination, however, the focus on creating a bulk natural environment bordered by mobility-oriented functions from initial stages might have restricted further experimentation with use of other elements. While many group workshops were conducted in relation to transit functions, holding workshops related to experimenting further with other design elements and functions would have expanded the horizon.

The design proposal addresses issues at multiple levels, at both human scale and global scale in terms of sociability, urbanization, ecological imbalance etc., which is necessary when designing for a +10-year scenario with respect to the current global trends. But the question arises if the design is flexible enough for a +10-year plan in relation to the local context. For instance, if the square can handle the increase in population of the coming years, if the uncertainty between light rail and Bus Rapid Transit (BRT) can be taken care of, if the proposed design can accommodate BRT system instead of light rail. Although, the very design might not accommodate the BRT system, the same principle of designing 'attention zone' and 'safe zone' and the way of integrating green islands may be applied for the same.

In further detail regarding the design process, although the green spaces were tested in a physical model, it proved to be helpful only to a certain extent in understanding that the heights of landscaped contours must be below the human eye level for gaining an overall view of the space due to the very function of the square. Instead, visualizing and testing the green spaces digitally with the help of 3D programmes would have been more beneficial to understand the space. Additionally, further experimentation with forms of bus and light rail shelters, materials could have been useful to strengthen the detailed design. Furthermore, to address the climate changes and ecological imbalance, steps such as use of permeable surfaces have been implemented. However, more measures such as re-use of collected rainwater and lowering of certain areas to slow down surface run-off could have been taken to enhance the sustainability quotient of the site and contribute to addressing the global issues. Despite certain lack in further detailing, the overall emphasis on revitalizing Aarhus Banegårdsplads through the 'Living Streets' approach by reinforcing a 'green' public realm ensures creation of more liveable, sustainable, resilient and people-oriented space.

LITERATURE LIST

A better city (2016), A guide to placemaking for mobility, Available at: https://www.abettercity.org/docs-new/Guide_to_Placeminaking_for_Mobility.pdf (Accessed: 04-04-2019)

Aarhus Kommune (2014) Forundersøgelse Letbaneetape Brabrand - Aarhus Ø. [Online]. Available at: https://www.letbanen.dk/media/146086/a039858_002_01_forundersoegelse-aarhus-h-brabrand_60.pdf (Accessed: 21/5-2019)

Aarhus Kommune (2017) Hovedstrukturen [PDF]. Available at: http://reader.livedition.dk/aarhuskommune/835/html5/ (Accessed 20-03-2019)

Aarhus Kommune (2017) Kommuneplan - Hovedstrukturen [Online] Available at: http://reader.livedition.dk/aarhuskommune/835/html5/ (Accessed: 22-05-2019)

Aarhus Kommune (2018) Fortællingen om Aarhus [Online] Available at: https://aarhus.dk/media/16234/aarhusmaal-og-aarhusfortaelling-2018-2021.pdf (Accessed: 22-05-2019)

Aarhus Kommune (2018) Køretøjer pr. Døgn. [Online] Available at: http://vej08.vd.dk/komse/nytui/komse/komSe.html?noegle=1390782556&fbclid=IwAR1KcfxEUeqYMHEz6IwLC9MwAYdrXvGrCmy6ZZSsDO8hrKAQ1RBUIZHhOMw (Accessed 21-03-2019)

Aarhus Kommune (2019) Befolkning i alt i Aarhus Kommune opgjort på demografi [Online]. Available at: https://ledelsesinformation.aarhuskommune.dk/aarhus-i-tal/default.aspx?doc=vfs://Global/Befolkning-antal.xview (Accessed 21-03-2019)

Aarhus Kommune (2019) Ønsk et træ [Online] Available at: https://aarhus.dk/demokrati/politikker-og-planer/natur-og-miljoe/onsk-et-trae/#2 (Accessed: 22-05-2019)

Aarhus Stadsarkiv (2017) Aarhus Hovedbanegård [Online]. Available at: https://aarhuswiki.dk/wiki/Aarhus_Hovedbaneg%C3%A5rd (Accessed 21-03-2019)

Aarhus.dk (2018) Fortællingen om Aarhus [Online]. Available at: https://aarhus.dk/media/16234/aarhusmaal-og-aarhusfortaelling-2018-2021.pdf (Accessed: 18-04-2019)

Aarhus2017.dk (2017) Om Aarhus 2017 [Online]. Available at: http://www.aarhus2017.dk/da/om-os/hvad-er-aarhus-2017/om-aarhus-2017/index.html (Accessed 22-04-2019)

Bain, Lesley (2012), et al. Living Streets: Strategies for Crafting Public Space, John Wiley & Sons, Incorporated, (2012), Available at: ProQuest Ebook Central, http://ebookcentral.proquest.com/lib/aalborguniv-ebooks/detail.action?docID=817501 (Accessed: 22-04-2019)

