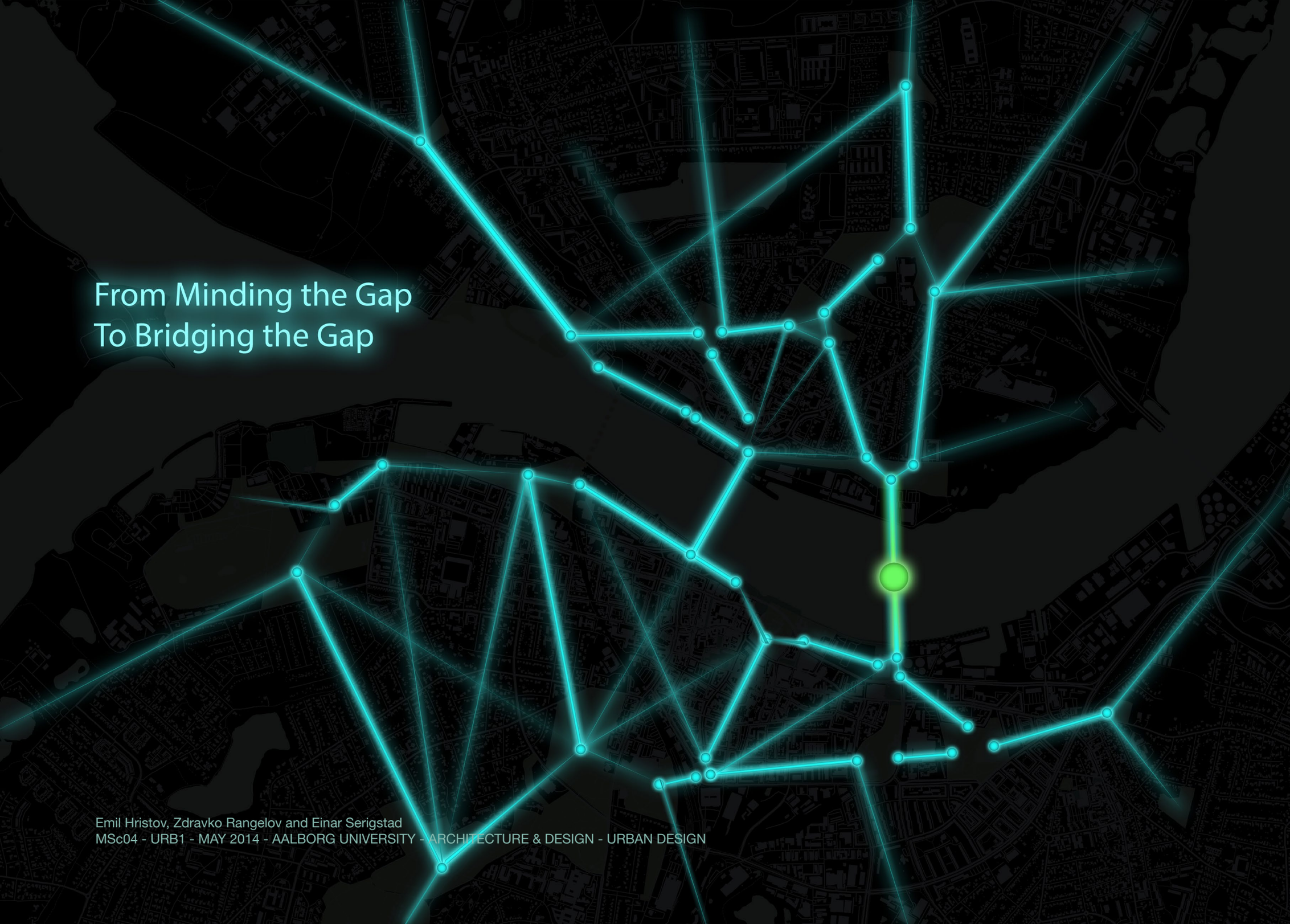

From Minding the Gap
To Bridging the Gap

Emil Hristov, Zdravko Rangelov and Einar Serigstad
MSc04 - URB1 - MAY 2014 - AALBORG UNIVERSITY - ARCHITECTURE & DESIGN - URBAN DESIGN

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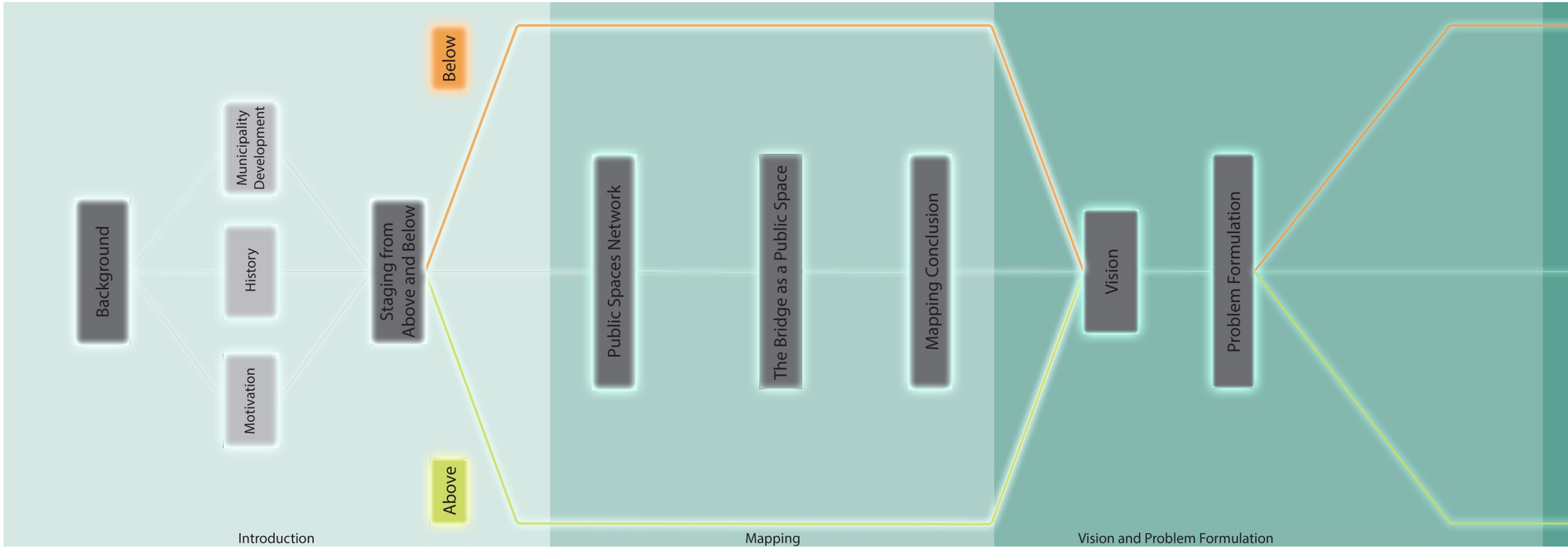
Preface

This master thesis is composed by group 1, 4th semester MA, Urban Design at Aalborg University. The project takes place in the period from February to June 2014.

The thesis is dealing with spatial and social issues in the context of Aalborg city, Denmark. The main foundations of the project are theories of motilities and public spaces acquired during the period of master thesis. The project aims to break the social segregation and spatial separation between Aalborg and Nørresundby. A pedestrian bridge is the proposal of the current thesis as an urban element triggering developing and regeneration at the waterfront.
For better understanding of the project going through the appendix chapter is strongly recommended



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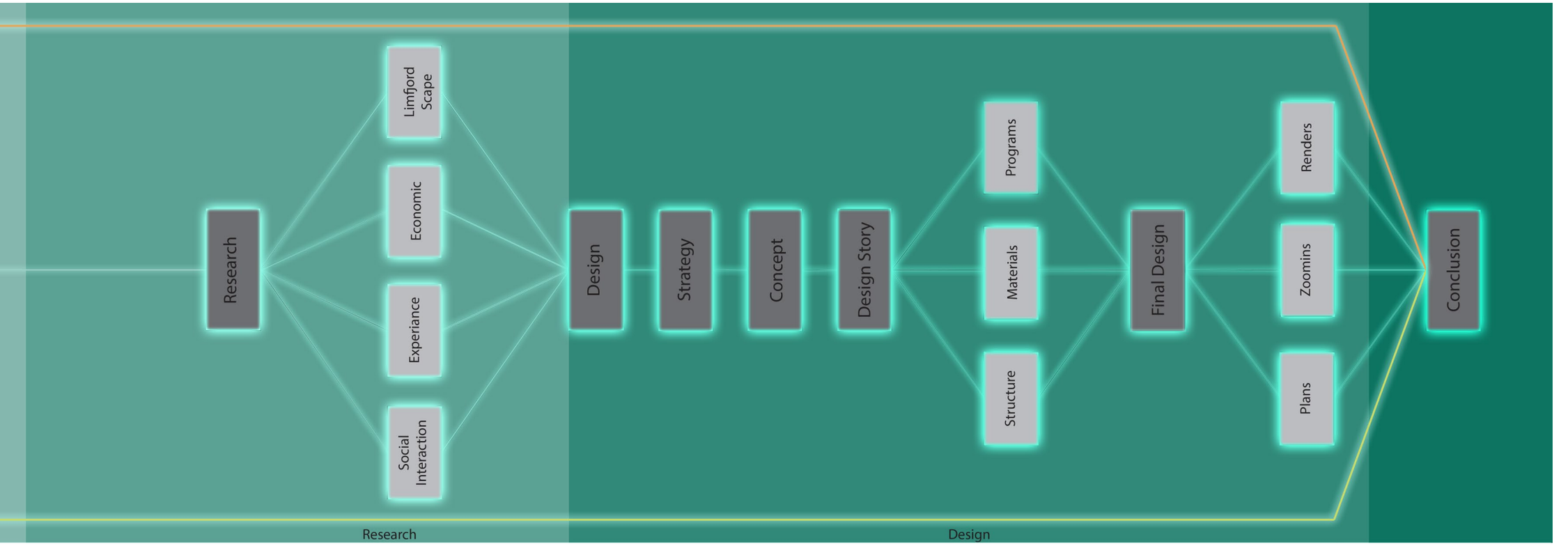

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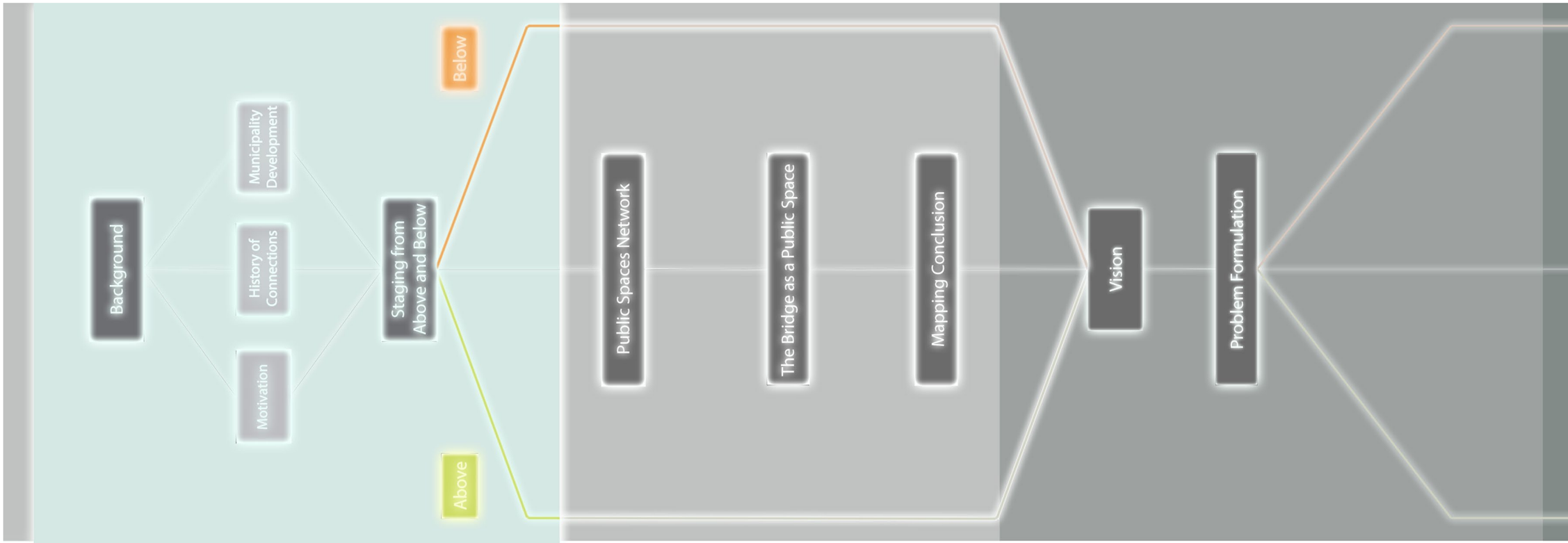
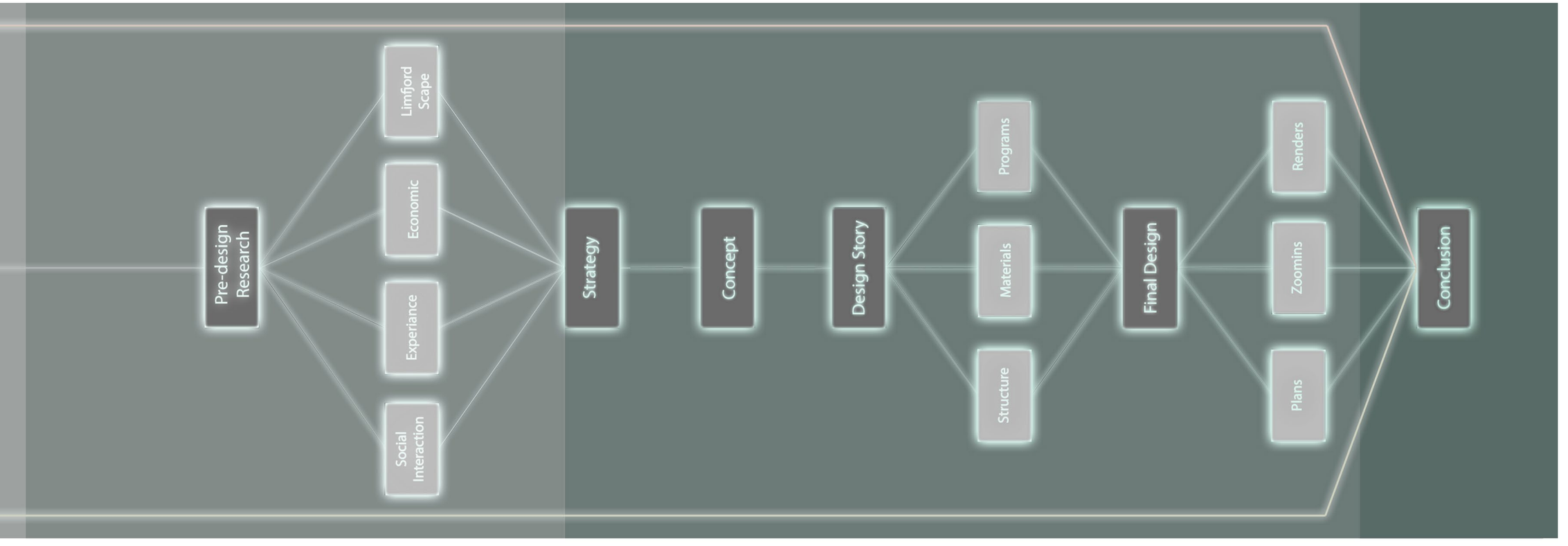


Background

For many years there has been a disconnection between Aalborg and Nørresundby. Nowadays, the segregation between them has scaled up due to the more projects and investments in Aalborg waterfront development, compared to Nørresundby.

How can we solve the disconnection and segregation between the two cities? Could a new connection be the potential solution to this problem?



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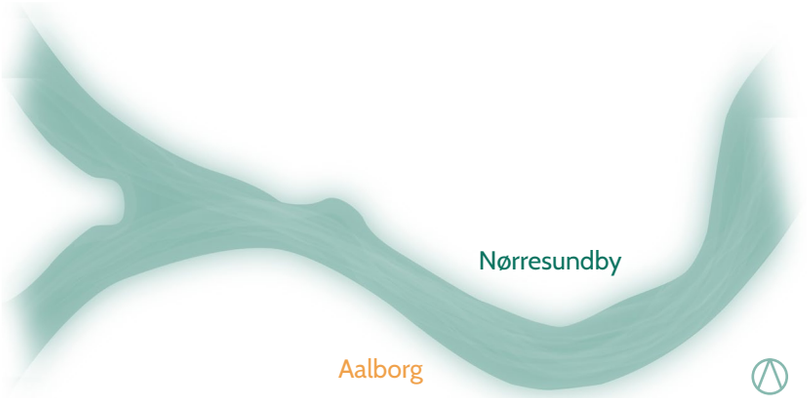
Motivation

"Fieldwork usually means living with and living like those who are studied. In its broadest, most conventional sense, fieldwork demands the full-time involvement of the researcher over a lengthy period of time..." (Van Maanen).

The group members of the current project have been living in Aalborg for a period of almost four years. This makes the team quite familiar with the city its potentials and problems. The urban environment is seen through two different perspectives – professional as planners and designers (staging from above) as well as regular citizens (staging from below).

History of Limfjord Connections

This subchapter explains the history of connections across Limfjorden - between Aalborg and Nørresundby.

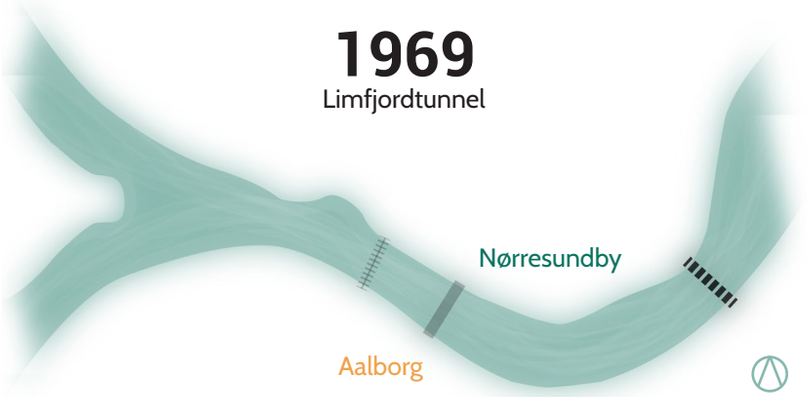


"Aalborg is without question the capital of North Jutland, and connections must first and foremost be established to and from the capital... Nielsen 1913" (Municipality, 2006).

1865
Pontoon bridge

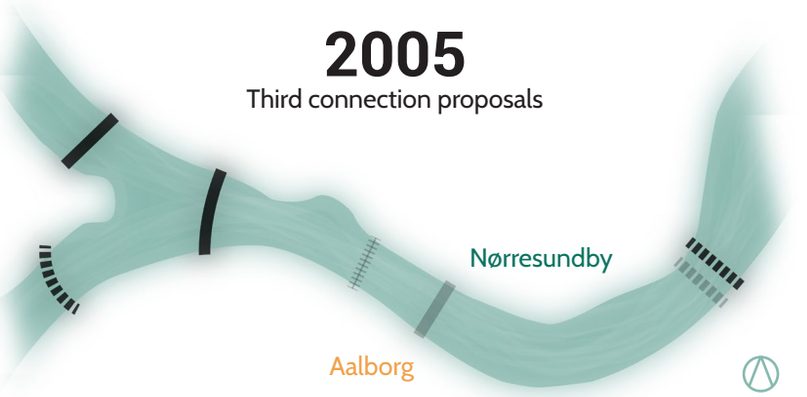
In 1863 a decision has been made for building a pontoon bridge between Aalborg and Nørresundby. However due to a conflict between Germany and Denmark the construction process has been delayed. In 1865 the new pontoon bridge is opened (Aalborg Municipality, 2006).

1969
Limfjordtunnel



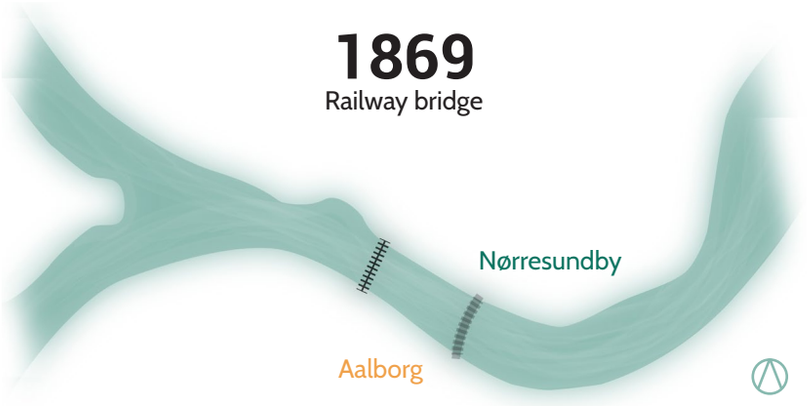
In 1969 the tunnel has been opened.
"Only taking the strain off the Limfjord Bridge for 20 years? On 6 May the Limfjord tunnel will be opened to traffic... However, traffic in the region is increasing at an enormous rate, and experts calculate that a tunnel will be necessary within the next twenty years or so...March 1969" (Aalborg Municipality, 2006).

2005
Third connection proposals



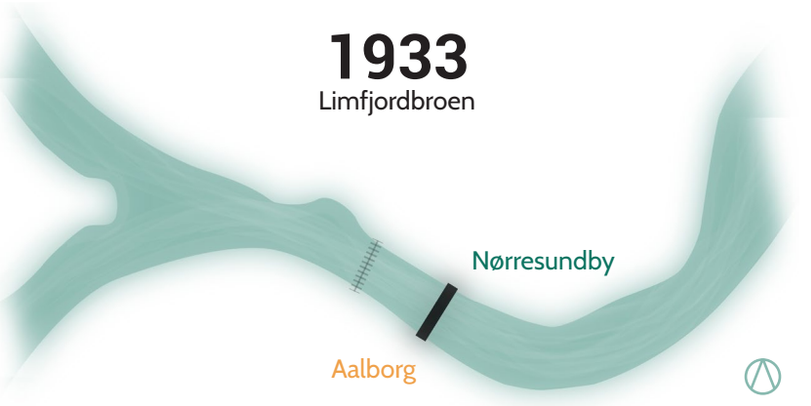
Right after the construction of the tunnel in 1969 there have been discussions about a possible third connection. From 1992 investigations have been done for possible routes as several proposals have been analyzed. Between 2005-2006 Aalborg Municipality in corporation with Nordjyllands Amt and Vejdirektoratet did VVM (Assessment of the Environmental Impact), as a result three main proposals were suggested: two west connections Egholmlinjen and Lindholmlinjen and one east connection Parralleltunnel (Vejdirektoratet, 2011).

1869
Railway bridge



In 1869 the railway bridge between Aalborg and Nørresundby have been opened and rail travel became possible throughout North Jutland (Aalborg Municipality, 2006).

1933
Limfjordbroen



Between 1913-1915 planning of a new modern bridge began. The old pontoon bridge had problems handling the new heavy trucks. However, plans are initially put on hold due to the outbreak of the First World War. In 1919 there is a competition where possible solutions considering the transport problems over the Limfjord have been proposed. In 1933 the new Limfjord Bridge was finally opened. The pontoon bridge has been dismantled and used for other purposes (Municipality, 2006).

2010
Add-on pedestrian bridge

Competition for building a new pedestrian and cycling bridge, attached to the existing railroad bridge across Limfjorden, has been held in 2010 won by C.F. Møller (Møller, 2010). However the plan is approved but is not clear when the construction will begin (Interview, TBS, 2014, Appendix).

2012
Decision for third connection

In 2012 one of the three proposals for a third connection over Limfjord has been chosen. The approved connection is Egholmlinjen consisting of two sub-connections - a bridge and a tunnel (Aalborg Municipality, 2012).

Municipality Development

The harborfronts of Aalborg and Nørresundby, as highlighted in illustration 12, consists of multiple subareas. All of these areas are planned to be developed, since the city is developing from industrial into a knowledge city. A phenomenon that happens in most cities around the world. Over the years the fjord has become accessible to the public rather than the industry. Some of the subareas are under transformation, others are being planned, and some are fully developed (Aalborg Municipality, 2013a).

Aalborg's central harborfront was recently finished with the opening of the House of Music. The area is developed as a promenade for pedestrians. The promenade binds together Limfjorden with the center of Aalborg and is a popular public space in the city. The area consists of five elements: Nyhavnsgade, Havnepromenaden, Jomfru Ane Parken, Slotspladsen and Utzonparken. Each of these areas has their own character and features. Part of this area is Aalborg University's new building, which is expected to open in the summer of 2014 (Aalborg Municipality, 2013b).

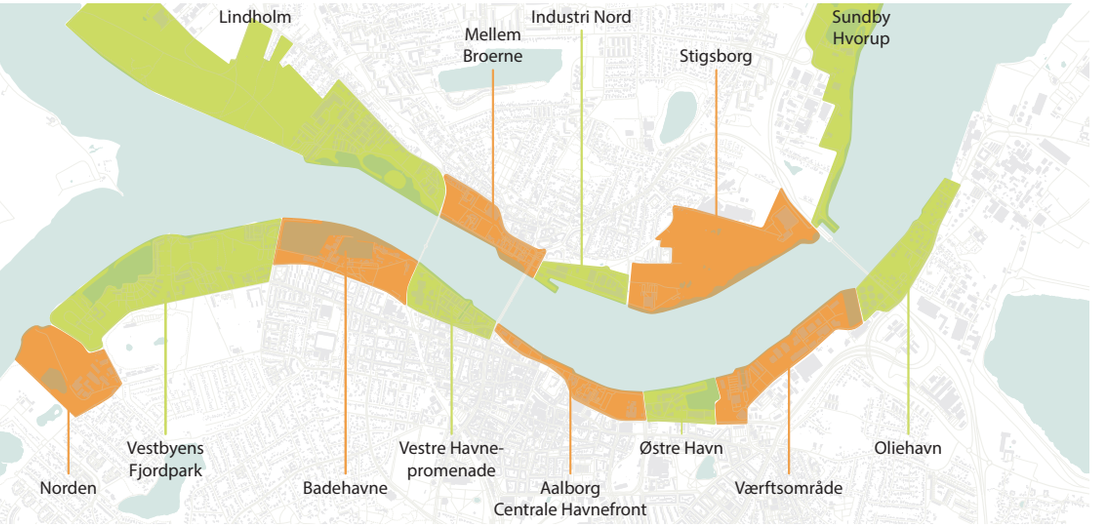
East of the central harborfront is Østre Havn. The area is currently under transformation from an industrial area into a new quarter with residential and businesses (Aalborg Municipality, 2013c). Værftsområde which is located to the east of Østre Havn is also under transformation with similar functions as in Østre Havn. The areas will offer recreational functions through the extension of the promenade (Aalborg Municipality, 2012a). Oliehavn (Oil harbor) is an oil depot. This industrial area is run by Aalborg Harbor (Aalborg Havn A/S) (Aalborg Municipality, 2012b).

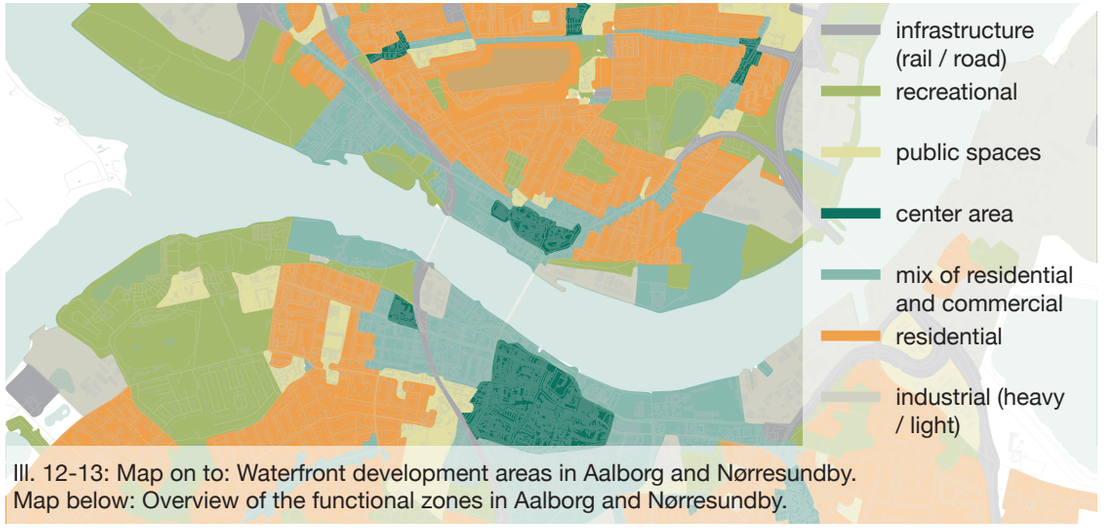
Norden is an area on the west side of Aalborg's harborfront. This is a commercial area. Further development plans include visual connections to the fjord from the road Mølholmsvej and creating a path along the fjord, which opens the shore to the public (Aalborg Municipality, 2012c). Next to Norden is the recreational area Vestbyens fjordpark (the west town's fjordpark). The area offers leisure activities which includes a camping site, a marina and a public swimming pool. The swimming pool is planned to get enhanced contact with the fjord, since currently it is not visually connected to the fjord. The area is planned to be for leisure activities and opens up for building more buildings in relation to this sort of functions. Part of the area is reserved for the new road system, the third Limfjord connection (Aalborg Municipality, 2012d). The area Bådehavne continues the recreational area along the fjord in the west, as shown on the illustration 13 with the functional zonings. The area has maritime activities, a maritime museum and canoe and kayak clubs. The area connects the west city with the fjord and ends next to the railway (Aalborg Municipality, 2012e). Between the railway and Aalborg's central harbor one finds Vestre Havnepromenade, which was the first area to be transformed in the city. It was planned during the 90's. Today the area consists of residential and commercial functions as well as the liquor factory which is a cultural heritage building (Aalborg Municipality, 2012f).

From Aalborg central harbor the most visible part of Nørresundby is the industrial building to Hedegaard A/S, which is part of the subarea Industri Nord (Industry North). Hedegaard A/S is one of the last remaining factories in the center of Aalborg. The municipality expect Hedegaard A/S to close down their factories when they find the property to be profitable enough to sell (Interview, TBS, 2014). Next to Limfjordbroen there are new local plans for transforming part of Industri Nord into a residential area with some commercial activities. There will also be a promenade along the fjord extending the promenade located to the west of the bridge Limfjordbroen (Aalborg Municipality, 2013d). The area Stigsborgkvarteret, which stretches all the way up to the Limfjordtunnel, used to be an industrial area targeted towards the agricultural industry. This caused the soil to be contaminated. A large part of the soil contamination has been removed. Today the area is empty except for hosting an administrational building for Aalborg Municipality. The building was actually built as part of a transformation development of the area in the beginning of the 2000's. According to illustration 13 the area is planned to consists of residential and recreation. The plans was momentarily paused due to more important development areas in the city (Aalborg Muni-

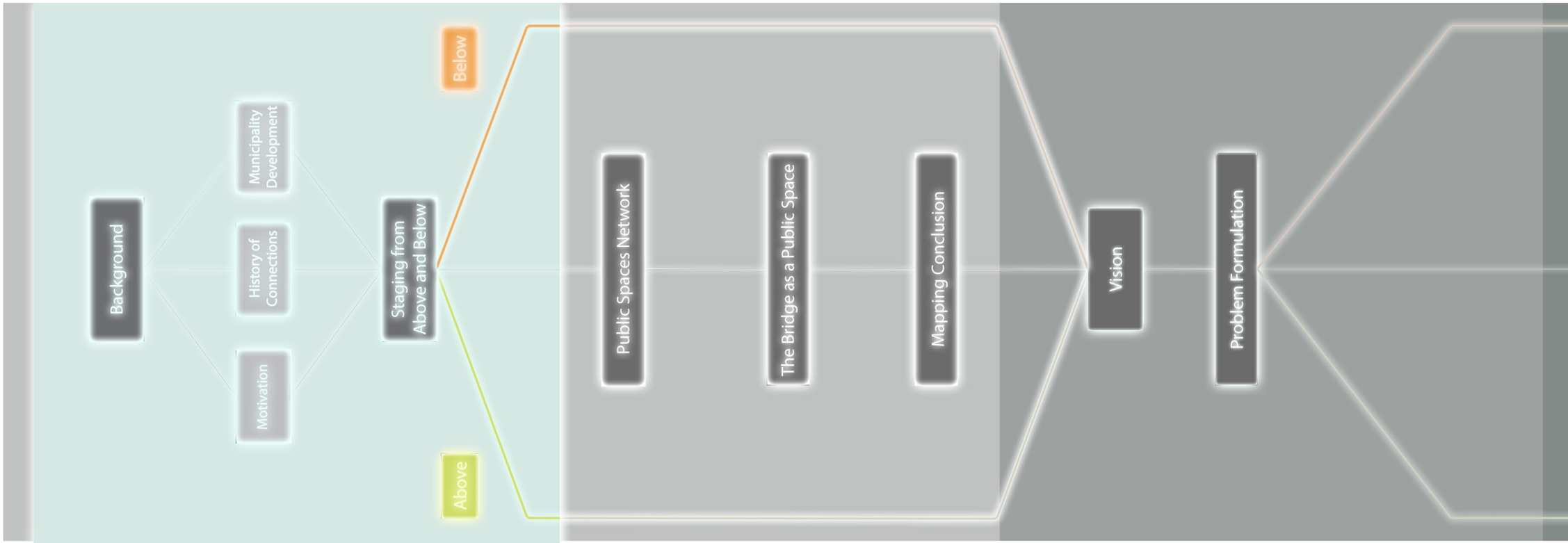
cipality, 2013e). Aalborg Municipality in cooperation with Aalborg Harbor have recently begun planning the area between Hedegaard A/S and Aalborg Municipality, though there is no set date for when transformation will take place (interview, TBS, 2014).
Sundby Hvorup is a mainly a recreational area with a variety of protected habitats, small lakes and a sailing club. In long term parts of the area are planned to be a park for local residents (Aalborg Municipality, 2010a).
Lindholm is also a recreational area. The area is divided in two parts by a building project with mixed functions of residential and commercial (Aalborg Municipality, 2009). The area gives the public contact with the fjord and extents the promenade coming from the area of the other side of the railway called Mellem Broerne (Between the bridges). This area is transformed into a residential area with high rise building blocks. Along the area is the promenade towards the fjord (Aalborg Municipality, 2010b).

Currently both harborfronts of Aalborg and Nørresundby have their own promenade stretching from east to west. In Nørresundby it remains to be developed on the east side of Limfjordbroen where the promenade is cut off by the industry in Industri Nord and the undeveloped area Stigsborgkvarteret; while in Aalborg the promenade stretches all the way from Vestbyen Fjordpark to Værftsområde, momentarily cut off by the development of Østre Havn.





Ill. 12-13: Map on to: Waterfront development areas in Aalborg and Nørresundby.
Map below: Overview of the functional zones in Aalborg and Nørresundby.



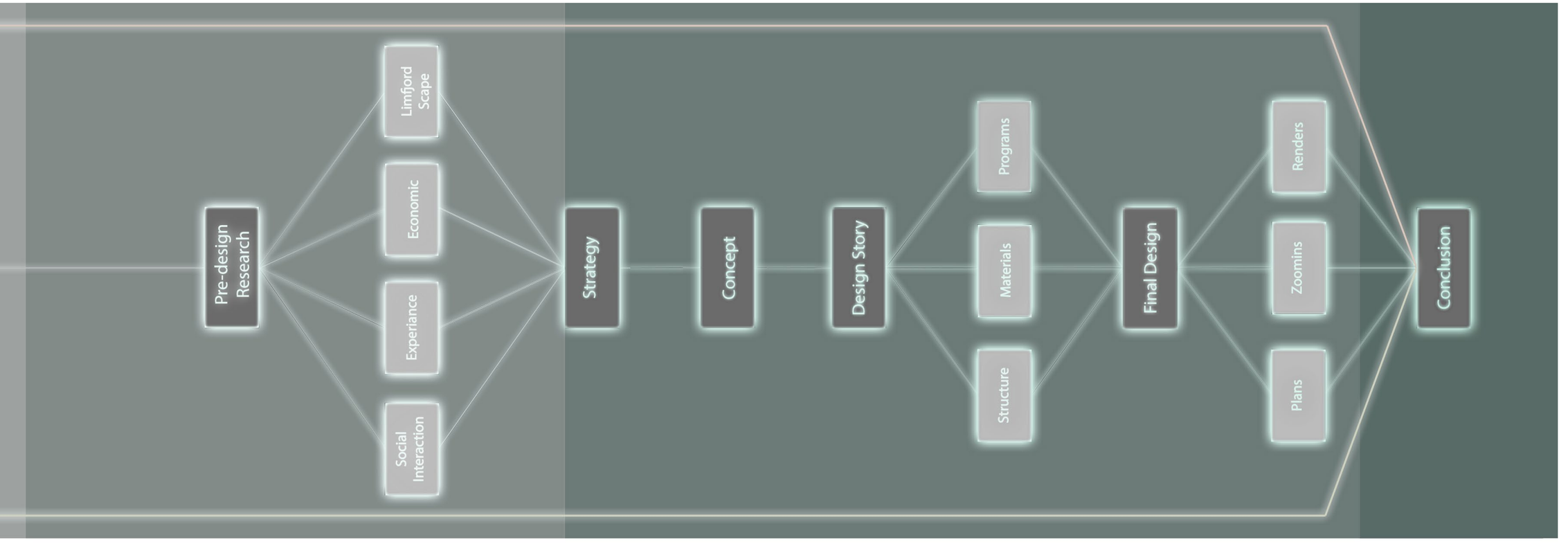
Introduction

Staging from Above and Below

This chapter presents the methods used in the project.

Mapping

Vision & Problem Formulation



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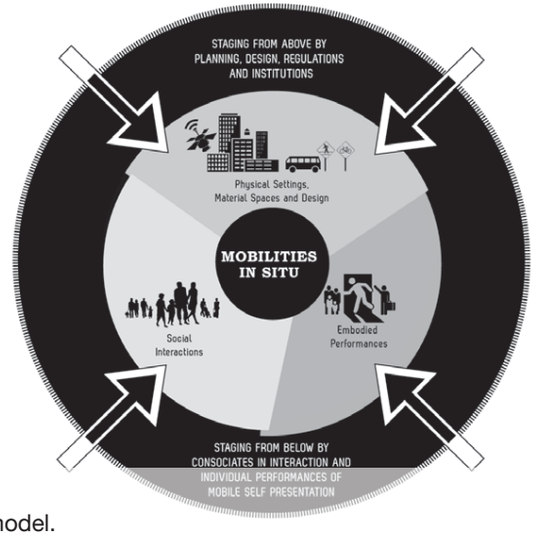
Staging from Above and Below



III. 15: Staging mobilities model.

This report is using one main theory called "staging from above and below" which shapes up the whole structure of the project and is used as an analytical and design tool further in the process.

"*To create certain behavior at a specific site, planners stage "from above" through planning, design, regulations and institutions. Still the systems are affected by the users, and acted out and lived "from below*" (Hajer & Reijndorp, 2001).

Both aspects are taken into consideration through the whole project.

The analytical part consists of numerous maps which show the main regulations, infrastructure, zones, legislations etc. However in order to understand better a particular area staging from below plays a significant important role in the research process. Mapping on the site, pictures, atmospheres, experience, different senses and perceptions have to be taken into account in order to understand better the particular environment. Being in the "body" of a local citizen is an essential part of the planning process.

The same is valid for the design process. On one hand the particular structure/area should be designed in a way that integrates it smoothly into the surrounding area, becoming a whole with the context, tied up together with all different functional layers of infrastructure, public spaces, buildings etc. However we build and plan for people. So the same approach from below is applicable here as well. People have particular perceptions of space, attractions, atmosphere and so on. Trying to understand what a potential user could feel, see, experience is a very important part of the design process. How could particular colours, materials and textures influence people's behaviour and mood? What could be the understanding and perception of people for different elements – guiding and navigation, different speed, dynamic or static, warm or cold and so on. Trying to see the things from different angles, understand from different points of view of different user groups is hard but a fundamental part of the design process.

The current report is using these two main approaches as two separate guiding lines, extracting different information and results and applying it to the final product.

Methods

Literature review

The literature review aims at building a theoretical background for designing a bridge as a public space. It encompasses the public space, the network city and experience design. It also lays a foundation for the analysis, empirical data collection, and toolbox for design strategies.

Reference projects

In the beginning of the project an initial research about existing pedestrian and hybrid bridges was done in order to learn from others and see how the task of creating a bridge as a public space had been "solved" before. This method provided inspiration for what can be done in this type of projectfield. In the research most projects were found from mainly two competitions for hybrid bridges. These were from Amsterdam in the Netherland and from Rhode Island in the United States. The research was part of the foundation of choosing a study trip to Amsterdam. A brief presentation of the inspiration projects can be found in the Appendix.

Data collection

When working with a bridge between Aalborg and Nørresundby it is useful to understand what has been planned and what Aalborg Municipality is planning in the future along the harborfronts. The website of the municipality provides an overview of objectives for the harborfronts, along with concrete local plans for future development. Reading of plans provides information about areas that have been developed or areas currently in the planning process. Through reading the plans it can be difficult to understand their motivation and expected outcomes. These are not clearly stated and often depend on interpretation. It is one of the reasons that we decided to interview the municipality.

Furthermore, data about the fjord was retrieved from Aalborg Harbor's website and the Geodata Library.

Interview

Interviewing as a method was chosen because it has the possibility of providing us with information which is not easily retrieved from websites. An interview with the municipality was important for us in order to get a quick overview of the development of the waterfront and its future situation. It was necessary for areas such as the existing industrial area in Nørresundby where Hedegaard A/S is located. This is information we were not able to find from the municipality website. Other topics besides the waterfront development were new bridges across Limfjorden; economy and properties, and their strategy for developing the waterfronts; data about ship traffic and how the bridge will affect the traffic; materials and function at the waterfront; and requesting digital documentation such as plans and maps. The interview was conducted as semi-structured, where questions were prepared in advance, but during the interview topics were followed in a loose order allowing for a "free" discussion. This qualitative interview method allows for some control during the interview and of the data we want to collect, and encourages explanations and answers that are detailed. A summary of the interview is available in the Appendix.

It would have been useful to interview other actors beside Aalborg Municipality. Unfortunately the group was unsuccessful in arranging more interviews.

Citizens questionnaire

The purpose of interviewing citizens was to better understand the mechanism of the city, how it is experienced, and how its public spaces are used by its users. The questionnaire process was performed with face-to-face interviews. This allowed us to collect qualitative data through a discussion with the people interviewed. Qualitative data was more important for us than statistical data, since it was unlikely to reach out to many users and would bring us a better insight in peoples choices of habits and how they experience the city. The questionnaire involves 35 participants. The citizen questionnaire was planned to be performed at four sites: Aalborg busterminal, Aalborg central harbor, Torvet in Nørresundby, and Lindholm Strandpark. The sites were selected based on the assumption of finding larger groups to interview and to get a more diverse group of participants for our small survey. The selection of places was largely successful since we managed to reach people living in different

neighborhoods of the city, though most people were from the center of Aalborg. It also turned out that Torvet was completely empty of people. Therefore the results are based on three locations.

Due to language barriers, we could not reach all people. None of the group members are Danish. One group member is Norwegian, but not all people could understand the Norwegian accent. A presentation of the main results from the questionnaire can be found in the Appendix. Minor parts of the result are also presented in conjunction with the theoretical framework, to reflect and directly substantiate the argumentation.

Study trip to Amsterdam

In order to design a pedestrian bridge it was necessary to analyse and draw inspiration from existing pedestrian bridges. In addition to finding projects online it was important to get more hands-on experience with these kind of bridges. In our design process we met some challenges that required us to visit pedestrian bridges to get better understanding of how they work. Amsterdam is a city with more than over 1700 pedestrian bridges and was therefore chosen as a destination to visit. For the trip we prepared four categories to be analyzed: Flows, opening mechanisms, bridge bank, and surface and atmosphere. More information about the study trip could be found in the Appendix.

Workshops

During the project we had three workshops: Mapping, sketching and model.

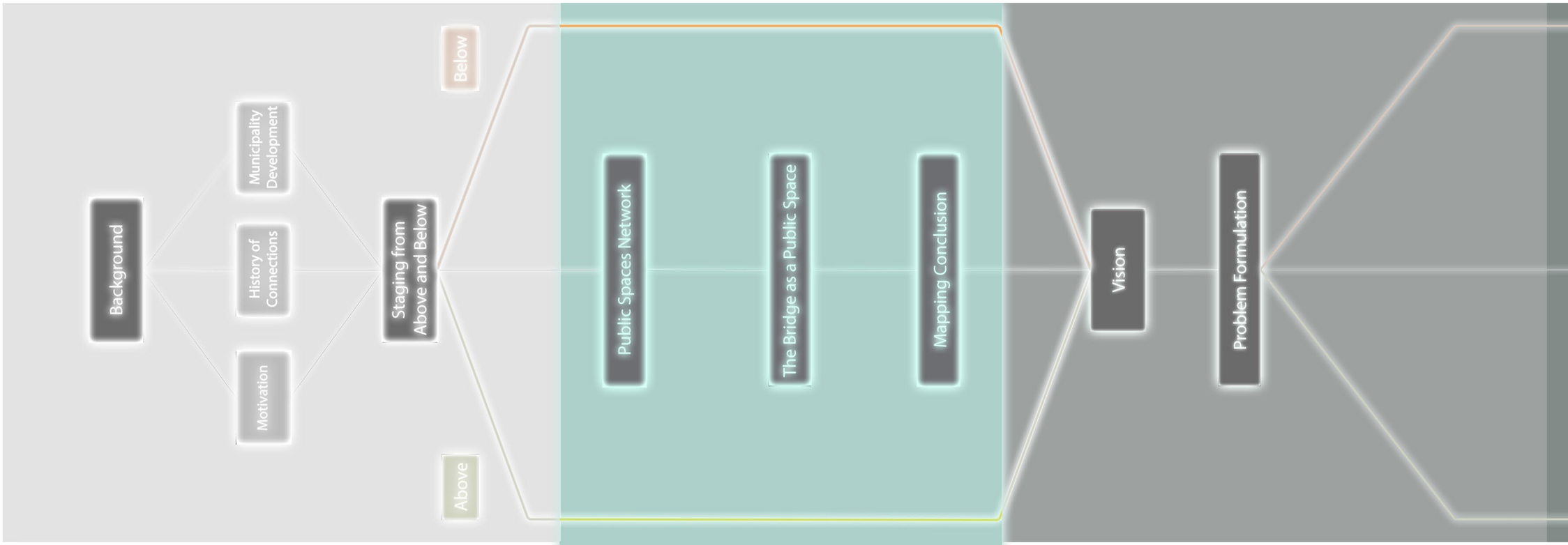
The mapping workshop consisted of two parts. The first part was visiting the fjord (site) and taking pictures of the harborfronts. In the second part we created various maps of the city. Part of the work in this workshop was to see how public spaces are connected and how they can be connected with semiotic elements. Therefore we did a method where we start from a point, which in our case was the park Kildeparken, and decided to walk towards the northeast and follow greenery elements, drifting through the city. This was done in order to see where it would take us. The method is similar to Dérive, a method used by the Situationist (l'Internationale situationniste) which was an artistic association active around the 1960's (Sadler, 2001). During the mapping workshop we began exploring ideas for the bridge and the concept. As a matter of fact the team would usually generate new ideas during the whole project when new information was found in the analysis, i.e. from interviews and other sorts of data collection.