Bylivsindex (2019) The train station square [Print] Available at: Addendum

C.F. MØLLER (2018) C.F Møller architects og MT Højgaard vil dække Aarhus' banegrav til med bilfri by [Online]. Available at: https://www.cfmoller.com/r/-da/C-F-Moeller-Architects-og-MT-Hoejgaard-vil-daekke-Aarhus-banegrav-til-med-bilfri-by-i17814.html (Accessed 20-03-2019)

COBE (n.d.) Nørreport Station [Online]. Available at: http://cobe.dk/project/norreport-station#0 (Accessed 30-05-2019)

Cullen, G. (1961) Casebook: Serial vision. [Online] Available at: http://www.arch.ttu.edu/people/faculty/ellis_c/ARCH4000/Cullen,%20Townscapes.pdf (Accessed 04-06-2019)

Dr.dk (2017) FN: Inden 2030 er Jordens befolkning vokset med en milliard mennesker [Online] Available at: https://www.dr.dk/nyheder/udland/fn-inden-2030-er-jordens-befolkning-vokset-med-en-milliard-mennesker (Accessed: 22-05-2019)

Dr.dk (2019) Vi bygger det væk - Naturen ind i byerne [Online] Available at: https://www.dr.dk/tv/se/vi-bygger-det-vaek/vi-bygger-det-vaek-2/vi-bygger-det-vaek-naturen-ind-i-byerne-3-4#!/00:28:15 (Accessed: 22-05-2019)

Farvernes betydning (nd) Farven grøn [Online] Available at: https://www.farvernesbetydning.dk/farven-gron/ (Accessed: 22-05-2019)

Fink, H (2003) Et mangfoldigt naturbegreb [Online] Available at: https://www.byplanlab.dk/sites/default/files/Et_mangfoldigt_naturbegreb_Fink.pdf (Accessed: 22-05-2019)

Fischer, M. et al (2016), Letbaner på strækninger. [Online]. Available at: http://www.vejdirektoratet.dk/DA/vejsektor/vejregler-og-tilladelser/vejregler/h%C3%B8ringer/Documents/H%C3%B8ringer%202016/H%C3%B8ringsudgave_HB%20letbaner%20p%C3%A5%20str%C3%A6kninger.pdf (Accessed 30-04-2019)

Green LA coalition (2012), The Living Streets Initiative, Available at: https://livingstreetsla.wordpress.com/ (Accessed: 22-04-2019)

Healthy Spaces & Places (2009), Design Principle – Parks and Open Space, Available at: https://www.healthyplaces.org.au/userfiles/file/Parks%20and%20Open%20Space%20June09.pdf (Accessed: 18-03-2019)

Højholt, M (2019) Interview at Aarhus municipality 25/2-2019.
https://smartgrowthamerica.org/program/national-complete-streets-coalition/publications/what-are-complete-streets/ (Accessed: 22-04-2019)

Jensen, O. B. (2013) Staging Mobilites, London: Routledge
Jensen, O. B. (2019), On the move: on mobile agoras, networked selves and the contemporary city, in Z. Krajina & D. Stevenson (eds.) (2019) The Routledge Urban Media Companion, London: Routledge (IN PRESS)

Jessen, C. (2016) Aarhus, Danmarkshistorien.dk [Online]. Available at: http://danmarkshistorien.dk/leksikon-og-kilder/vis/materiale/aarhus/ (Accessed: 20-03-2019)

Knudstrup, M. (2004) The integrated Design Process IDP. A more holistic approach to sustainable architecture. [Online] Available at: https://vbn.aau.dk/ws/portalfiles/portal/1624830The_Integrated_Design_Process__IDP____A_more_holistic_approach_to_sustainable_architecture (Accessed 04-06-2017)

Lynch, K. (1960) The image of the city. [Online] Available at: http://www.miguelangelmartinez.net/IMG/pdf/1960_Kevin_Lynch_The_Image_of_The_City_book.pdf (Accessed 04-06-2019)

Mobility between movement, meaning and practice - Tim Cresswell (2014) YouTube video, added by Forum Vies Mobiles/ Mobile lives Forum (online), Available at: https://www.youtube.com/watch?v=EXo0g-dlVvNU&t=241s (Accessed: 21-05-2019)

Mostafavi, M. and Doherty, G. 2016, Ecological Urbanism (Revised edition), Harvard University, Graduate School of Design, Lars Müller Publishers

Project for Public Spaces (n.d.), What makes a successful place? Available at: https://www.pps.org/article/grplacefeat (Accessed: 18-03-2019)

Rodrigue, J-P et al. (2017) The Geography of Transport Systems, Hofstra University, Department of Global Studies & Geography, Available at: https://transportgeography.org (Accessed: 20-05-2019)

Smart Growth America (2015), What are complete streets? Available at: https://smartgrowthamerica.org/program/national-complete-streets-coalition/publications/what-are-complete-streets/ (Accessed: 22-04-2019)