The second workshop was our sketching workshop. Here we began applying ideas to paper. It considered information we had from our analysis, the theoretical framework and ideas we had written down. It was also based on our concept which is about three different experiences (namely about the view, the transit and the water). In the beginning the sketches were more conceptual, and then we began working in scale in order to better understand the proportions and the site.

The sketching workshop merged with a model workshop. The reason for working with a model was to better understand the bridge design and get closer to it. The bridge's physical aspects offered a deeper three-dimensional understanding of the bridge. Indeed, there was certain limitations to sketching which modelling allowed us to explore. The model workshop was a fine mix of sketching and modelling. Mainly the modelling was used to explore sketching proposals and test how they work. From this we moved over to digital 3D models, which also could give us new perspectives.

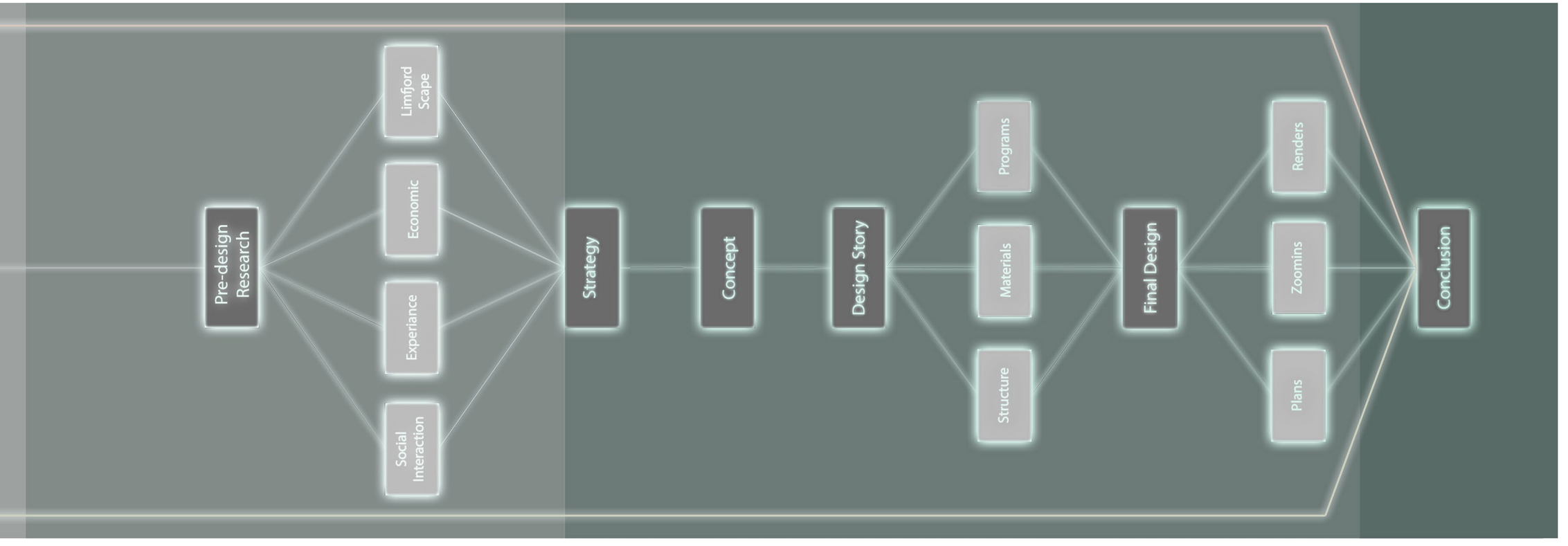
More details from the documentation of the process of the project and the design process is presented in the Appendix.

Ill. 16: From Mapping workshop.



Public Space Network

This chapter introduces the idea of creating homogenous network of public spaces in Aalborg and Nørresundby which could contribute for strengthening the connection between them and fading the separation. Different factors influencing people's behavior are analyzed as well as proposals of how to improve the connection between the public spaces in both cities are represented.



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Design

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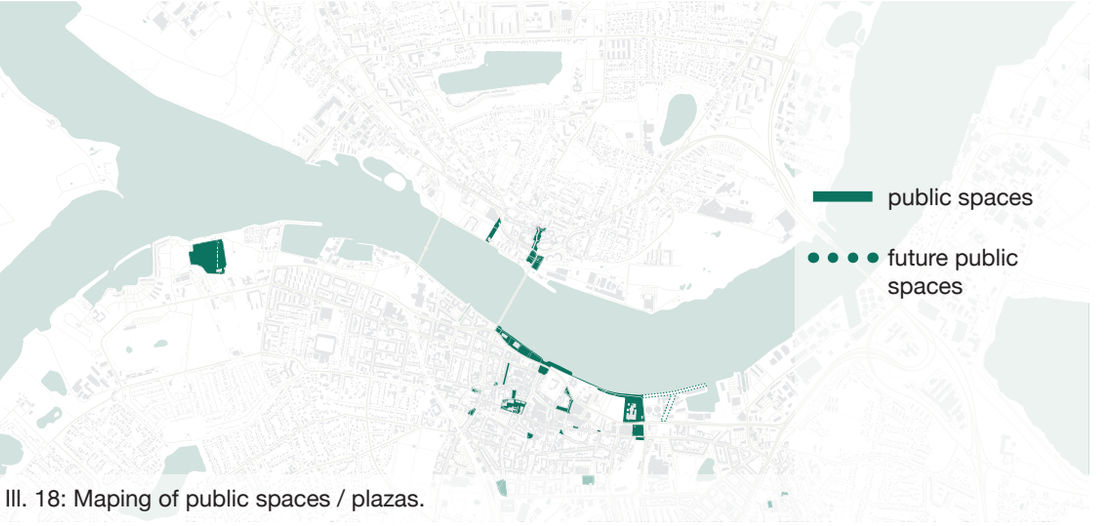
Public Space Network

Urban public spaces are seen as an integrated part of spatial and urban planning which combines and interweaves them with other spatial functions. (OPENspace Research Centre, 2011) They are an important element in the city which can have significant impact upon people's quality of life.

"*Recent evidence suggests three principal ways that neighborhood outdoor spaces can contribute positively to people's health and quality of life: through support for physical activity such as walking; through support for mental health by offering restorative experiences and engagement with the natural environment; and through opportunities for positive social interaction*" (OPENspace Research Centre, 2011).

Public open spaces can provide a variety of physical and social benefits to individuals and communities. Furthermore public spaces like parks, plazas and playgrounds not only provide places where people can engage in physical activities such as walking, but they also can serve as interesting destinations that can persuade people to walk to reach them. (Koohsari, Karakiewicz, & Kaczynski, 2013)

In order to get better picture of the whole situation in Aalborg and Nørresundby in terms of public spaces, detailed maps of outdoor places and parks have been created. They function as a foundation for further analysis in the report.



Ill. 18: Maping of public spaces / plazas.

Ill. 19: Mapping of green public spaces.

There are several factors which could affect the frequency and duration of visiting public spaces and which should be taken into consideration during planning processes.

Even though many people mentioned the attractiveness of a public space as one of the most important feature, studies have found out that other aspects affect much more people's intention to go to public spaces (Koohsari, Karakiewicz, & Kaczynski, 2013).

"*Therefore, simply adding physical features (e.g., courts, restrooms, landscaping) into existing POSs to increase attractiveness might not be helpful in improving people's perceptions of those POSs and subsequently encouraging them to walk to and within these destinations*" (Koohsari, Karakiewicz, & Kaczynski, 2013).

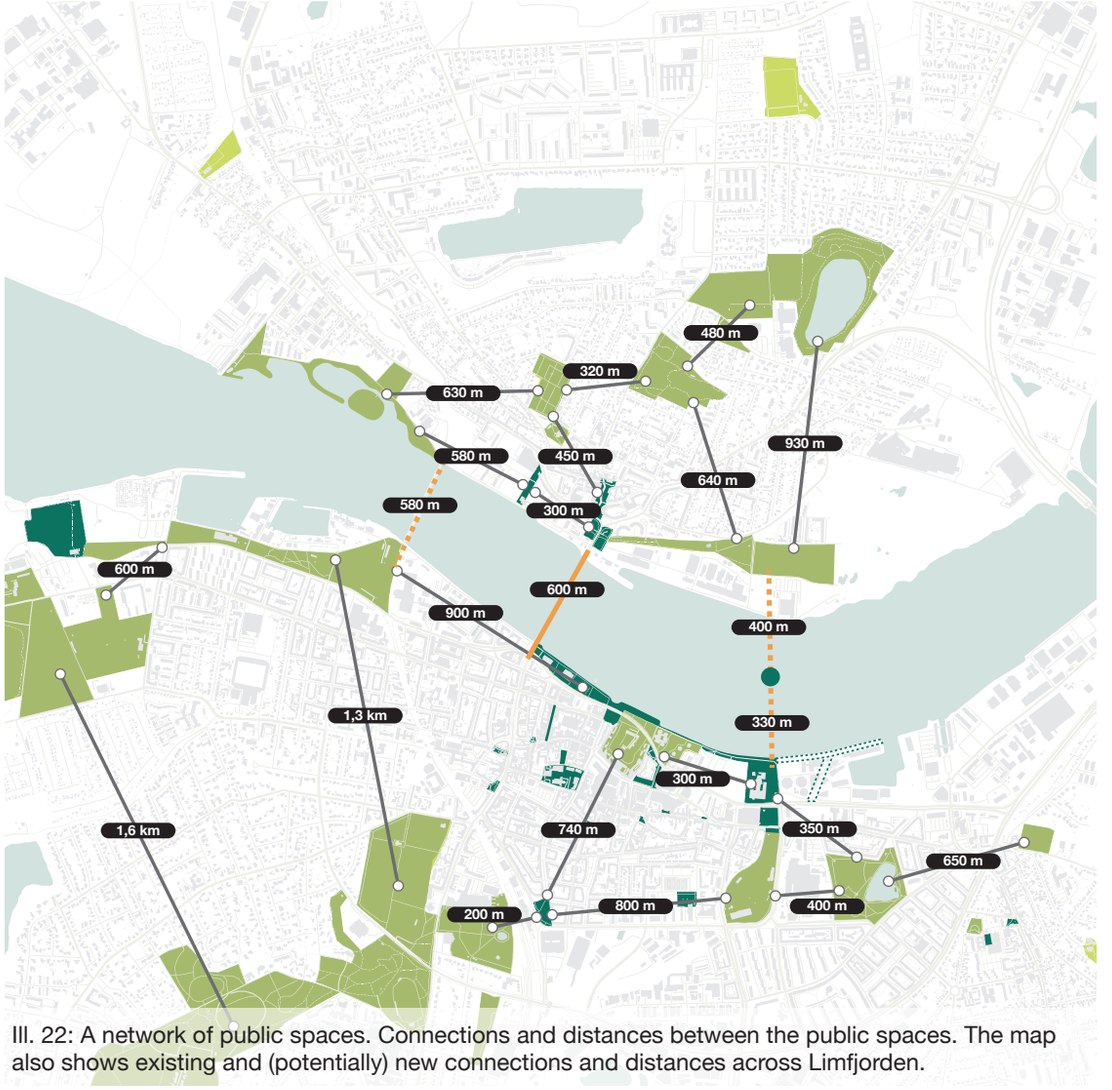
The awareness of attractiveness and true opportunities is important, but factors like proximity, connectivity, accessibility, conspicuousness, information and safety from traffic, influence people's behavior significantly more (OPENspace Research Centre, 2011).

Proximity

The distance from point A to a particular public space influences significantly people's behavior. Studies show that within 1 km from home usually is perceived by residents as a part of their walkable neighborhood (Koohsari, Karakiewicz, & Kaczynski, 2013). That is why providing route

Ill. 20: Mapping summary of outdoor public spaces.

Ill. 21: Formal bike routes. Existing and new routes.



Ill. 22: A network of public spaces. Connections and distances between the public spaces. The map also shows existing and (potentially) new connections and distances across Limfjorden.

guidance and supply shortcuts are important elements when creating public space network (OPENspace Research Centre, 2011).

"*...spatial configuration influences the distribution of movement within a network system and that when spaces are more directly connected to other spaces, this is likely to attract more movement*" (Koohsari, Karakiewicz, & Kaczynski, 2013).

Taking into consideration the fact that the project site is in Denmark, detailed map with updated bike infrastructure in Aalborg, has been created in order to see and understand better the connections between all public spaces in the context of the bike network urban layer. A well-developed bicycle network allows higher flexibility and accessibility, giving opportunity to citizens to roam around the city reaching different public spaces in a short time. However even though the network is well developed in both cities (more advanced in Aalborg), the link between them is only one going through the existing bridge Limfjordsbroen. This situation is a reason for so called "detours" which citizens from both cities have to often take in order to reach a particular point.

Another issue which could affect the behavior of people, in the context of proximity is the visual connection. View corridors between two or more public spaces could also influence people's behavior and perception for distance. Having a direct visual connection to another place

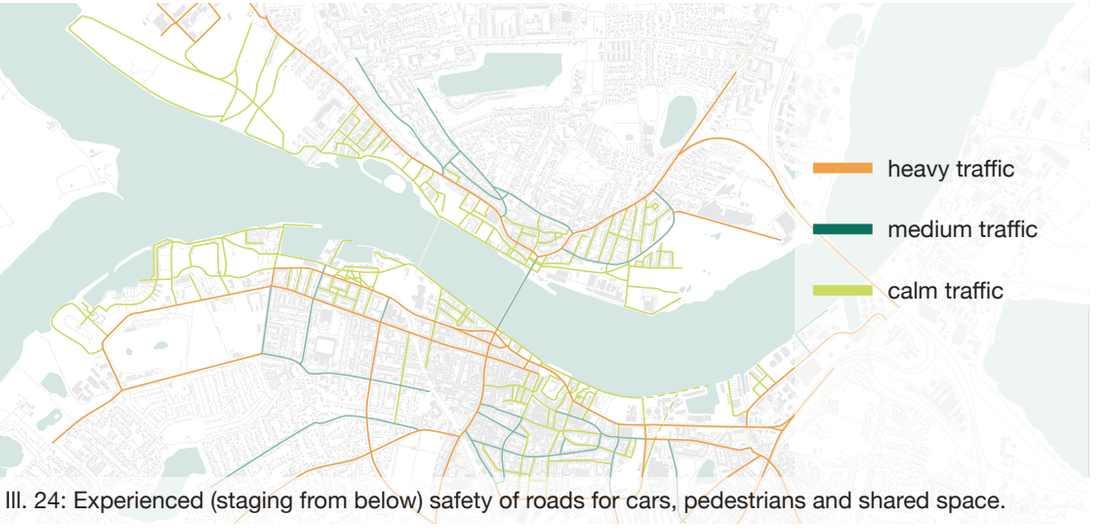
could give you firstly a better orientation of the area and secondly trigger an eventual desire of visiting the particular place. Planning "viewpoints" at public spaces is a strategic approach connecting non-physically all public spaces in a visual network layer.

Safety from traffic

"*...perceptions of safety from traffic and aesthetics were significantly related to engaging in some walking to and within public open spaces, evidence shows real and perceived danger from traffic can negatively affect walking and bicycling. Likewise, Lee and Moudon (2008) found traffic volume was reported by their participants as the most significant barrier for walking and cycling*" (Koohsari, Karakiewicz, & Kaczynski, 2013).

Due to safety issues a map representing the experience on streets in Aalborg and Nørresundby has been created. The idea is to show that unlike the officially labeled by law streets (pedestrian, shared space, vehicular) people's perception for a space could be different. Roaming around the city helped us to categorize the street network based on our personal experience and perception for safety. The result is much more walking areas in the center of the city than the official legislation map. This map helps us to claim that beside the official pedestrian streets and bike paths there are very good potential routes for walking between the different public spaces in the cities.

Ill. 23: Formal (staging from above) roads for cars, pedestrians and shared space.



Ill. 24: Experienced (staging from below) safety of roads for cars, pedestrians and shared space.

Surrounding environment

When talking and discussing the public spaces in the city and their different characteristics affecting people's behaviors, it is really important to take into account perceptual characteristics of the surrounding built environment that encompasses the public open spaces and through which people must move to reach them (Koohsari, Karakiewicz, & Kaczynski, 2013).

"*...many studies have reported that perceptions of environmental attributes such as aesthetics, safety from crime, traffic, and the availability of facilities for walking (e.g., sidewalks, trails) can affect the frequency and duration of walking*" (Koohsari, Karakiewicz, & Kaczynski, 2013).

Ill. 25: Experience route; a 'derivé' through Aalborg following green elements.

As you can see choosing the shortcut to some place is not the only and most important factor which affects people's behavior. Moving in an environment which makes you look around and enjoy the walk, feel the atmosphere, is really important.
People love trees, nice facades, warm colors and smooth surfaces (Amsterdam Study Trip, Appendix), an atmosphere which stimulates walking and exploring and make you feel comfortable and safe in the urban environment.

Information

As it was mentioned at the beginning of this chapter, public spaces in the cities are very important for the citizens and their quality of life. However many people do not really use these places due to several reasons mentioned above - safety issues, distance etc. but also because of their unfamiliarity. The conducted questionnaires for this report (Questionnaires, Appendix) showed the same results for Aalborg and Nørresundby. There are many people who even have no idea what kind of parks and public places exist in the cities, what kind of activates and programs you can find and where actually these places are located. But we cannot really judge these people for their unfamiliarity. The lack of information about public spaces seems to be important factor for the usage of the same places and respectively the frequency of visiting them. Not everybody has the desire and time of randomly walking and exploring the city, many people know and visit just their closest public space and are not really interested in other areas. But what if we create a homogeneous network in the two cities supported by comprehensive information system? People will be able to get informed about the programs in the city, distance, direction, quality, recommended routes and much more.

We want to create information, navigation system in the same way as the one for mobility networks guiding you to a particular train station, road, or other destination. For this purpose semiotic theories are used as a navigational tool of guiding people and creating strong homogeneous public space network in Aalborg and

Ill. 26: Green elements creating spaces. Picture from Aalborg (DK).

Ill. 27: Green elements in the streets of Aalborg (DK), as a guiding element.

Ill. 28: Greenery coloring the space and creating atmosphere. Picture from Aalborg (DK).

Ill. 29: Green elements with water gives a warm atmosphere. Picture from Amsterdam (NL).

Ill. 30: Green elements and red bricks in the streets of Amsterdam (NL), framing the space.

Ill. 31: Greenery as a guiding element in a residential neighborhood of Amsterdam (NL).

Nørresundby together, a future network, which would considerably strengthen the connection between the two separated cities.

Semiotics is the study of signs and signification in general. Moreover, it is the study of the conditions of potential meaning production. So semiotics is concerned not so much with what a phenomenon means as how it may mean something (Jensen, 2012).

The idea is setting direction-finding elements at and between the particular public spaces which inform, remind and guide you to another one.

There will be two types of information systems – hardware and software.

Hardware
Part of the hardware information system will be all physical elements which will guide and navigate people in and between the public spaces. However here we have also two sub-categories, respectively the signs in the public spaces and the guiding elements between the areas.

At the place
Every public place will have an information board and signs, which will give you different information about the public places around the cities – name, direction, distance, size, activities, maps, location, programs and activities, potential user groups, recommended routes etc. This information could significantly influence people's behavior, giving them a choice to choose the most appropriate place(s) for them depending on their priorities.

Between the places
As it was mentioned earlier the surrounding built environment has a significant impact on people's frequency of walking to public spaces.

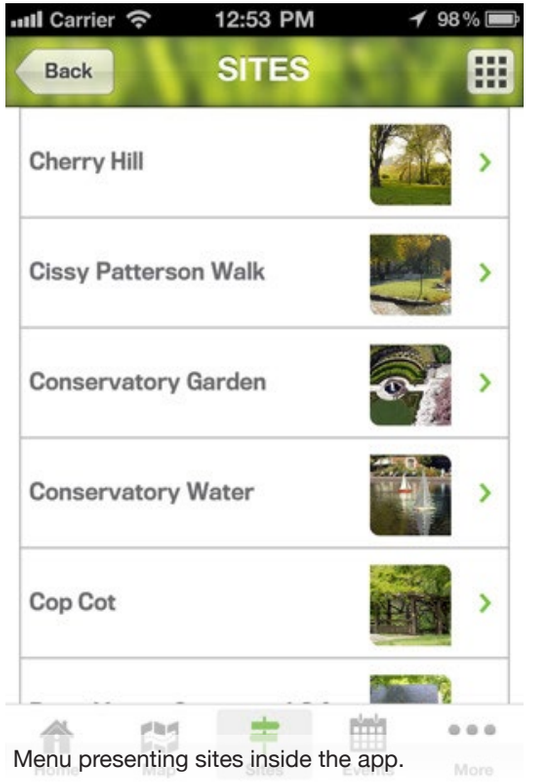
The signs and the sign systems are however not only affording and creating circulation, they are also distributed across the urban landscape themselves.

Choosing some particular routes between the different public places, give us a chance to improve them in way that strengthen the connection between the public places. However instead of focusing only on the aesthetic and safety aspects, we can use different elements which could function as navigation and guiding tools. Elements which people would perceive and understand in a more navigational and also recreational way, elements or objects that indicate or refer to something other than itself (Jensen, 2012).

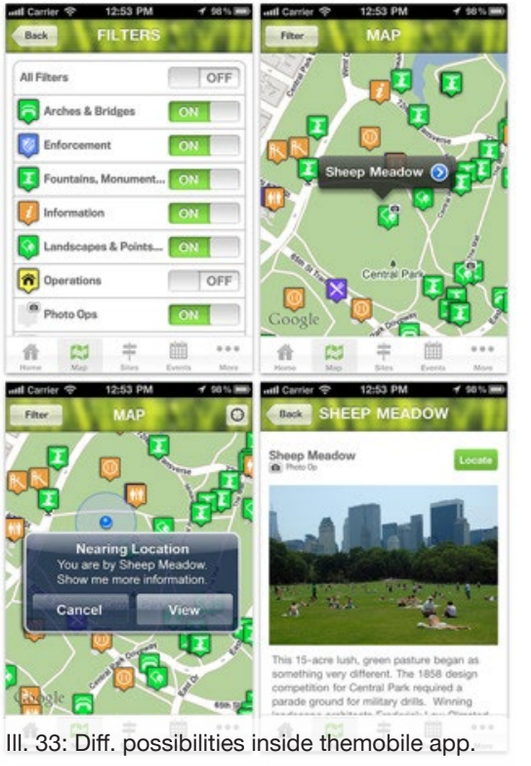
The environment is 'read' as a semiotic system in order to make sense of the situation at hand as well as it shapes and affords particular interpretations and action opportunities to the acting individual. In architecture and urban design theories the study of cities and buildings 'as signs' have been discussed for option to explore the symbolic meanings of the material environment. This is by no means an attempt to reduce the material and physical world to signs or texts but rather to claim that all our environs need some kind of interpretation to make sense of the key question; 'what is this situation?' (Jensen, 2012).

As it was mentioned above the surrounding environment while walking from one place to another has a huge impact on people's behavior. Furthermore the same environment could also function as a navigation map, by adding different elements. Thinking about connecting public spaces, the routes between them should also be nice for walking and safety but also leading you in a more abstract way from point A to point B. That is why the group decided to combine and use the natural elements like trees, flowers, and green walls not only as urban elements improving the surrounding environment but also as guiding components from one public space to another. For this purpose experimental map has been done in Aalborg city so called "green route". The idea was to start from a public space – Kildeparken and go in direction north-east as the final destination had to be the House of Music. As navigation tool were all natural elements which functioned as our "semiotics", leading us to particular areas. The map is not 100% accurate as it is something more abstract and based on personal experience which does not have some strict dimensions. The final routes could be many, but the main conclusion was that the

Ill. 32: Screenshot from Central Park app.



Menu presenting sites inside the app.



Ill. 33: Diff. possibilities inside themobile app.

greenery as a navigation tool between public spaces is a really good approach, allowing a smooth transition between public spaces and urban street scape, making you feel at the same time relaxed, safe and ready to explore.

Software

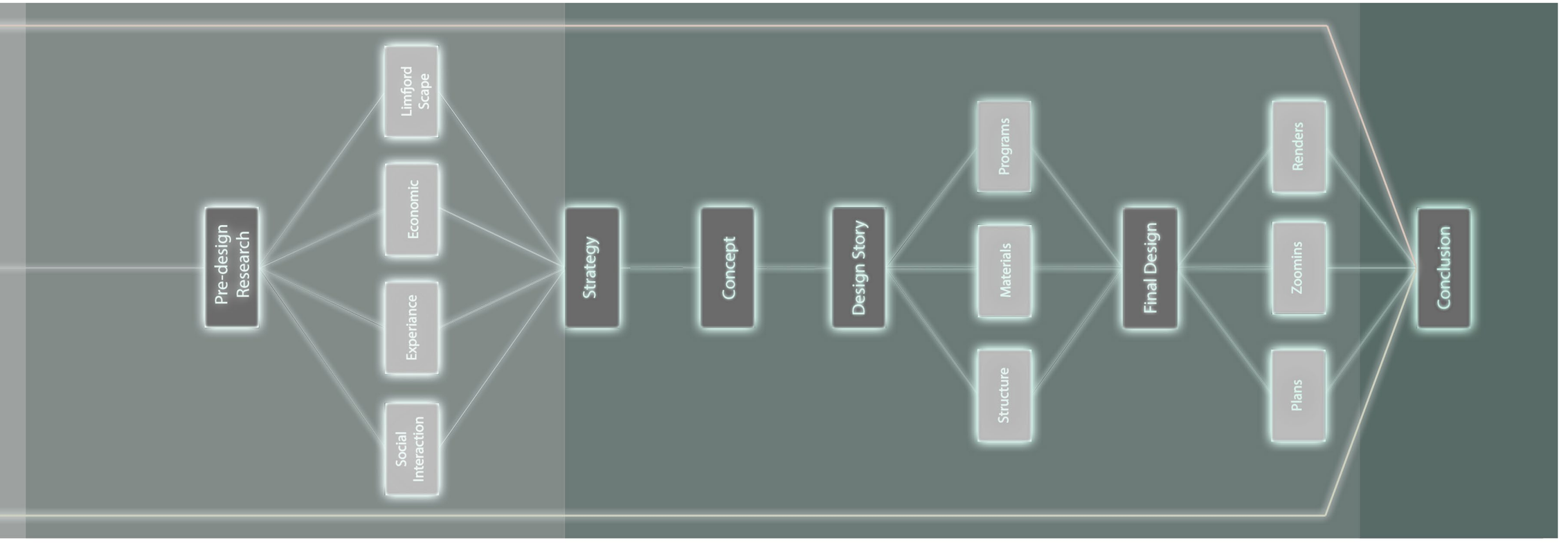
Living in 21st century, we cannot ignore all new technologies. We have to try to incorporate and integrate them in our future designs because they are and will be part of people's daily life. That is why instead of creating only the regular "hardware" navigation system, special applications and websites could be developed for the same purpose – giving different useful information about the public spaces in the city – events, ratings, routes etc. Social networks could additionally contribute to the system by allowing people sharing information and experiences, giving recommendations, critics and advices, a tool which would be also useful for the municipality for improving reasons (Bigcitypix, 2010).

Conclusion

Creating a homogenous network of public spaces in both cities would considerably improve the connection between them and provide a potential field for higher social interaction between the citizens. Giving detailed information to people about the surrounding public spaces could definitely affect their behavior as well as frequency and duration of visiting. It is a simple question of giving options and choices to people to select the best for themselves.

The Bridge as a Public Space

This chapter consists two parts. The first part investigates the "understanding" of what a public space is, and explores "tools" that can be useful when analysing public spaces and creating a public space on a bridge. The second part utilizes the theoretical framework as a "lens" for mapping public spaces on the waterfronts.



Pre-Design Research

Design

Conclusion

The Bridge as a Public Space

Defining the Public Space and Its Role

When thinking about public spaces, we tend to think about physical spaces in the city. Public space is accessible by everyone. These spaces are usually outdoor spaces that are spatially defined, by for example the surrounding buildings, streets, plazas, parks and more. It is also a mental space. Public space is accessible by everyone, thus a bridge is a public space.

The public space is not just a spatial place, but also a space one share with others. A space where one observes others and is observed by others. Walzer describes public space as a "space we share with strangers, people who aren't our relatives, friends, or work associates. It is space for politics, religion, commerce, sport; space for peaceful coexistence and impersonal encounter. Its character expresses and also conditions our public life, civic culture, everyday discourse" (Walzer, 1995 : pp 320). It is the opposite of private. In the public one becomes anonymous, while in the private one has knowledge of the others. "*The difference between public and private lies in the amount of knowledge one person or group has about others; in the private realm, as in a family, one knows others well and close up, whereas in a public realm one does not; incomplete knowledge joins to anonymity in the public realm*" (Sennett, 2008).

Project for Public Spaces (PPS) is a nonprofit organization that work with public spaces in order to strengthen the surrounding communities in cities. They claim that public spaces are important for cities. "*What defines a character of a city is its public space, not its private space. (...) The value of the public good affects the value of the private good. We need to show every day that public spaces are an asset to a city*" (PPS and UN-HABITAT, 2012, p 1). This shows the importance of the bridge as a public space for the city. PPS believes that public spaces are important when breaking down the barriers between neighborhoods in cities.

The Public Space Toolbox

The goal of this project is to create the bridge as a public space and an asset for the city. Walzer distinguishes between two categories of public space. These spaces are about mono- and multifunctional spaces, but also predefined and non-predefined spaces. The first is single-minded space. The single-minded space is according to Walzer, designed by planners and developers who have only a single purpose in mind and is similarly unambiguously used by its citizens. The second category is open-minded

space. This is designed for the purpose of several different uses; which includes unforeseeable uses. Thus the space consists of programmed and unprogrammed features. It makes users do unforeseen uses. *"It's not only that space serves certain purposes known in advance by its users, but also that its design and character stimulate (or repress) certain qualities of attention, interest, forbearance, and receptivity. We act differently in different sort of space - in part, to be sure, because of what we are doing there, but also because of what others are doing, because of what it means to be "there", and because of the look and feel of the space itself"* (Walzer, 1995: pp 321).

The current connections over Limfjorden are similar to single-minded spaces. These are infrastructural roads that mainly serve one purpose which is to move from point A to B. The citizen survey showed similar result for the use of Limfjordbroen, where a large amount of the participants answered that they used the bridge as a predefined functional space where they only pass over it (Appendix).

Walzer points out that open-minded and single-minded spaces are not equal to good or bad spaces. However they have different properties. Single-minded spaces are usually used when we are in a hurry, and here one perform a single task efficiently. It becomes instrumental where we go in and go out. We do not abide there. Walzer also mentions how these spaces can be convenient when we do not want to notice or be noticed by other people, and further arguments that it is a private and intimate space.
"Single-mindedness is designed to serve and facilitate privacy; it has no value itself, and no one ever thought that it did (even the romance of the highway is largely the romance of the private car)"

III. 35: From Limfjordbroen. An infrastructural connection that functions as a single-minded space.

(Walzer, 1995: pp 324).

Single-minded spaces does not contribute to unpredictability, these are spaces that does not encourage engagement, and people have no hope to engage with one another.

Open-minded spaces tend to be used when we have time to loiter. It is places with multiple functions, where people meet, walk, sit, discuss, and wait for something to happen. An open-minded space provides disorder, chaotic mix of discourses and unexpected experiences.

One might argue that the current connections does not contribute to brake down the segregation between the two cities, Aalborg and Nørresundby. Single-minded spaces create private "spheres" where there is little room for unpredictability and engagement. It is therefore important that a new connection is an open-minded space.

Richard Sennett share some of Walzer's definition and relate public spaces to mono-functional and multi-functional spaces. "In principle, an overlay of functions creates public space: the thicker the collage of functions, the more public a space becomes" (Sennett, 2013).

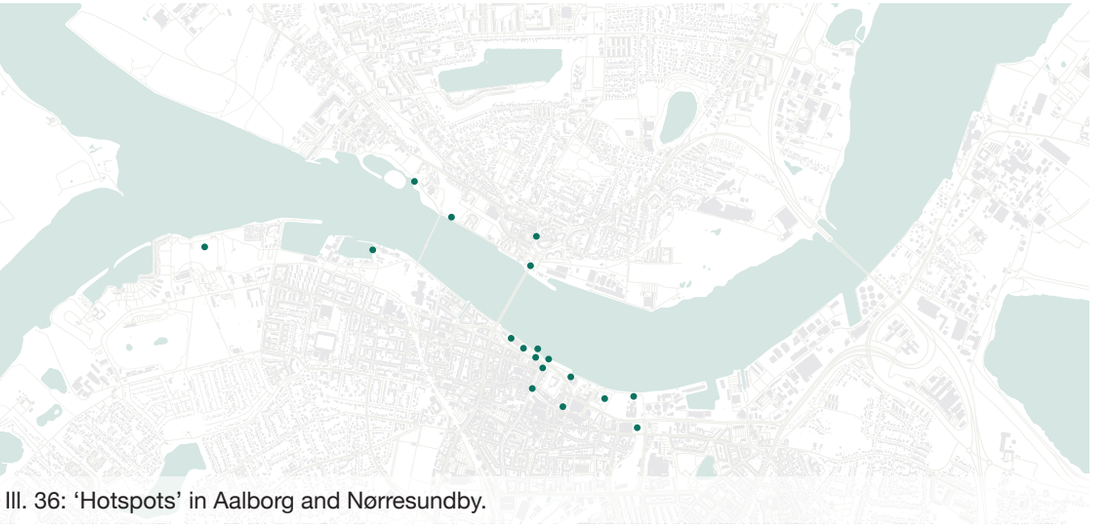
In his book The Uses of Disorder he arguments that those spaces which are more concerned with role play and the theater of the public life, are more multifunctional than monofunctional. He describes how the city influences the city person and his identity. Public spaces in the city provide the possibility for unique encounters and social exploration. Sennett explains the importance of public spaces to not to be predetermined, with predetermined functions. They should rather allow diversity and conflicts. "*My belief is that this disorder is better than dead, predetermined planning, which restricts effective social exploration. It is better for men to be makers of historical change than for the functional design of a pre-experiential plan to be "carried out"*" (Sennett, 1996, p 142). This kind of multifunctional space gives room for social exploration. With a disorder, the identity of the place is not planned, but rather added by its users. It opens an invitation to the user to be involved with the space and to create its own space; thus taking part of the content created in the space. The question then becomes, how do one create public spaces that attracts different social groups?

Hajer and Reijndorp have investigated, in their book "In search of new public domain", what factors lead to places developing into public domain. They "*define 'public domain' as those places where an exchange between different social groups is possible and actually occurs*" (Hajer and Reijndorp, 2001, p 11). They make a distinction between 'public space' and 'public domain'. Where a public space is accessible for everyone, a public domain on the other hand is a place with "shared experience by people from different backgrounds" (Hajer and Reijndorp, 2001, p 11). Public domain is a place where groups of different backgrounds have reason to come and thereby meet different social and cultural backgrounds, thus exchanging experiences; and it does not require to be in a public space, but can occur in private places or private places managed by the public, such as London Underground where a variety of people travel in the rush hours. This means that the public domain is not so much about the space itself, but rather about the experience. It is motivated by an urge or search after the experience with "others" and the unfamiliar of other social groups. It is about experiencing something different than yourself. When thinking about designing a public domain, Hajer and Reijndorp explain that it is not so much about the actual layout of the separate spaces. Instead it is a "*conscious design of different spaces and their interrelationship*" (Hajer and Reijndorp, 2001, p 116). In order to design a public domain they present a set of instruments. These are three strategies: theming, compressing and connecting. Theming focus on creating places that can be meaningful for specific groups. Compressing is about generating a public domain with numerous elements by bringing the different groups and the places that are meaningful to them into close proximity to one another. Connecting concerns the importance of how the different places are relating to one another (Hajer and Reijndorp, 2001, p 117).

Public domain as a tool becomes interesting when designing a public space. One could relate

'themes' with programs. From this perspective, the programming of the space and the proximity of the programs becomes of more importance than the room itself or the architecture of the space or a building. Hajer and Reijndorp explains that "*the core of successful public space thus lies not so much in the shared use of space with others, let alone in the 'meeting', but rather in the opportunities that urban proximity offers for a 'shift' of perspective: through the experience of otherness one's own casual view of reality gets some competition from other views and lifestyles*" (Hajer and Reijndorp, 2001, p 89). This means that when designing a public space, it is not just about designing one space, but working with multiple places. The programs becomes of importance when attempting to create places that can invite to occupation by specific groups.

Jan Gehl has a toolbox which lists criteria a place should take into account in order to be a well functioning space that people find enjoyable to use. These criteria can be considered to be useful when detailing the space. Gehl divides the criteria into three categories: Protection, comfort and delight. Criteria regarding protection deals with how the space should be designed so it protects the user against dangerous traffic, crime, and discomfort for the senses. Gehl mentions both problem areas to solve and methods and goals in order to cope with these main issues that can lead to protection. The next step is to work with comfort for the user which involves creating seating, places for stay, walk to and look at as well as activities for unfoldment. Last is working with methods that pleases the senses of the user. This involves working with the human scale, utilize possible positive effects from the climate and the attention to aesthetic details.



Ill. 36: 'Hotspots' in Aalborg and Nørresundby.

In this project these criteria can be used when detailing the spaces on the bridge. The criteria should also be considered before reaching a detailed scale in the design process; and it could function as a checklist to make sure the spaces include crucial elements.

Public Spaces as "Hotspots"

As part of the mapping the waterfronts of Aalborg and Nørresundby were explored by walking. The result from this mapping revealed the most attractive public spaces and most actively used. We refer to these public spaces as "hotspots". As shown in illustration 36, most 'hotspots' are located in Aalborg. Aalborg has 14 hotspots compared to 4 in Nørresundby. The mapping also shows how attractive public spaces attract other public spaces, which is the case of Aalborg central harbor.

Conclusion

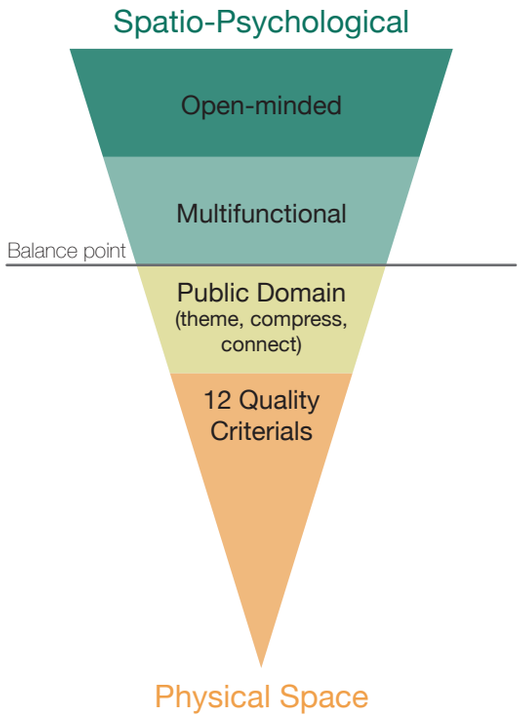
This chapter has examined several theories relating to public spaces as well as a mapping of public spaces on the waterfronts. The mapping of public spaces reveals a biased development

of public spaces on the waterfronts. The result shows considerably more 'hotspots' in Aalborg compared to Nørresundby.

The chapter encompasses definitions of the public space and theories that can be part of a toolbox which can be utilized when designing a bridge as a public space. The theories have common arguments, which apply in different levels (or scales) going from an overview and down to the detailed space, as shown in the diagram to the right. They mention the importance of multifunctional spaces and the opportunities they create with social exploration.

Developing open-minded spaces can cause unpredictable events, which may cause a stronger sense of ownership of the city; and brake down the segregation. People take over the places. They create their own mental connections of the city. To enable unpredictable events and exchanges, public domain becomes a vital tool for programming and thinking about the proximity of areas and their relations.

As designers we should be aware of the balance of pre-determined and undetermined functions and spaces. Certain functions are necessary and some parts can be more flexible and open in order to allow for a balance of attraction and ownership. Programs and functions can enable new experiences, therefore this will be an important topic for the design process. These tools are both important when thinking about the space itself, but also the purpose of the space itself, which is to solve the segregation. If the public space is done right it can get people out of their own sphere and challenge, "expand" and enlighten people's minds and perspectives.



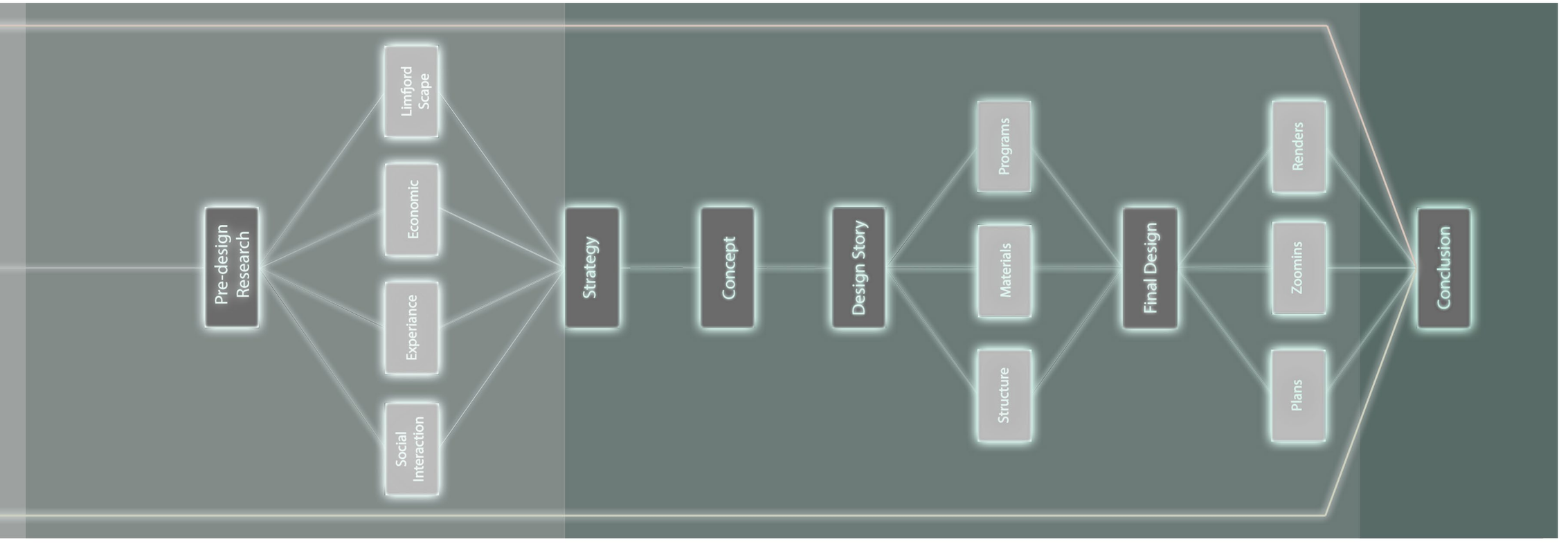
Ill. 37: Diagrammatic model of public space theories and how they work in different scales or levels, going from the overview of "spatio-psychological" and down to the physical space. The spatio-psycological is about the perception of the space and the psychological effects it has on the user. While the physical space narrows down to the design and to the human scale. We notice a sort of balance point between multifunctional and public domain, where designing moves from psycoligcal design and over to a physical design.

"Building inclusive, healthy, functional, and productive cities is perhaps the greatest challenge facing humanity today. There are no easy solutions. And yet a key part of the puzzle lies right in the heart of the world's urban areas: the public spaces" (PPS, 2012).

Ill. 38: Aalborg Central Harbor is a public space with many 'hotspots' within close proximity. The 'hotspots' have differents themes, such as playground, park, and a swimming pool. The areas are compressed and connected by the promenade; and attracts different user groups to the area, making it a public domain.

Mapping Conclusion

A brief conclusion of the mapping.



Pre-Design Research

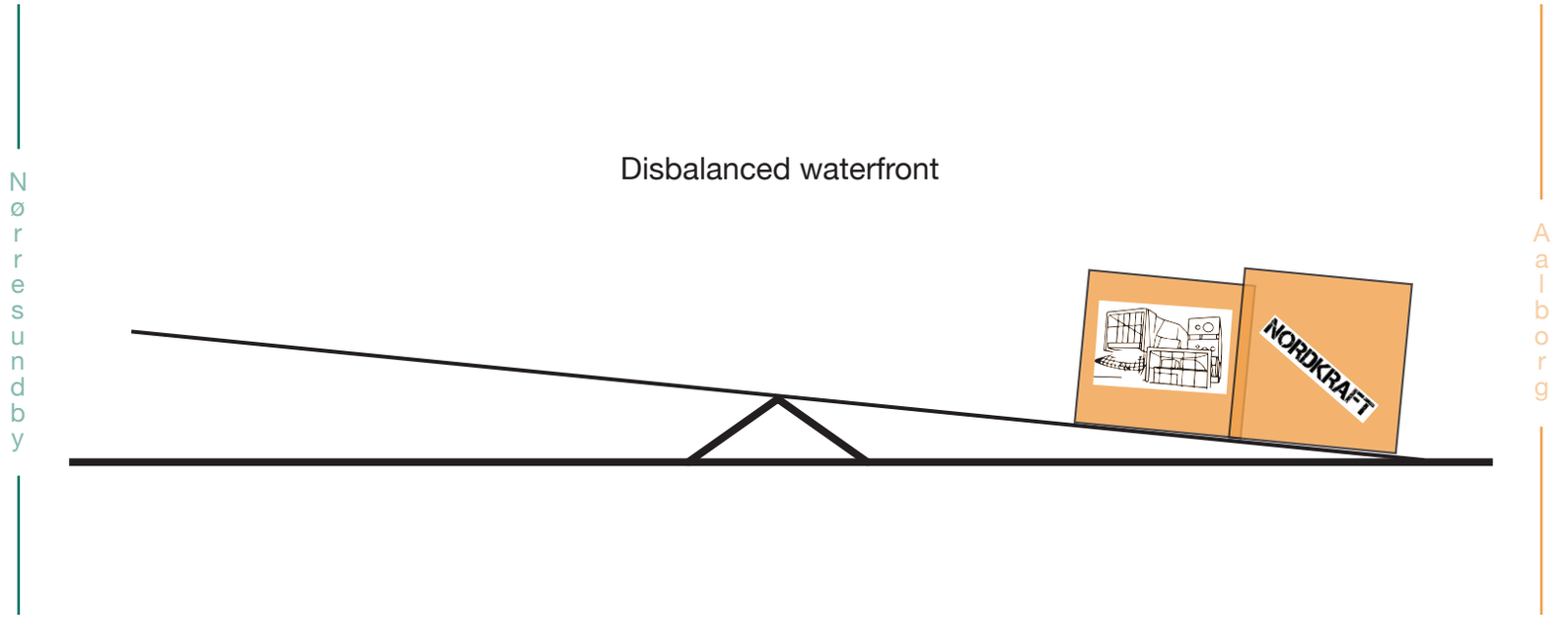
Design

Conclusion

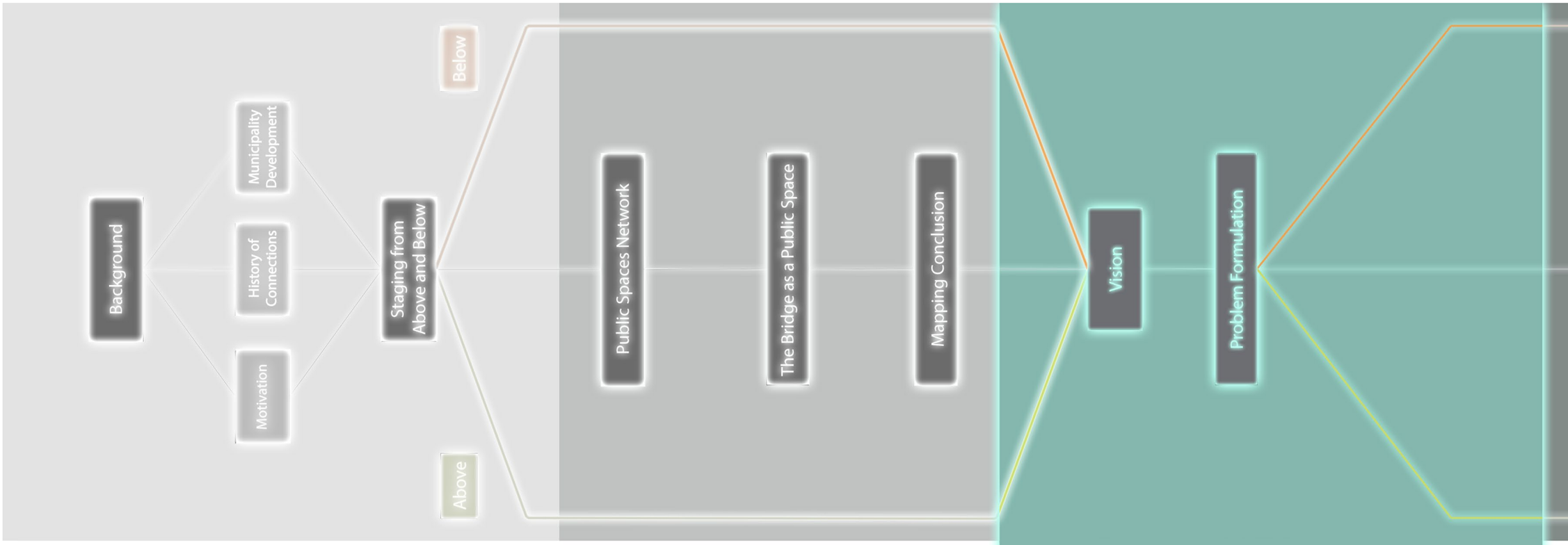
Mapping Conclusion

The public networks in both cities Nørresundby and Aalborg are very well developed as it was shown at the analytical part. However the main problem is that the networks are still strongly separated from each other with limited connections. This fact strengthens the segregation between both cities additionally. The waterfronts of both areas are also significantly disconnected and different. A strong disbalance between both harborfronts is observed. In addition to extreme contrast is seen between the undeveloped areas at central Nørresundby waterfront and developing Aalborg waterfront (see illustration 40). The second one is a field for new projects and boom of transformation, compared to the other one where non-places could be easily found. As it was shown on the hotspots-map (illustration 36) most of the attractions "hot spots" are located at Aalborg central waterfront reinforcing the separation between both cities.

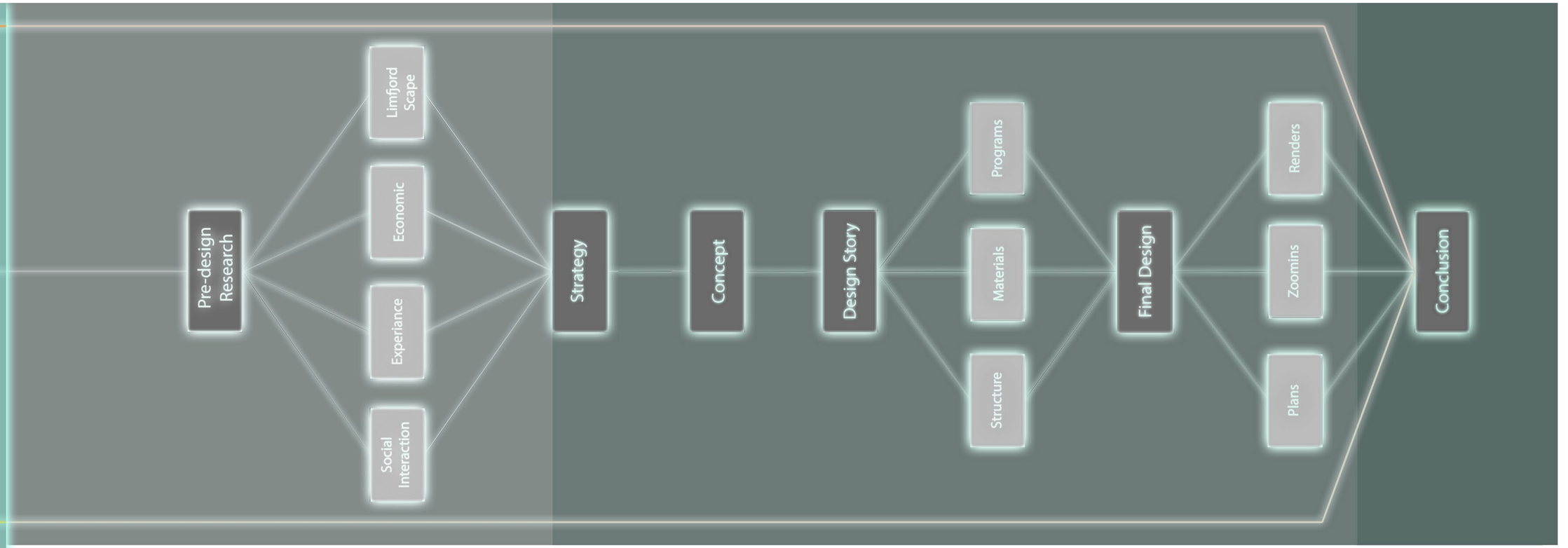
Ill. 40: Segregated waterfront development.



Ill. 41: Disbalanced waterfront development where Aalborg in recent years has had more development than the opposite side in Nørresundby which is a non-place.


Background
Municipality Development
History of Connections
Motivation
Staging from Above and Below
Below
Above
Public Spaces Network
The Bridge as a Public Space
Mapping Conclusion
Vision
Problem Formulation

Vision



Pre-Design Research

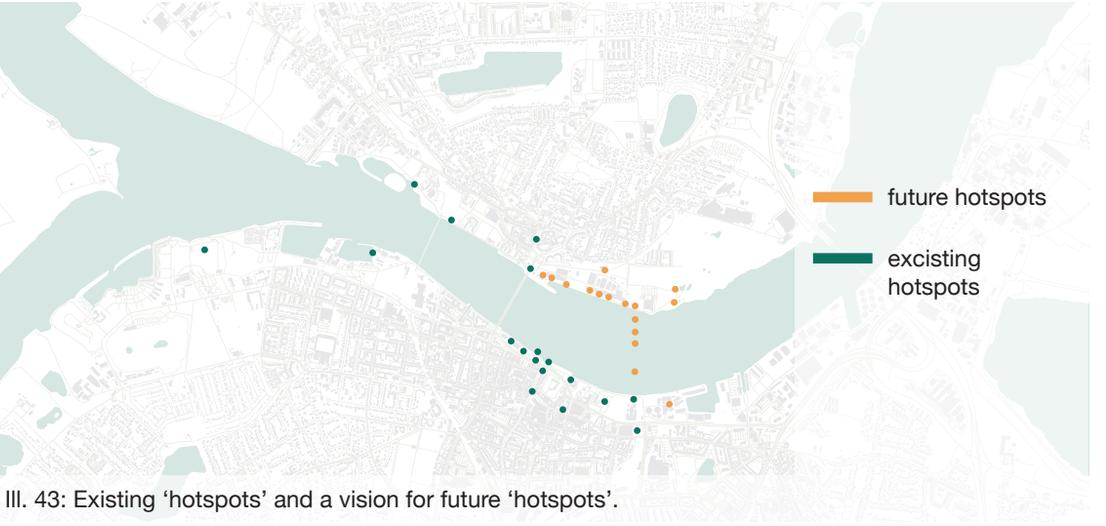
Design

Conclusion

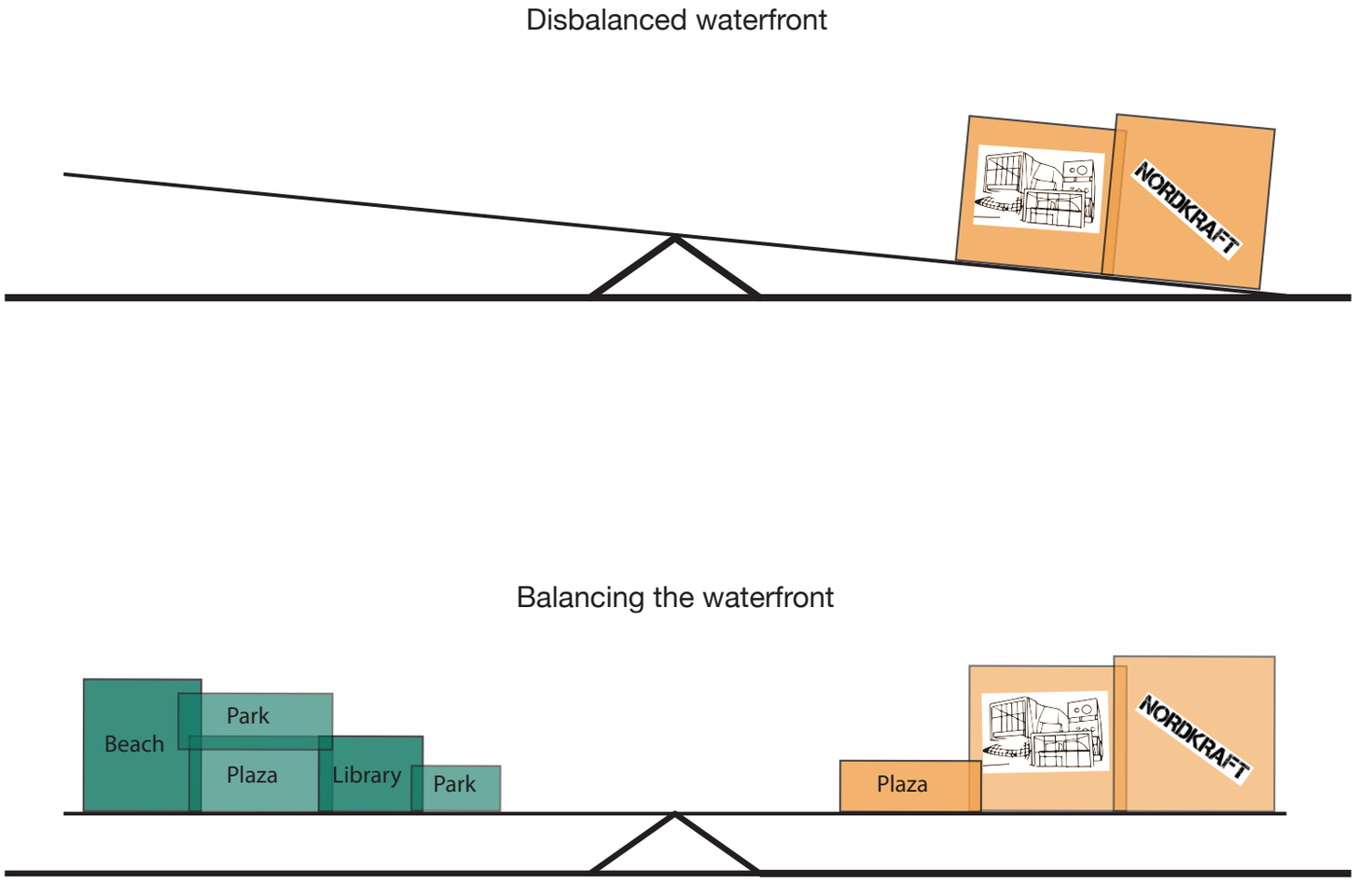
Vision

The current and planned pedestrian connections over the fjord, introduced in the historical chapter, are highlighting the gap and problematic situation east from Limfjordsbroen. This is the area where strong contrast between both waterfronts is observed. While at Alborg site huge buildings are built and vast areas are developed; on Nørresundby part neglected and abandon territories are detected. The lack of almost any activities increases the effect of the "non- place", which most of the people are avoiding.

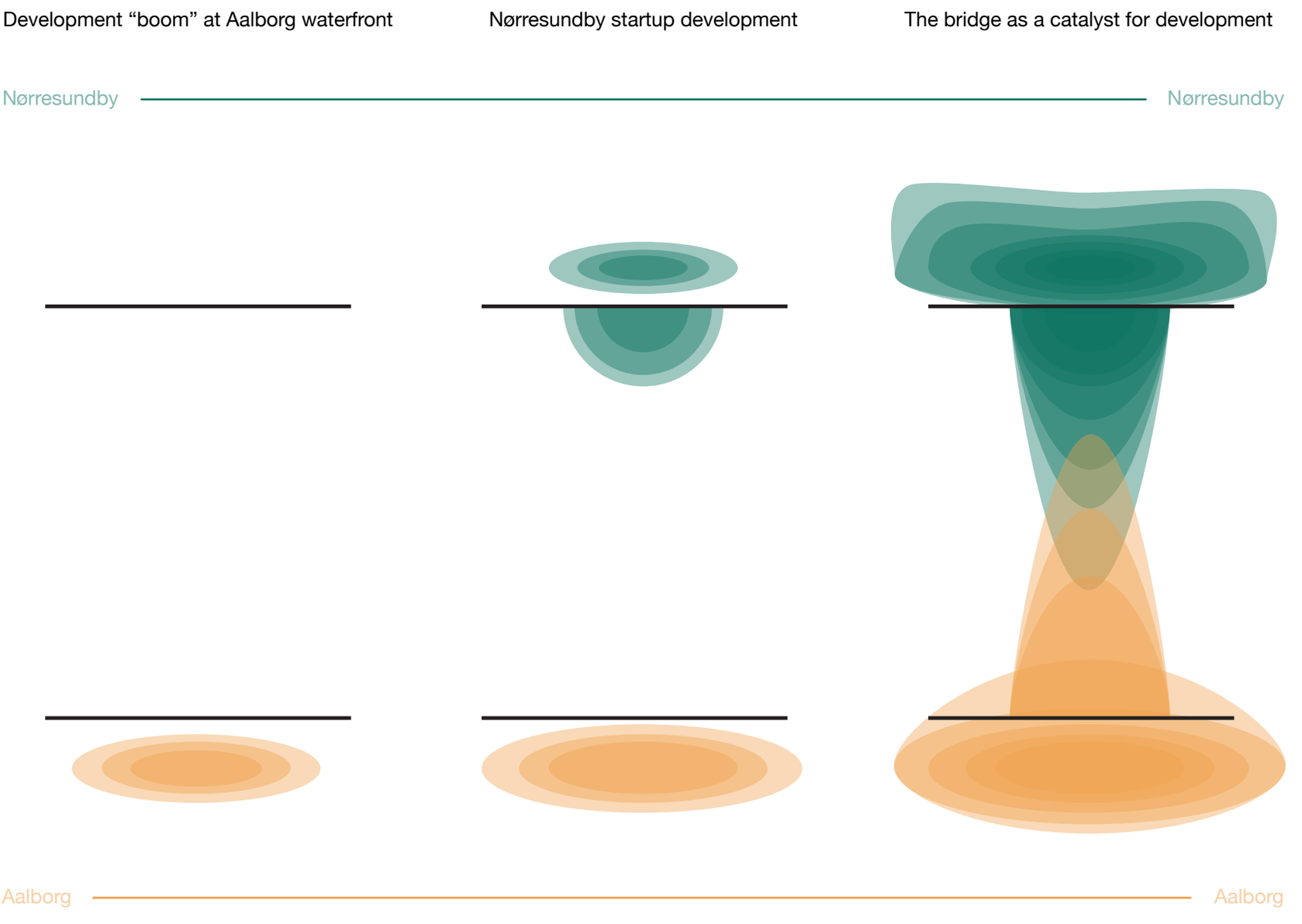
The idea of this project is using the enormous developing energy of Aalborg waterfront to trigger some transformations in Nørresundby and regenerate the waterfront. However both sides should be activated before linking them – "something should meet something". The plan of the current project is before using the power of development in Aalborg city, the already planned area between the Municipality and Hedegaard, to be developed. New active points will be created as a first stage of the process "balancing waterfronts". As a respond to the demand for new facilities and public spaces a structure in the fjord will be built expanding the waterfront area and approaching Aalborg site. After both zones are developed a connection between Aalborg and Nørresundby starting from the plaza in front of the House of Music and ending next to the Municipality area will be built. The released energy from the "boom" developing in Aalborg will be used as a trigger for an additional development in Nørresundby, creating more "hot spots" and reaching the required balance of the two otherwise contrast waterfronts.



Ill. 43: Existing 'hotspots' and a vision for future 'hotspots'.

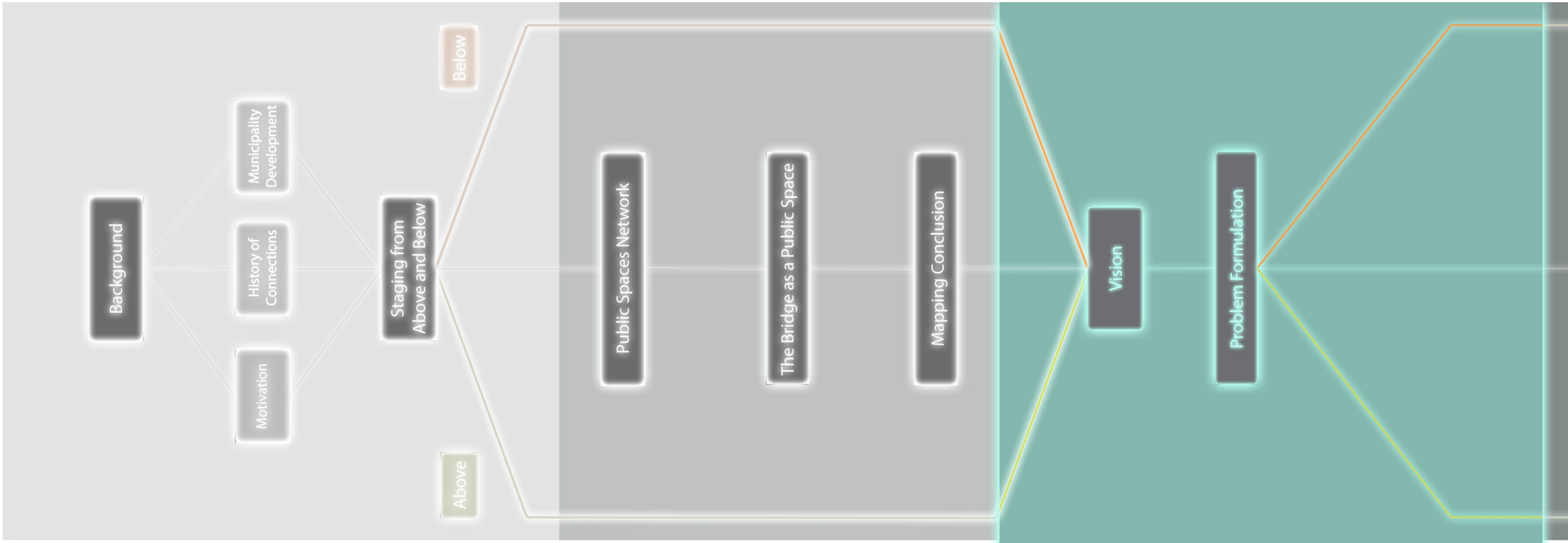


Ill. 44: A vision for balancing out the waterfronts.



Ill. 45: Development strategy.

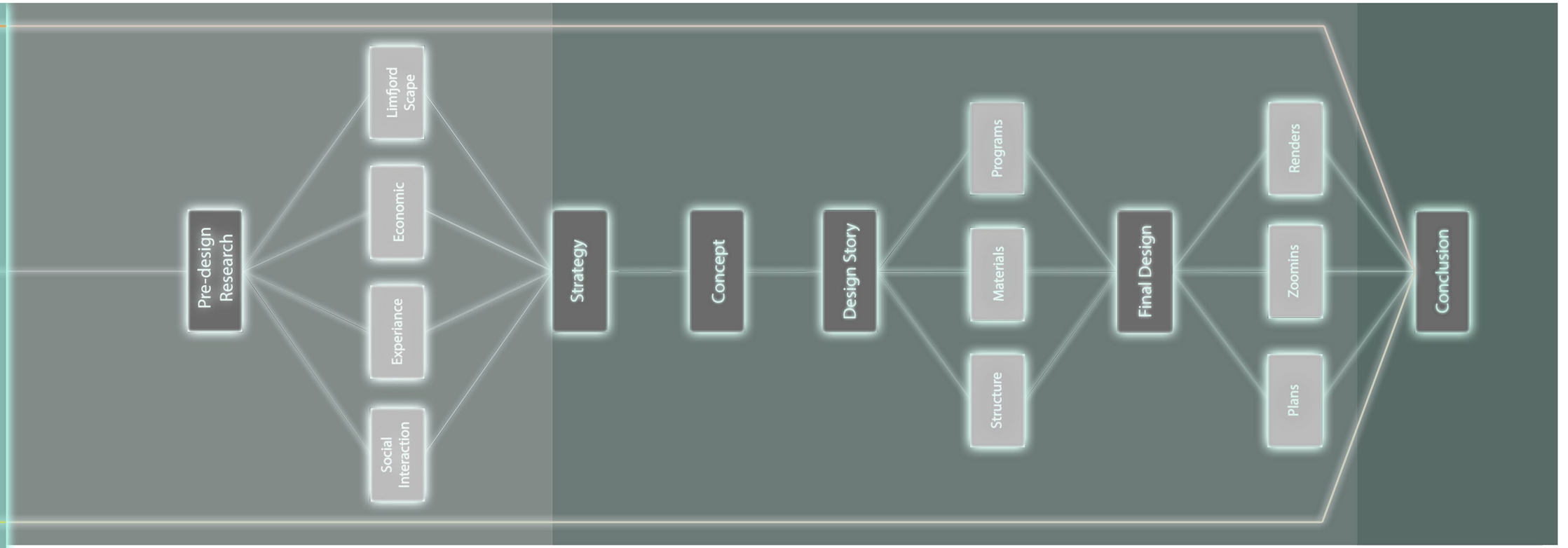
The bridge project is seen as an urban element which will allow the transition of "development energy" in Aalborg to be released and used as a force for new development and economic growth in Nørresundby. A structure which will break the segregation between these two cities by balancing the waterfronts, filling the psychological and physical gap over the fjord. The bridge could be the key element, connector between the two separated networks of public spaces. A new pedestrian connection which is seen as a 'meeting point' between cities, promoting social interaction and offering different experiences to the users.



Vision & Problem Formulation

Problem Formulation

This chapter presents the problem formulation and research questions in relation with working with the segregation of the cities and building a bridge.



Pre-Design Research

Design

Conclusion

Problem Formulation

How can a new hybrid pedestrian bridge strengthen the connection between Nørresundby and Aalborg, diminishing the existing segregation?

Could a creation of a new meeting point in the middle of the fjord, tie up the public spaces in both cities into one homogeneous network?

Research Questions

What could promote social exchange between the two cities?

Can the development in Aalborg waterfront impact Nørresundby?

Can a hybrid bridge promote a new development in Nørresundy?

How can we overcome the economic barriers of building a new bridge?

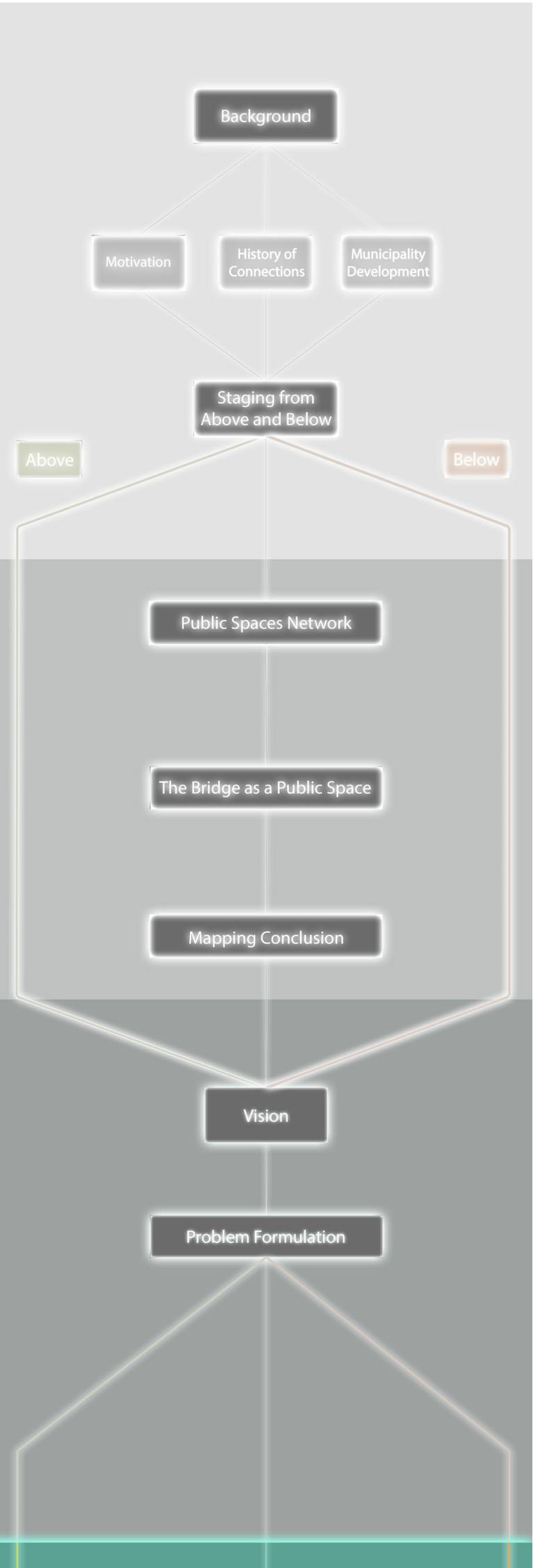
How could the environment of the fjord affect the design of the bridge?

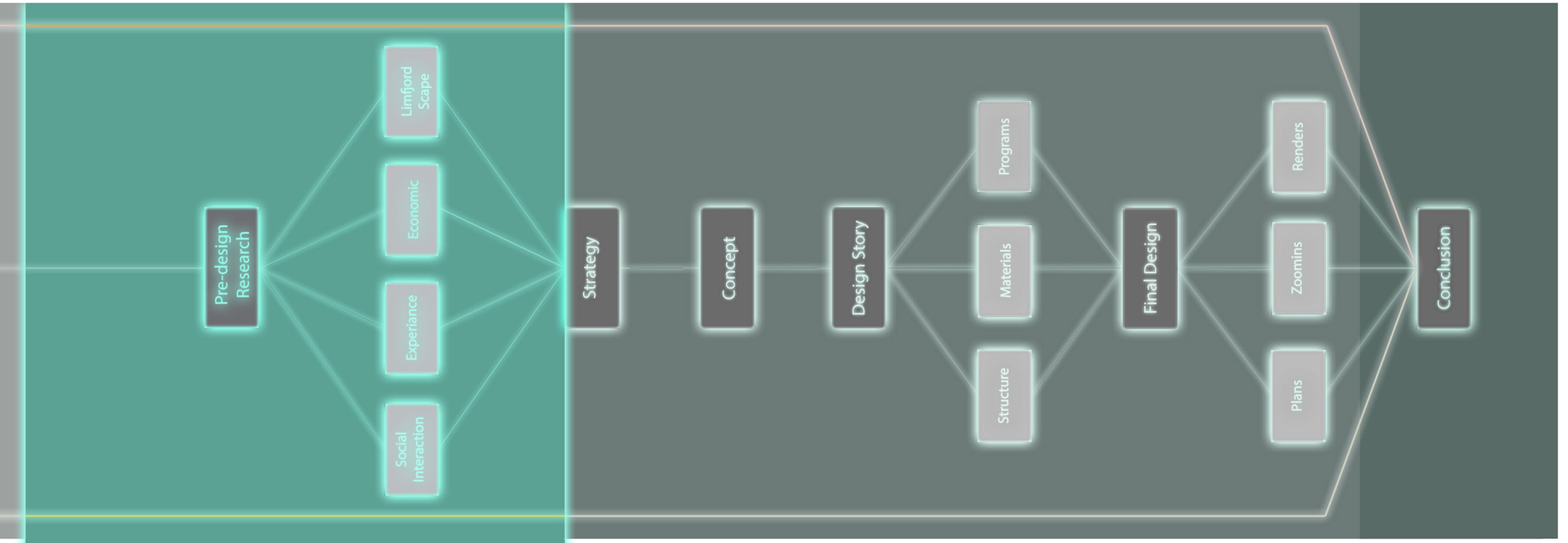
Which design features could the bridge include in order to create an environment of public space emphasizing on the individual experience?

Introduction

Mapping

Vision & Problem Formulation



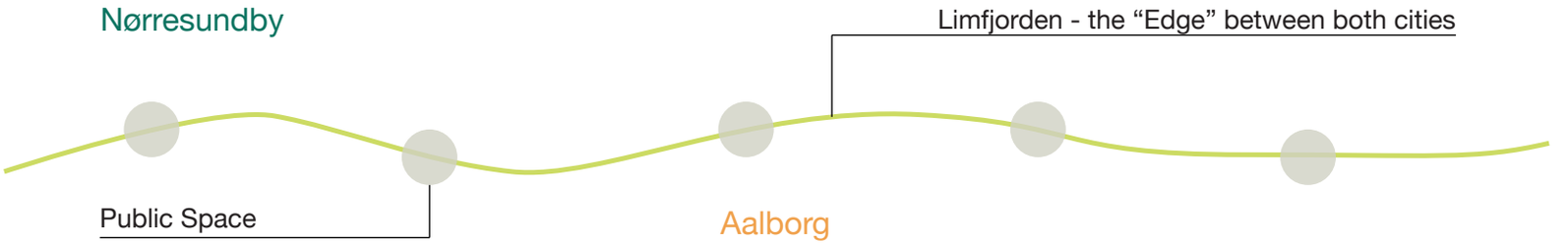


Pre-Design Research

Pre-design Research

This chapter will introduce four main sub-chapters which are closely related to the design process. Every single section has elaborated on and analyzed different aspects and issues which could and have influenced the design process in the current project.

Social Interaction



III. 48: Diagram that show how public spaces along the “edge” between cities (here Aalborg and Nørresundby) can create exchanges and unite the areas.

As it was mentioned previously one of the biggest problems between Aalborg and Nørresundby is the strong segregation. In order to break down this obstacle there should be created a spatial field which connects both cities and allows strong interrelation and interaction between their inhabitants.

This subchapter will represent and explain two main theories respectively by Sennett and Goffman. The first theory is used to explain and justify the importance of locating a public space on the edge of two separated areas in order to create social interaction, building up something more than just a physical connection, fading the segregation away. The second theory narrows down, elaborating more on the social process or after we have decided the location and area of a public space what do we need to have and create in order to trigger interaction between the potential users. The theories are supposed to be understood and filtered through the concept of hybrid bridge in the context of Aalborg and Nørresundby.

Exchange on the Border

The two cities Aalborg and Nørresundby have a network of public spaces, although these public spaces seem to be clustered in two areas which have a limited connection. This emphasizes that the two cities are physically divided. Though there are attractive public spaces in both cities, the distance between the public spaces limits the accessibility between them. The development of the cities and their public spaces appears to be biased. As mentioned before, Aalborg has gained more development in the waterfront in the recent years. Our analysis also finds more public spaces and “hotspots” in Aalborg compared to Nørresundby. Findings from the questionnaire with the citizens revealed that the interaction level between Aalborg and Nørresundby is low (Citizens Questionnaire, Appendix). Mainly inhabitants living in Aalborg answered that they rarely visited Nørresundby, except passing through Nørresundby or visiting friends. From Walzer’s point of view as mentioned in a previous chapter, this means they are in private spheres when visiting Nørresundby.

When participants had been to the public spaces available in Nørresundby, it turned out that they were not aware of other attractions in the same city. The results reveal that the social interaction between Aalborg and Nørresundby is limited and appears to be biased where mostly people from Nørresundby visit Aalborg, but not the other way around. Richard Sennett is a contemporary sociologist who writes about cities. His research works with the challenges of cities developing an open culture (SENNETT’S WEBSITE). Sennett warns against the development of cities that are divided. Divided cities can enhance the ghetto effect in neighborhoods, leading to more social and cultural division between districts (Sennett, 1995).

Sennett is argumenting for the importance of an opened and integrated city where functions overlap and citizens are part of the whole complexity. Furthermore, it is claimed that the unfamiliar and unknown both socially and culturally can challenge one’s perceptions, and bring positive contributions to a person, as well as make

one take chances in life (Sennett, 1995).
"...then to overcome the unknown, to erase differences between people, seems to be a matter of overcoming part of the basic illness of capitalism. To erase this stranger hood you try to make intimate and local the scale of human experience - that is, you make local territory morally sacred. It is the celebration of the ghetto. Now precisely what gets lost in this celebration is the idea that people grow only by processes of encountering the unknown." (Sennett, 1995, p227).

Sennett claims that strategies of enhancing local communities could have a negative impact on the individual and city itself. He refers to a project for building a cultural house in a poor hispanic area of New York close to the wealthy neighborhood Fifth Avenue. The cultural house was placed inside the poor district. Sennett believes that the placement lead to furthermore structural and social segregation. According to him the cultural house could have instead functioned as a cultural interface between the two different neighborhoods (Sennett, 2005).

In order to work with the city as a whole and not with a divided city with local communities, one should work with the edges between the neighborhoods in cities. One of the citizens we spoke to, who lived in Nørresundby, called it "living on the other side of the wall". This emphasizes that Limfjorden works as a wall or an edge between the two cities. According to Sennett, erasing the division is not as simple as connecting everything, as it is already done with the existing connections across Limfjorden. As Sennett says:

"...connecting everything up so that everything flows into each other is not a very good social recipe. It annihilates difference. It does not provide a forum for difference in which you acknowledge difficulty but permit interaction." (Sennett, 2005, p 46-47).

From the questionnaire we found that many people who lived in Aalborg only used the connections in order to pass through the bridge to get to their workplace in Nørresundby or through Nørresundby. The existing bridge doesn't provide field for social interaction or new and unexpected experiences. Sennett points out that an edge can be compared to a cell wall which has resistance and is porous.

"It is the space least controlled by the local communities. It is where all the stuffs that escape regulation happen. It is a permeable membrane. And my notion about this is that the combination of resistance and porosity matters because it is a qualitative condition for concentrating energy" (Sennett, 2005, p 46).

This mechanism in the cell wall is what keeps the cell alive. If it was tight, it would die. The same goes for a city. Therefore the edge becomes important for creating life.

Sennett's work strengthens our argument for locating and creating a new bridge, public space as a meeting point between Aalborg and Nørresundby. It is a method for working with the city as a whole since it combines the two cities. Limfjorden is the border which we need to work with in order to increase the exchange between the two territories. This means that the development of the two waterfronts becomes significantly important sites, since the same can create visual exchanges and work as attractors. Furthermore the connections across Limfjorden will be even more important. Which means that a future connection, a new pedestrian bridge can be catalyst for exchanges.

Social Interaction

After the location, of a particular public space between two segregated areas, is chosen, comes the challenge of how to design and create a space which stimulate and trigger social interaction.

The sociologist Ervin Goffman defines a range of concepts and rules which are explaining and describing the behavior of people in social situations. Even though his study is from the middle of the last century in US, these rules are still valid in a Scandinavian context today. (Ludvigsen, 2006)

The concepts of social interaction in public space represented here will be applied to a bridge concept and more specific to a hybrid

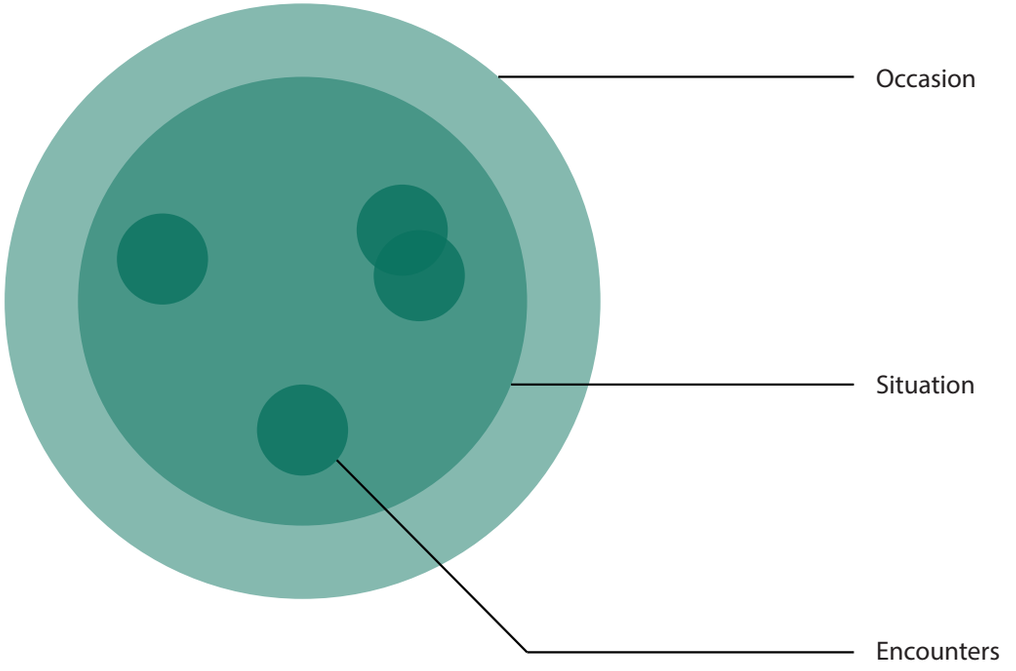
bridge between Aalborg and Nørresundby. Goffman defines three main concepts – occasion, situation and encounter.

The occasion is the social construct of the event. It is what we already know or should know about conduct at a given event. (Ludvigsen, 2006)

The situation then is the specific manifestation of the occasion. Influencing the situation is among other things the amount of people present and the room or spatial arrangement in which the situation takes place. A situation is "an environment of communication possibilities" in which everyone entering the situation is accessible to the other participants in the situation. (Ludvigsen, 2006)

The encounter or the face-to-face engagement is the smallest unit of social interaction. Consisting of only two or more people currently present in front of each other, focusing on a shared object, it also constitutes and delineates norms that shape the interaction. Even though a given occasion defines a very formal code of conduct, an encounter might evolve into a more informal interaction. (Ludvigsen, 2006)

Understood in the context of a bridge as public space, the occasion is the particular fixed environment of the bridge as a spatial existence. Even though this is more as infrastructure element, there is still a specific conduct that people are following while being on a bridge. However



Ill. 49: Diagram of Goffman's concept of social interaction.

that is what this project is trying to break up, and go out of the stereotype for behavior on a bridge or simply said transit "antisocial crossing". On the other hand the situation as Goffman mentions is a specific manifestation of the occasion or in our case at the bridge. If we talk again about regular bridge then this stage of the concept would be completely missing, since there is no space for its existence. However if we accept the bridge as a typical public space, then a situation could be variety of things – from sport events and concerts, exhibitions, and summer cinema to sunset, skate tricks or lights show. Once we have this second stage in a particular area we can talk about potential encounters and social interaction. Due to the variety of possible situations, the number of shared focuses increases and respectively the number of involved users at this area rises as well, leading to higher level of social interaction.

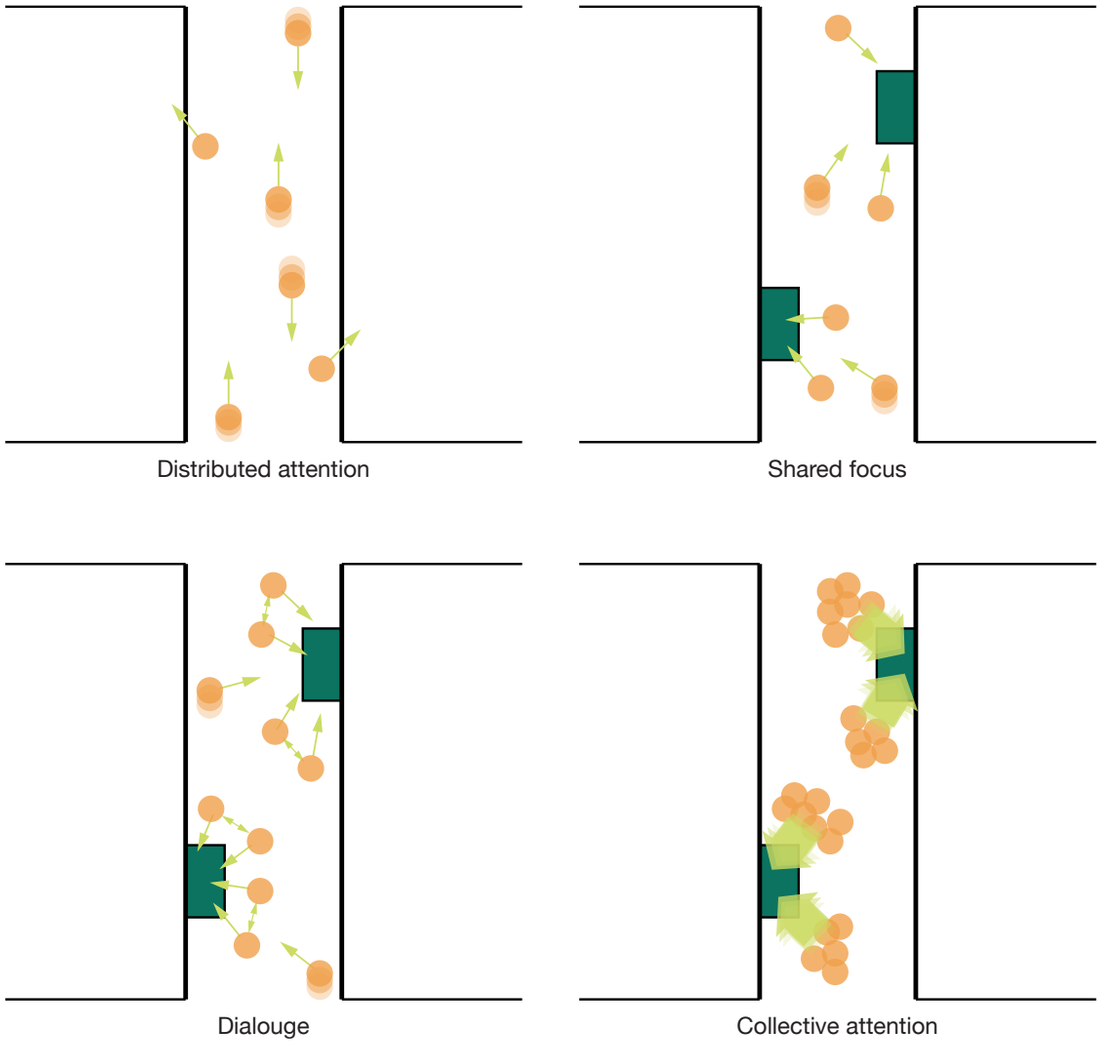
Depending on the levels of social interaction four main stages could be defined:
distributed attention
shared focus
dialogue
collective action

The conceptual framework of interaction in social spaces is structured along a scale of engagement, as in to what extend participants in each type of social interaction are actively engaged in the social activity, or what is the level of attention accredited to the social situation by the participants - how close are they and what do they share.