Stiften.dk (2018) Folk er ikke i tvivl: Aarhus er og bliver Smilets By [Online]. Available at: https://stiften.dk/aarhus/Folk-er-ikke-i-tvivl-Aarhus-er-og-bliver-Smilets-By/artikel/496360 (Accessed: 18-04-2019)

Vejdirektoratet (2016) 15 m bus (BUS 15). [Online]. Available at: http://www.vejdirektoratet.dk/DA/vejsektor/vejregler-og-tilladelser/vejregler/Sider/K%C3%B8rekurver.aspx (Accessed 30-04-2019)

VisitAarhus.dk (n.d.) Aarhus' historie [Online]. Available at: https://www.visitaarhus.dk/danmark/vikinger/aarhus-historie (Accessed: 22-04-2019)

Visitdenmark.dk (n.d.) Aarhus - Explore Denmark's happiest city! [Online]. Available at: https://www.visitdenmark.com/east-jutland/art/aarhus-explore-denmarks-happiest-city

Webgisaarhus (n.d.) Bygninger og deres bevaringsværdier. [Online] Available at: http://webgis.aarhus.dk/kommuneatlas/index.htm (Accessed 03-06-2019)

Willacy, S (2019) Presentation at Aarhus municipality 25-02-2019.

Wind, S. (2019). Info meeting with Simon Wind from Aarhus Municipality.

ILLUSTRATION LIST

Ill. 1 Jakobsen, D. B. (2019) 36 timer i Aarhus (som studerende har råd til) [Online]. Available at: http://kontekst.it/36-timer-aarhus-studerende-har-raad/ (Accessed 02-06-19)

Ill. 2 Ryolf, P. (2008) Århus Rådhus [Online]. Available at: https://www.flickr.com/photos/per ryolf/15857006152 (Accessed 02-06-19)

Ill. 3-5 Own illustrations

Ill. 6 Larsen, N. (2006) Aarhus Strøget. [Online] Available at: https://en.wikipedia.org/wiki/Ryesgade,_Aarhus?fbclid=IwAR0Ug_xtoOw-NNP_QWGlw13FDr8JMfjX0fAlbIbPk5MlJoiLcTxDOSqN7IY#/media/File:AArhusStroget.jpg (Accessed 03-06-2019)

OpdagDanmark (n.d.) Aarhus central food marked. [Online] Available at: https://www.opdagdanmark.dk/oplevelser/aarhus-central-food-market/?fbclid=IwAR1pwHpn0U1LBV93QFFxyo-sZYMp9BtEOatUq4sXZH6xcLUSC17Wd09XL-k (Accessed 03-06-2019)

Baarsch, G (2011) Forår i Aarhus. [Online] Available at: https://gittebaarsch.blogspot.com/2011/04/forar-i-arhus.html?fbclid=IwAR3UFNCRMe4O9_2P42HRFnvIegqYLy57jPaRQzdsLw-wgIGHAYtrbKmAxbk (Accessed 03-06-2019)

Aarhuslokalavisen.dk (2019) Tyvetogt i Bruuns Galleri: Rumænere med 'russerpose' smidt ud af landet. [Online] Available at: http://aarhus.lokalavisen.dk/112/2019-01-16/Tyvetogt-i-Bruuns-Galleri-Rum%C3%A6nere-med-russerpose-smidt-ud-af-landet-3948306.html (Accessed 03-06-2019)

Laursen, D (n.d.) Aarhus station busterminal. [Online] Available at: https://mapio.net/wiki/Q12300335-da/?fbclid=IwAR3ag2NSXe2Bur4GGJwdy7sbQUlJtVffH9oSJfXPsPa6ppmq9YxcM0GemyM (Accessed 03-06-2019)

Ill. 7 'Jesper' (2011) Aros er godt for øjnene [Online]. Available at: http://hjemmegodt.blogspot.com/2011/09/aros-er-godt-for-jnene.html (Accessed 02-06-19)

Ill. 8-9 Own illustrations

Ill. 10 Stiften.dk (2018) Folk er ikke i tvivl: Aarhus er og bliver Smilets By [Online] Available at: https://stiften.dk/aarhus/Folk-er-ikke-i-tvivl-Aarhus-er-og-bliver-Smilets-By/artikel/496360 (Accessed: 18-04-2019)

Ill. 11 Wind, S. (2019) Info meeting with Simon Wind from Aarhus Municipality.

Ill. 12 Aarhus billeder (nd, a) Banegårdspladsen 1972. [Online] Available at: https://aarhusbilleder.dk/catalog/Aarhus/r/25768/viewmode=infoview/qsr=baneg%C3%A5rdspladsen (Accessed 27-05-2019)

Aarhus billeder (n.d., b) The train wagon, erected by the youth clan 1972. [Online] Available at: https://aarhusbilleder.dk/catalog/Aarhus/r/7762/viewmode=infoview/qsr=baneg%C3%A5rdspladsen (Accessed 27-05-2019)

Aarhus billeder (n.d., c) Banegårdspladsen 1981. [Online] Available at: https://aarhusbilleder.dk/catalog/Aarhus/r/43424/viewmode=infoview/qsr=baneg%C3%A5rdspladsen (Accessed 27-05-2019)

Aarhus billeder (n.d., d) The rail station seen from Banegårdsgade 1963. [Online] Available at: https://aarhusbilleder.dk/catalog/Aarhus/r/25762/viewmode=infoview (Accessed 27-05-2019)

Aarhus billeder (n.d., e) Banegårdspladsen 1932. [Online] Available at: https://aarhusbilleder.dk/catalog/Aarhus/r/14050/viewmode=infoview (Accessed 27-05-2019)

Aarhus billeder (n.d., f) The railway station facing Banegårdsgade and Park Allé 1951. [Online] Available at: https://aarhusbilleder.dk/catalog/Aarhus/r/32781/viewmode=infoview (Accessed 27-05-2019)

Ill. 13-21 Own illustrations

Ill. 22 Bylivsindex (2019) The train station square [Print] Available at: Addendum

Ill. 23-26 Own illustrations

Ill. 27 Bagger, H. (2017) Odense har plan for at undgå letbane-bommert [Online]. Available at: https://www.dr.dk/nyheder/regionale/fyn/odense-har-plan-undgaa-letbane-bommert (Accessed 02-06-19)

Ill. 28 Aarhus kommune (2018). Mobilitets plan, Aarhus midtby. [Online] Available at: https://aarhus.dk/media/7839/mobilitetsplan-aarhus-midtby.pdf (Accessed 02-04-2019)

Ill. 29 Tai, W. (2004) Better lean to ease up on that comfort zone space. Pedestrians and bicyclist share the road with cars and buses. [Online] Available at: http://www.wilsontai.com/shanghai/ (Accessed 22-05-2019)

Rediff (2013) The problems pedestrians face in Indian cities. [Online] Available at: https://www.rediff.com/business/slide-show/slide-show-1-special-the-problems-pedestrians-face-in-indian-cities/20130620.htm#5 (Accessed 22-05-2019)

Ill. 30 Aarhusbyarkiv (n.d., a) Aarhus Banegård, 1862 [Online]. Available at: http://aarhusbyarkiv.dk/gamlebilleder/ls-0011.jpg (Accessed 27-05-2019)

Aarhusbyarkiv (n.d., b) Guldsmedgade 1902 [Online]. Available at: http://aarhusbyarkiv.dk/gamlebilleder/ls-0132.jpg (Accessed 27-05-2019)

Vognstyrer (n.d. Aarhus sporvogne [Online]. Available at: http://www.vognstyrer.dk/Sporvogne/AaS/Vogne/Motorvogne/16/16.htm (Accessed 28-05-2019)

Aarhusbyarkiv (n.d., c) Aarhus Banegård, 1890 [Online]. Available at: http://www.aarhusbyarkiv.dk/gamlebilleder/ls-0105.jpg (Accessed 27-05-2019)

TV2 Østjylland (2017) Åbningen af Letbanen udskudt. Sikkerheden ikke godkendt [Online]. Available at: https://www.tv2ostjylland.dk/artikel/aabningen-af-letbanen-i-aarhus-er-udskudt (Accessed 28-05-2019)

Jacobsen, L. (n.d.) That's life [Online]. Available at: http://larsjakobsen.com/category/by/page/2/ (Accessed 28-05-2019)

Evp (n.d.) Aarhus letbane [Online]. Available at: http://evp.dk/index.php?page=aarhus-letbane---aal (Accessed 29-05-2019)

Ill. 31 Midttrafik.dk (n.d.) Letbanens køreplaner [Online]. Available at: https://www.midttrafik.dk/koreplaner/letbanen/letbanens-koreplaner/ (Accessed 30-04-2019)

Wind, S. (2019). Info meeting with Simon Wind from Aarhus Municipality.

Bylivsindex (2019) The train station square [Print] Available at: Addendum

Ill. 32 Wikipedia (2019) List of parks in Aarhus [Online]. Available at: https://en.wikipedia.org/wiki/List_of_parks_in_Aarhus (Accessed 02-06-19)

Ill. 33 Aarhus Kommune (2017) Kommuneplan - Hovedstrukturen [Online] Available at: http://reader.livedition.dk/aarhuskommune/835/html5/ (Accessed: 22-05-2019)

Ill. 34 The Sawon (2014) EWHA Womens University Korean Language Program Review [Online]. Available at: http://thesawon.blogspot.com/2014/01/ewha-womens-university-korean-language.html (Accessed: 21-05-19)

SLA (n.d.) Reinvent Paris [Online]. Available at: https://www.sla.dk/dk/projects/reinventparis/ (Accessed: 21-05-19)

Awad, A. (2018) Højhuse beklædt med skov renser luften i Milano [Online]. Available at: https://www.bolius.dk/hoejhuse-beklaedt-med-skov-renser-luften-i-milano-48643/ (Accessed 21-05-19)