Distributed attention
The first level of the conceptual framework is when people are at a same space but there is no apparent center. In this case their focuses could be at different directions around the space, as the level of social interaction will be very low. When the attention is distributed the only shared thing is the presence in the space, in this case the bridge itself. (Ludvigsen, 2006)

"The distributed attention simply means that as a social space there is not much going on." (Ludvigsen, 2006)

Shared focus
The second level of interaction is when a particular situation creates a central focus which is shared between all involved users.



Ill. 50: Social interaction.

The shared focus is often giving a spatial orientation of participants or vice versa - the spatial configuration of participants is emphasizing a shared focus.

Dialogue
The third level is when people are getting engaged in a shared activity, where they can express their opinions and thoughts.

"...the dialogue is dependent on standing on "the shoulders" of the two levels before it as a dialogue would be difficult without shared presence at some form and shared focus of a subject. Dialogue is concerned with separate individuals participating in encounters or situations, taking a stance towards each other and keeping focus on the social situation at
hand, either exploring or debating a subject." (Ludvigsen, 2006)

Collective Action
The last level is a situation when a group of participants are working together, collaborating toward a shared goal.
"Closely related to dialogue but with a stronger emphasis on the shared subject, the collective social activity is the socially most engaging interaction. These collective experiences are often those big experiences that really stand out, being remembered for a long time and able to establish strong bonds between people." (Ludvigsen, 2006)
The concepts of Goffman for social interaction give us a better understanding how a space should be designed in order to reach a descent level of social exchange. The first stage of distributed attention is the exact situation and condition of the most bridges including the existing one between Aalborg and Nørresundby. There is nothing which could attract you and make you stop. The environment is quite unpleasant and uninviting. The conducted questionnaire confirms the antisocial atmosphere of this bridge as on the question "do you ever stop on the bridge" everybody mentioned "No". Yes the bridge functions perfectly but as an infrastructural element, just a connection, which as Sennett mention is not enough to solve a segregation problem between two areas. The faster you get out of the bridge the better!
The idea of the current project on the other hand is creating a hybrid, multifunctional bridge as a public space, place where people can stop, enjoy, talk, rest, sport etc. A bridge which provides plenty of spaces for shared focuses and activities, intending to reach high level of social interaction between the inhabitants of both cities from different user groups. The idea is shaping up a space on the border between Aalborg and Nørresundby where people can do some things together, relax together, experience together. An irregular bridge environment full of possibilities and choices.
"You can have fun "there" it is not just about getting from one place to another It is about engaging in this space!" (Exploratorium, 2013)

Experience Design

This subchapter cover part of the field experience design. It explores what experiencing means and provides tools that can be utilized when working with experience design.

To Experience

Experiencing is about changing an organisms conditions. Experiencing is entertaining and can arouse or relax us. It creates emotions and makes us feel alive. Experiencing can be challenging when encountering surprises or unfamiliarities. Experiences does not only challenge existing perceptions, but widens our understandings. It makes us learn and can change our habits. "Unique experiences sits in the 'system': they change roles, behavioral forms and scope forms, skills, insights and self-understanding" [translated by authors of the report] (Jantzen, Vetner and Bouchet, Oplevelsesdesign, 2011, p 152). Jantzen, Vetner and Bouchet summarizes it to: "Experiences moves. They get our bodies to move. And as they move us physically, they can come to touch our emotions, our self-understanding and our routines. Unique experiences are also characterized in that they can not deflect us from the everyday. They engulf us. In the situation we lose ourselves: unique experiences lead to self-forgetfulness: they put through against our will and get us for a while to forget what we were doing" [translated by authors of the report] (Jantzen, Vetner and Bouchet, Oplevelsesdesign, 2011, p 151).

Sense, Feel, Think, Act, and Relate Architecture

In the book Brandscapes (2007) Anna Klingmann refers to Bernd Schmitt's five 'strategic experimental modules'. The modules are used to describe the experiences. Schmitt is writing about an experience based marketing strategy. His proposition is that experiences rarely occur by themselves, but have to be strategically planned and implemented for the customers, in order to brand the product. The five experience modules are called Sense, Feel, Think, Act and Relate Marketing. Klingmann translates the concept over to the architecture field with the modules: Sense, Feel, Think, Act, and Relate Architecture.

'Sense architecture' appeals to the users senses with the objective of creating sensible experiences through the vision, hearing, touching and smelling; thus enabling an embodied experience. 'Feel architecture' attempts to appeal towards the user's inner feelings and seeks to promote an inner mood and emotion. The architecture should create certain atmospheres in order to make the user emotionally engaged and challenge the user's mood. 'Think architecture' aims at people's intellect and make them think and reflect through surprises and provocation. Think architecture is targeting the user's curiosity. 'Act architecture' is about enabling physical unfoldment where the user is interacting with people of different backgrounds. This could be achieved through play which catalyses social interaction. Last is 'Relate architecture' which is a combination of all the previous four categories. Here the goal is to appeal to the individual user and make him belong to the context.

Ill. 51: The Blur Building is a pavilion for Swiss EXPO 2002. Designed by Diller & Scofidio.

Interactive architecture

The last 20 years in information technology and telecommunications has completely changed our behaviour and lives. And it is affecting how people are using public spaces. No longer are we limited to meet in physical contact, but we are reachable all the time. The notion of a 'meeting place' has a different meaning, which means that the public space also has a new role. "This expanded and mobile city implies a new agenda for the public space. (...) If one takes the time to consider these design tasks, one realizes that the way in which we have thought about public space thus far has its shortcomings" (Hajer and Reijndorp, 2001, p14). Technological devices such as smartphones makes it possible for users to interact with spaces, and making spaces that reacts to their users. "Interactive Architecture (iA) is NOT simply architecture that is responsive or adaptive to changing circumstances. On the contrary, iA is based on the concept of bi-directional communication, which requires two active parties" (Oosterhuis and Xia, 2007, p4). Thus interactive architecture is a dialogue between the user and the architecture and space.

Conclusion

Experience design is directed towards the individual. Experience design encompasses user engagement and also allows the user to manage the situation, the space and the atmosphere. It is an interactive experience, where the space affect the user, and the user affect the space. Sense, Feel, Think, Act, and Relate Architecture and Interactive architecture are methods for applying experiences to the individual, in addition to the social experiences created by users in the space. A combination of the two methods (sense, feel, think, act and relate architecture and interactive architecture) could also provide for interesting approaches in creating experience design.

Economics

Building a pedestrian bridge nowadays is a big challenge for many cities mainly from economical point of view. Unlike the typical vehicular bridges the potential results, contribution and affects are not as transparent and economically efficient in the case of purely pedestrian bridges.

"*Within the last two decades, pedestrian bridges have increasingly been promoted for reasons other than the purely functional. In addition to their primary role in permitting the passage of pedestrians, cyclists and horse riders across obstacles, footbridges have been designed consciously as instruments of social and economic regeneration, as signposts to new developments, as symbols or icons of a community, and as urban sculptures.*" (Duguid, 2011)

The purpose of a particular footbridge, its design, structure and budget could vary considerably. In order to get better perception about the economic issues of a pedestrian bridge, couple of examples from projects around the world will be represented as well as some of the main structural aspects which could influence significantly the budget of a bridge.

Examples

Many people would ask how much exactly does this or that bridge cost. Well the answer would not be for sure one number. What is even more interesting is that in fact the variation in cost for footbridges is enormous. In order to get a better picture of that statement a list of some of the most expensive and respectively least expensive pedestrian bridges will be represented.

Bridge	*Year opened*	Cost	*Cost € at2010*	Longest span (m)	*Total length (m)*	*Width (m)*	*€ per metre overall*	€ per sq. meter overall
Millennium Bridge, Gateshead, Newcastle, UK	*2001*	*£22,000,000*	*€ 44,153,546*	*105*	*126*	*8*	*€ 350,425*	*€ 43,803*
Millennium Bridge, London, UK	*2000*	*£23,000,000*	*€ 48,274,980*	*144*	*333*	*4*	*€ 144,970*	*€ 36,242*
Ponte della Costituzione, Venice, Italy	*2008*	*€ 11,276,000*	*€ 11,846,848*	*81*	*94*	*7.4*	*€ 126,030*	*€ 17,031*
Golden Jubilee Footbridge, London UK	*2002*	*£19,750,000*	*€ 38,264,597*	*65*	*315*	*4.7*	*€ 121,475*	*€ 25,846*
Turtle Bay Sundial Bridge, Redding, USA	*2004*	*$ 23,500,000*	*€ 21,938,858*	*150*	*213*	*7*	*€ 102,922*	*€ 14,703*

Five of the most expensive bridges per metre length until 2010 (Duguid, 2011)

"Inevitably, the costs are sensitive to the place of construction, with two Eastern European bridges in the least expensive bracket. There is also a span effect, with the more expensive bridges generally having longer spans, although there are numerous exceptions to this trend, such as the Nesciobrug, which spans 171 m yet cost only €17,472 per meter length." (Duguid, 2011)

Main factors affecting the price of a bridge

In this subchapter three main elements influencing the cost of a bridge will be represented:

- Structure
- Materials
- Opening mechanisms
- Structure

In general bridge structures are divided in four main categories (DeCelle, Efron, Ramos, & Tully, 2013):

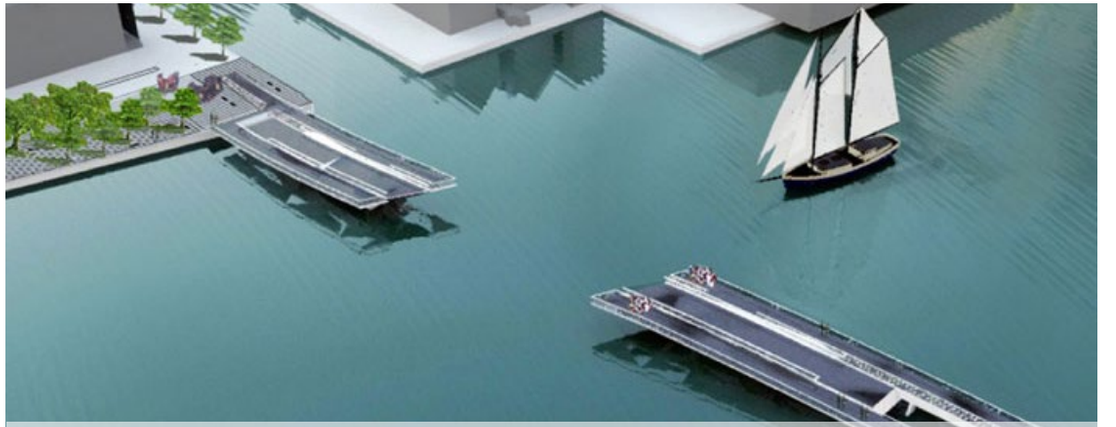
- Simply Supported Beam
- Truss Bridge
- Suspension
- Cable Stayed
- Arch

Every type structure has specific features and performances in different categories. For example a truss bridge is considered as not aesthetical structure but on the other had is cheap, easy

for construction, and minimizes the amount of material needed for structure. Cable stayed and suspension bridges are aesthetically pleasant structures but not easy for construction and quite expensive (Constantino, Ripke, & Welch, 2009). For better understanding a table with criteria of the different structures is introduced.

Materials
In general the construction materials for a bridge could be a lot. There are many bridges made out of timber, bamboo, stones and so on. However in the contemporary bridges, especially big constructions, the main construction materials are steel, concrete and reinforced concrete. Depending on the size and structure of the bridge the quantity of a particular material could differ considerably. For example an arc bridge requires enormous amount of steel compared to truss one. (Constantino, Ripke, & Welch, 2009)Furthermore many modern pedestrian bridges are using also other decorative, surface or structural materials which increase the price additionally, like different transparent or reflecting materials in order to reach a special effect.

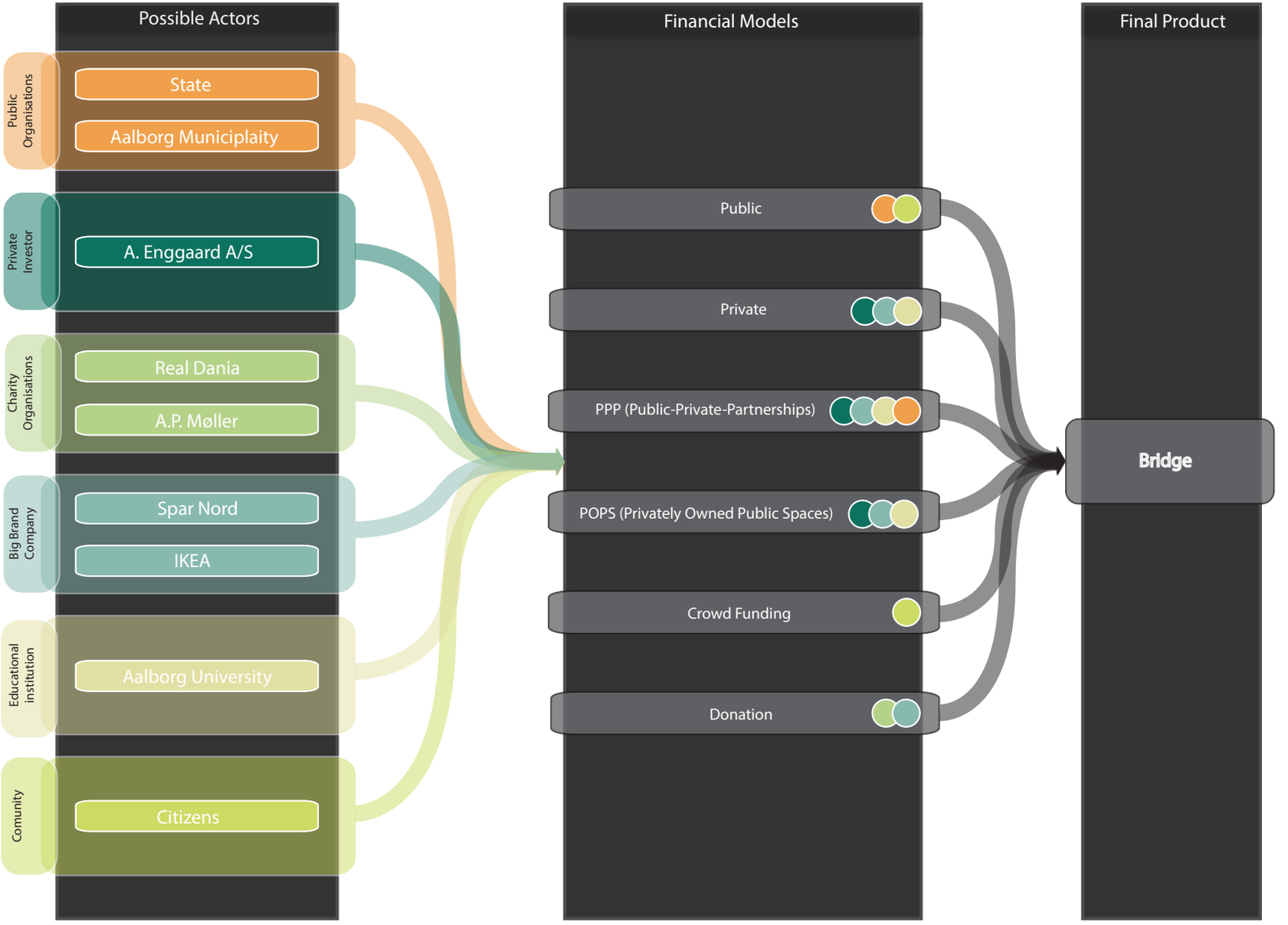
Opening mechanisms
The moveable bridges could increase the level of the budget due to the necessity of a mechanism which should be integrated in the bridge. However the type of the mechanism could vary a lot (appendix). Depending on it the economic issue also fluctuates. It makes difference whether it is implemented "old-school "opening mechanism like the ones in Amsterdam and the existing bridge in Aalborg (Pictures of both) or some innovative technologies like the sliding "Inderhavnen Bridge" Copenhagen.


Ill. 51: Inderhavnen Bridge, Copenhagen.

Possible actors and financial schemes
Once a project is done and the design is finished comes another challenge, finding actors who would participate and finance the project. This sub-chapter will introduce a list of possible, potential actors as well as different financial models for Aalborg-Nørresundby bridge. Examples of the particular actors and their contribution to various previous projects will be represented in order to get better perception of their role and amount of subsidies they have invested.

Potential actors and financial models
The possible actors are divided in six main categories – Public organizations, Private Investors, charity organizations, Big Brand Company, educational institution, community. Depending on the collaboration, number of participants and their type, six main financial models are generated – Public, Private, Public Private Partnership, Privately Owned Public Spaces, Crowd Funding, and Donation.

Actors
Short description of the possible actors in the different categories will be represented:
Public organizations – part of this category are the State and Aalborg Municipality. From the interview conducted in the municipality we found out that the State is investing at Aalborg city projects, but mainly at some transport big



Ill. 52: Finacial model.

projects, like 3.Limfjord and the light rail projects. On the other hand Aalborg municipality has been participated in the financial processes for some of the stages part of the waterfront development.

Private Investors – one of the biggest private investor in Aalborg participating in many developing projects like CAMPUS - Godsbanearealet, Østre Havn, 254 Undgomsboliger- Aalborg, Havnefornyelse - Nørresundby Havnefront is A. Engaard A/S. If the bridge project is seen as a potential trigger for development together especially with the new development in Nørresundby, Engaard could be serious potential investor. (www.enggaard.dk, 2014)

Bridge	*Year opened*	**Cost**	*Cost € at2010*	**Longest span (m)**	*Total length (m)*	*Width (m)*	*€ per metre overall*	**€ per sq. meter overall**
Can Gili Footbridge, Granollers, Spain	*2010*	*€ 574,000*	*€ 574,000*	*33*	*40*	*2*	*€ 14,350*	*€ 7,175*
Merchants Bridge, Manchester, UK	*1995*	*£416,000*	*€ 913,573*	*38*	*67*	*3*	*€ 13,635*	*€ 4,545*
Svratka River Bridge, Brno, Czech Republic	*2007*	*€ 530,000*	*€ 570,752*	*43*	*43*	*-*	*€ 13,273*	*-*
Pedro and Ines Footbridge, Coimbra, Portugal	*2006*	*€ 3,298,450*	*€ 3,640,872*	*110*	*274.5*	*4*	*€ 13,264*	*€ 3,316*
Studenci Footbridge, Maribor, Slovenia	*2007*	*€ 1,200,000*	*€ 1,292,269*	*42*	*126*	*4*	*€ 10,256*	*€ 2,564*

Five of the least expensive bridges per metre length until 2010 (Duguid, 2011)

Charity organizations – there are two main charity organization in Denmark which are donating and participating in different development projects around the country – Real Dania and A.P. Moller. So far A.P Møller does not have some big investments in Aalborg municipality but it has participated in other around the country – Opera House Copenhagen which cost 500 million US Dollars (ca. 360mil euros). It has been donated to the Danish State in 2000. (Copenhagen Opera House)

Furthermore the organization has been participated exactly in projects for the new pedestrian bridges in Copenhagen called "Inderhavnsbroerne" (the inner harbor bridges):

"*To help pay for the bridges, Copenhagen City Council has received DKK 216m including gift tax for the set-up from A.P. og hustru Chastine Mc-Kinney Møllers Fond til almene Formaal (Danish Foundation). In addition to this, the City Council will contribute DKK 37.5m*" (DAC&LIFE, 2013). The other organisation is Real Dania.

"*We are a member-based philanthropic organization that supports projects in the built environment: cities, buildings and built heritage.*" (www.realdania.org, 2014).

In fact Real Dania is well known in Aalborg due to its "gift" to the city donating the Music House at the waterfront. For the purpose of this project the organisation has given 600 million Danish krona (ca. 80million euros). (Interview TBS, 2014)

Big Brand Company – it is a well-known practice around the world big brand companies to invest in different projects as their main purpose is promoting and advertising themselves. Companies like Coca Cola, Sprite, Samsung and so on are sponsors of different events and developing projects all over the world. Taking into account the context and situation of Aalborg city, two main companies have been picked up as potential investors for the bridge – IKEA and SPAR NORD.

The Danish bank is quite often a sponsor of different events around the city - marathons, sport events at the waterfront and university events in collaboration with AAU.

On the other hand IKEA is a big international company popular all over the world. It has been participated in several projects contributing to the development in different areas. Example is an Eco-Vallee project in France for 100 million euros. The Swedish giant plans to finance an urban development that will include housing, local shops and offices. (Investincotedazur, 2013) Another project is in New York called "Erie Basin Park":

"*A one mile long waterfront promenade in Red Hook, Brooklyn- this park is built as a component of the new IKEA retail development. The design references the industrial and maritime history of the site through graphic signage and historic relics, while developing a contemporary language for the landscape expression. It provides a unique opportunity for residents and visitors of the area to engage with the waterfront through a publically accessible neighbourhood park*." (Graincollective, 2014)

Educational Institution – another potential investor could be Aalborg University. Very soon the new architecture department will be finished at the waterfront near by the project bridge location. The bridge could be used as an element improving the area around the building in terms of functional and aesthetical point of view. Furthermore the bridge could be short cut and part of the main bike route going to AAU Campus, improving the connection between Nørresundby and the University.

Bridge	*Year opened*	**Cost**	*Cost € at2010*	**Longest span (m)**	*Total length (m)*	*Width (m)*	*€ per metre overall*	**€ per sq. meter overall**
Nesciobrug, Amsterdam, Netherlands	*2005*	*€ 12,200,000*	*€ 13,803,180*	*171*	*790*		*€ 17,472*	

Similar details to one of the longest and newest pedestrian bridges in Amsterdam are introduced as well due to the relation to the study trip in Amsterdam.

Community – the last potential actor could be the citizens of Aalborg. There are couple of projects around the world where people are part of the investing scheme. However examples and more information will be represented in the next subchapter.

Financial Models

Beside the charity organizations which donate the whole sum for a particular project it is really rare one actor to be a single investor in a specific project. Most of the time different schemes and models are developed where various participants are collaborating.

Public – the first scheme involves mainly the participants from the states and municipalities as well as citizens participating mainly in public discussions.

Private – in this sector potential investors and collaborations could be between all private actors like companies, university and other private organizations.

Public Private Partnership – this scheme is one of the most flexible in terms of participants and their collaboration. Involved actors could be all private and public ones participating in a project in different scale and stages.

Privately owned public spaces – It is quite typical practice nowadays undeveloped public places to be privatized as a part of a usual contemporary urban regeneration feature. (Vasagar, 2012)

"...public space that is open to the public, but owned by a private entity, typically a commercial. " (Privately owned public space, 2014)

Examples of this practice are a lot as one of the most large scale one is Granary square in London which is one of the biggest public squares in Europe as part of the new development around Kings Cross Station. (Vasagar, 2012)

Crowd funding

"...collection of finance from backers–the "crowd"– to fund an initiative and usually occurs on Internet platforms. Crowd funding models involve a variety of participants. They include the people or organizations that propose the ideas and/or projects to be funded, and the crowd of people who support the proposals. Crowd funding is then supported by an organization (the "platform") which brings together the project initiator and the crowd." (Crowdfunding, 2014)

This model has been used in Rotterdam for building namely a pedestrian bridge. The platform is called "I MAKE ROTTERDAM".

"I Make Rotterdam is a new way of creating urban qualities in a post-crisis economy. Through web- and digital applications citizens will be given full opportunity of private development: small-scale, non-bureaucratic, low-budget. I Make Rotterdam will be developed in the next years as a contemporary alternative for large-scale city planning, since traditional developing strategies have proven to fail in the current market economy." (Luchtsingel, 2014)

Bridge Type	Depth	Cost	Aesthetics	Maintenance
Truss	2	2	2	2
Simply-Supported Beam	3	1	3	1
Arch	1	3	1	2
Cable-Stayed	1	4	1	2
Suspension	1	4	1	2

Selection Criteria (DeCelle, Efron, Ramos, & Tully, 2013)- 1 is the best and 4 is the worst

Donation – as it was mentioned earlier in case when some charity organization or other organization donates money to the city or state to benefit a cause without seeking profit is called donation.

Conclusion

"The bridge is seen as a visual symbol of confidence in a community and its role in wider improvements to the public realm can make a location more attractive to private business investors" (Duguid, 2011)

"Building inclusive, healthy, functional, and productive cities is perhaps the greatest challenge facing humanity today, but when done right, they can jumpstart economic development, help build a sense of community, civic identity and culture, facilitate social capital and community revitalization. Investing even a little bit into the quality of a public space delivers a significant return to a city that has the foresight to see its value." (Poradа, 2013)

Limfjordscape

This subchapter will introduce the main features and activities of Limfjorden which would have impact on the project bridge and influence its design.

The main elements which are taken into consideration in this report are three - traffic of ships, Limfjord bottom topography as well as water level fluctuation.

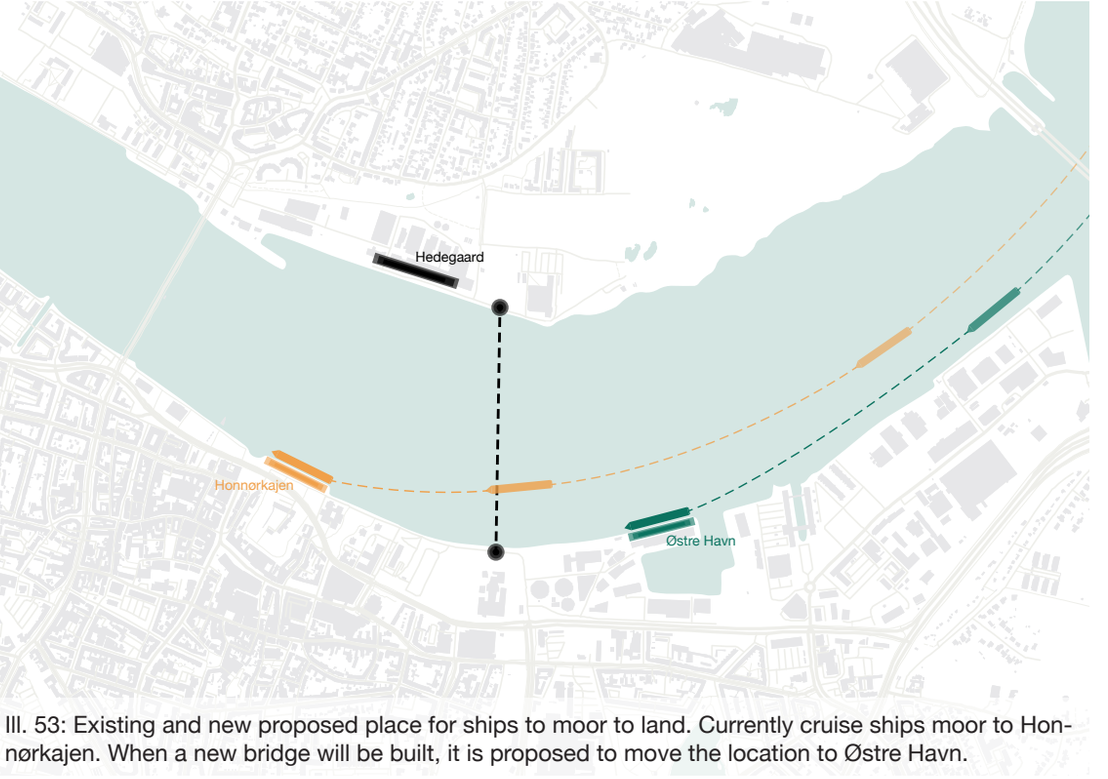
Traffic of Ships

Beside the small motorboats and sail boats there is also traffic of big ships in Limfjorden circulating from east to west as the end point is the existing Limfjordsbroen. Two main types of big ships are reaching the area where the project bridge will take place across the fjord:

- Large transport ships part of Hedegaard industrial zone in Nørresundby.
- Tourist cruise ships mooring at Aalborg waterfront - Honnørkajen.

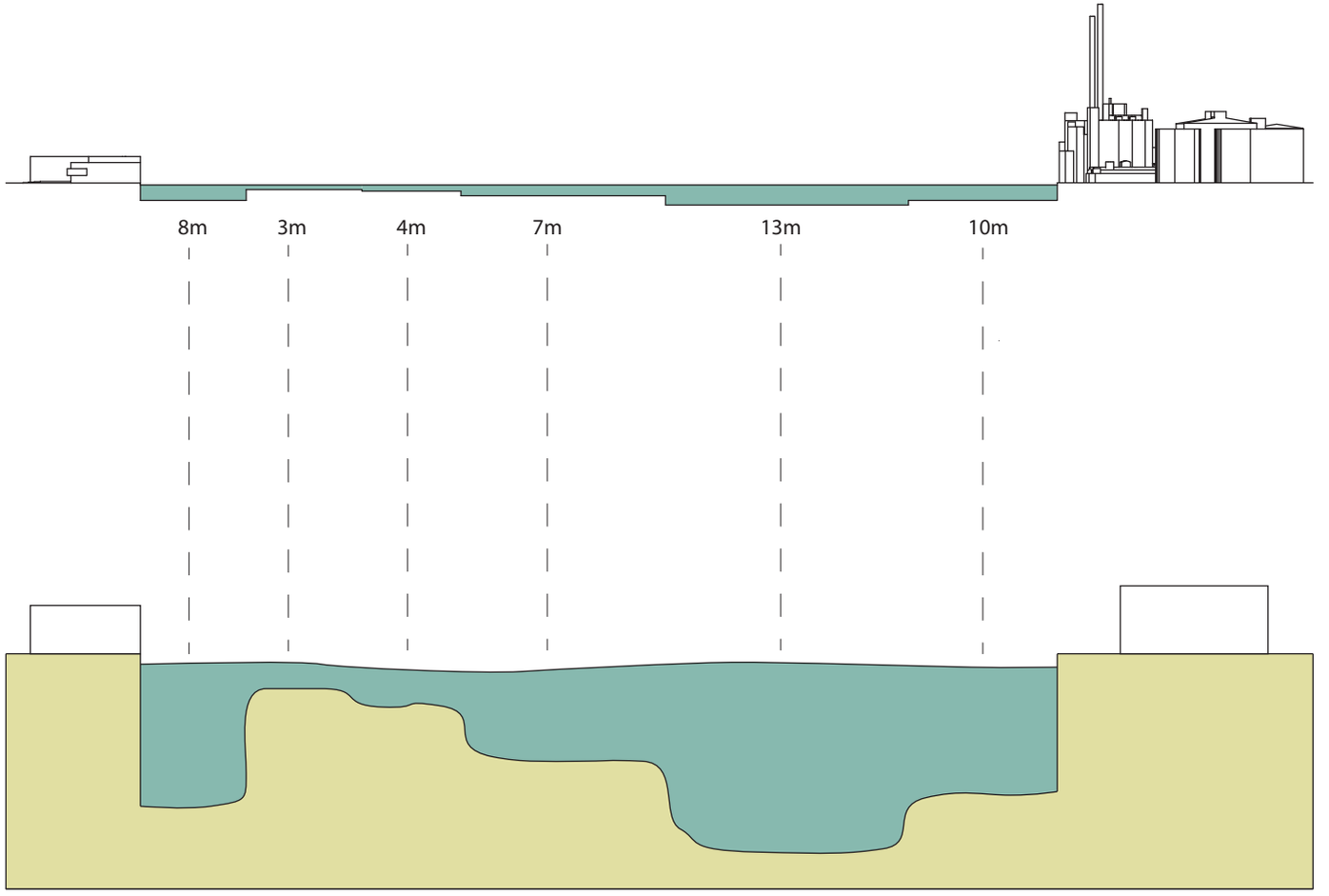
In order to solve this problem and deal with the challenge some ideas and changes are proposed.

First of all the flow of small boats will not be disturbed as opening mechanism will be integrated in the future bridge so the tall sail boats could pass through it. Otherwise height of permanent 8 meters will be provided under the bridge so all small motor boats and small sail boats could pass without a problem.



Ill. 53: Existing and new proposed place for ships to moor to land. Currently cruise ships moor to Honnørkajen. When a new bridge will be built, it is proposed to move the location to Østre Havn.

In terms of the big cruises the research showed that the traffic is only for three months in a year during the summer from end of May until end of August. Furthermore some years such like 2014 only one ship will visit Aalborg city (Cruise Ships, 2014)). However a proposal has been taken that the current mooring location will be changed, moving it to the new developing area of east harbor (Østre Havn) where also a big open area is provided for all passengers. Furthermore the tourists will have the opportunity to walk along the promenade passing by all new development areas and landmarks such as Music House and Utzon Centre reaching the center of Aalborg in no more than 15 minutes.
The big transport ships in relation with Hede-



Ill. 54: Typography of the Limfjord bottom. Section from Municipality building in Nørresundby to the House of Music in Aalborg. Above: Staging from above. Below: Staging from Below. Experienced typography.

gaard Factory are supposed to be shut down. The reason is that the Municipality has already plans for new development at this area waiting for Hedegaard to sell the land soon. From the interview conducted at Aalborg Municipality it was claimed that this will happen in maximum a period of 5 years from now on. (Aalborg Municipality interview)

Limfjorden Bottom

Since the project bridge crosses more than half a kilometer over Limfjorden, the group has decided to make a more detailed research of the bottom which could influence the future design. After long search among different websites, a detailed map of the depth of Limfjorden has been found. Thanks to it, section of the fjord where the bridge is passing was created in order to understand the situation better.

The result is – large area which is quite shallow from Nørresundby site reaching somewhere depth of only 2m and deeper zone between 10-13m where the corridor for bigger ships and boats is. The final results are taken further into consideration into the design part where the difference of the depth is tried to be used and utilized better, transforming it into advantage.

Water Level

Global warming is contemporary issue which has to be taken into account as an environmental aspect. Even though this report doesn't go deeper into this sphere, a research of the water level fluctuation in Denmark has been done.

Interesting fact is that the northern part of Denmark where Aalborg city is also located is a zone with isostatic uplift. There is a slight upward move of the land with approximately 1mm per year. (Future sea levels, 2014)

On the other hand the sea levels around Denmark are rising as well with also approximately 1mm per year. (Jørgensen, Cappelen, Schmith , & Nielsen, 2014)

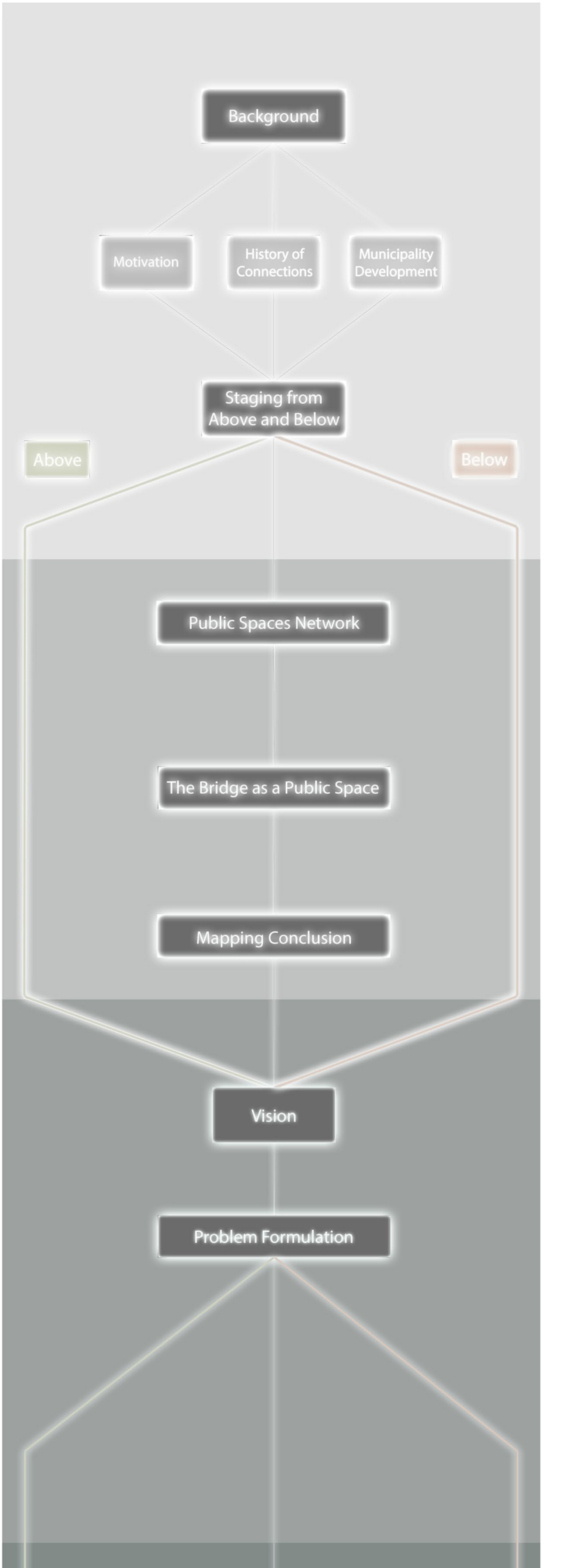
Conclusion

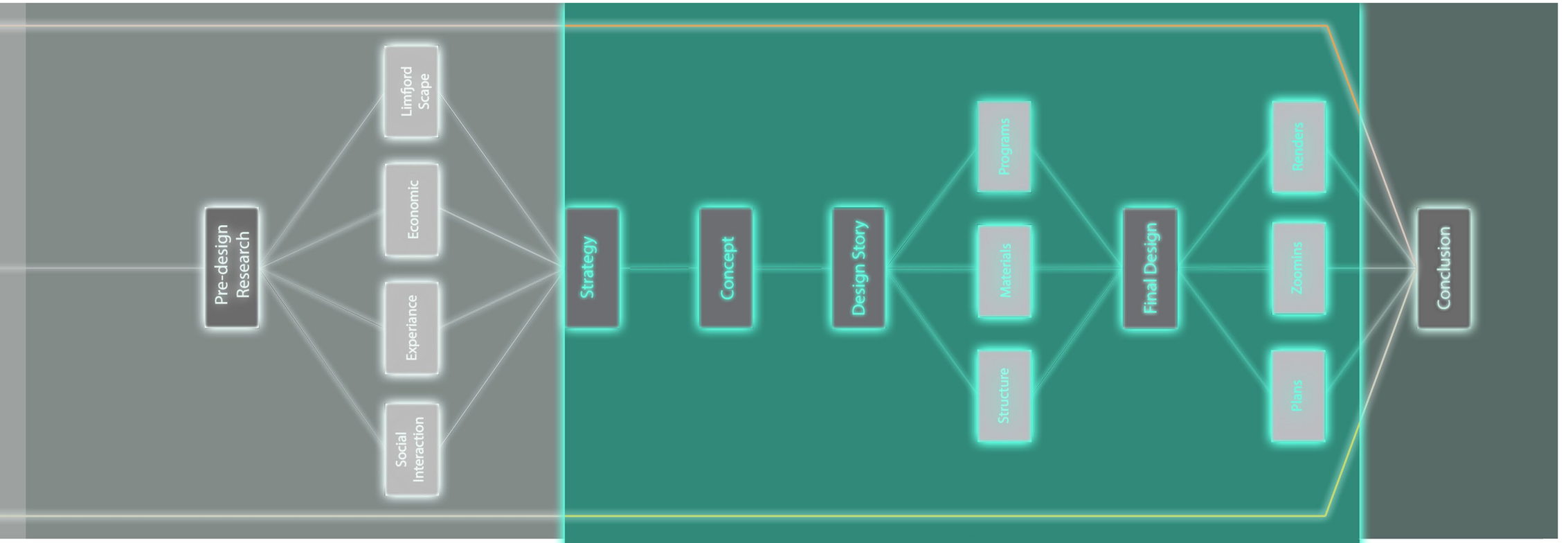
The project site of the current project is in fact water or Limfjorden. That is why it was important this "scape" to be studied more into details. The better you know the site the more options for a design you have. Even though these are more side aspects, they are affecting considerably the design process of the bridge, shaping out the initial frame of the design structure. Furthermore some of the information acquired here helps also to manage with some of the economic challenges. Limfjorden itself is one of the first design elements which developed further in the report sets the foundation of the whole design of the future bridge.

Introduction

Mapping

Vision & Problem Formulation





Strategy

This chapter presents a development strategy for the project.

Strategy

The project will be separated in three main stages. This is first of all from an economical point of view suitable since the three stages give a period of time for implementing a particular structure and split the final budget in three sections making it more feasible. Secondly the features of the fjord and more specifically the shallow bottom allow us to think of more and different solutions but a bridge in order to connect the two shores.

Artificial peninsula

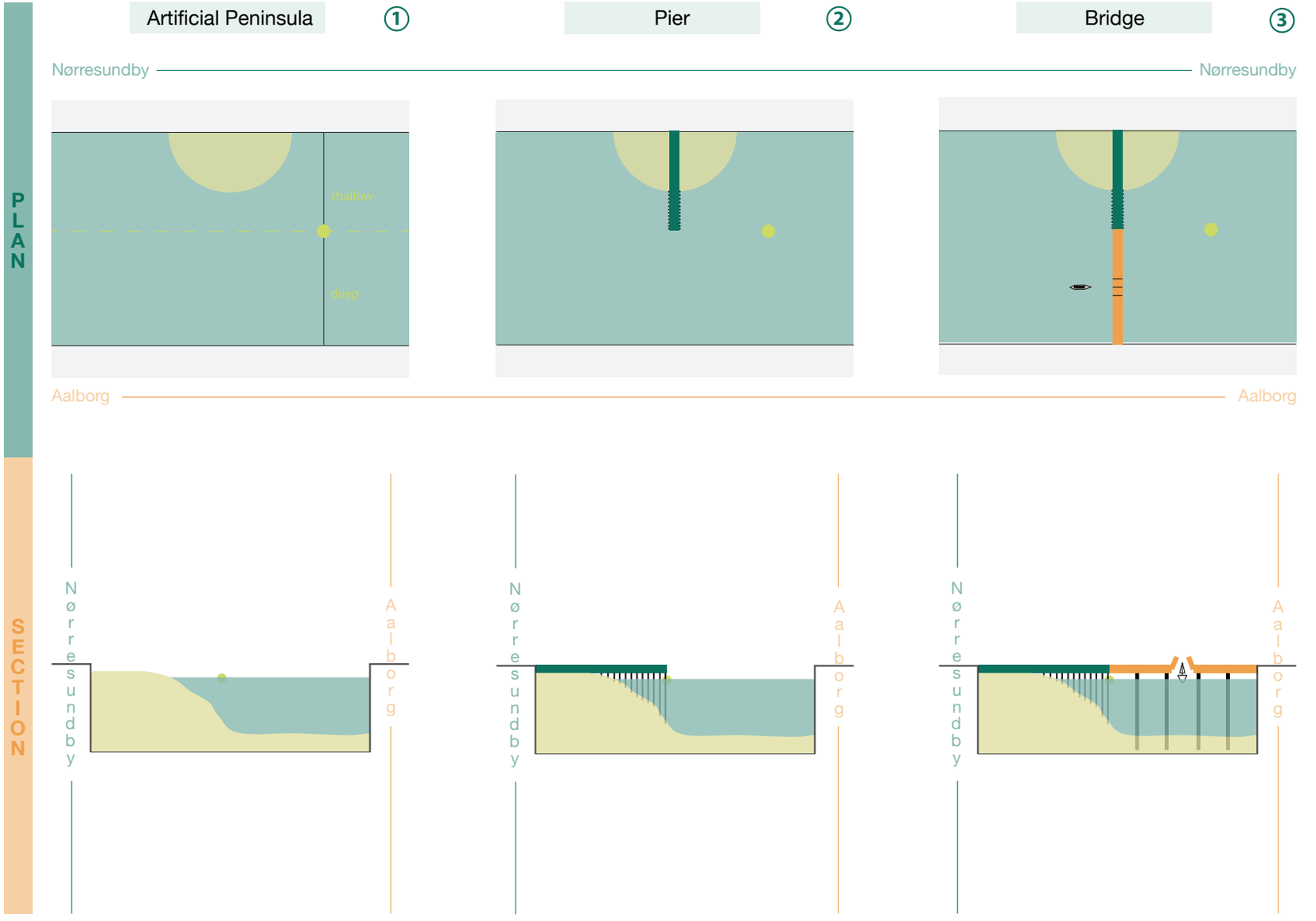
Due to the fact that the fjord side to Nørresundby is a very shallow area a decision of building an artificial peninsula as a first stage of our project has been taken. It would allow much bigger area to be facilitated and used for different programs as a demand to the developing area. Furthermore the shallowness of 2-3 meters allows this structure to be quickly done and economically efficient.

Pier

As a second stage of the structure a pier will be build up. The shallow area to the green buoy in Limfjorden of 3-7m will easily allow this stage to be fulfilled. Moreover building a simple structure of a pier would be much faster and cheaper than a bridge structure with concrete pillars deep in the fjord bottom and span considerations.

Bridge

The building of a an expensive bridge of 550m between Nørresundby and Aalborg is decreased to only 300m which would defiantly affect the budget of the whole structure and decrease the time of building it. Opening mechanism is integrated in the middle of the bridge due to traffic issues mentioned in the previous chapters.