EFFEKT (2018a) Helsinge Haveby – Village of Tomorrow [Online]. Available at: https://www.effekt.dk/hno (Accessed 21-05-19)

Highways-USA (2014) The High Line - grøn bypark i 3. Sals højde på Lower West Side [Online]. Available at: https://highways-usa.com/new-york-city-high-line/ (Accessed 21-05-19)

EFFEKT (2018b) Regen Villages [Online]. Available at: https://www.effekt.dk/regenvillages (Accessed 21-05-19)

Tredje Natur (n.d. a) Omdannelse af Åboulevarden [Online]. Available at: https://www.tredjenatur.dk/portfolio/omdannelse-af-aaboulevard/ (Accessed: 21-05-19)

Wanderers & warriors (2018) Gardens by the bay + light show Singapore [Online]. Available at: https://wanderersandwarriors.com/gardens-by-the-bay-light-show/ (Accessed: 21-05-19)

Tredje Natur (n.d. b) Vinge [Online]. Available at: https://www.tredjenatur.dk/portfolio/vinge/ (Accessed: 21-05-19)

Ill. 35 Aarhus Kommune (2019) Ønsk et træ [Online]. Available at: https://webkort.aarhuskommune.dk/spatialmap?page=minimap2.showmap&id=76103892-e26a-4bb4-9141-8e3e498d7e6f&version=2.7https://webkort.aarhuskommune.dk/spatialmap?page=minimap2.showmap&id=76103892-e26a-4bb4-9141-8e3e498d7e6f&version=2.7 (Accessed 22-05-19)

Ill. 36 Allsup, D. (n.d.) Rotterdam: Europe's hottest design destination [Online]. Available at: https://www.cntraveller.com/gallery/rotterdam-netherlands (Accessed 29-05-19)

Ill. 37-38 Own illustrations

Ill. 39 National Street Service (n.d. a) #2 Good street form embraces the human scale [Online]. Available at: http://www.ourlivingstreets.com/good-streets/#human-scale (Accessed 29-05-19)

National Street Service (n.d. c) #5 Good street form invites participation [Online]. Available at: http://www.ourlivingstreets.com/good-streets/#participation (Accessed 29-05-19)

Allsup, D. (n.d.) Rotterdam: Europe's hottest design destination [Online]. Available at: https://www.cntraveller.com/gallery/rotterdam-netherlands (Accessed 29-05-19)

Living streets (n.d.) Living Streets - Make the city of tomorrow visible today ! [Online]. Available at: http://www.energy-cities.eu/spip.php?page=living_streets (Accessed 29-05-19)

National Street Service (n.d. b) Good Mobility [Online]. Available at: http://www.ourlivingstreets.com/good-mobility/#shared (Accessed 29-05-19)

Smart Growth America (n.d.) Complete Streets Case Studies [Online]. Available at: https://smartgrowthamerica.org/tag/complete-streets-case-studies/ (Accessed 29-05-19)

Ill. 40 UTM (2017) What Makes a Successful Place? – Project for Public Spaces [Online]. Available at: https://people.utm.my/lylai/2017/05/25/what-makes-a-successful-place-project-for-public-spaces/ (Accessed 23-05-19)

Ill. 41-45 Own illustrations

Ill. 46 Schonherr (n.d., a). Pladsen – Aarhus festuge 2014. [Online] Available at: http://schonherr.dk/projekter/2949-2/ (Accessed 02-06-2019)

Schonherr (n.d., b). Med skoven som nabo – Aarhus festuge 2010. [Online] Available at: http://schonherr.dk/projekter/skoven-nabo-aarhus-festuge-2010/ (Accessed 02-06-2019)

Schonherr (n.d., c). Byparken – Aarhus festuge 2012. [Online] Available at: http://schonherr.dk/projekter/byparken-aarhus-festuge-2012/ (Accessed 02-06-2019)

Ill. 48 ArchDaily (2011) Teshima Art Museum / Ryue Nishizawa [Online]. Available at: https://www.archdaily.com/151535/teshima-art-museum (Accessed 30-05-19)

Benesse Art Site Naoshima (n.d.) Teshima Art Museum [Online]. Available at: http://benesse-art-site.jp/en/art/teshima-artmuseum.html (Accessed 30-05-19)

Baan, I. (2010) Teshima Art Museum [Online]. Available at: https://www.domusweb.it/en/architecture/2010/12/09/teshima-art-museum.html (Accessed 30-05-19)

Ill. 49 COBE (n.d., e). Integrated bicycles hills. [Online] Available at: http://www.cobe.dk/project/karen-blixens-plads#3556 (Accessed 02-06-2019)

COBE (n.d., f). Karen Blixens Plads. [Online] Available at: http://www.cobe.dk/project/karen-blixens-plads#2862 (Accessed 02-06-2019)

COBE (n.d., g).Multifunctional roof. [Online] Available at: http://www.cobe.dk/project/karen-blixens-plads#2874 (Accessed 02-06-2019)

Ill. 47 COBE (n.d., a). Main flow lines of people. [Online] Available at: http://cobe.dk/project/norreport-station#1822 (Accessed 27-05-2019)

COBE (n.d., b). Nørreport. [Online] Available at: http://cobe.dk/project/norreport-station#3835 (Accessed 27-05-2019)

COBE (n.d., c). Nørreport at night. [Online] Available at: http://cobe.dk/project/norreport-station#3839 (Accessed 27-05-2019)

COBE (n.d., d). Bikes. [Online] Available at http://cobe.dk/project/norreport-station#3840 (Accessed 27-05-2019)

Ill. 50 Own illustration

Ill. 51 Aarhus Kommune (2014) S202-Alt 'Forundersøgelse' (Obtained from Simon Wind, Aarhus municipality)

Ill. 52-55 Own illustrations

Ill. 56 Saatchi art (n.d.) Mirrorhouse sculpture by Ekkehard altenburger [Online]. Available at: https://www.saatchiart.com/print/Sculpture-Mirrorhouse/325253/1807494/view (Accessed 02-06-2019)

Visitcopenhagen (n.d.) Superkilen [Online] Available at: https://www.visitcopenhagen.dk/da/copenhagen/superkilen-gdk707822 (Accessed 03-06-2019)

Tutik, A. (n.d.) Pretty Japanese bonsai front yard for spring [Online]. Available at: https://decorhead.com/2019/01/16/42-pretty-japanese-bonsai-front-yard-for-spring/pretty-japanese-bonsai-front-yard-for-spring-25/#main (Accessed 02-06-2019)

Muñoz, O. (2017) Casa Verne / Zeller & Moye [Online]. Available at: https://www.archdaily.com/868211/casa-verne-zeller-and-moye?ad_medium=gallery (Accessed 03-06-2019)

Quddus, S. (2014) Olafur Eliasson creates an indoor riverbed at Danish museum [Online]. Available at: https://www.archdaily.com/540338/olafur-eliasson-creates-an-indoor-riverbed-at-danish-museum/ (Accessed 02-06-2019)

Gardiner, R. (2019) Activities of looking : in conversation Linda Tegg [Online]. Available at: https://www.thisispublicparking.com/single-post/2018/12/17/Activities-of-looking-in-conversation-Linda-Tegg?fbclid=IwAR3ircADGW-I-6rdUVQhGioDNT5STkv82t-8zy0rKvcoV11y9vj-VA-LOEpM (Accessed 02-06-2019)

Iconic Landscapes (2008) The Garden of Foyer Laekenois [Online]. Available at: https://iconiclandscapes.tumblr.com/post/152761185846/brussels-jardin-du-foyer-laekenois-gilles?fbclid=IwAR11nJxQTVpI9qifIkUGBjjdnbbvzgsqrVJjTVgjoq_iPwOpyn8yp-zok6U (Accessed 02-06-2019)

Chino, M. (2013) Temporary Gallery Space Frames Nature As. [Online] Available at: https://inhabitat.com/courtesy-of-nature-museum-like-installation-frames-nature-as-art/ (Accessed 02-06-2019)

Baan, I. (2011) Teshima Art Museum / Ryue Nishizawa [Online]. Available at: https://www.archdaily.com/151535/teshima-art-museum (Accessed 30-05-19)

Quingshan, W.(2018) Secluded cave-like galleries. [Online] Available at: https://www.trendhunter.com/trends/network-of-galleries (Accessed 01-06-2019)

Berger, A. (n.d.) Makoto Azuma's incredible art and design with plants. [Online] Available at: http://www.beautifuldecay.com/2012/08/03/makoto-azumas-incredible-art-and-design-with-plants/ (Accessed 01-06-2019)

Ill. 58 Braner, P. (2010) Træer og buske i by og land. 1 edition. Grønt Miljø.

Ill. 59-64 Own illustrations

Ill. 65 Ireport360 (2018) Asphalt pavement. [Online] Available at: https://ireport360.com/project/asphalt-paving/ (Accessed 02-06-2019)

123rf (n.d., a) Concrete or cobble gray square pavement slabs. [Online] Available at: https://www.123rf.com/photo_55612387_concrete-or-cobble-gray-square-pavement-slabs-or-stones-for-floor-wall-or-path.html (Accessed 02-06-2019)

123rf (n.d., b) Rough concrete cement. [Online] Available at: https://www.123rf.com/photo_

73251630_rough-concrete-cement-texture-wall-for-abstract-background.html (Accessed 02-06-2019)

York building (n.d.) Permeable pavers. [Online] Available at: http://www.yorkbuilding.com/cornerstone-100-project-shrewsbury-commons-2/10566/ (Accessed 02-06-2019)

Eplast (n.d.) Polycarbonate termoplade. [Online] Available at: https://e-plast.dk/shop/tagplader/termotag-click-step/click-step%C2%AE-16-mm-2-lags-polycarbonat-termoplade-opal-2.aspx (Accessed 02-06-2019)