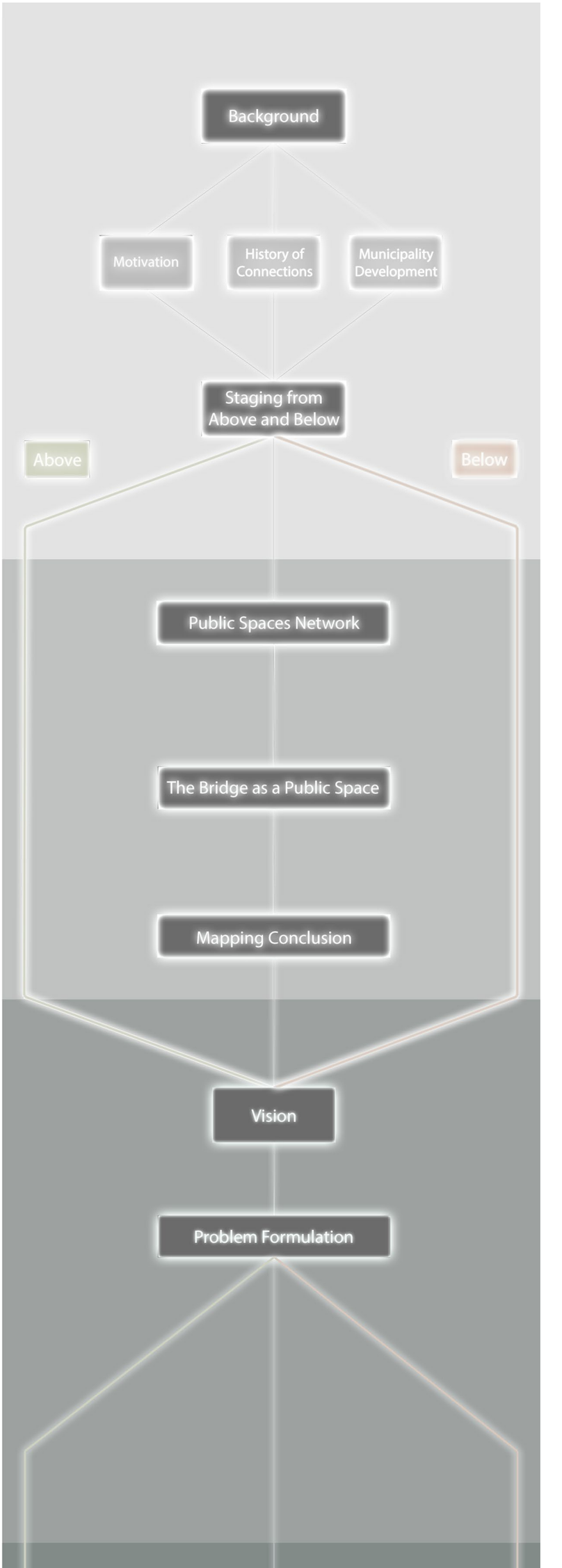


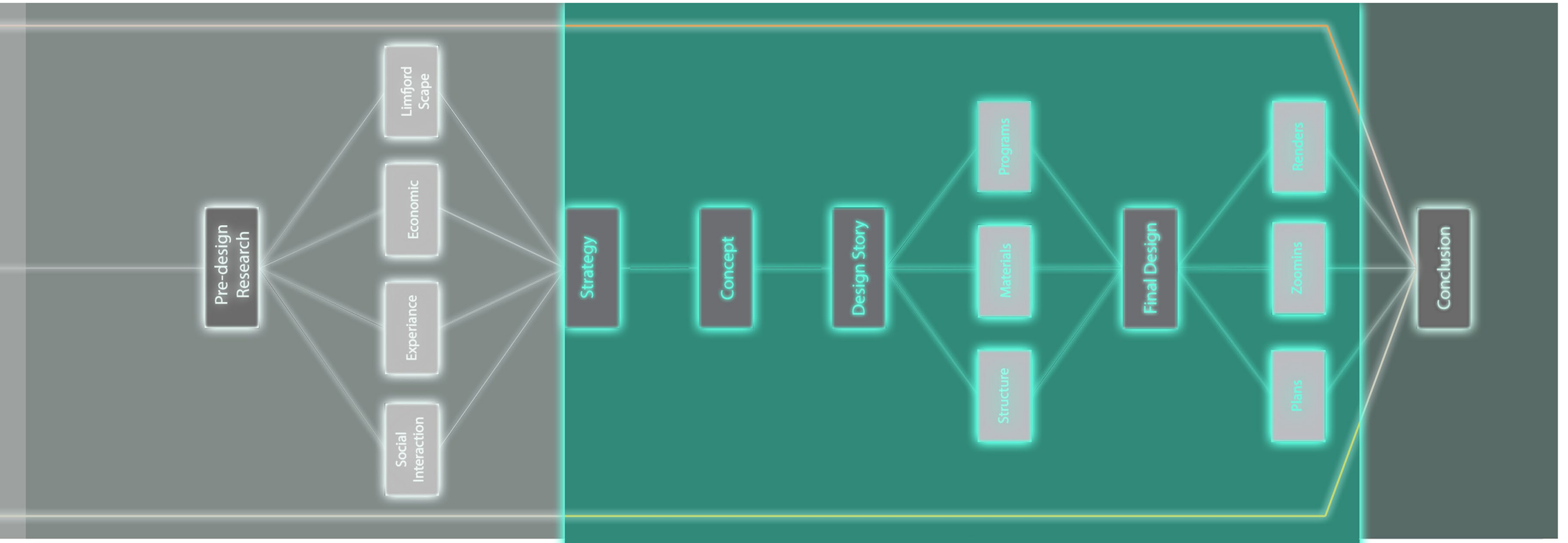
Ill. 56: Diagram of strategic development.

Introduction

Mapping

Vision & Problem Formulation





Concept

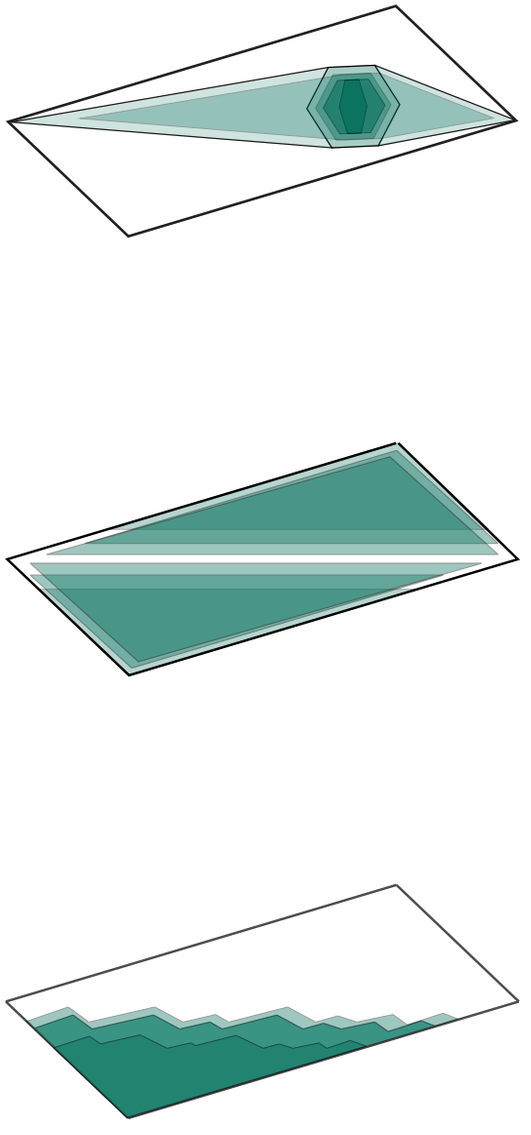
This chapter will introduce the main concept of the current project. It sets up the foundation of the designing process, defining some main areas, elements, experiences and functions.

Concept

Three main elements are defining the concept of this project – transit, view and water. They vary by two fundamental features – spatial vertical dimension and type of function. The pedestrian connection will be divided in three main levels shaped out of the concept:

- Top Level – View
- Middle Level – Transit
- Bottom Level– Water

In terms of function the middle level is related more to the infrastructural issues based on the theories of proximity and public space network described at the beginning of the report. The other two elements of the concept view and water are associated with the experience as an essential design aspect which is described deeply in the chapter "Experience".



View

This element is mainly generated by the theories for Experience.

"*The architecture should create certain atmospheres in order to make the user emotionally engaged and challenge the user's mood*" (chapter experience).

The idea is creating an elevated level, area which offers a nice view of the city, landmarks and other attractive situations. The so called "view point" will give the users an experience of "360 view" plus framing out some particular areas discussed more into details at the "Design Story" chapter. However this part of the concept is also related indirectly to the infrastructural and spatial issues introduced in this project. As it was mentioned in the chapter "public spaces network" view points and view corridors could be part of a separated "invisible" layer part of the infrastructural grid between public spaces.

Transit

Even though this project elaborates more on the idea of creating a bridge as a meeting point and public space it is still also labeled as an infrastructure element. Furthermore considering the analytical part, this is really important element for the city, strengthening the physical connection between the two cities, providing one more choice of crossing the fjord, decreasing the detours by offering an additional connection as a shortcut. The transit route is located at the middle, "regular" level of the structure smoothly connected and extended from the level of both promenades. The main meaning of this conceptual component is that the flows of people and cyclists which are just using the structure as a connection element should not be interrupted. The axis should be straight, wide and directly linked to the infrastructure network of both cities, providing quick and unimpeded movement.

Water

The last but not least element is the lowest one. It is also linked mainly to the experience theories in this project. Providing proximity and access to Limfjord is an important challenge and factor influencing the waterfront experience of both cities. People should be able not only to look at the water and its calming effect, but also to interact with it, feel it. This last element aims to use Limfjord as an essential potential and key resource for the design process.

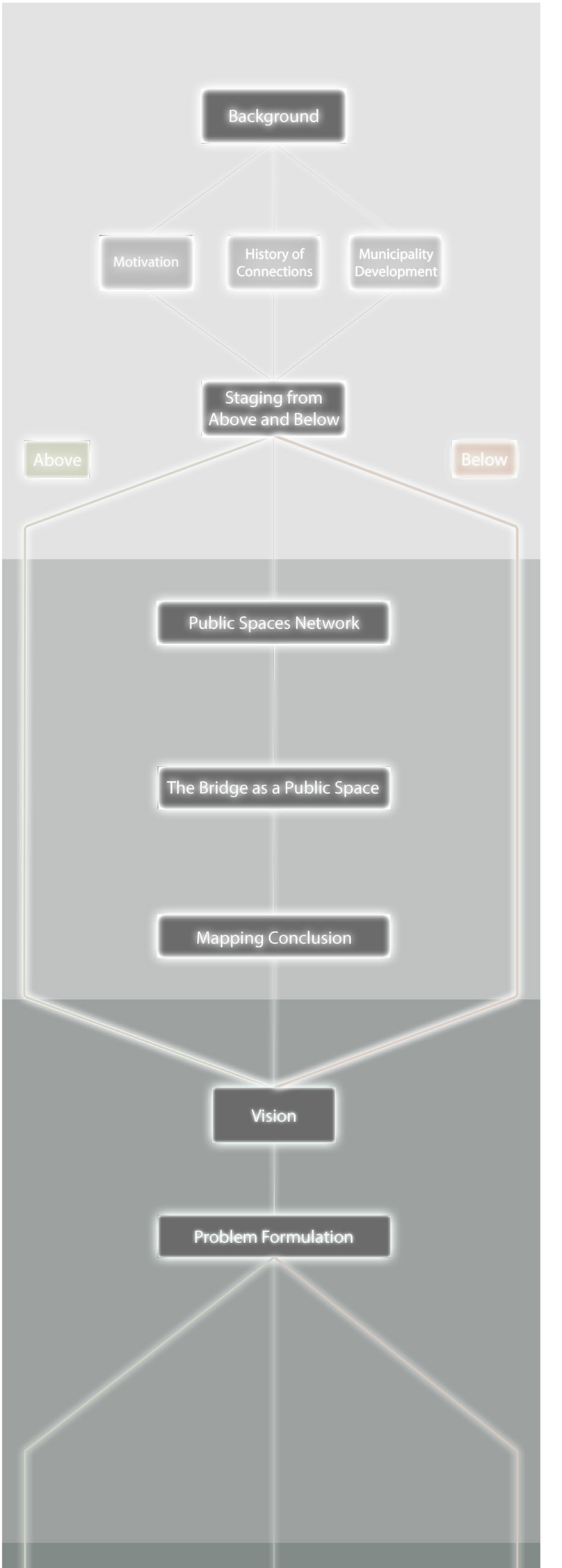
"I would like something which is close to the water so you can even touch it..." (Appendix, Questionnaire).

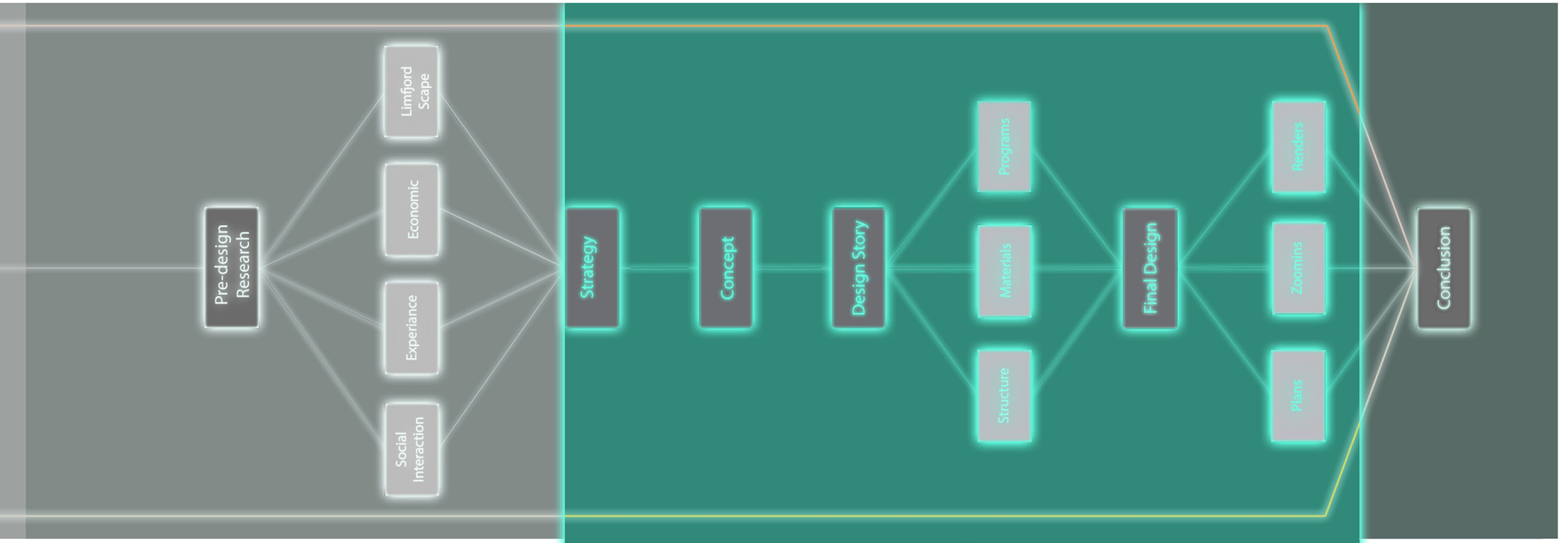
Ill. 58: Concept of three experiences.

Introduction

Mapping

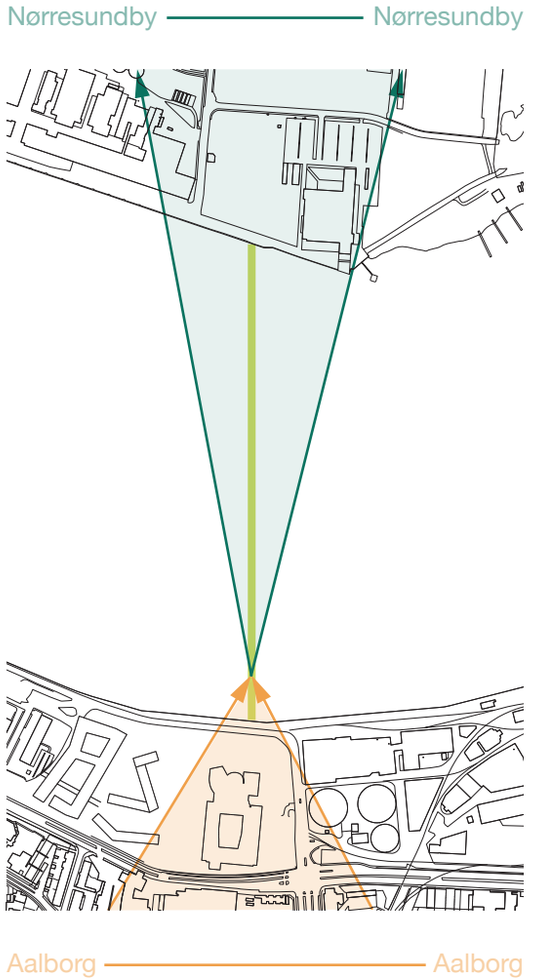
Vision & Problem Formulation





Design Story

This chapter presents the design story. And the elements of structure, materials and programs.



Balance of the waterfronts

As it was mentioned earlier the difference between the waterfronts in Aalborg and Nørresundby in terms of development is huge. While one can see spaces with playgrounds, small parks and rest areas, restaurants, Utzon Centre and the newest acquisition of Aalborg the Music House south of the Limfjorden, Nørresundby waterfront keeps this industrial character, looking empty, grey and neglected. Building a bridge between this two contrast urban areas can't be designed without taking into account the existing context, developments which in this case is extremely different. Right in front of the location of the project bridge on the Aalborg side is the enormous plaza in front of the Music house, followed by another opened space often used for public events in front of Nordcraft followed by another big public space - Kildeparken.

Furthermore the two mentioned building Music House and Nordcraft are one of the biggest structures in Aalborg with semi-public function, generating flows of people all the time. All these urban spaces affect considerably the future design of the bridge. In order to compensate and balance the two waterfronts the bridge should be narrow on Aalborg side and opens up significantly on the Nørresundby part, creating more spaces, functions and triggering development in order to reach the required equilibrium. These main axes of balance are the base, framing out the shape of the future bridge.

Ill. 60: Diagram from design story.

Level of intervention based on structural constraints

Based on the research of the bottom of Limfjorden, the bridge structure has been divided into three main stages - artificial peninsula, pier and a bridge. Due to economic as well as structural constraints the spatial area of every stage varies.

Peninsula

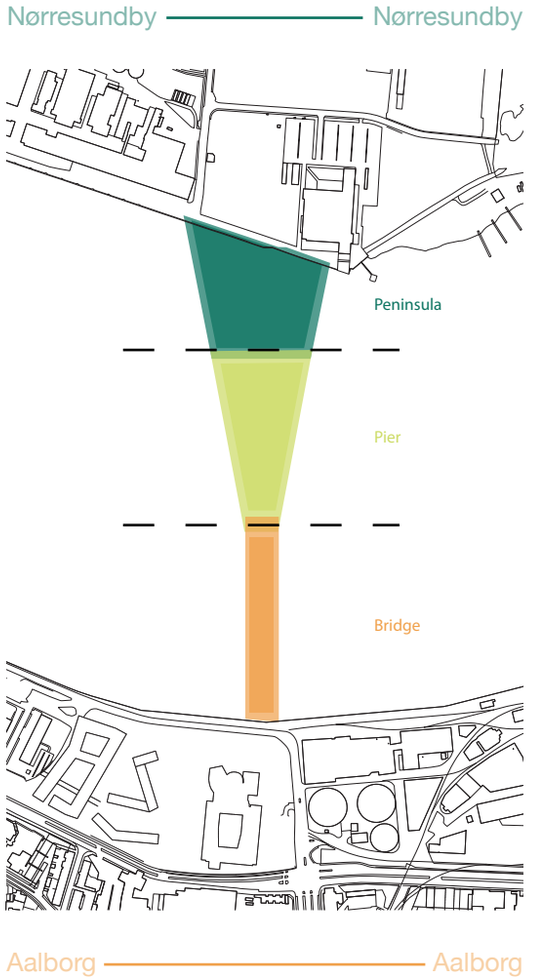
The first step of the pedestrian connection is the artificial peninsula. Due to the low depth of the fjord from this side the area will be filled with sand which allows much more freedom and flexibility. As it was mentioned in the previous phase of the design story, the Nørresundby side will be most developed with more programs and space than Aalborg site in order to reach the so called waterfront balance. The peninsula is an approach which will allow the high amount of activities and structures at this area since it is a solid base.

Pier

The second stage is the construction of the pier. The light structure of a pier makes it much cheaper than bridge structure. There is no need for a large span so the pillars are small but really dense which on the other hand provides very good stability of the structure. There is plenty of examples where huge adventure parks are located namely on a wooden pier. That is why the area of the pier could be also developed with several programs taking larger space.

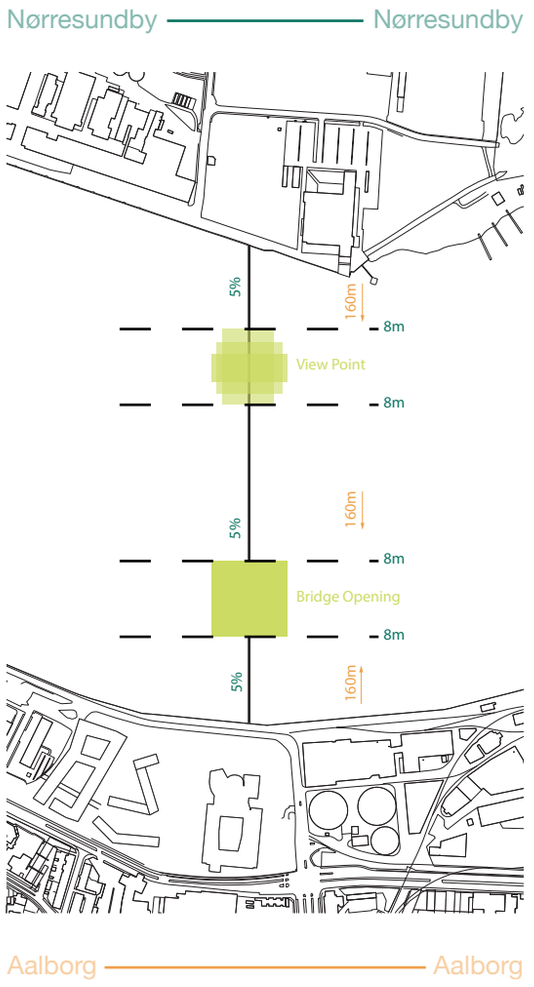
Bridge

The bridge is the last, third stage of the pedestrian connection. Due to economical and structural constraints plus water front balance issue, this area cannot and will not be as wide as the rest. The main purpose of it will be mainly functional, accommodating the transit route.



Ill. 61: Diagram from design story.

Vertical dimensions



III. 62: Diagram from design story.

The third stage of the design process explores the vertical dimensions as a key element influencing the design and structure of the bridge. In the current design there will be two main high points on the bridge. Both of them have same vertical dimensions of 8m but differ in functional aspect.

Bridge Opening

As it was mentioned in a previous chapter due to the traffic of big sail boats an opening mechanism should be integrated. However for the rest of the boats there should be provided a permanent height similar to the one at the existing bridge in order not to interrupt frequently the flows of people on the bridge. The location of the highest point should be over the deepest area which is explained in details at the Limfjord-scape chapter. Following the requirements of the universal design for access of old people and people with disability, the slope to the highest point could be with angle of maximum 5%. This means that the distance to the same point is 160m.

View point

Due to the spatial restrictions over the bridge structure mentioned in the previous stage, the view point should be located from the other side of the bridge. The same dimensional requirements are followed there as well.
Both areas are additionally shaping up the frame of the future bridge design, setting up some basic limits and distances which are developed further in the design process.

Infrastructure axes

At the fourth stage of the design process the continuation of the infrastructure connections is used to frame out separated zones and basic outline of a potential bridge. Based on the limitations applied from the previous steps some of zones will be ignored.
Three main connections are used for this stage - Transit connecting Aalborg-Nørresundby, axes from Nørresundby and axes from Aalborg.

Transit

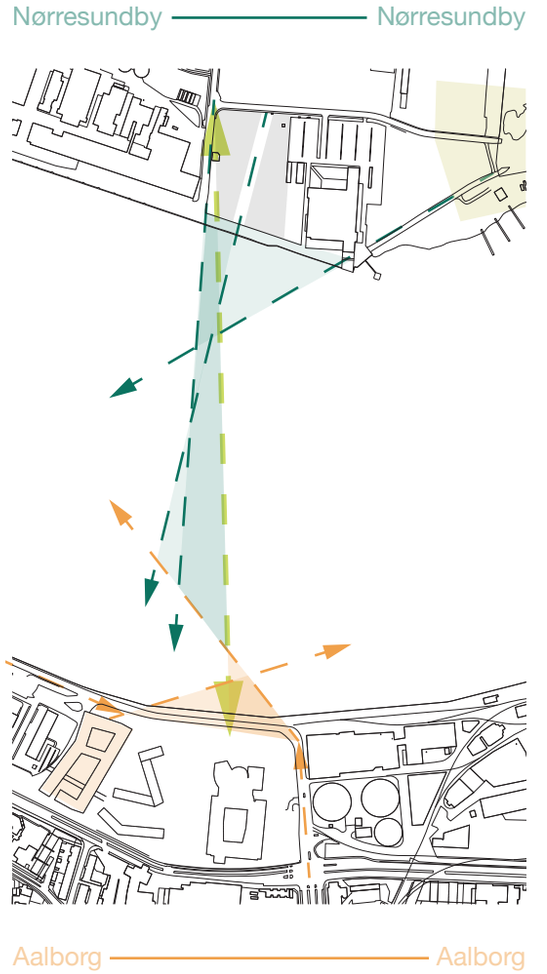
The transit is one of the main elements in this project's concept. It aims to connect directly the vast plaza in front of the Music House and the crossroad on the side of Nørresundby which "collects" multiple connections including the pedestrian-bike path from Limfjordsbroen to the Municipality.

Aalborg axes

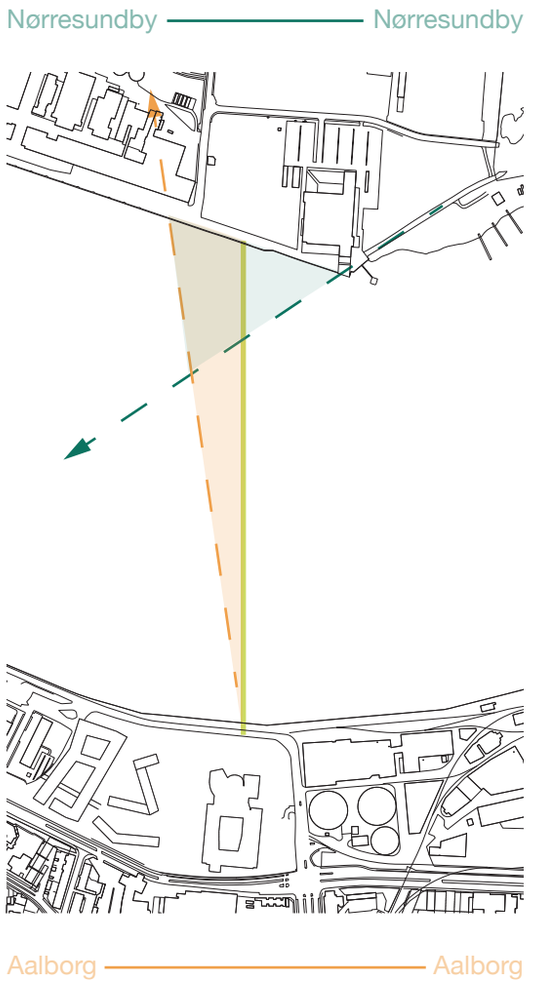
Two main axes are used on the southern part. One is a continuation of the promenade plus direct connection with the new Architecture department where flows of people will be constantly generated. The other connection shapes up as a continuation of the main service street of the music house and the future Østre Havn area. Furthermore it is a straight connection going deeper in the city reaching the main campus of AAU.

Nørresundby axes

Three main axes are used on the northern side. One is continuation of the eastern part of the waterfront which is not developed but there are plans for its future development. The second one is a natural extension of one of the street coming out of the main crossroad mentioned above. The last one is coming out from a future development at this area (light black). Residential and commercial development will take place there as this connection appears to be a service road in the middle, splitting the complex of future buildings and providing quick access to the bridge, the transit route and respectively all other programs.
Using the infrastructural axes, this stage narrows down additionally creating more specific spatial areas and outline of the bridge, tiding it up at the same time with the context and infrastructure network of both cities.



Ill. 63: Diagram from design story.



View corridors

This step in the design process generates two main view corridors which are defining additional spatial areas on the bridge.
It is taking step forward identifying more specifically the location of the desired view point. The intersection of both view corridors is a logical place for a view point area which allows the visual contact with both "objects". One of the view corridors is coming out of Nørresundby towards Aalborg as it is also extension of one of the infrastructure connections mentioned in the previous design step. The second visual corridor is coming out of Aalborg towards Nørresundby.

Aalborg Corridor (orange) - the axis of this corridor starts from the beginning of the bridge in front of the Music House and aims the hill of Skanse Park in Nørresundby. This hill is one of the highest points in Nørresundby and provides a panoramic view of Aalborg.

Nørresundby Corridor (blue) - the axis of this corridor is a continuation of a street leading to east waterfront in Nørresundby aiming the view tower (Aalborg Tårnet) in Mølleparken.

The main idea of these two corridors is connecting view point with view point and public space with public space. The notion view point in this project should be understood both as a high area where you have the opportunity of 360 views, but also an area which allows you to frame out and have a visual connection with other key elements in the urban environment like, public places, landmarks as well as other viewpoints. The reason of connecting visually public spaces is more from informational perspective. However the importance of linking visually public spaces is explained more in details in the chapter Network of Public Spaces.

This fifth stage of the design process defines additionally more spatial areas as well as determines the exact location of the view point on the bridge.

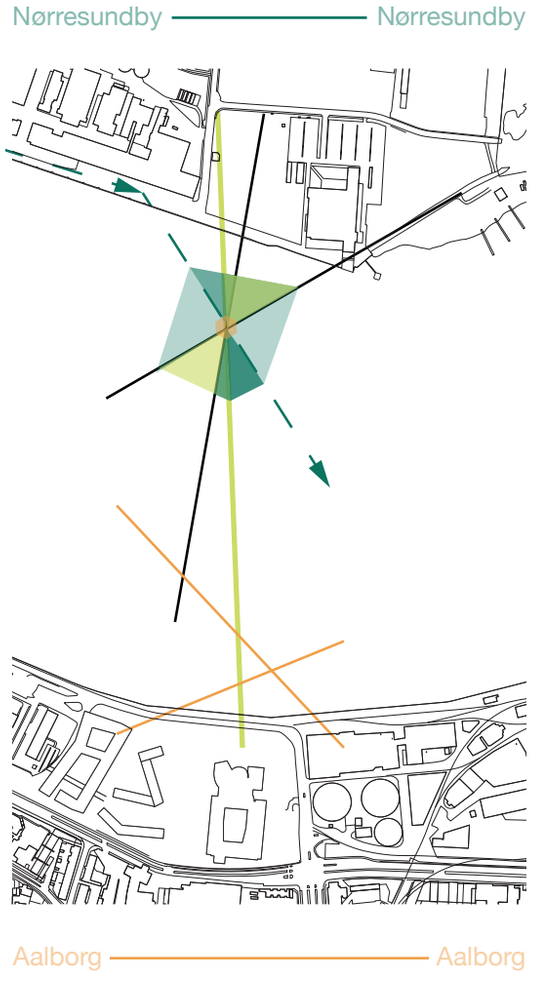
Ill. 64: Diagram from design story.

Junction of multiple program zones

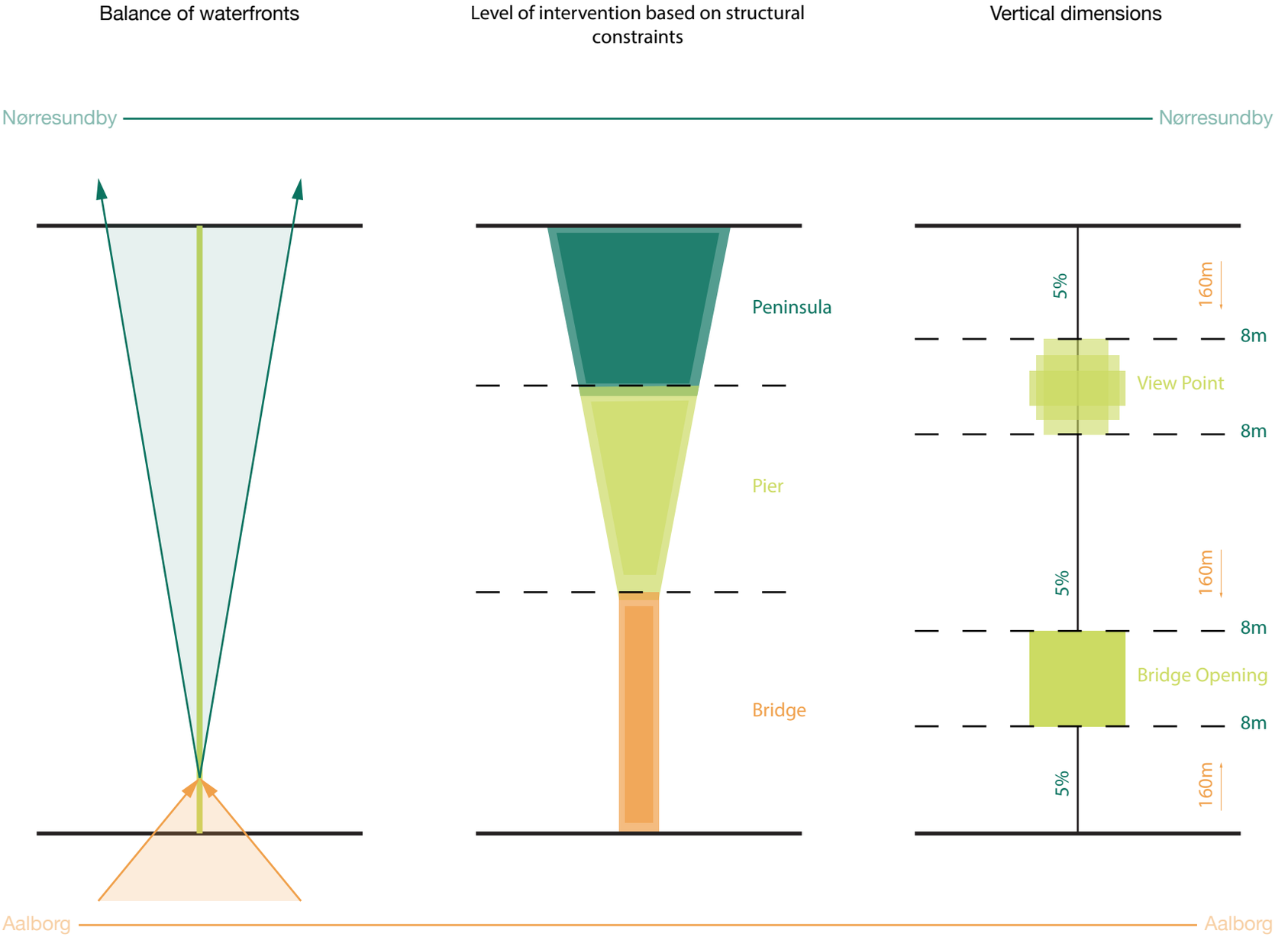
The last step of the design process is introducing one more connection coming out of Nørresundby. The axis is continuation of the waterfront promenade in Nørresundby which currently is not used but it will be developed in the next few years. The orientation of the axis is toward a junction which gathers almost all main connections at one place. This intersection is turning to be a key element of the bridge where different surfaces, programs, areas and routes are meeting together. This point is an orientation area where one can stop or slow down and make a decision what route to take and which area to enter depending on the desire of the particular person.

This is the symbolic element of liberality in a hybrid bridge, a structure which gives you choice and multiple options of activities and movement.

The last axis in this stage is strengthening additionally the junction as at the same type is shaping up new areas for the future bridge.



Ill. 65: Diagram from design story.

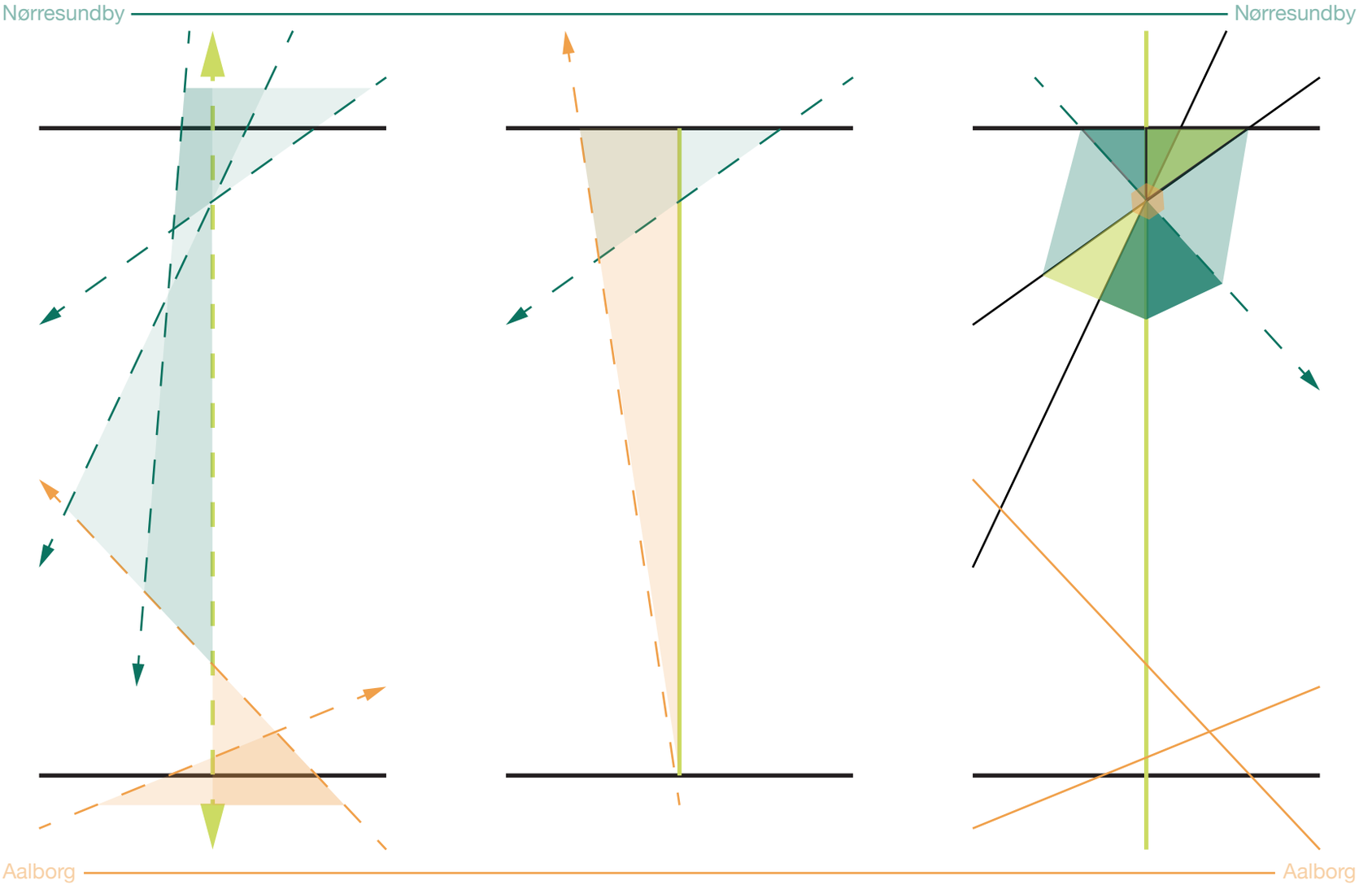


Ill. 66: Diagram of design story

Infrastructure axes

View corridors

Junction of multiple program zones

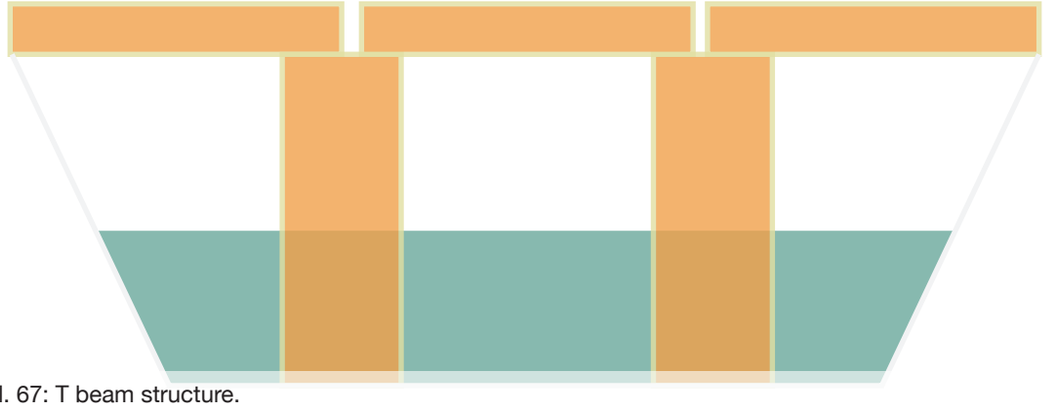


Structure

Due to time constrains and project limitations the engineering part of the project is not as detailed as it could be. However some essential issues have been analysed and taken into consideration which have influenced the design of the bridge.

First of all as it was mentioned in the economic chapter, due to budget issues, considering the acquired information from the Limfjord scape, the bridge has been separated in three main phases. Furthermore the phases are also three different structures as only one of them is actual bridge. This approach facilitates significantly the implementation of the whole project. The otherwise significantly long pedestrian connection of more than 500m is split in three. In this way the span issues are shrank.

The **bridge** part will be simply supported beam structure which as it was explained before is one of the cheapest and easiest for implementation. The aesthetical aspects are not as good as other types of bridges, but considering the economic pressure and the fact that this project bridge is trying to emphasize on the spatial aspect in terms of publics space and programing ignoring the landmark facets, the choice of a simple supported beam structure is quite reasonable. Furthermore the bridge is simply "following" the structure of the existing Limfjordsbroen bridge in Aalborg. It is also simply supported beam structure with maximum span of 75m (see illustration with section of the existing bridge). The span between the pillars supporting the opening mechanism is 46m axial distance and maximum height is 9m. For comparison the project bridge has maximum span of 79m, distance between pillars supporting the opening mechanism 42m and maximum height 8m. The dimensions are quite similar considering the fact that the project bridge is a pedestrian one and doesn't need to accommodate the same weigh as a typical vehicular bridge. The construction material will be reinforced concrete as the construction is lighter than the existing bridge.



Ill. 67: T beam structure.

The second phase of the pedestrian connection is a simple structure of a wooden **pier**. The shallowness of Limfjorden allows the typical dense pillar structure of the pier to be implemented. Even though the pillars are quite small namely these densification allows the pier to accommodate significantly big structures on it. Perfect example for this is the remarkable historical pier in Santa Monica with an adventure park on it.

The final structure is an **artificial peninsula**. Once again due to the shallow area of the fjord the phase could be easily realized. There are plenty of examples around the world of building artificial islands, beaches and peninsulas, weather as a climate adaptation measure (Viena), touristic reasons (Dubai) or simply expanding causes (Japan). There are two main options of creating artificial beach, island or peninsula by adding additional layers of sand. One is by big ship digging out sand from the water bottom and the other one is simply unloading sand by trucks. However the type of the process depends on many factors such as type of sand which should be used, origin of the sand and of course economic issues, as the second variant is considered cheaper than the first one.

Ill. 68: Japan - Artificial island as an expanding strategy.

Ill. 69: Vienna, Austria - Artificial island ‘Donau-insel’ as a climate adoptation meassure.

Ill. 70: Dubai - Artificial islands as a turist strategy.

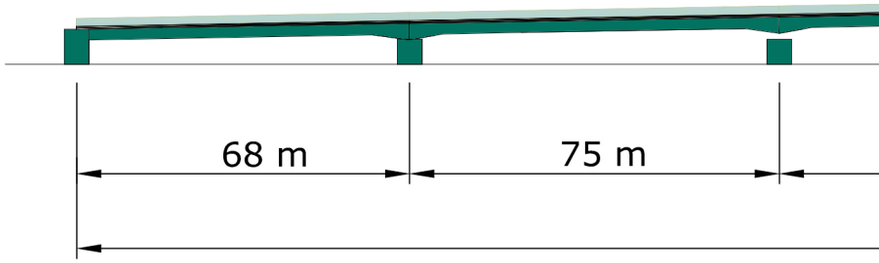
Ill. 71: Santa Monica Pier. Timber structure.

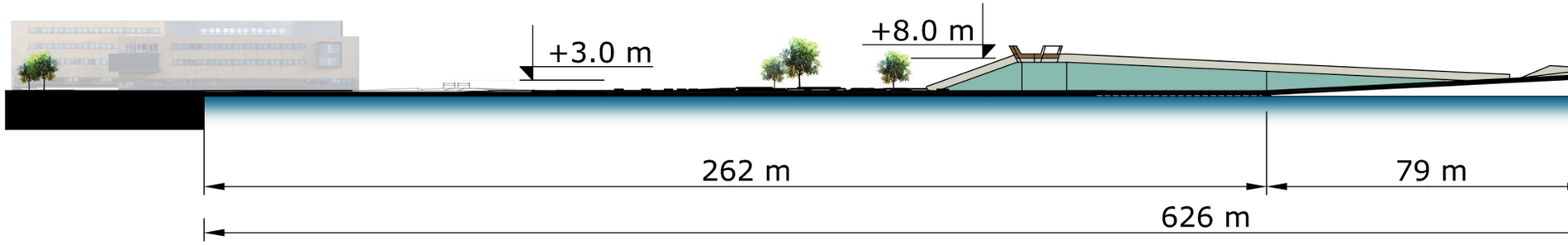
Ill. 72: Creating artificial island/peninsula by using the sand from the water bottom.

Ill. 73: Creating artificial island/peninsula by trucks.