Ill. 66 Global sources (2019) Polycarbonate sheet [Online]. Available at: https://www.globalsources.com/gsol/I/Polycarbonate-hollow/p/sm/1141792900.htm#1141792900 (Accessed: 02-06-2019)

AGC (n.d.) Polycarbonate Sheet, Thin Sheet, Film [Online]. Available at: http://www.agc.com/en/products/electoric/polycarbonate/index.html (Accessed: 02-06-2019)

Frutos, D. (2018) A Polycarbonate Incubator: Start-up Centre in Archena [Online]. Available at: https://www.detail-online.com/artikel/a-polycarbonate-incubator-start-up-centre-in-archena-33081/ (Accessed: 02-06-2019)

Ill. 67-86 Own illustrations

APPENDIX

APPENDIX A

BUS & LIGHT RAIL FREQUENCY

Bus & light rail frequency		
	Stopping at Randersvej	
Bus line	August 2017	August 2018
1A	x	-
6A	x	x
11	-	-
12	x	-
13	x	-
14	x	-
15	-	-
16	-	x
17	-	-
18	x	x

This appendix presents the calculations done to estimate the effect that the light rail will have on the current amount of busses going through the site. It will also give an estimate of the busses and light rails future frequency crossing the site. This is done using Randersvej and the implementation of the light rail along the road as a reference.

First the current timetables are compared to the old timetables. This reveals a 50% decrease in busses after the light rails introduction.

Applying this number to the current amount of busses, calculated from the current timetables (Midttraffik, n.d., a), results in the following calculation:

Bus traffic (both directions)				
Current conditions		Removal %	New proposal	
1100 daily	1 per. minute	50%	550 daily	5 per. 10 minutes

Using the same frequency for the light rail crossing at the site as the one along Randersvej (Midttraffik.dk, n.d., b),within the same time frame from 4:34 am - 00:19 am, the frequency of the passing light rail traffic will occur as following:

Light rail traffic on Randersvej (both directions)				
Current conditions		Removal %	New proposal	
258 daily	2,5 per. 10 minutes	50%	258 daily	2,5 per. 10 minutes

In average during the day, in a 10 minute interval, the results are:

Busses: 5 pr. 10 minutes
Light rail: 2,15 pr. 10 minutes
In total: 7,15 'objects' pr. 10 minutes

RANDERSVEJ, AARHUS

(Google, 2019)

(Google, 2017)

RUSH HOUR

Taking the rush hours into consideration, the frequency over one hour has been calculated from 7:00am - 8:00am based on the bus schedules busiest hour (Midttraffik.dk, n.d., a). The rush hour for the light rail has been calculated within the same time frame (Midttraffik.dk, n.d., b).

The results are as following:

Rush hour frequency			
	Current conditions	Removal %	On our site
Bus	17 per. 10 minutes	50 %	8,5 per. 10 minutes
Light rail	2,7 per. 10 mintes	0 %	2,7 per. 10 minutes

The results of the calculated rush hour:

Busses: 8,5 pr. 10 minutes
Light rail: 2,7 pr. 10 minutes
In total: 11,2 'objects' pr. 10 minutes

These calculations support the wish to collect busses and the light rail in two shared tracks, one in each direction. Here it is important to mention that not all busses will drive across the site along the tracks between the east and north connection, but also between the north and south connection.

REFERENCES:

Google (2017) Randersvej. [Online] Available at: https://www.google.dk/maps/@56.1813918,10.1979368,3a,75y,147.92h,89.36t/data=!3m6!1e1!3m4!1s7I4bWEcwWYiH8_AIE18i9Q!2e0!7i13312!8i6656 (Accessed 04-06-2019)

Google (2019) Google maps. [Online] Available at: https://www.google.dk/maps/@56.1811417,10.1984758,145a,35y,147.55h/data=!3m1!1e3 (Accessed 04-06-2019)

Midttrafik.dk (n.d., a) *Bybusser i Aarhus* [Online]. Available at: https://www.midttrafik.dk/koreplaner/bybusser/aarhus/ (Accessed 30-04-2019)

Midttrafik.dk (n.d., b) *Letbanens køreplaner* [Online]. Available at: https://www.midttrafik.dk/koreplaner/letbanen/letbanens-koreplaner/ (Accessed 30-04-2019)

APPENDIX B

CAR PARKING CALCULATIONS

It has been decided to remove through going car traffic from the site, thought it should still be possible to drop-off and pick up people from the train station square. Field work was conducted on friday 22-03-2019 and following observations were noted:

Observations on the need of parking/drop off				
Time/Place	A - Taxi	A - car	B - car	**Notes**
Start amount parked	3	2	2	B was craftman cars
7:30 - 7:45	1	6	4	
7:45 - 8:00	6	8	5	1/2 of taxi someone dropped off
8:00 - 8:15	6	12	10	
8:15 - 8:30	2	5	17	B: many uses bus stop to drop off people
End amount parked	25	2	6	

Taking the 15 minutes with the highest intensity of cars, the amount can be divided into 1, 2, 3 and 5 minute intervals. Therefore depending on the parking time planned for, the necessary amount of parking spaces can be determined.