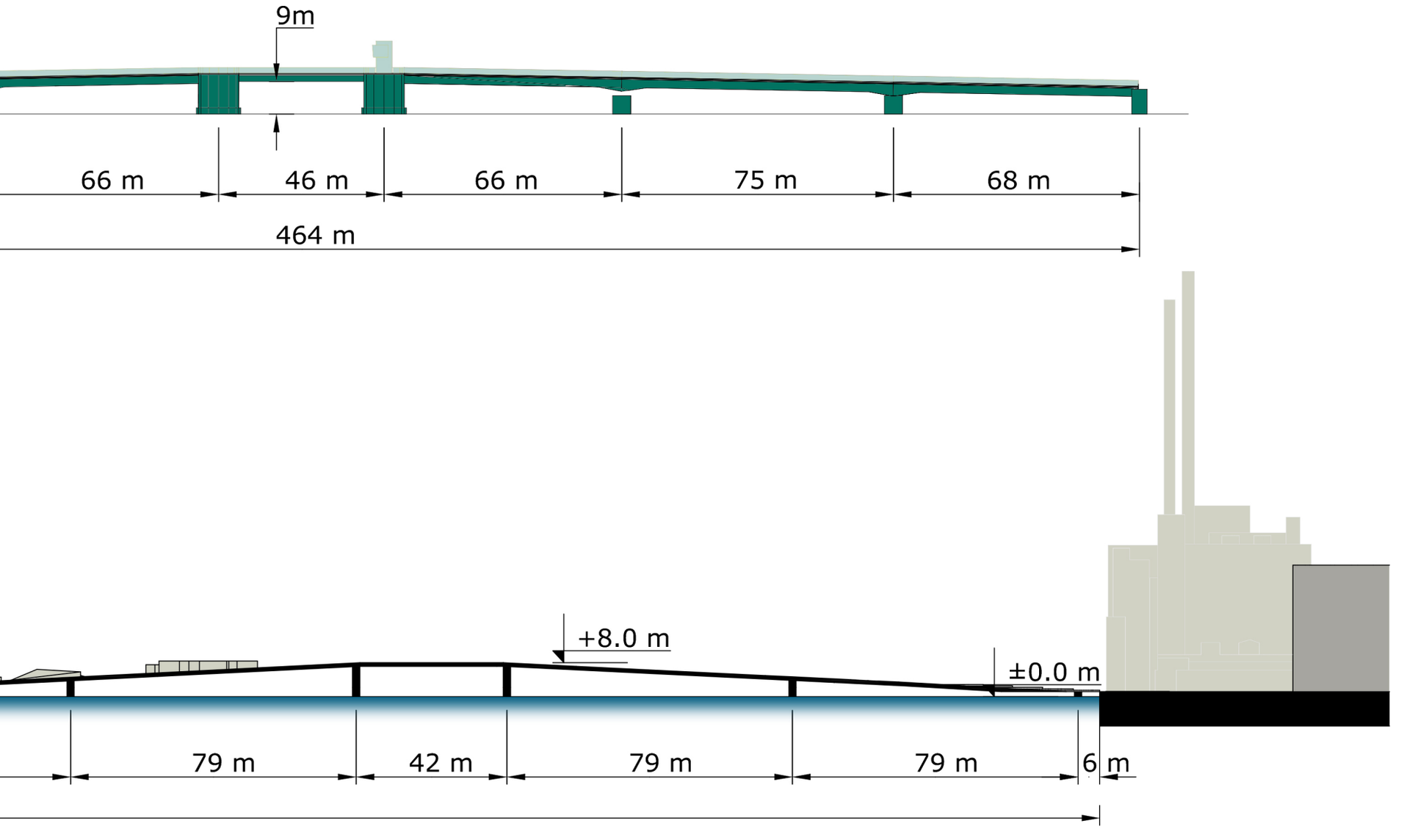
Conclusion

Even though the engineering part has not been explored so much into details the most essential aspects have been considered. Furthermore the structure of the bridge is related to the context of the project site, the economic issues as well as the design process. The structural issues in this project are perceived not as a restriction but as a potential for something different and extraordinary. Moreover the final design and the structure of the pedestrian connection are overlapping adapting to each other and benefiting from each other.





Ill. 74 (above): Section of Limfjordbroen.
Ill. 75 (below): Elevation of our pedestrian bridge.

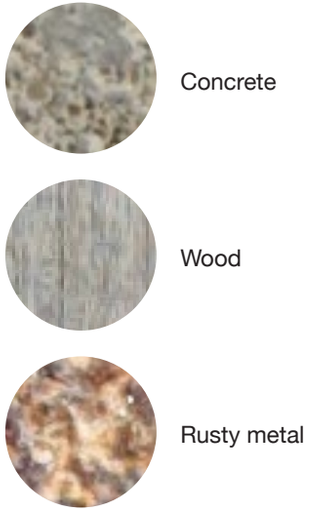

9m
66 m
46 m
66 m
75 m
68 m
464 m
+8.0 m
±0.0 m
79 m
42 m
79 m
79 m
6 m

Materials

As it was mentioned at the beginning of the project, small details like textures and materials create specific atmosphere which could affect significantly people's experience. Different materials have different features and effect in a particular space and situation. Some are warmer than others, some are more inviting and so on. Beside the fact that a material could define a particular environment and atmosphere, they could be used also as a navigating and controlling element – the orientation, texture, and color could mean much more than a regular surface. As it was mentioned in the chapter "Public Space Network" talking about semiotics, it is not about what a particular element means but how it may mean something else, how it could be understand and perceive in another context. This chapter will introduce two main considerations about materials which were used in the current design process. One of them is the existing materials on the project site and the other category is what materials could mean in terms of navigation, environment, speed etc.

Existing Materials

The mapping process on the project site helped us to explore more into details the existing materials along the waterfront, different textures and elements, different details, combinations, meeting points of different surfaces. Three main materials were observed and extracted from the context environment with the idea to integrate them in the current bridge design – concrete, rusty metal, wooden planks. The reason of doing this is because the bridge itself should not be just an external element which is separated from both waterfronts. The intention of this project is creating a homogenous network of public spaces as the connections are merging into one another creating continuity. Using the same type of materials creates this environment which is much user friendly and easier to be understood. After picking the materials up, a more detailed research has been done in order to understand how they are used, where and what reason for. The next subchapter will explain better the meaning of these three main materials plus some extra ones.



Ill. 76: Existing materials on the waterfront of Aalborg.

"Meaning" of materials

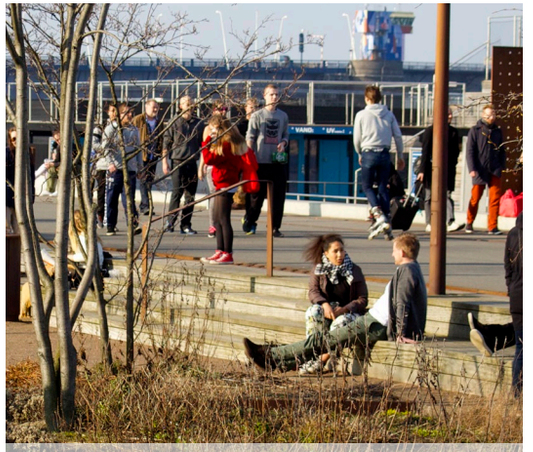
How the materials will be read, what purpose they have and where they should be implemented are really important design issues. As it was mentioned earlier materials could create specific atmosphere in a particular area, function as navigation elements etc. Three main categories are selected which are developed and analyzed in the context of Aalborg waterfront and the existing materials.

Color and texture

The color of material could be interpreted in different ways. The main separation in terms of colors usually is cold and warm colors which in a way represent also a potential atmosphere and environment they could create. The warm and soft colors are more inviting used mainly for static areas. On the other hand cold colors are usually implemented for dynamic areas like infrastructure or playgrounds as in playgrounds more bright colors could be used stimulating activity and movement.

The texture also play important role especially when talking about public spaces. Smooth and curvy materials are usually used for static areas and more rough and edgy materials for infrastructure and other maintenance elements.

Considering the three main materials on the waterfront in Aalborg, wood or wooden plank are used mainly for static rest areas as a sitting element. The wood is warm color with "friend-



Ill. 77: Wooden stairs / seating on the waterfront.

Ill. 78: Concrete stairs with asphalt approaching the water.

Ill. 79: Rusty trash bin. One of the many rusty elements on the waterfront.

ly texture which has inviting features. However wooden planks are used also as a surface for path walks, but mainly for secondary connections where the speed is lower. (See picture of wooden elements on the waterfront).

On the other hand concrete is used mainly as an infrastructure and main structural element shaping up specific landscape. The concrete is a cold material which together with its greyish color appears to be not so inviting element. However along the waterfront there are several places where a big stairs are shaped out of concrete as a sitting area. The reason for this is again the continuity issue. The whole edge of the waterfront with Limfjord is concrete and supposed to be continues and homogeneous edge all the way. That is why somewhere just small planks of wood are integrated into this concrete steps. (See picture of concrete elements on the waterfront).

The last material is the rusty metal. Its color, texture and typical metal features in general are far away from inviting. This material is used more for different elements such like drainage, trash bins, lightings etc. However there is also a bit of background behind this material which is about the meaning of harbor and industrialization part of the city's history. That is why it is also a symbolic and important material to be used. (See picture of rusty metal elements on the waterfront).

Other materials which are considered in this project are more natural elements such as grass and sand. Both are soft and smooth, used quite often at public spaces. They are implemented for more static area unless it is some playground. Merging these elements together with the mentioned above materials could create really interesting environment where dynamic and static are meeting, overlapping, interacting.

Orientation

The orientation of a specific material could have sometimes "hidden meaning". This is usually valid when there is some particular pattern

which could be interpreted and understood differently. Usually when elements are placed longitudinal this predisposes movement and higher speed. On the other had if the material is used crossly, it has this stopping or slowing effect which creates slower and even static environment. Example for this are the wooden planks on the waterfront. At the walking paths mentioned earlier, the planks are placed crossly on the direction of movement which subconsciously gives you a sign for more secondary slow area. Also the small space, "hole" between the boards is perceived as somehow obstacle which doesn't invite to high speed and smooth movement. On the other hand where the main promenade is, a thin metal elements are implanted longitudinal as continues element guiding you along the waterfront and accommodating more dynamic environment. The same function has the concrete edge along the whole waterfront mentioned earlier, which has also guiding function.

However orientation of a material could be understood also in the context of navigation in the urban environment or particular area. For example specific surface could show easily what program the area accommodates. A soft rubber surface is usually related to kids' playground or similar zone. In Aalborg city, as it was mentioned earlier, the metal rusty elements are not only implemented at the waterfront but all over the city – tree base grid, bins, drainage, bike signs, etc. The same material could be used for example to guide you through the city to a particular area. Furthermore as it was mentioned, the rusty element is used due to its relation to Aalborg history as a big harbor. In fact the closer you get to the waterfront the denser are these metal elements. This is a perfect example of planning approach giving you better perception of the urban environs by simply and strategically using specific material. Another example are the preserved old railway tracks at the waterfront which are not just historical elements but also directional elements emphasizing the frame and movement of the promenade.
Similar technics should be used and implemented on the bridge in order a smooth transition from one waterfront to another to be done.

Meeting points
This subchapter will elaborate additionally on the relation between two or more surfaces. As it was mentioned earlier different surface could define a particular area with specific program. However the border between different materials is quite important as well. What was observed at Aalborg waterfront is that the transition between different surfaces is usually done by integrating small element of rusty metal material. This is a really elegant way of framing out and separating particular area. On the other hand by implementing the rusty material at multiple places an interesting "framing layer" is created which function as both separator and connector.

Conclusion

Due to the intention of creating a homogenous network of public spaces in Aalborg and Nørresundby, the existing materials will be used to improve the connection between both areas and integrate better the bridge in the context. Implementing continues elements along Aalborg waterfront through the bridge to Nørresundby waterfront strengthen the link between both cities by converting them into one whole. Understanding better the function and potential of different materials helped us significantly during the design of the different spaces located on the bridge.

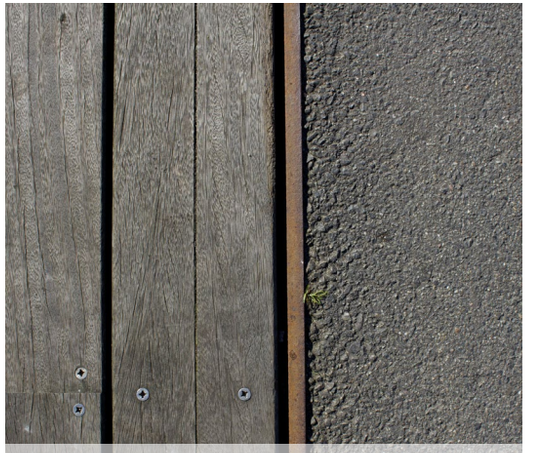
Ill. 80: Meeting of sand and grass. Picture from the beach Jærstranda, Norway.

Ill. 81: Meeting of sand and grass. Picture from the beach at Blokhus, Denmark.

Ill. 82: Meeting of grass and tiles at Aalborg waterfront.

Ill. 83: Bike sign with a rusty material. Picture from Aalborg waterfront.

Ill. 84: Rusty ‘line’ framing the tree. Picture from Aalborg waterfront.



Ill. 85: Transition from wooden planks to asphalt with a thin rusty ‘line’ inbetween. From Aalborg.

Programs

This subchapter will introduce the main programs and zones located at the bridge. Short overview of the main features of every area will be represented accompanied with plans showing the spatial distribution at the bridge. Furthermore a plan presenting the three main structures (peninsula, pier, bridge) will be showed in order to get better perception of the particular programs every structure accommodates. Most of the programs are detailed described in the subchapter "Zoomin".

Distribution of programs

Plazas
At the project bridge two plazas separated by the opening mechanism are designed.

Main Plaza
One of the biggest areas on the bridge is the main plaza. It is in close relation with the park shaping up together a potential "stage" area for different events. The zone is right next to the transit route, but it offers more static atmosphere.

Secondary Plaza
On the bridge around the opening zone there is one more, smaller plaza. First of all it provides quite vast space for a crowd waiting an opening and closing of the bridge. Second of all this space utilizes additionally the vertical potential of some of the highest points on the bridge, offering nice view over Limfjord. Moreover the area shapes out a space which could be used for eventual performances connected with the opening mechanism.

Beaches
The beach areas are created as a response to the concept and the water element, artificial peninsula structure and its potential as well as citizens answers in the conducted questionnaire.
"*... beach with sand is one for the things I miss in Aalborg, and it would be awesome if you can build one...*" (appendix).

Main Beach
The main beach is quite spatial area accommodating plenty of subprograms. It is designed to be diverse area in terms of "speed" and types of activities. It is a mix of dynamic and static subzones overlapping each other.

Secondary Beach
A small beach is designed close to the skate park area. This secondary beach is purely beach without any additional structures or programs. Compared to the other one, this area is supposed to be more calm and static, where people can relax.

Rest Area
This zone is shaped out as an answer to the big plaza in front of the House of Music. Its beginning is wide and it narrows down incrementally "capturing" the flows from the big open space. On the other hand two main static areas are placed between the main connections. Dynamic and static are twisted together in this zone. The main purpose is to provide the smooth movement from the main connections and Music House respectively but at the same time offer rest zones typical for the waterfront spaces.

Water bodies
As it was explained in the concept chapter water is one of the main elements influencing the design process. Three main types of water experience and bodies are designed – water bodies Limfjorden, Water Mirror, Swimming pool.

Water bodies Limfjorden
There are two water bodies, using the water from Limfjord, located respectively on both sides – Aalborg and Nørresundby. The purpose of these elements is to integrate better the structure to the context. By penetrating the banks these openings in the structure create perception for continuity and entirety.
On the other hand they are related also to the experience aspects. Symbolizing transparency, these water bodies break up the structure of the bridge at its widest points trying to specific atmosphere of being over the fjord.

Water mirror
This water body is part of the previous shapes. However in this case the water element is transformed and represented trough water mirror. The idea is continuing the water element in

Nørresundby, following the same lines, but creating more urban environment. It is a smooth transition from natural to urbanized elements. Furthermore this structure is also supporting the experience theories creating more playful environment allowing people to interact with it indifferent ways.

Swimming pool
The last water body is a swimming pool located in the middle of the main beach using also water from the Limfjord. It is designed shallow area considering the kids as user groups plus the temperature issues. In addition to this water body is going to be transformed during the winter into ice-skate rink.

Park
There is one park zone on the bridge which is completely covered with grass. This park is placed on a slope or roof of building. It is area for relax providing at the same time elevated places facing the main plaza strengthening the correlation between both zones.

Indoor public space
Underneath the park area is located building. It is an indoor public place with big glass façade facing the fjord. The building will provide small library, play zone, chill area close to the glazing, opened space for different small events and exhibitions.

View point
At the highest part of the park is located the view point. Here the users are going to be able to enjoy the city's skyline, natural phenomena as well as the framed areas described in the design story chapter.

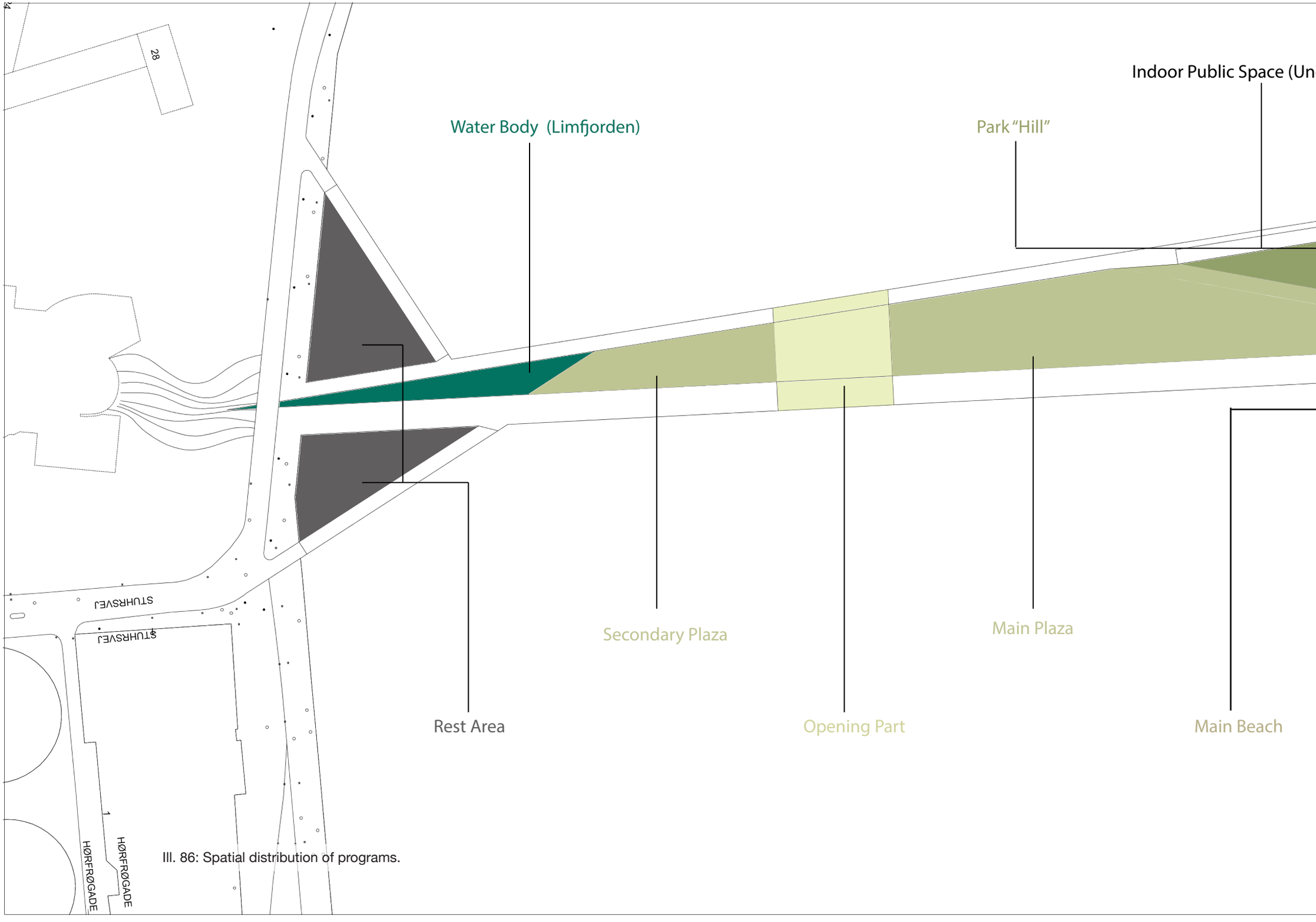
Skate Park
One of the most dynamic areas on the bridge is the Skate Park next to the building. Unlike most of the examples of skate parks isolated locations, the group has decided to place the skate park at quite central areas. The idea is integrating it with the rest of the zones stimulating social interaction between different users, by opening up and providing observing points. Part of the glass face of the building is facing the skate park on purpose so the people can just watch and enjoy the performance of the young skaters.

Kids Playground
A kid's zone is designed between the skate park and the main beach. The idea is providing proximity to the swimming pool as well as the beach area. Furthermore the playground right next to the skate park so kids easily can observe the "elder brothers and sisters".

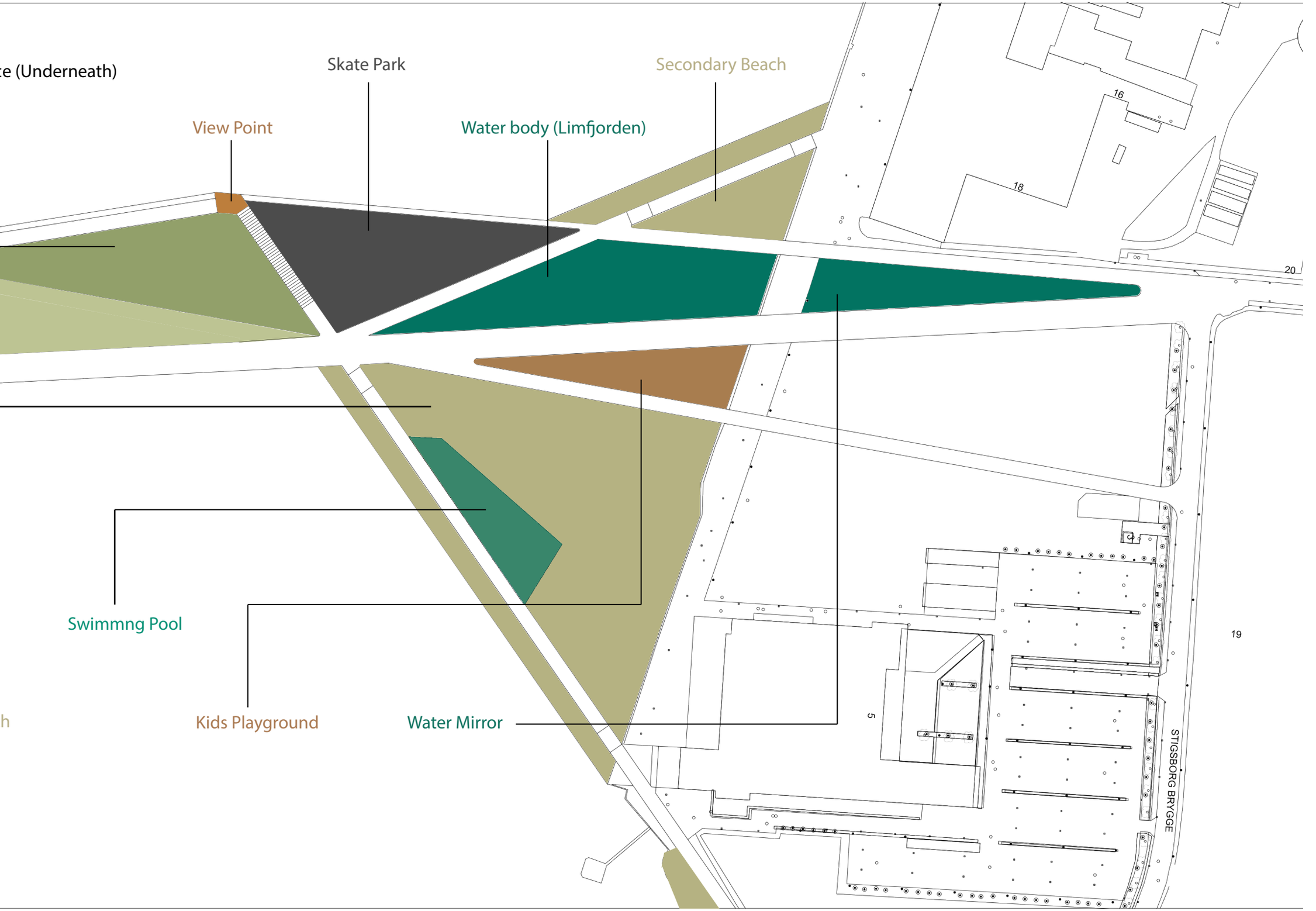
Opening part
The last zone located at the pedestrian connection is the opening area. Due to its specific function the area doesn't really have any particular character. However potentials of creating something symbolic, transparent and entertain were discussed.

Conclusion
The design of the programs is closely related and supported by the theories explained at the beginning of the project. Multifunctional areas, with separate programs "spheres "for different user groups placed close to each other so interaction between all users is possible. The boundaries between the different zones are at the same time quite fixed defining the particular program but at th same time quite blurry allowing overlapping and transparency of the whole structure.

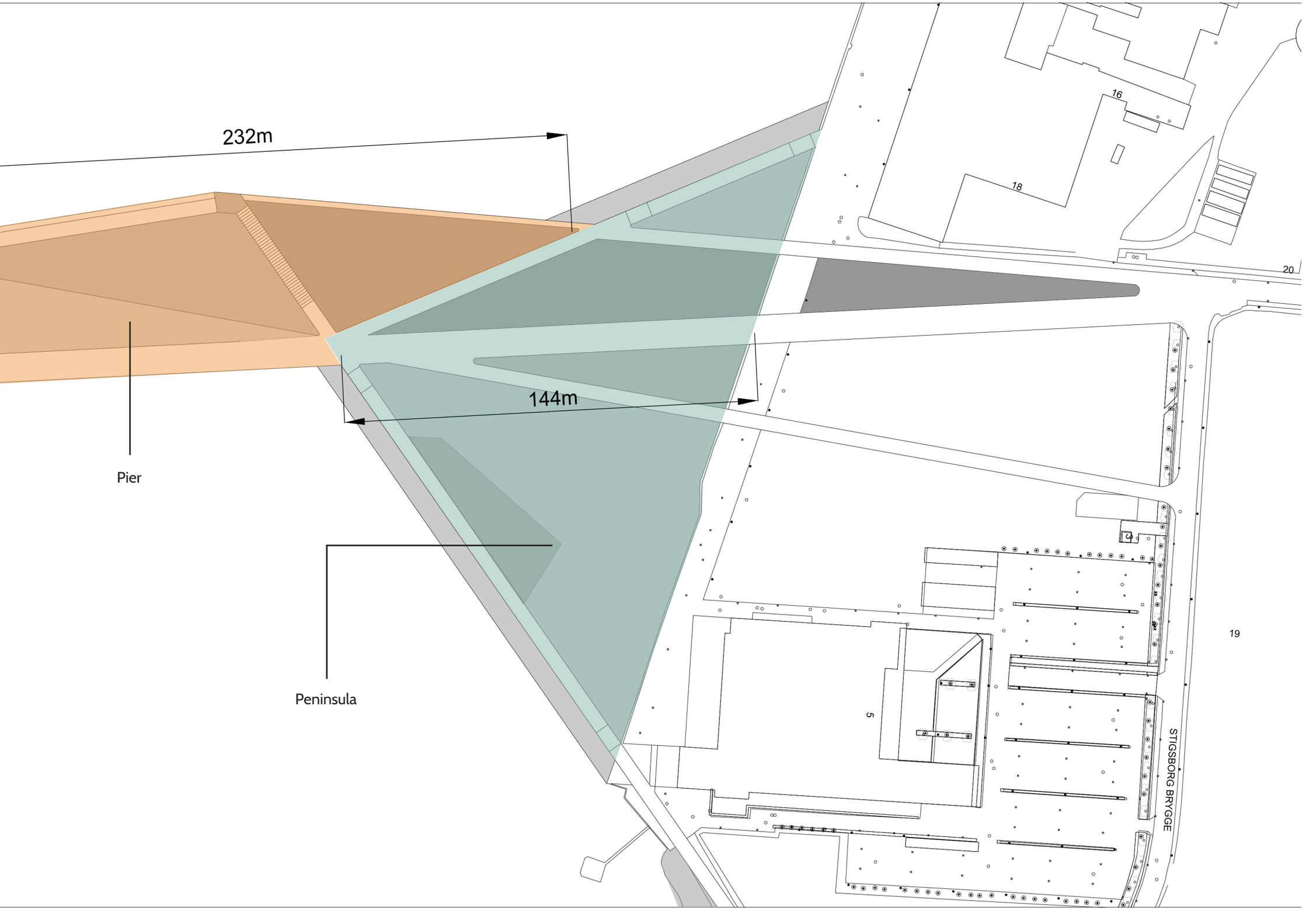
Zones distribution by structures
In terms of the structure distribution, the first stage of artificial peninsula is going to accommodate the two beach areas, the kids' playground and some of the water bodies.
The pier as a second stage will firstly accommodate only the skate park and the rest will be open plaza. Once the building of the last step, the bridge, starts, the building together with the park and the view point will be constructed sharing space of the bridge and the pier.



Ill. 86: Spatial distribution of programs.


ce (Underneath)
Skate Park
Secondary Beach
View Point
Water body (Limfjorden)
16
18
20
19
Swimmng Pool
Kids Playground
Water Mirror
5
STIGSBORG BRYGGE

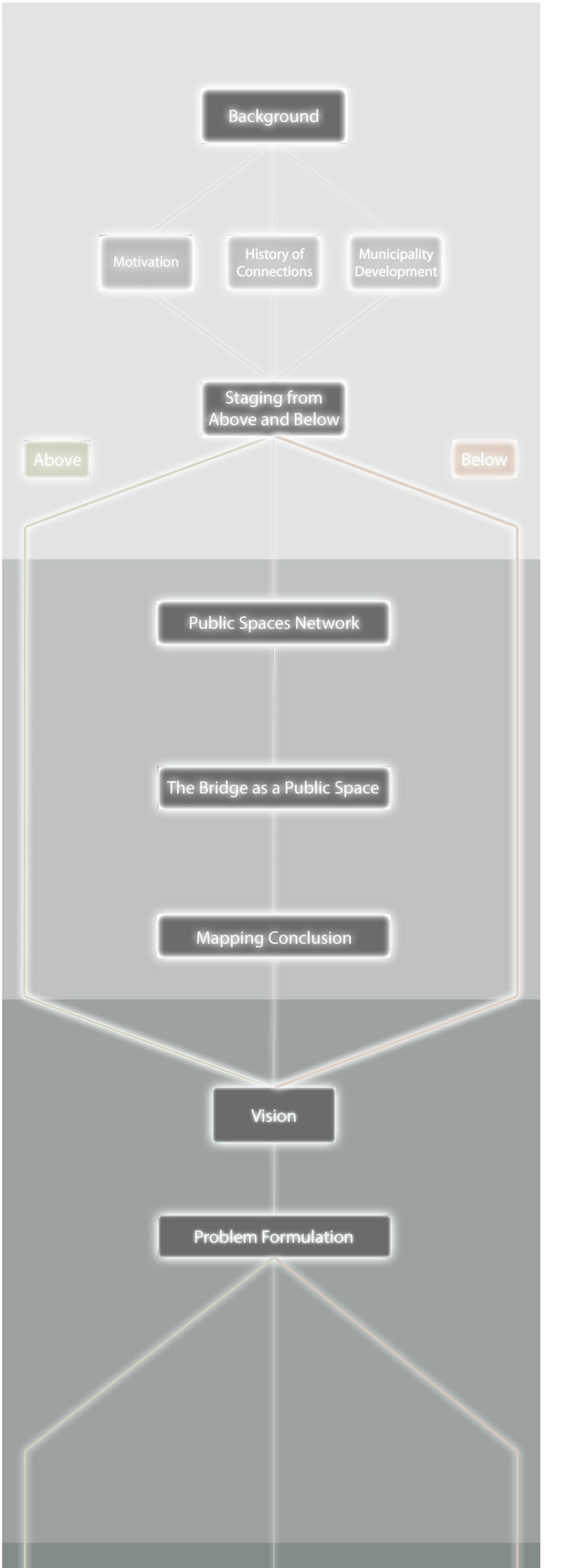
Ill. 87: Zones distribution by type of structure.

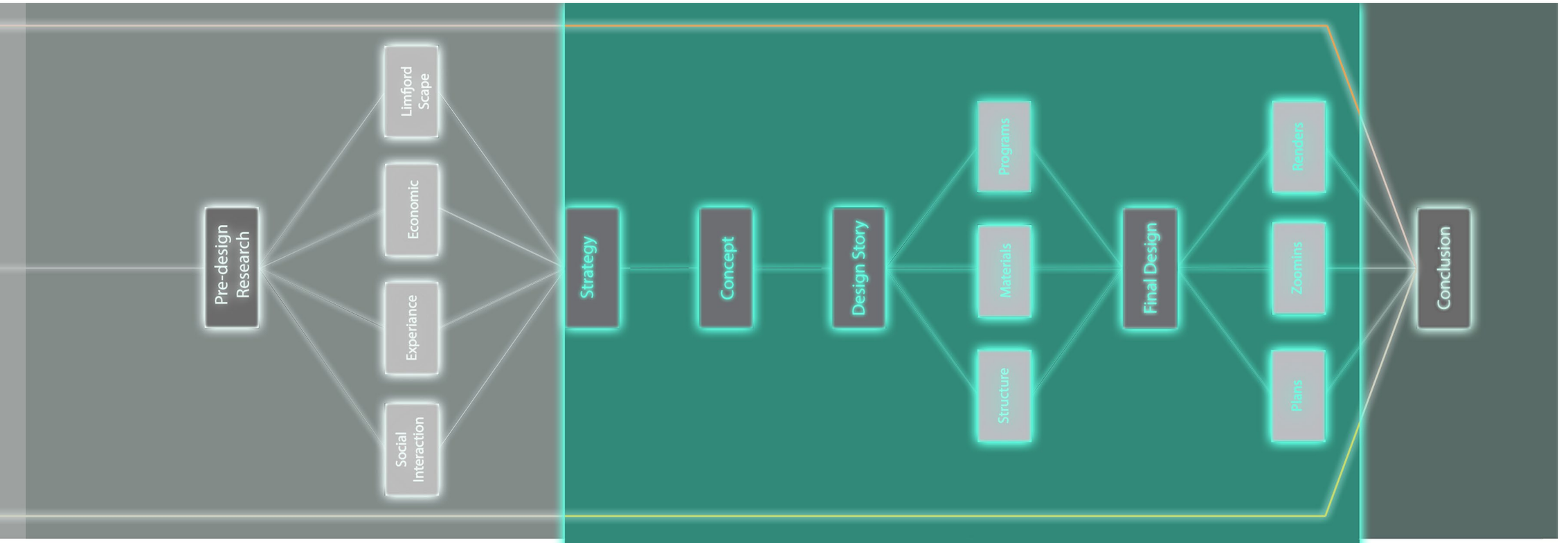

232m
144m
Pier
Peninsula
16
18
20
19
5
STIGSBORG BRYGGE

Introduction

Mapping

Vision & Problem Formulation





Final Design

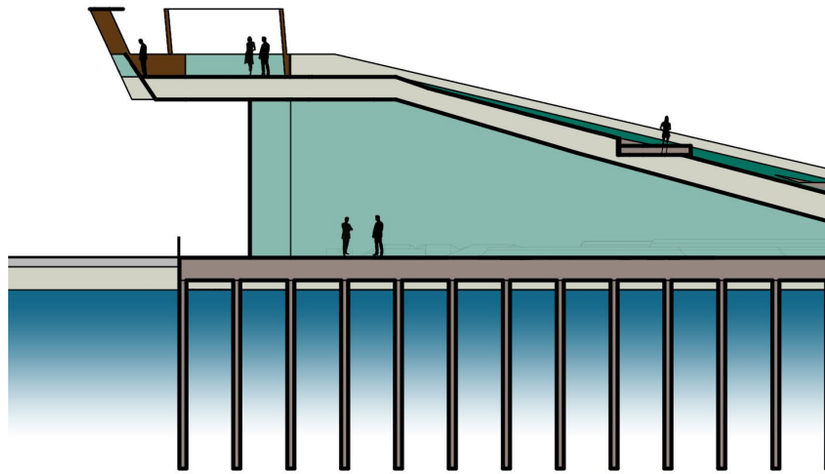
This chapter will represent the final design in a mainly graphical way. Plans of the whole structure, detailed zoomins plus renders will be introduced. While the first two are representing "staging from above" showing 2D plans, the last subchapter is dedicated to the human scale "staging from below" and the experience in and through the different areas.

Plans

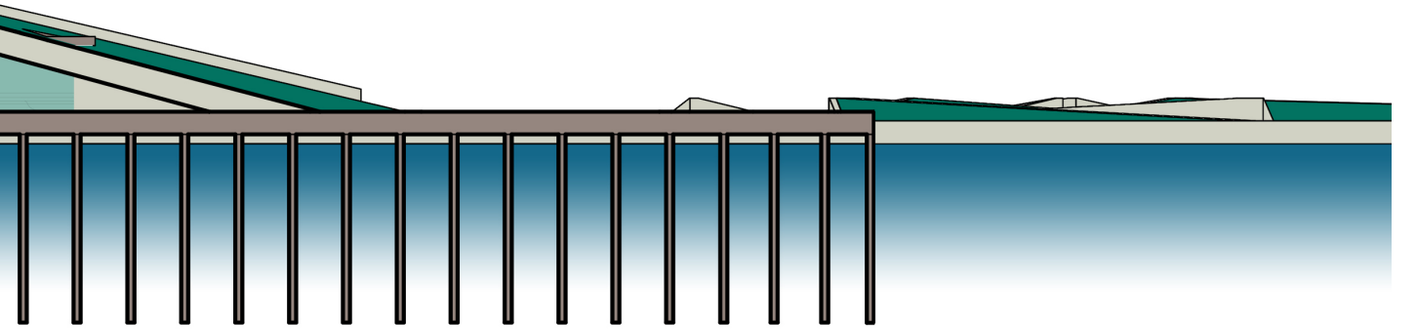
This subchapter will introduce a plan of the whole structure in scale 1:1500. The main idea is showing the distribution of materials and colors among the different programs and areas as well as the selected location of the particular Zoom-in. Section and elevation will be also introduced for better understanding of the vertical dimensions and proportions.

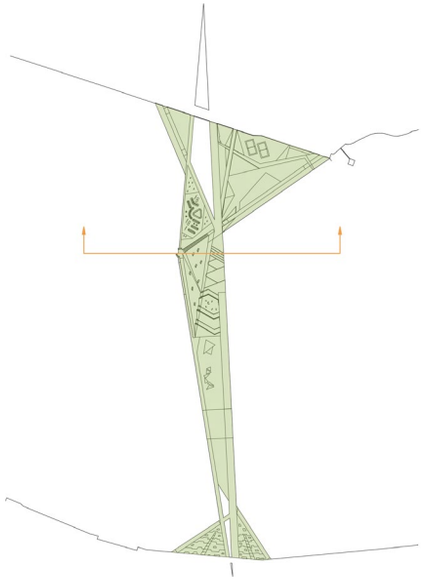
As it could be seen on the plan more static areas like plazas, Rest area and secondary explorative paths are done with wooden planks representing warm and quite atmosphere. The direction of the planks crossly the way of movement is sign for slow and static areas. On the other hand are the main concrete connections like the transit axis, representing high speed and dynamic of movements. The dynamic feature of the concrete is applied also to the skate park which is the most active zone. The playground is covered by red rubber surface material appropriate and safe for kids. The color is at the same time warm and calm but also quite bright provoking to some extend movement and activities. The rest of the areas park, beach and water bodies are implementing so called natural materials – grass, sand and water. All of them are inviting elements, appropriate at same time for dynamic and static areas. Applying "materials" is part of the integrating the structure at the fjord as a natural element. Artificial and natural, dynamic and static, cold and warm are different layers which are overlapping and interacting, at the designed space, creating a diverse but homogenous atmosphere.

This plan is also showing the location of the zoomins. Three main zoomins will be represented in this project. Every one of them has its own function and atmosphere. Made in scale 1:400 due to irregular dimensions, they are not covering the whole area. However their location is at some key areas, trying to cover the most important elements of the structure. Two of the zoomins are covering completely the two edges on both sides, showing more into details how the structure is integrated into the context. The third one is from another key area explained earlier in the project – the "multiple function junction". It represents also the correlation between some of the biggest areas like the main plaza, park and the skate park as well.

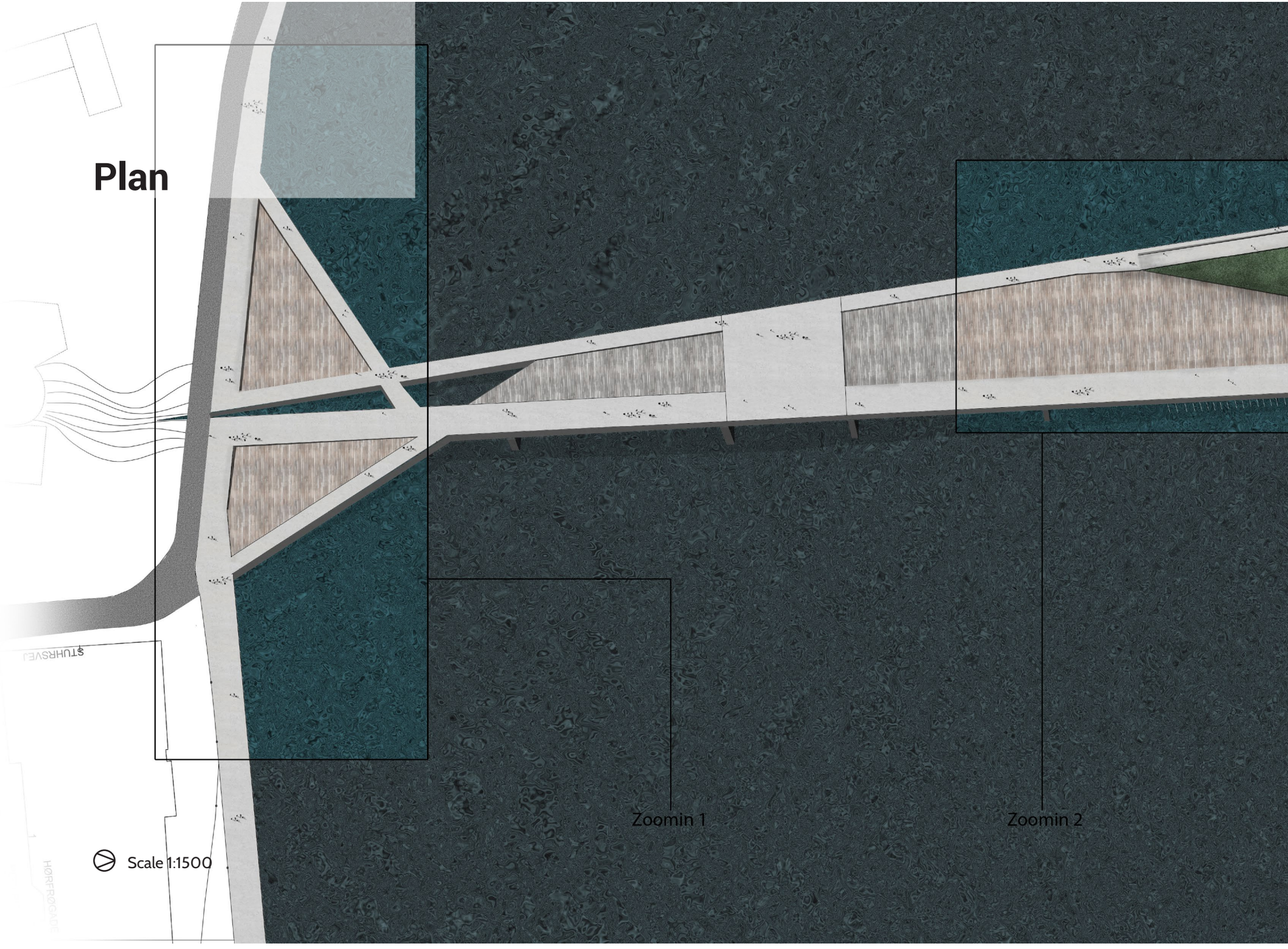


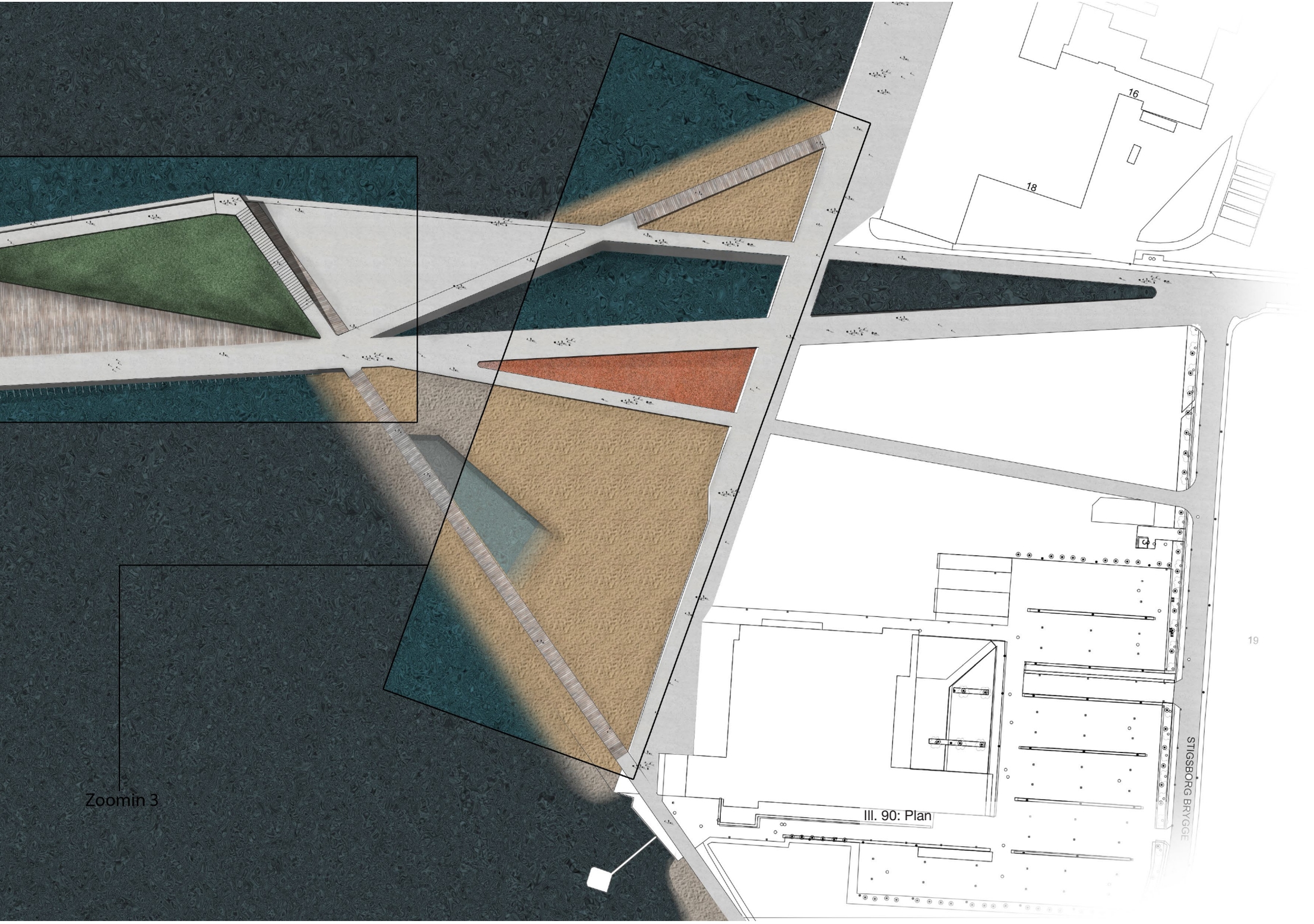
Ill. 89: Section of bridge. Exaggerated staging from below.





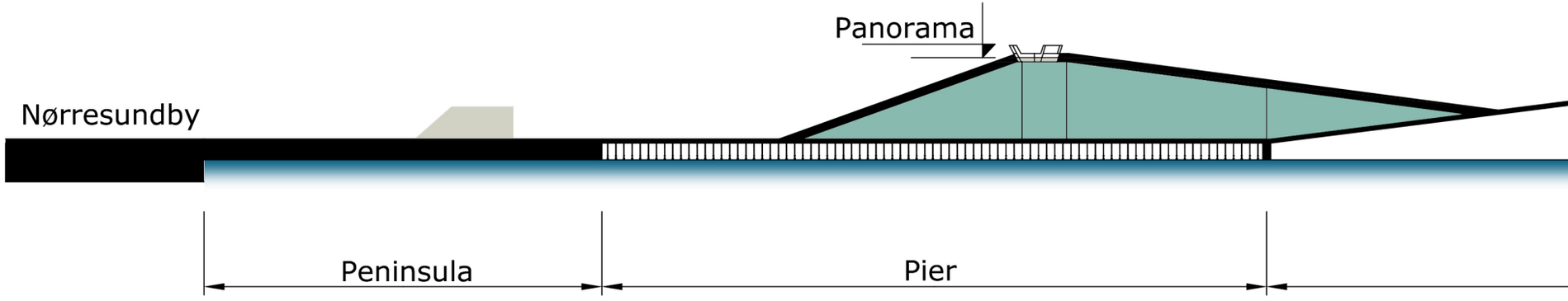
Plan



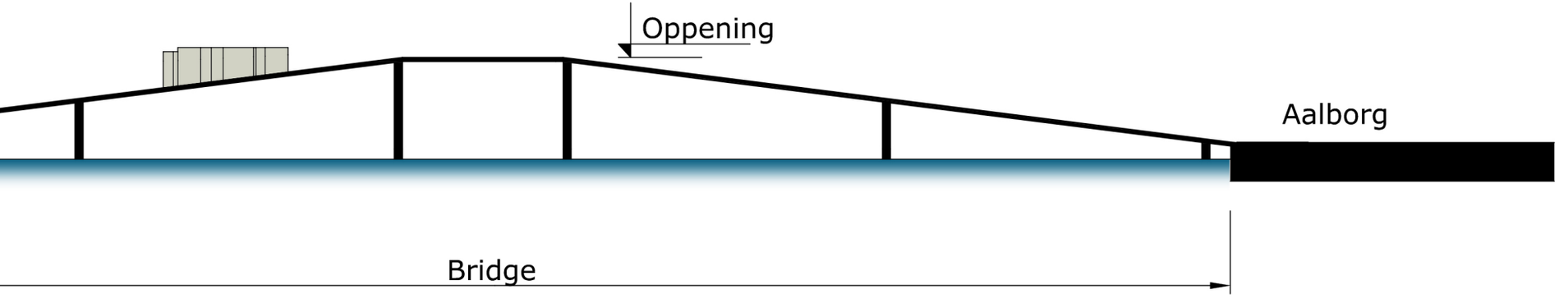


Ill. 90: Plan

Elevation



Scale 1:1500

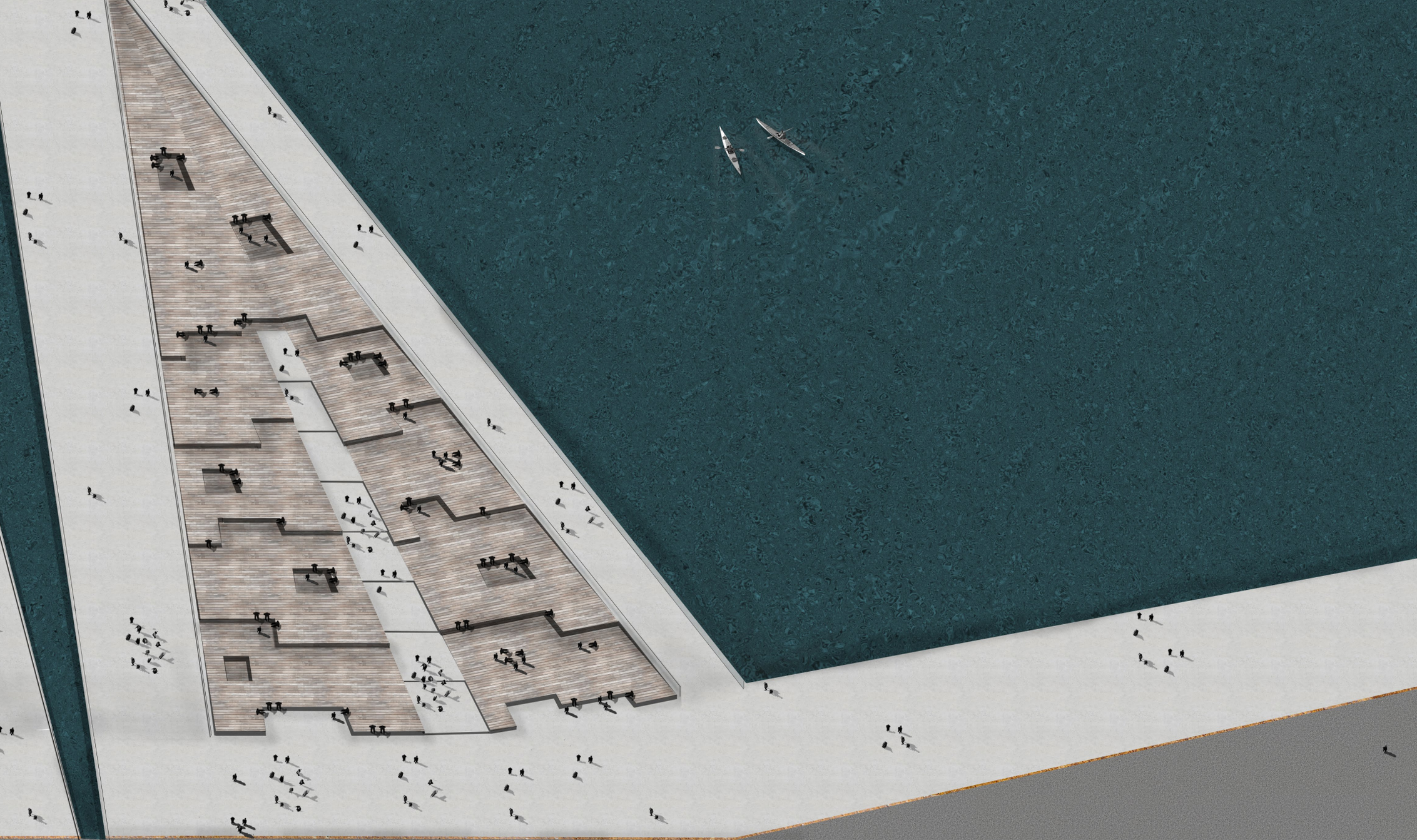


Ill. 91: Elevation

Zoom-in: 1

This Zoomin covers the whole edge at Aalborg site, representing the Rest Area of the bridge. As it was mentioned in the previous chapter it is a zone designed as a respond to the big scale plaza. The transit connections are framing up the static area. Due to reasons presented in the material chapter a wooden material and more specifically the wooden planks are implemented. The idea is creating this feeling of calm and static atmosphere, where people can slow down and rest. The whole area of the structure is designed in a way that, people have choice to either take the transit "high speed connections" or enter the "wooden environment and rest. One can choose to sit or lie. The Rest Area is adapted to the slope the bridge structure is forming. Five main levels of 40cm are designed, facing the southern sunny part. The edges of the whole area are asymmetric and irregular, creating specific "social pockets" in different sizes. Furthermore inside some levels "social holes" are shaped out where people can find their intimate space. The area is again based on the multiple choices option, so one can choose between either open public area where to sit or a more enclosed pocket isolated from the rest of the users. The pockets are designed with the idea of face-to-face interaction and communication. Furthermore the elevated edge of 40cm could be used as a sitting area but also as a leaning structure functioning at the same time as wind protection..

Scale 1:400

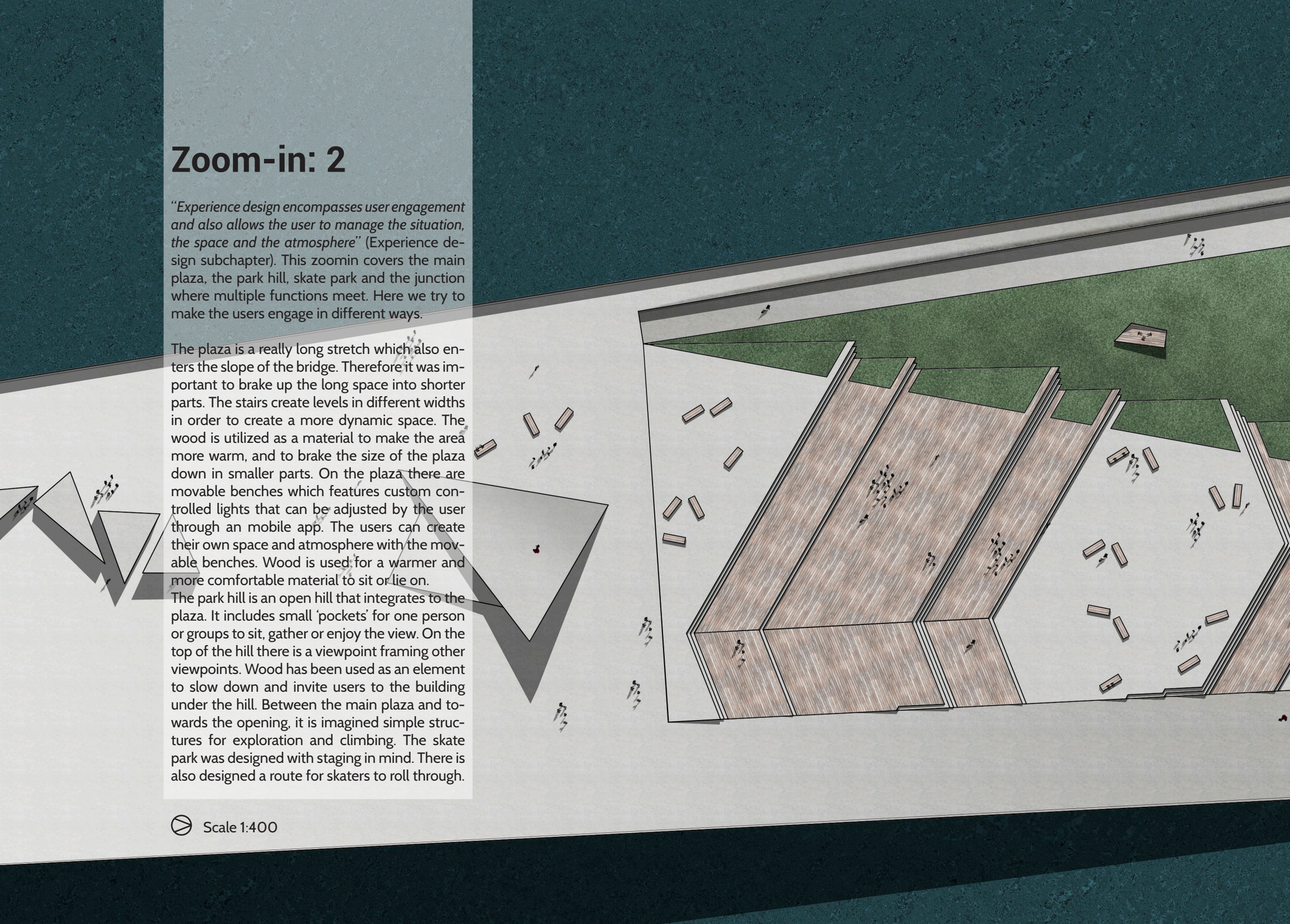


Ill. 92: Zoom-in 1

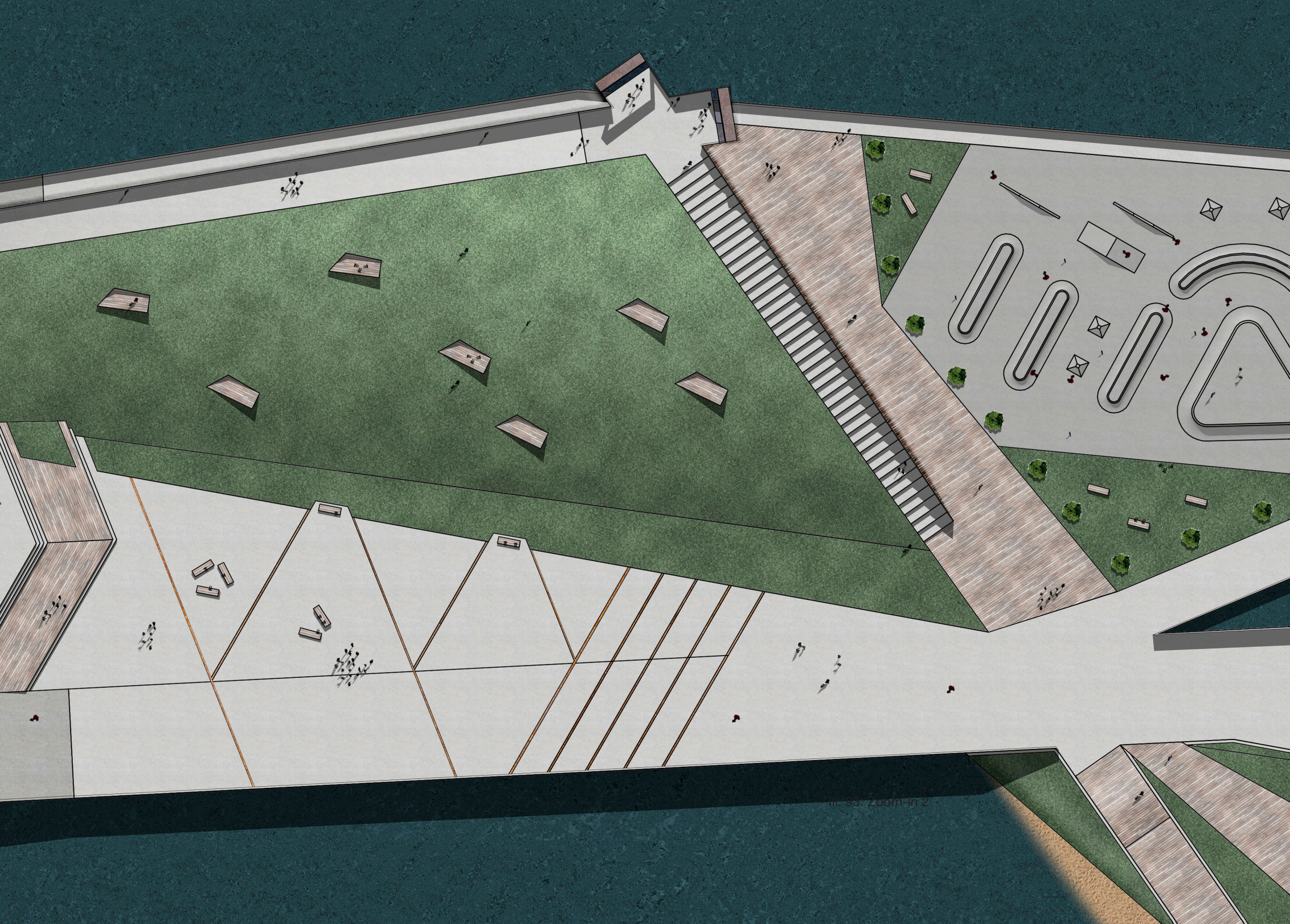
Zoom-in: 2

"Experience design encompasses user engagement and also allows the user to manage the situation, the space and the atmosphere" (Experience design subchapter). This zoomin covers the main plaza, the park hill, skate park and the junction where multiple functions meet. Here we try to make the users engage in different ways.

The plaza is a really long stretch which also enters the slope of the bridge. Therefore it was important to brake up the long space into shorter parts. The stairs create levels in different widths in order to create a more dynamic space. The wood is utilized as a material to make the area more warm, and to brake the size of the plaza down in smaller parts. On the plaza there are movable benches which features custom controlled lights that can be adjusted by the user through an mobile app. The users can create their own space and atmosphere with the movable benches. Wood is used for a warmer and more comfortable material to sit or lie on.
The park hill is an open hill that integrates to the plaza. It includes small 'pockets' for one person or groups to sit, gather or enjoy the view. On the top of the hill there is a viewpoint framing other viewpoints. Wood has been used as an element to slow down and invite users to the building under the hill. Between the main plaza and towards the opening, it is imagined simple structures for exploration and climbing. The skate park was designed with staging in mind. There is also designed a route for skaters to roll through.



Scale 1:400


Ir. 93: Zoom-in 2

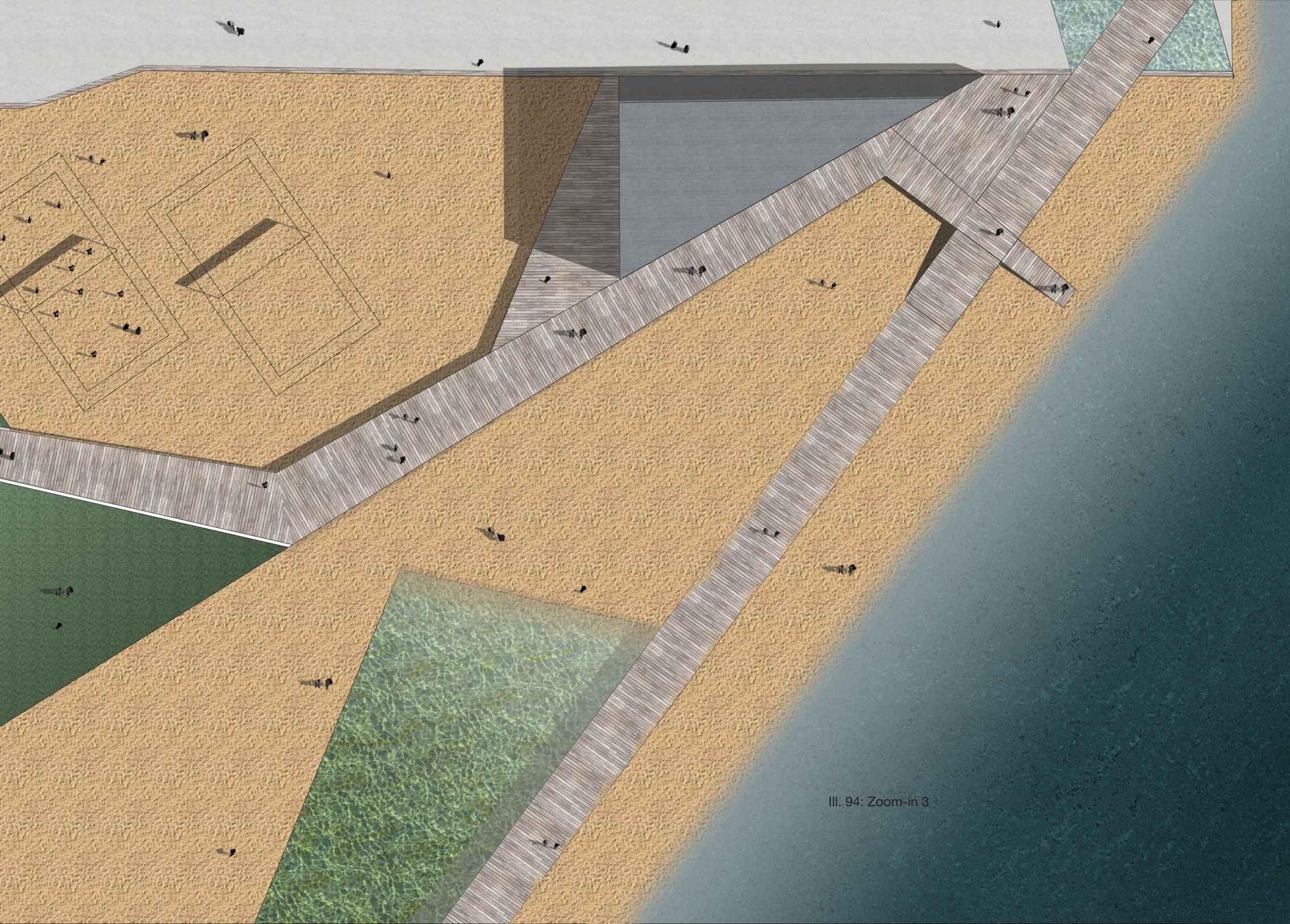
Zoom-in: 3

In the current zoom-in as an example is shown the close-up of the most northern part of the bridge. This area is bigger compared to the rest and includes an artificial beach, couple of playgrounds - providing for different ages, as well as a building to the north-east. This building is expected to accommodate mainly a café and the kayak club and is in proximity to the water. The idea is to re-create the beach environment having the possibility to experience your drink in a totally new way.

Different considerations were taken into account when designing the area. Different materials will correspond to different zones, for example wooden planks were chosen as main material for the pathways inside the zones where wood is much more "warm" and "slow" material in the case. The main pathways will be from concrete where they are going to be the main arteries.

The layout is speaking the same language as the bridge, taking into account different flow lines and programming. Some of the spaces were subdivided with the help of landscaping aiming for more pleasant and diverse experience. The bridge penetrates Nørresundby at five places but in general there are no physical or visual obstacles and the plan is open. Except the pathways the rest of the areas go inside ground with 40 cm aiming for even more inviting feeling. Alongside the shore where the bridge connects a wooden edge is present with the possibility for sitting and observation.

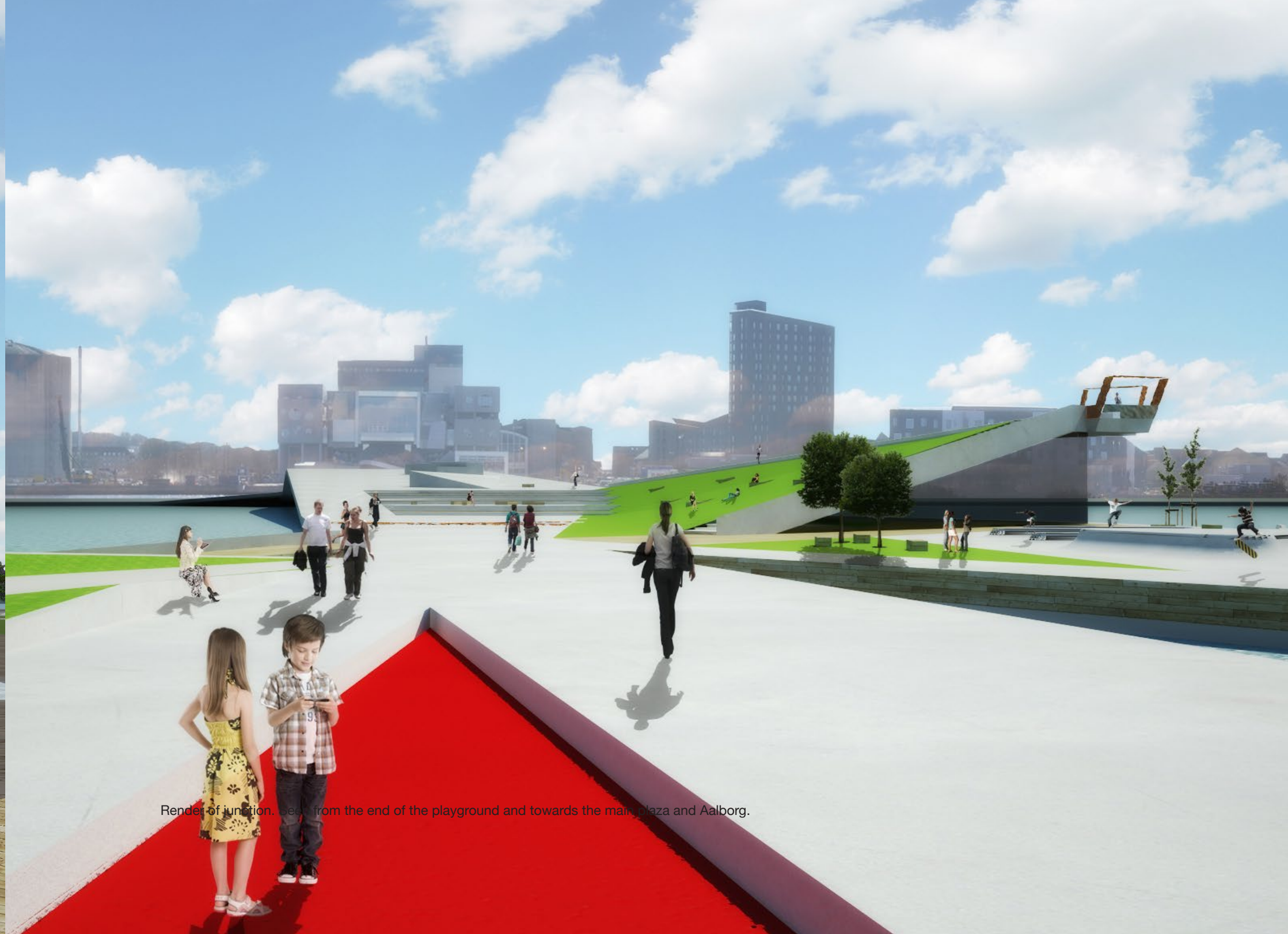
The water as an element is also present. A big chunk of the peninsula is subtracted and the fjord breaches inside the land as well. The rest of the beach is gradually entering the fjord.



Ill. 94: Zoom-in 3

Renders

Render from main beach.

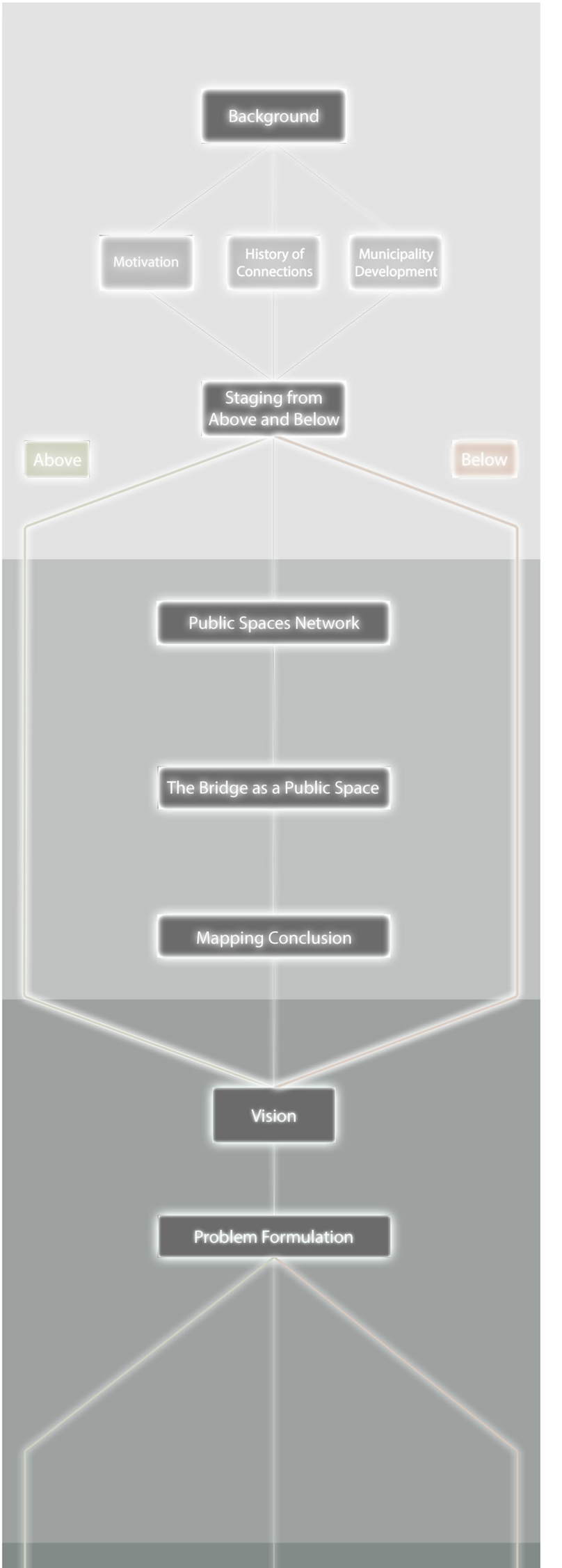


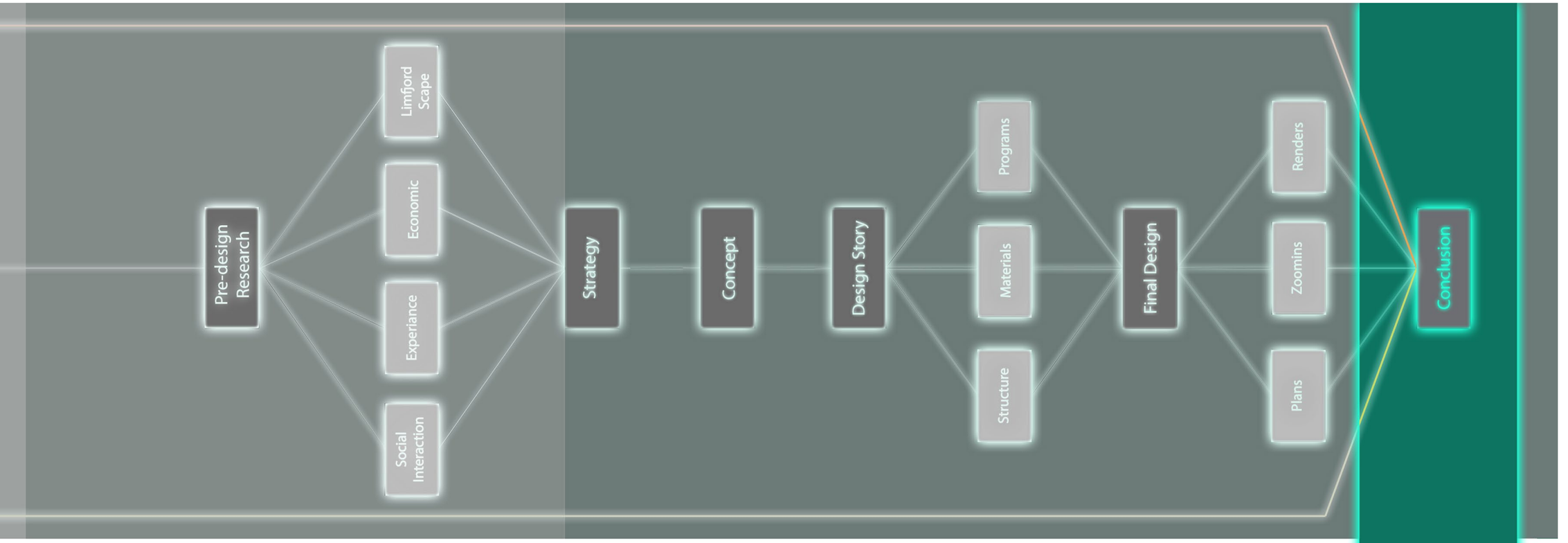
Render of junction. See from the end of the playground and towards the main plaza and Aalborg.

Introduction

Mapping

Vision & Problem Formulation





Conclusion

The last chapter will represent two main subchapters – Conclusion and Reflections. The first one will summarize the content of the project while the reflection one will introduce some missing points, limitation and restrictions taking the project through the rough filter of the real life conditions.

Conclusion

The historical overview of the connections over the Limfjord is showing very well the slow and old connection infrastructure between Aalborg and Nørresundby.

The initial mapping section of the project represents the spatial segregation between both cities. The network of public spaces, infrastructure and other urban layers are developed in both places on a very high level, but the connection between them is extremely weak provided by only one pedestrian bridge. The Limfjord is still functioning as a "wall" between both areas as one of the citizens expressed himself.
In addition to a big contrast between the developing processes in both cities strengthen the segregation even more. While the Aalborg waterfront is "popping up" with more and more new developed areas, buildings and landmarks, most of Nørresundby waterfront area is reminding of the old industrial era, where the factories are dominating the neglected empty and grey areas are extending along the waterfront edge. The spatial and social segregation is increasing even more. The unfamiliarity of the people about the other "site of the wall" is staggering.
Using as a foundation of the whole project, theories are guiding the whole process from the beginning to the end showing the problems and the potentials at the same time. The project analyses into details the potential of a new pedestrian bridge as a trigger and catalyst for developing in Nørresundby, connecter between both cities which could reinforce the links between the different city layers of both areas balancing the waterfronts. On the other hand detailed research about the way of solving the social interaction has been done. The bridge as an open minded structure for different user groups with shared focuses and different situations is the way to create space, meeting point where social interaction and exchange between the citizens of both cities could happen.

By implementing the theory of "staging from above and below" the problem of segregation has been analyzed and researched from two angles. Tiding up together not only the structure with the context and the existing infrastructure but also elaborating more on the small details like materials and colors, atmosphere and experience, programs and moods, is a very important approach which helps to solve the social segregation and create a multifunctional public space for everybody.

Due to economic issues and Limfjord features the bridge will be built in three main stages. Every stage accommodates different zones and programs. Dynamic and static, natural and artificial, cold and worm, bright and dim, summer and winter different functional layers are mixed and overlapped creating diverse and multifunctional environment in the middle of the fjord, but at the same time extending the continues elements of both waterfronts shaping it as one homogenous whole.

Reflection

Due to the limited time the project is lacking some detailed information about some particular areas. Example for it is the opening mechanism of the bridge and the spaces around and on it. Brainstorming of ideas how this "problematic situation" could be transformed into a potential has been done. Research questions considering this issue have been raised. How the waiting time could be transformed into some kind of attraction and experience? How the opening element as a physical obstacle could be designed in a way to symbolize the broken psychological and physical boarder between both cities? Different ideas such as transparent opening mechanism or the mechanism as a canvas for projecting were discussed. However due to the restricted time, mentioned earlier, these proposals could not reach design stage.
Another space which is not detailed represented is the indoor public space. Main ideas and drawings represented in the project describe the potential programs inside and give better understanding of the main dimensions.

However considering the type of project in the urban design sphere the level of design and analysis is enough to represent the main problems of the area and potential solutions in spatial, economic and social aspects. The project group has taken rally serious this project trying to deal with real problems and challenges. However the more knowledge it was acquired the more it was realized how complicate is actually to promote in real life a similar project espe-

cially here in Aalborg. First of all the group had to take into consideration one of the main problems namely the economical issues. Promoting a bridge which doesn't bring visible and direct economic benefits but only social benefits for the cities is unfortunately un-convincing argument for politicians. At the municipality interview it was told that it would be really hard the politicians to approve and finance a project like this. The municipality doesn't have money; the government does not have money. Maybe just the priorities should be re-thought.
"For conventional bridges, which are essentially functional, the value of a bridge can be quantified by consideration of reduced or more reliable journey times and distances. This information can be used to assess reduced accident frequency, time savings and reductions in pollution, particularly for highway bridges." (Duguid, 2011)

However the group was encouraged by the words that the tool of representing nice visual graphics of what it could be how it could look like and so on sometimes may work. But is it just an illusion or serious statement. When start thinking, country as Denmark claimed to be one the most sustainable and environmental friendly countries continues with planning big transport projects such as 3.Limfjord. Yes the main highways cannot be just ignored, the cars also still exist but where is this transition that everybody is talking about - sustainable transport modes like walking cycling and public transport are the future. Obviously the things are happening quite slowly. Even worse, millions of money is still investing into not sustainable structures like highways and big infrastructure projects, but for regular pedestrian-bike connection there is no money. Even a small project of a pedestrian attachment to the existing railway bridge is still not implemented, ordinary simple construction which is being forgetting for years.
What is even worse is that the politicians are manipulating very people by filtering what information to provide for them. It will be represented hundreds of pages about the economic benefits of the new big highways, but not body will inform peoples about their own city about the effect of public spaces and so on. It is even sad that as foreigners the members of the project group are times more familiar with the public places in both cities, with their potentials and problems as well. However somehow it is accepted that actually the city doesn't need more connection since the exiting bridge is functioning perfectly. But once you explain the regular citizens why it could work, how it could be, and the importance of it they change their mind quite fast (Citizens Questionnaire). Why a city with population more than 200 000 should consider SECOND pedestrian connection over water obstacle. It is not Vienna, or Paris, or London, Budapest, Salzburg or many more cities located and divided by big rivers having at the same time dozens of bridges creating a homogeneous whole.

However the group is still positive that the changes soon or later will happen. Innovations and changes are taking always time. The car ownership is still one of the biggest problems, which also the government accepts as well. But encouraging it by building more and more highways will not accelerate the transition to more sustainable transport modes. Yes projects like the light rail in Aalborg a reasonable. But again the segregation and separation between both cities is ignored. The main priorities should be changed significantly. As it was mentioned in the project, the public spaces are one of the key elements of every city influencing in so many ways citizen's life. Looking and working in this direction will help the transition to be done faster. A potential pedestrian bridge like the project one would defiantly act as catalyst for development into more sustainable context. Projects around the world transforming parking into green loans, or old railways into public spaces are becoming more and more. Car-free neighborhoods are also becoming more popular. If Aalborg and its politicians decide to change and reconsider a bit the direction of development, maybe one day not only one but more hybrid pedestrian bridges will be built and the existing bridge will be transformed also in mainly pedestrian and bicycle one, with different places and programs.

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List of interviewees:
TBS: Thomas Birket Smith, Architect at Aalborg Municipality (Aalborg kommune), interviewed March 18th 2014.

Maps from GIS (the mappings):
http://download.kortforsyningen.dk/mine/downloads - April 2014
All maps in the report: Contains data from Geodatastyrelsen, cadastral map-Aalborg 2, GIS - ArcMap
Maps - for AutoCAD: http://www.geodatabiblioteket.dk/index.php (\\aub.aau.dk\fileshares\geodata\tekniske\tekkort_aalborg\2013_FOT - Sheets 2km-6322_554, 6322_556, 6320_554, 6320_556)
Bottom of the fjord: Danske s-kort - it-format - http://www.geodatabiblioteket.dk/index.php (\\aub.aau.dk\fileshares\geodata\topografiske\danske_soekort) - Map number: 107 (INT 1383)
Aalborg Havn

Illustrations

Illustration 1-11: Own illustration(s)
Illustration 12-13: Own illustration(s). Contains data from Geodatastyrelsen and Aalborg kommune.
Illustration 14: Own illustration(s)
Illustration 15: Jensen, Ole B, 2012, p 9. Staging Mobilities. Full draft 6.0. Routledge International Library of Sociology
Illustration 16-17: Own illustration(s)
Illustration 18-25: Own illustration(s). Contains data from Geodatastyrelsen.
Illustration 26-31: Own illustration(s)
Illustration 32-33: http://www.bigcitypix.com/central-park-app-iphone-ipod-conservancy-new-york-city-nyc-urban-forest-outdoors-grass-trees-non-profit-organization
Illustration 34-35: Own illustration(s)
Illustration 36: Own illustration(s). Contains data from Geodatastyrelsen.
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Illustration 157-165: Own illustration(s)
Illustration 166: Own illustration(s). Contains data from Geodatastyrelsen.
Illustration 167: Own illustration(s). Contains data from Google Maps.
Illustration 168: Map from Geodatabiblioteket.
Illustration 169: Wind diagram from DMI.
Illustration 170: Sun diagram based on simulations of shadows using SketchUp.
Illustration 171: Own illustration. Based on statistics from Aalborg Municipality (Bosætning, 2012), Danmark Statistik.
Illustration 172: Own illustration. Based on statistics from Aalborg Municipality, KÅS Danmark Statistik.

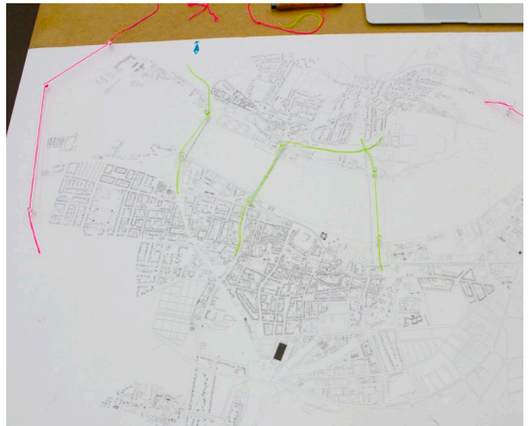
Appendix

This chapter contains insights to the design process, a brief presentation of reference projects, the experience from Amsterdam, and other data collection.

Documentation of the process - a brief presentation of the working- and design process.

The initial discussion about a new bridge and the segregation of the cities. Utilizing our knowledge in order to place the bridge.

Visiting the site. This is the view from Nørresundby towards Aalborg and the House of Music.



Mapping workshop. Thinking about connections across the fjord for cars and pedestrians.

Drifting

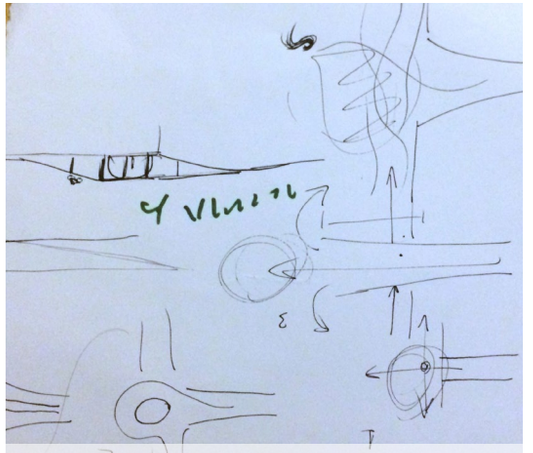
Drifting

Final point of the experience route - our site in front of the House of Music.

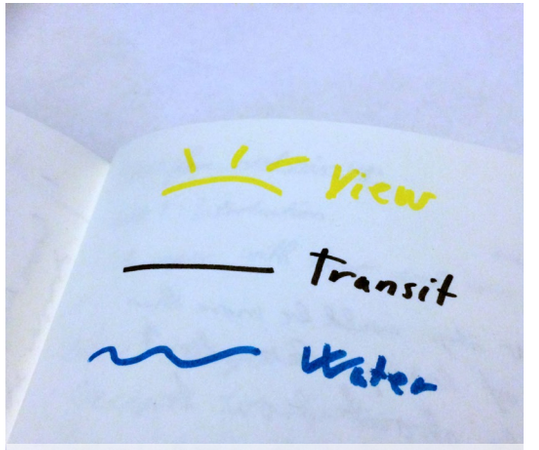
Various mappings was created. Here we see a mapping of streets and their safety. The street network is of importance in order to connect public spaces. Public spaces are important when dealing with a segregated city.

Mapping of current hotspots and discussing new potential hotspots.

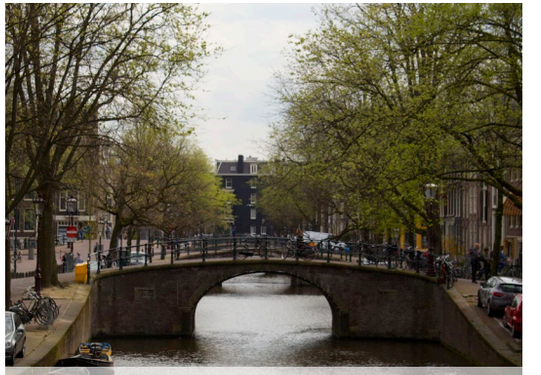
Drifting - following the green. We use it as a way to figure out how semiotics could connect public spaces - such as parks to parks as an example.