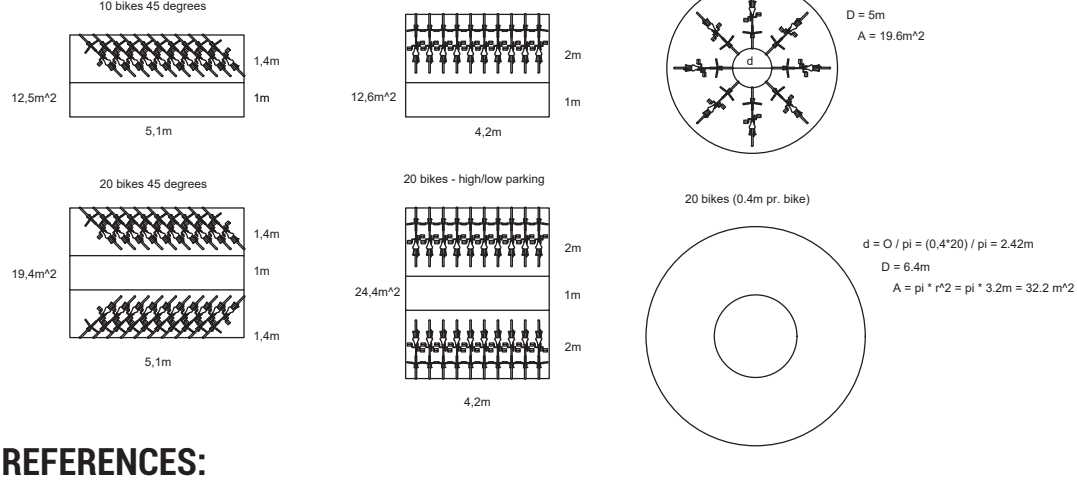
		Taxi	A - car	B - car	Total amount	
	Minutes	Amount	Amount	Amount	**Amount**	**Minutes**
Observed	15	6	12	17	**35**	**15**
Calculated	1	0,4	0,8	1,2	**2,4**	**1**
	2	0,8	1,6	2,3	**4,7**	**2**
	3	1,2	2,4	3,4	**7**	**3**
	5	2	4	5,7	**11,7**	**5**

As the table shows:

5 min parking = 12 spaces **3 min parking = 7 spaces**
2 min parking = 5 spaces **1 min parking = 3 spaces**

BICYCLE PARKING

Various options for bicycle parking was tested to find the optimal placement regarding space.

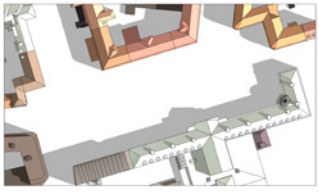


REFERENCES:

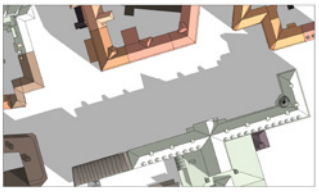
HFB (2016), Parkeringsarealer. [Online]. Available at: https://www.hfb.dk/fileadmin/templates/hfb/dokumenter/rum-pdf/14_Parkeringsarealer.pdf (Accessed 30-04-2019)

APPENDIX C

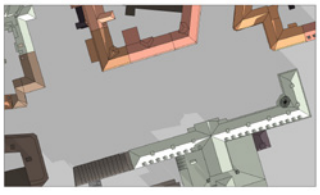
MICROCLIMATE DETAILED



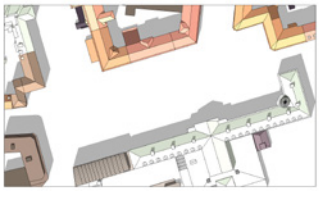
Summer - 0900



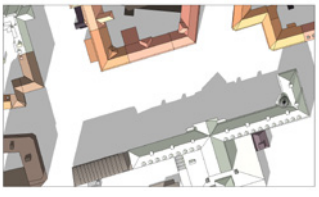
Equinox - 0900



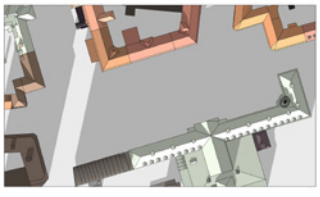
Winter - 0900



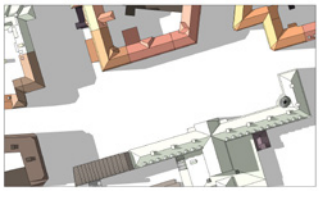
Summer - 1300



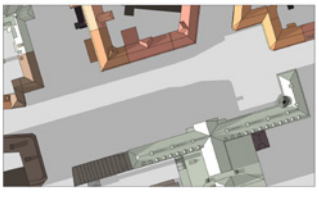
Equinox - 1300



Winter - 1300



Summer - 1700



Equinox - 1700

Winter - 1700