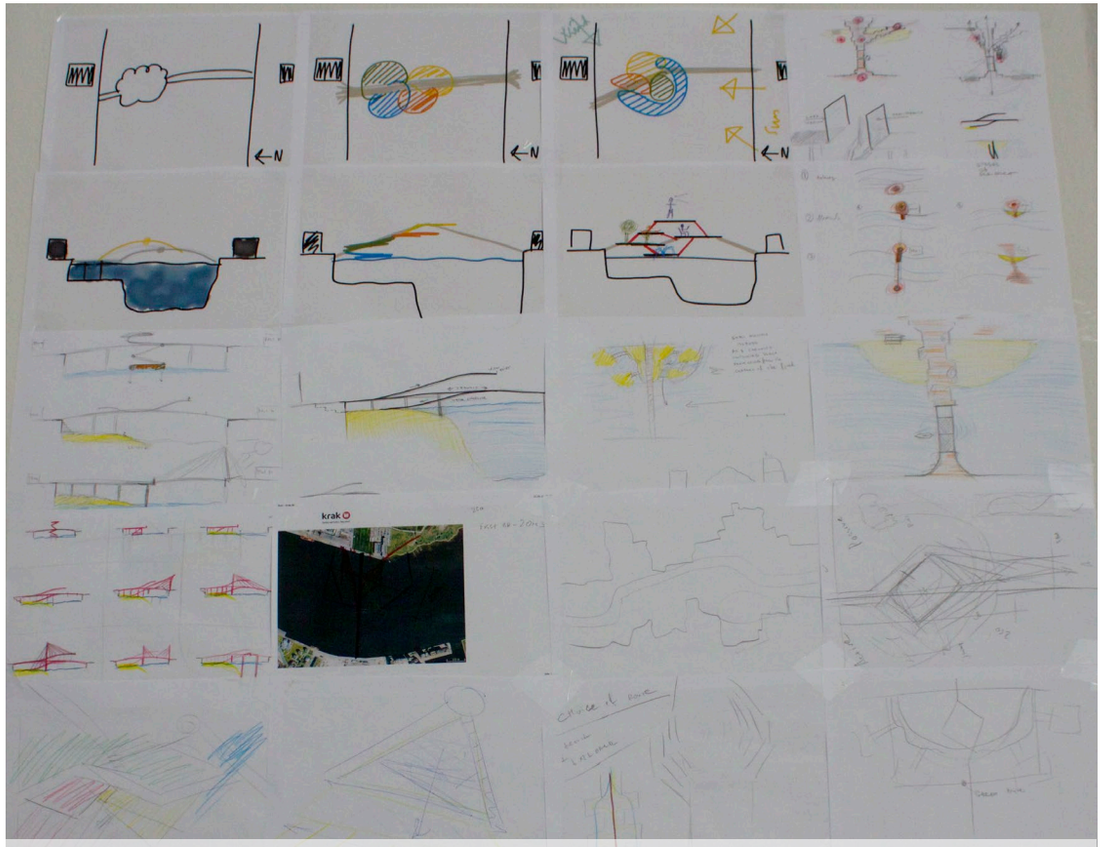
Design discussion begins. Generating ideas. How will the bridge connect to the shores?



During the discussion the concept of the three experiences (transit, water, view) is created.

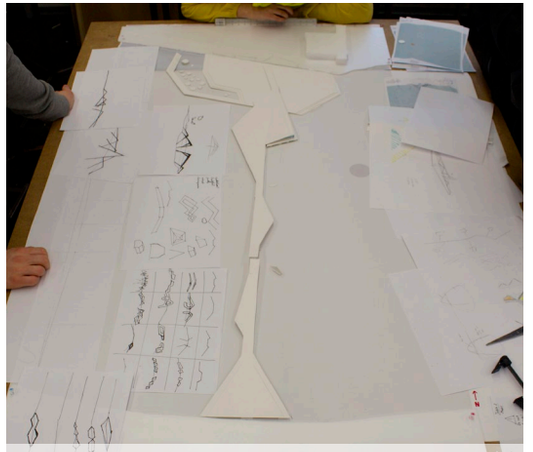


Various data collection and literature reading etc. was performed. In Amsterdam the solution to the connection to the shores was found, also negotiation was decided to be solved with shared space.

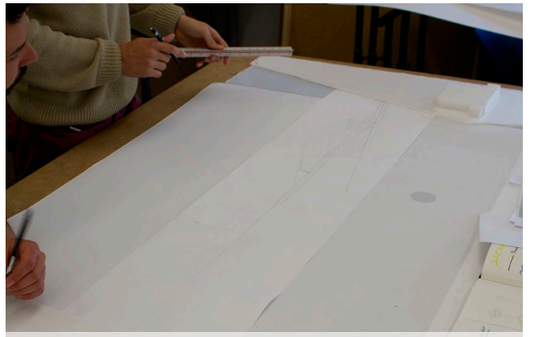


The first sketch workshop takes place. Here we try to utilize the concept which is based on the experience design research and apply public space theories, especially public domain (theming, compressing and connecting), to the design. The development strategy is also discussed and becomes a parameter for the design along with the concept and public space theories. The strategy is to take advantage of the shallow area near Nørresundby and divide the development into three stages - peninsula/island, pier, bridge. The existing edgy/squared waterfront design was also taken into concideration. The design tries to balance out the waterfront development, by enlarging the space in Nørresundby compared to the space of the bridge connecting to Aalborg shore.

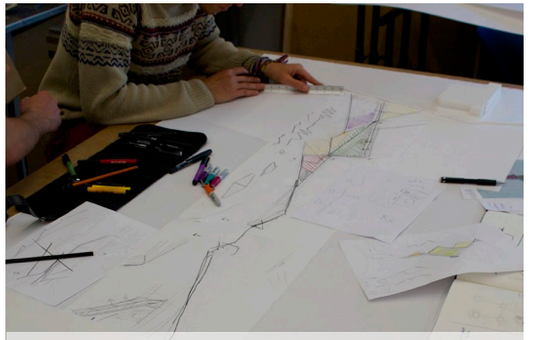
A design proposal where the different zones bump into another and creates an edgy style.



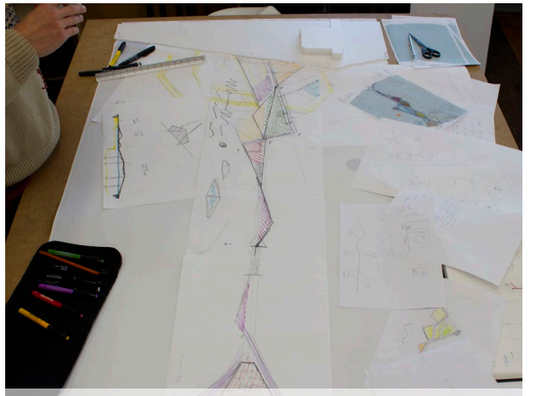
Model is assembled.



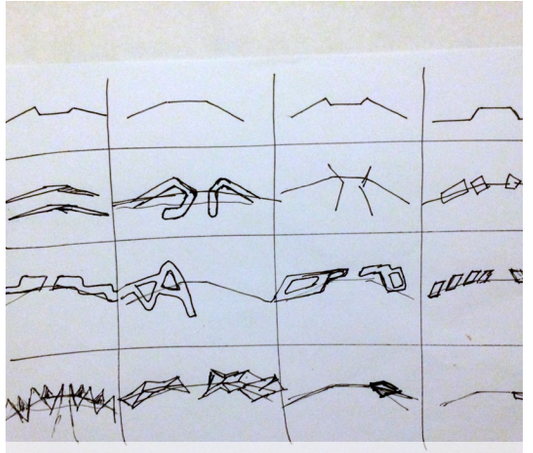
The edgy design is brought into the thirds step of the workshop - the model workshop. The workshop model was in the scale of 1:500. It could have been better with a scale up to 1:200, but the model would have become extremely huge if this had been done.



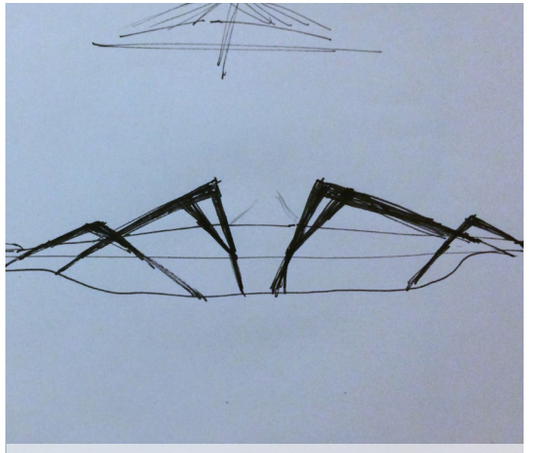
The purpose of the initial workshop was to try out the design proposal. We also wanted to explore the three dimentional space and work with the elevation and structure of the bridge. During the model workshop, sketching and modeling was done side by side.



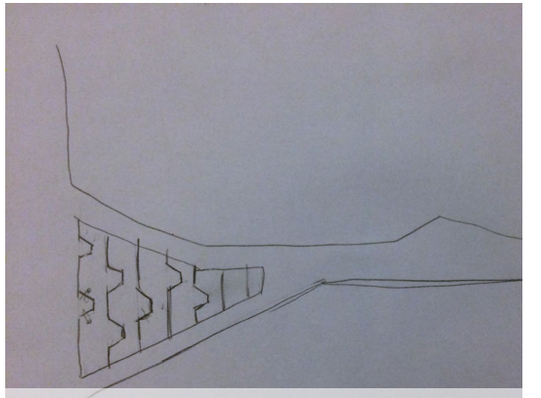
The connections to the shores was worked on. The peninsula with the beach area in Nørresundby; while in Aalborg we wanted the bridge to respond to the House of Music.



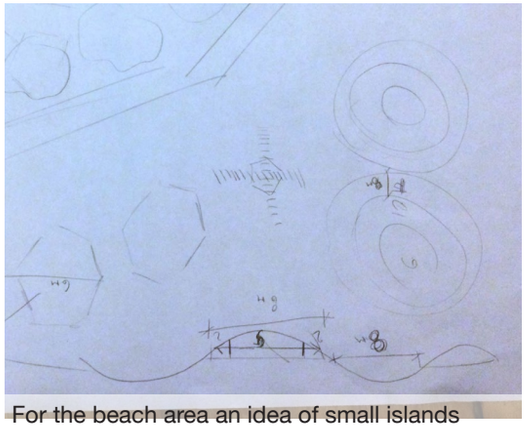
Exploring structure by sketching.



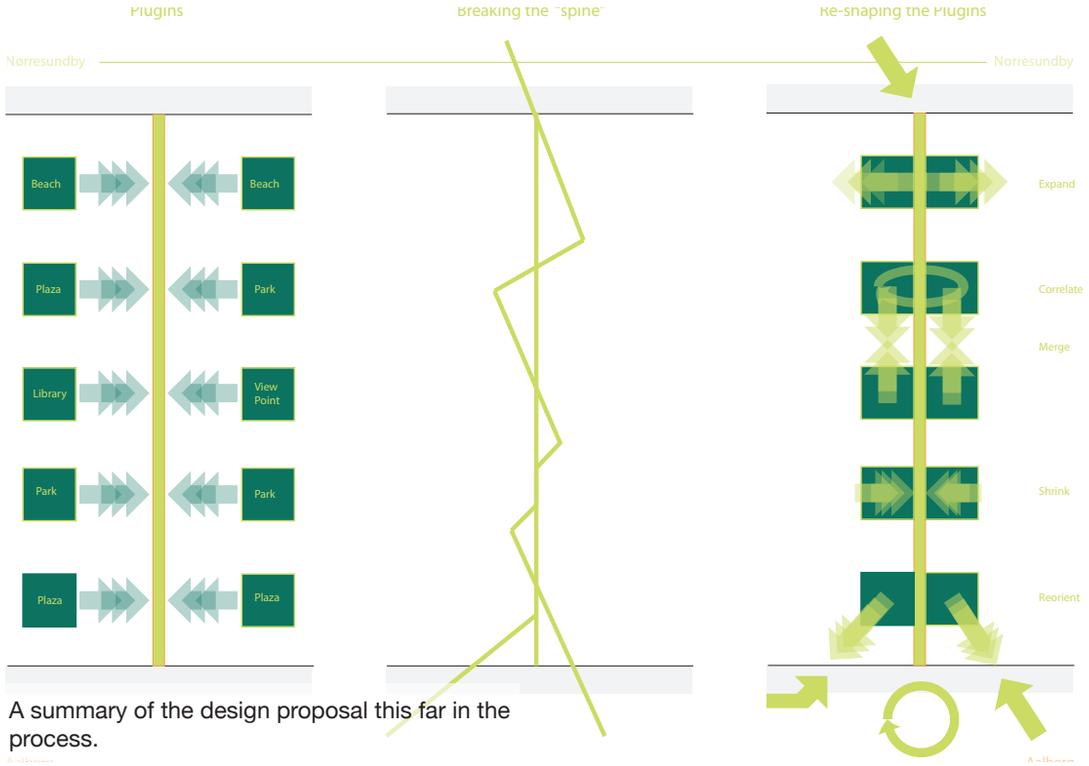
Structure could be potential for defining the space in the bridge.



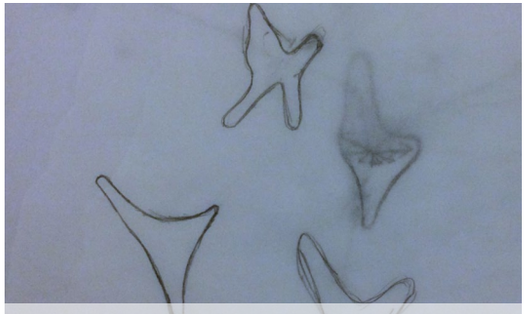
The space in front of the House of Music is discussed. The team envision an area that works as a seating area directed towards the sun and square in front of the House of Music.



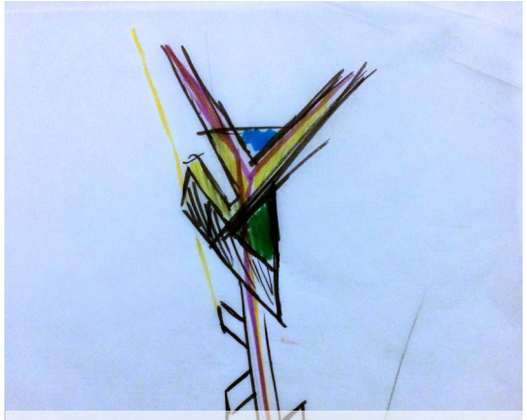
For the beach area an idea of small islands came up. Groups could claim their own island. The design explores the sizes and how they are connected.



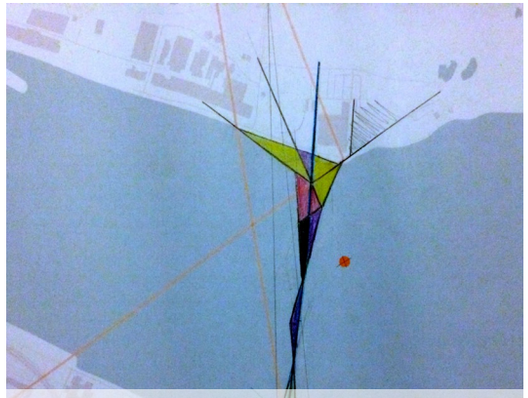
A summary of the design proposal this far in the process.



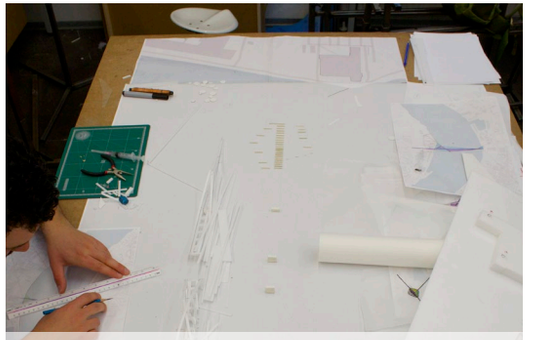
The organic shape is interesting, but the approach of the concept of three experiences as forces does not create a shape that we are completely confident with. The other issues are how the pier and bridge would be connected to this design, and would it clash with the existing waterfront promenade?



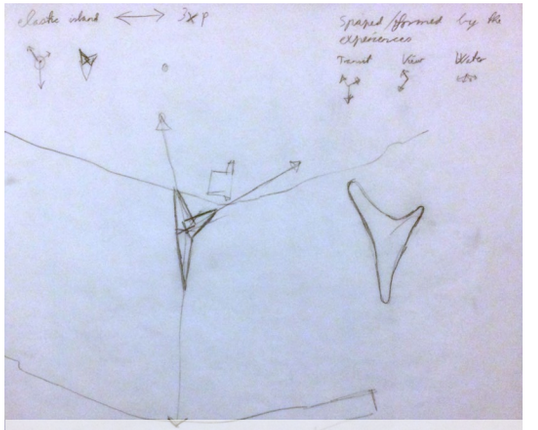
Then we try to work with how the peninsula, pier and bridge could be more elegantly put together, with a more streamlined design.



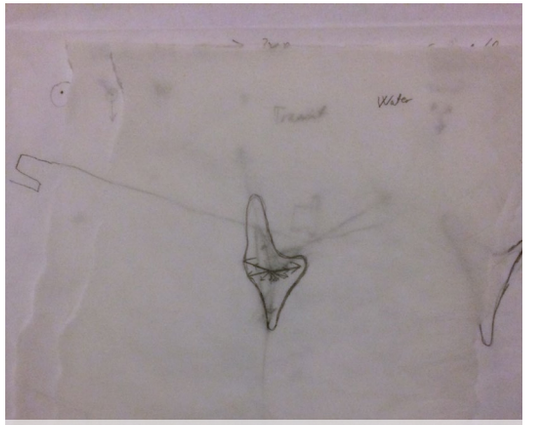
We also take into concideration that we want the bridge to be part of a public space network. Maybe the design could be informed by its context?



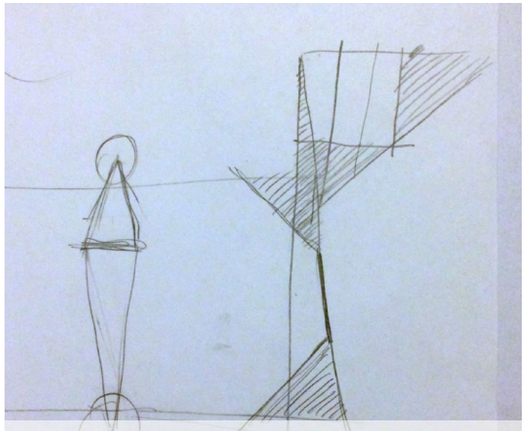
The design is reviewed. The connection between the peninsula and the shore of Nørresundby is not concidered to be very elegant by the team. The search after a “new” design begins. We decided to take a step back and work on both peninsula and island.



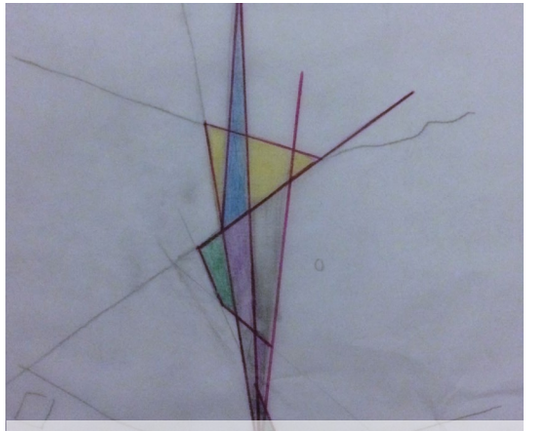
Working with the island and thinking about how the concept could function as forces that shapes the design.



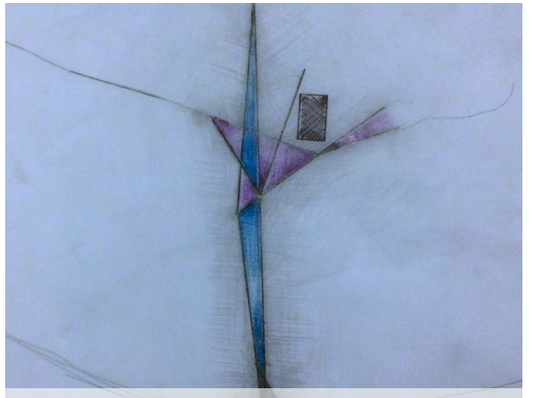
Could the forces apply to an elastic material? Here the forces of transit and water has been applied.



The non-developed area in Nørresundby is taken into concideration. What if it was developed and divided into sections? Could this help us?



We begin working with lines coming from the context. Different proposals are made. (All proposals are not included here).

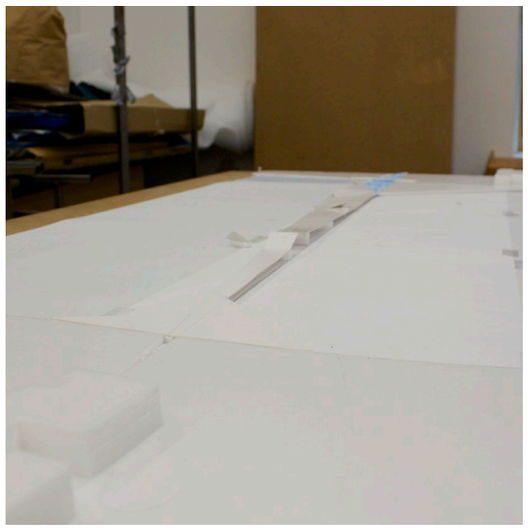


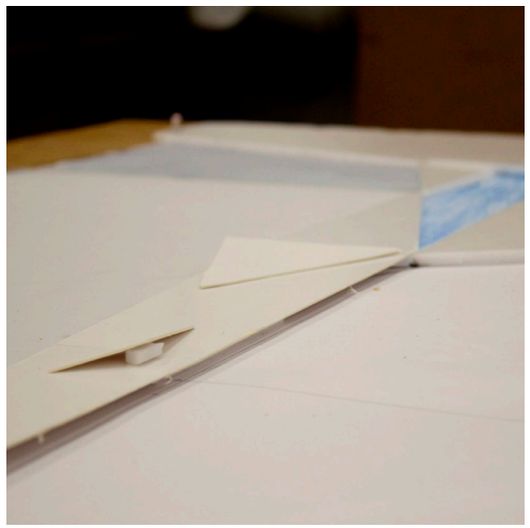
Finally we find a design that pleases us. The lines comes from the context. It utilizes the concept in order to decide what kind of lines are used.

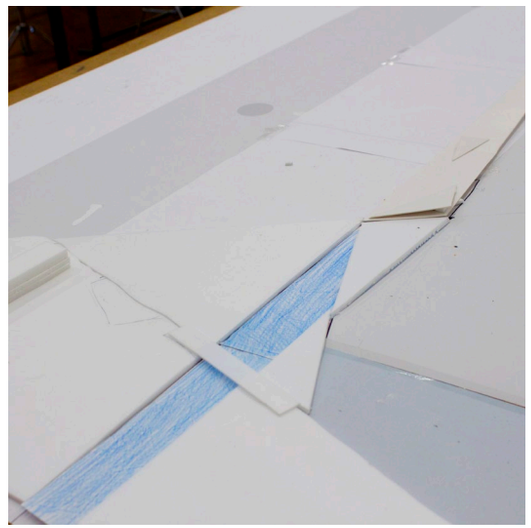
The design puts various zones / programs in proximity to one another. The junction becomes a point of exchanges.

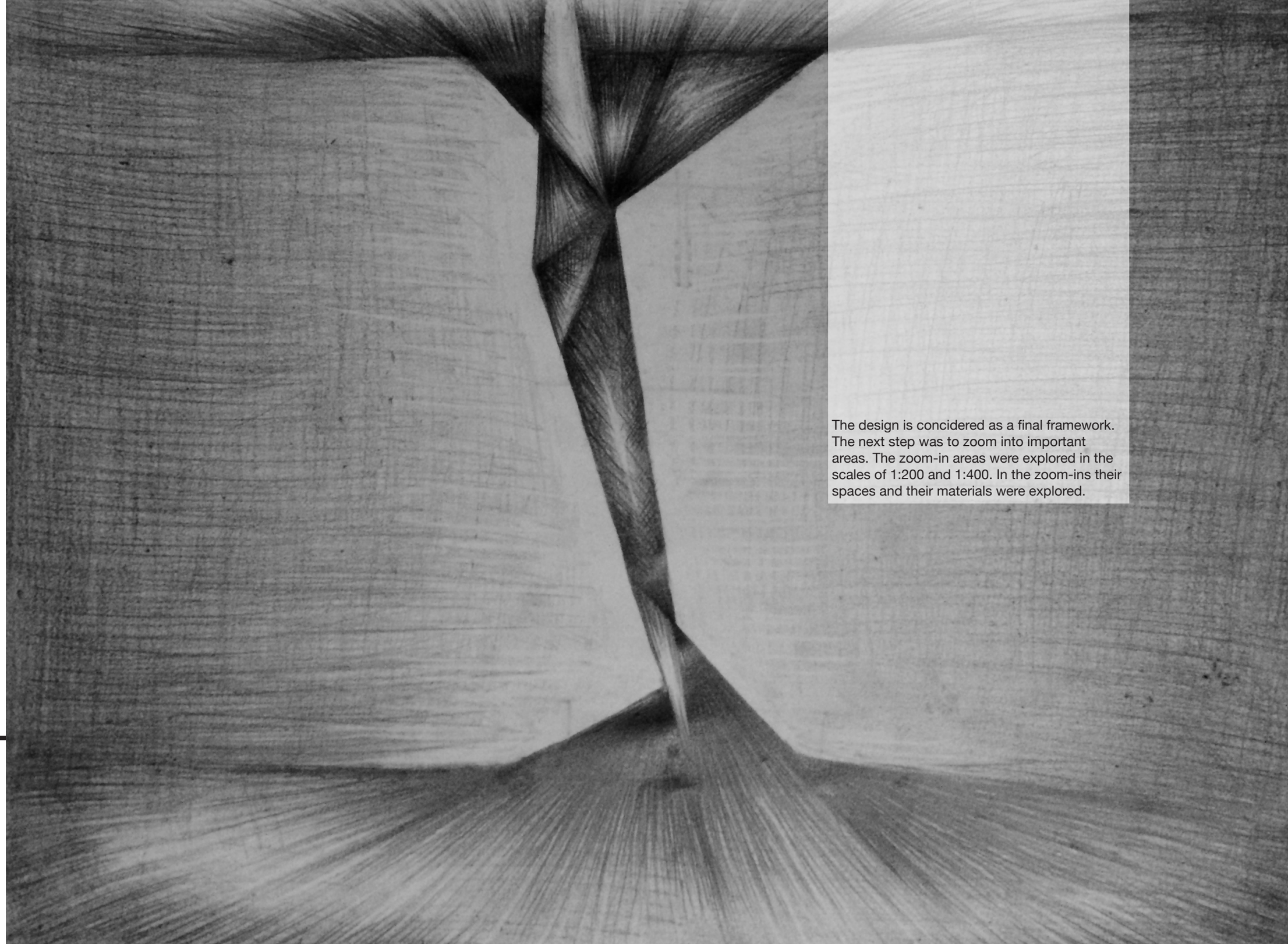
A new model is assembled.

The full bridge.









The design is concidered as a final framework. The next step was to zoom into important areas. The zoom-in areas were explored in the scales of 1:200 and 1:400. In the zoom-ins their spaces and their materials were explored.

Reference Projects

Here are some of the inspiration projects we found of bridges, namely hybrid bridges. Most of the bridges are from two competitions - one from Amsterdam, and one from Rhode Island. These are pedestrian bridge competitions. In Amsterdam it was also meant to be a landmark for the city.

What is interesting about these reference projects, is how they work with the bridge as a place. Places that are multifunctional, which allow for more activities rather than just serving as an infrastructural installation. They create places for exploration and stay. This is either done by creating an artifical island on the center of the bridge, or having it along the whole bridge. The bridges are often in multiple levels, either as separate levels with stairs or similar functional elements as connectors, or as continuous surface that moves up and down. Usually these bridges are not very long. Usually they are about 100 - 200 meters long. These are short distances compared to our site we, which is a stretch over 500 meters. Some of the reference projects also shows interesting ways to frame a particular point, such as the the Te Rewa Rewa bridge which frames a mountain top.

The projects helped us rethinking what a bridge could be and how it could work as a place and more than a connection. These bridges creates opportunities for exploring.

Ill. 147: Proposal for pedestrian bridge competition in Amsterdam.

Ill. 148: Proposal for pedestrian bridge competition in Amsterdam.

Ill. 152: Proposal for pedestrian bridge competition in Rhode Island.

Ill. 153: Proposal for pedestrian bridge competition in Rhode Island.

Ill. 149: This is actually a concept for “tomorrow’s hotel” - a hotel as a bridge.

Ill. 150: The futuristic bridge, Wuxi Xidong Park Bridge, in Jiongsu, China.

Ill. 151: Pedestrian bridge proposal in London. Designed as a park on a bridge.

Ill. 154: Bridge proposal in Stockholm.

Ill. 155: Drava bridge, Maribor, Slovenia.

Ill. 156: The Te Rewa Rewa bridge where the structure frames the mountain in New Zealand.

Amsterdam Study Trip

Considering the fact that the current report is doing a research in the sphere of urban pedestrian-bicycle bridges, the group has decided at the beginning of the semester that important location for visiting, with analytical, informational and inspirational purpose, would be Netherland and more particularly Amsterdam. The capital has more than 1700 bridges, different types, designs, sizes etc. Furthermore the planners in Amsterdam had to deal with various challenges and problems involving bridges, flows of people, boats, cyclists and cars for ages. The city has a huge experience in designing, controlling and managing this enormous network of hundreds of bridges allowing people to reach from point A to point B safe and smooth.

Before going on a study trip to Amsterdam, the group has done a research of the city and selected four main categories important for the project, which had to be analyzed:

- Flows - negotiations between pedestrians and cyclists going on and out of a bridge.
- Opening mechanisms - types, time and aesthetical features.
- Bridge-Bank – how does the bridge connects to the both waterfront edges.
- Surface and atmosphere – what kind of materials, colors and elements are used.

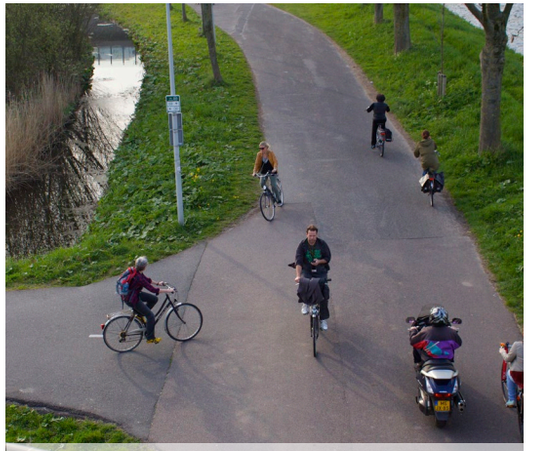
Flows

The main concern of the group by designing a bridge in Aalborg was the negotiation between pedestrians and cyclists and mainly the safety issue. Is it important to separate the two types of flows? If yes how we are supposed to distribute them in the area? What would happen when the two main flows from the bridge and along the waterfront promenade meet? Should they be divided?

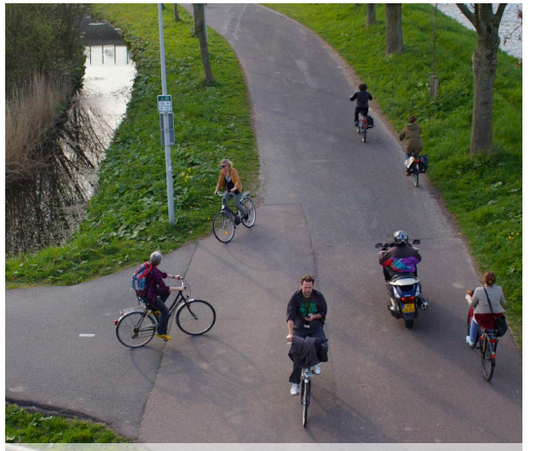
The answer of all these questions fortunately was found in Amsterdam. The city with much higher population than Aalborg and respectively much more cyclists showed us how all these negotiations could easily work within a shared space. At main big crossroads and boulevards there are bike lanes and traffic lights controlling the flows. However at the small inside streets with plenty of bridges the lack of traffic lights or other guiding elements is not an issue. Cyclists, pedestrians, scooters and even cars are moving smoothly without any problems and accidents. The flows from the bridges and the ones from the connecting streets are negotiating perfectly just by slowing down or accelerating additionally.

In order to get better perception of the flows, the scale and negotiations, the group has visited one of the biggest pedestrian-cyclist bridges in Amsterdam – Nesciobrug. Even though it was much different than the rest of the bridges inside the city, its huge capacity and design helped a lot to understand better the flows negotiations at all critical points. For this purpose we did "units" counting at one of the most critical point of the bridge for 5 min and took respectively pictures of different negotiation situations. The other important thing was that we distinguished the so called "units" in four categories – pedestri-

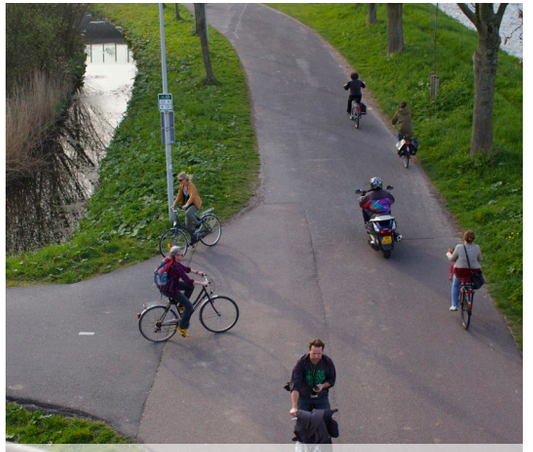
Ill. 157: Negotioation in motion in front of the entrance to Nesciobrug. Amsterdam.



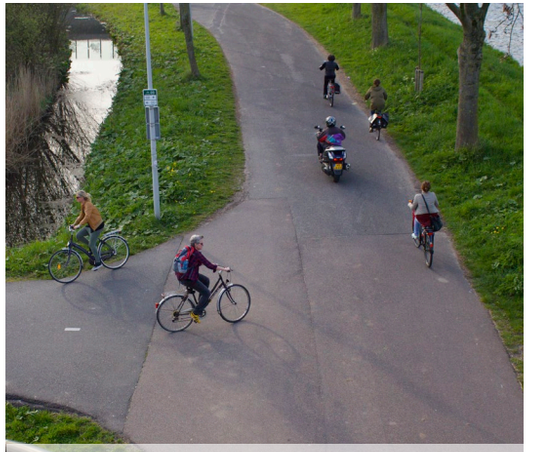
Ill. 158: Negotiation in motion. The pathway is shared by pedestrians, bicyclists and mopeds.



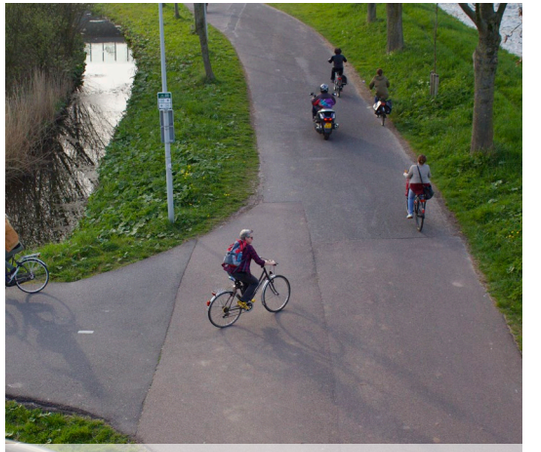
Ill. 159: After observing the negotiation, we noticed it worked fine.



Ill. 160: The bridges in the center of Amsterdam were shared space, and functioned well.



Ill. 161: Negotiation in motion.



Ill. 162: Negotiation in motion.

Ill. 163: Bridge opening to allow a boat to pass through.

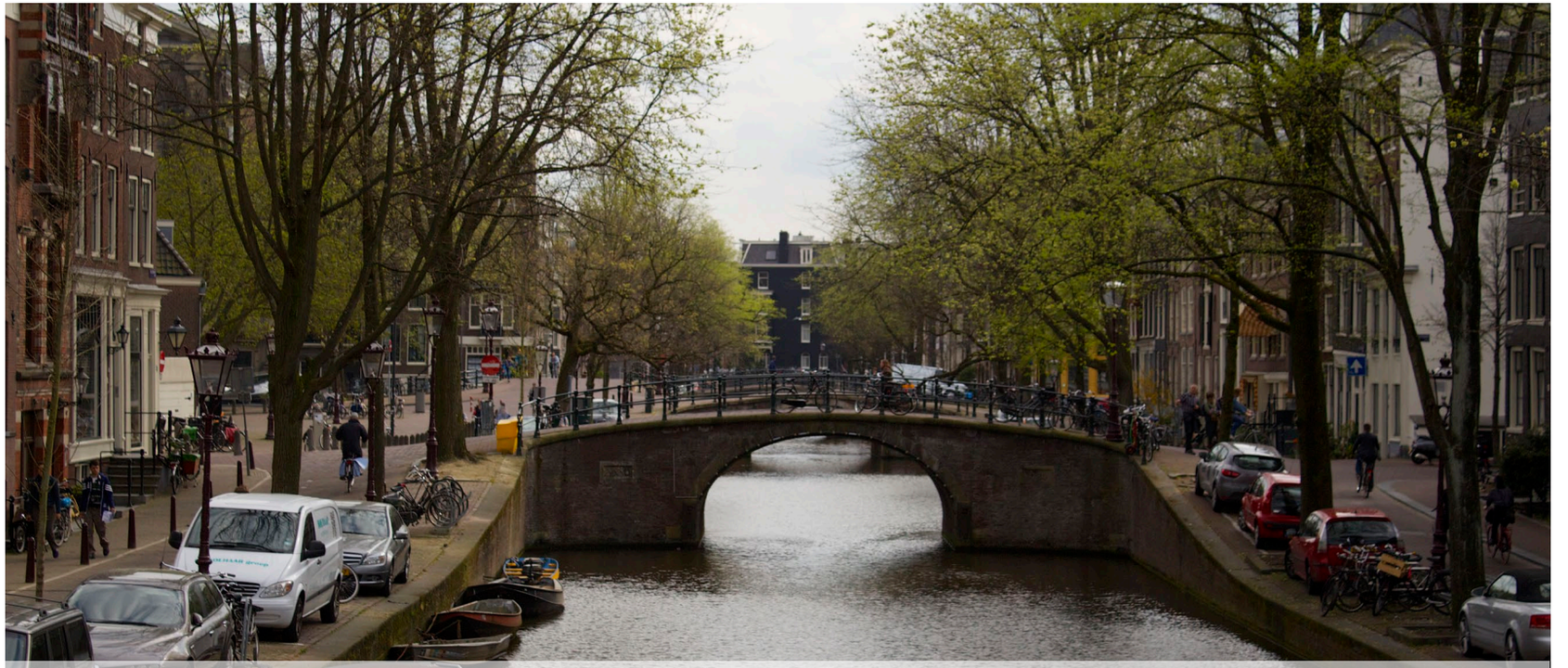
ans, cyclists, joggers and scooters. Every type of users had different speed which makes the environment and negotiations even more complicated. The result was 100 "units" for 5 minutes in a non-rush hour, which means for about half day of 12h it is about 15 000 users compared to Aalborg bridge with approximately 5000 per day. The movement between all involved users on the bridge was perfectly smooth and safe. Once you have visual corridor of the whole situation around the critical cross section, your speed and place in that particular situation are quickly figured out. The wider and longer visual corridor the easier and safer it is for negotiations between different users.

Opening Mechanisms

Even though Aalborg doesn't have as big boat traffic as Amsterdam this is still an issue that should be considered. The group wanted to investigate what types of bridge mechanism are there in Amsterdam, how it works, and how does it affect the flows of people. Most of the bridges had old opening mechanisms with a weight which allows lifting up from one or two sides. Some of them are not even working but functioning as a historical heritage. However we decided to calculate how much time it takes the process of open-close and how it affects the flows. We did it at three different bridges, two small ones and one at big boulevard as the average time was max 3min. For this period of time even at the most busy streets the flows of pedestrians and cyclists was not critical at all. Everything is so well managed and controlled that almost does not affect the movement in the city. This observation helped us to take a decision of having opening mechanism at the project bridge which apparently would not affect seriously the smooth flows of pedestrians and cyclists. The only issue and challenge which we wanted to take further into our design was how to transform the waiting time into something more interesting and exciting!

Bridge-Bank

Another issue which was really important for the group while designing the bridge in Aal-



Ill. 164: Bridge with old opening mechanism.

borg was how to connect it to the shores of the Fjord. This problem was also interrelated to the first issue about the different flows. There were two main options. The first one is starting and respectively ending the bridge further in the shore as the bridge flow and waterfront flow are separated. The second option was to connect the bridge at the edge of the waterfront as at the same point the two main flows meet and interact. However as it was explained earlier the observation of the flows in Amsterdam helped us a lot to realize and see that separation of the flows is not necessary. Almost all bridges in Amsterdam are connected "edge to edge" and the negotiations between the different flows are perfect. Furthermore if the design separates the two main flows, there is a risk the underpass for the promenade flow to turn into potential "backstage" or area where different critical user groups could gather. Keeping the transparency of the structure and flows was the decision for our design.

Surface and Atmosphere

Walking on a bridge could trigger different emotions, could create different atmosphere and be in a way not just an infrastructure but a special urban element which make you feel good. That is how exactly the visitors in Amsterdam feel like. Walking not on one but dozens of bridges, crossing different canals make you feel extraordinary. There are different elements creating this specific atmosphere.
First are all the stones and bricks textures with warm red-brownish color creating this friendly environment. On the other hand all edges at the streets, sidewalks and bike lanes were simply missing. Due to the fact that there were so many shared spaces the edges were either really small or smoothly curved, a small urban detail which subconsciously make you feel safe and comfortable.

Another key element contributing to the extraordinary atmosphere in Amsterdam are all the trees along the promenades, a natural component framing out the canals and the bridges, creating a visual green covering, which makes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you slow down, relax and enjoy the view.
The last but not the least element affecting the atmosphere is the small curved structure of the bridges from different centuries with slight arcs, receiving a blurry reflection in the water underneath, creating typical Renaissance atmosphere. However the last one is a part of the whole Amsterdam history and architecture which couldn't be and should not be replaced anywhere else. The rest of the urban interventions are easily applicable almost everywhere.

The study trip to Amsterdam helped us a lot to get better perception about the nature and function of the bridges and the surrounding environment, to understand better the negotiations of the different users and realize how even small details could positively affect the urban environment, peoples experiences and quality of life.

Ill. 165: View from a bridge in the center of Amsterdam.

Summary of Municipality Interview - an Interview with Thomas Birket Smith - March 18, 2014

The main topics prepared for the interview covers the future waterfront development, bridges across limfjorden, economical issues and development stages, the fjord and its traffic, materials and functions for the waterfront, and request for documentation. Here we present the most important information that was obtained from the interview.
The conversation focused on the waterfronts east of Limfjordbroen, where the central harbor was developed a few years ago. The plan for the future waterfront is to bring functions such as student housing, luxury apartments and offices to the area. The mix-use buildings will have offices along the road. The existing colosos in Østre Havn will be torn down in 2018. The Municipality expects the industry in the area Industry Nord to move away in the future. Hedegaard A/S is still staying, probably until property has a high enough value to sell. The Municipality in cooperation with Aalborg harbor are in the early stages of determining how the area between the municipality and Hedegaard A/S, could be developed.

The municipality has not thought of nor planned to connect the two shores from the central harbor to Industri Nord with a pedestrian bridge. Regarding new connections across Limfjorden, it was mentioned that the third Limfjord-connection is planned to pass through Egholm but its unclear when the construction will take place. In terms of pedestrian bridges, an add-on bridge to the existing railway bridge is planned and money has been granted to the project. Though it was unknown when it will be built.

When developing the waterfront, the municipality bought out Aalborg harbor in order to develop the area themselves. The Music house was a gift from RealDania and costed 600 million Danish kroner (DKK). The development of the central harbor costed approximately 300 - 400 million DKK. Østre Havn is owned and developed by A. Engaard A/S.

The development of the central harbor was developed in two stages and areas. The first area is developed as a public space with different areas along the way. Inspiration for the waterfront came from Barcelona. The second area includes buildings for students and the House of Music. Materials used are concrete, wood, steel, asphalt. It is the same kinds of materials and lights along the waterfront. The costs for the first stage was about 300 - 400 million DKK, and the second stage costed about 100 million DKK.

The interviewee unfortunately did not have detailed knowledge about the fjord or ships. However it was mentioned that the bottom of the fjord out of Stigborg is shallow, while it is deeper on the side of Aalborg. Estimated depth was 7 to 9 meters where the deep area is located. It was suggested to contact Aalborg Harbor for more information.

Prepared Questions for the Municipality (Interview with Thomas Birket-Smith - March 18th 2014)

Future waterfront development:
What are the future development plans of the waterfront?
What are the future functions of the new development?
How do you deal (use in) and consider the historical heritage?
- Nørresundby / Platform 4

Bridge:
Do you / How do you plan to connect the two shores / cities?
Have you ever / Do you plan building a new bridge?
- Pedestrian proposals
What do you think of our bridge?
- What about our choice of location?
What are the main constraints for building a new bridge?

Economy:
What are the economic strategies / Schemes for the waterfront development (diff. stages) ?
- Partners/Actors (public / private) - Stakeholders, investors
- collaboration - Realdania, AAU, etc.
- Have you / Do you involve the public in the design process?
- Music house project: Price, actors
- Stages / economic strategies
Where did you take inspiration / development strategies from?
- Bonn, Lion

What are the property issues?
- East from the municipality
- Between the municipality and existing bridge
How is the economic liability of the Music house?
- Full cost - Will it ever make enough money on its own to pay the costs?

Ships:
What are the ships flow regulations/requirements?
- Destinations
- Frequencies
- Types / Dimensions
- Move
What do you think of moving the place of tourism ships to Platform 4 area?

Materials & functions:
How do we use / deal with historical heritage?
What are the main architecture trends, features of the waterfront?
- Buildings / volume / style
- Public spaces
- Materials
- Historical elements
Who do you plan for?
- What is the role of students, tourist, young, old, middle age, local citizens?

Documentation:
Can we ask you for some digital Maps/Plans?
- Platform 4
- Nørresundby
- Bikes
- Pedestrians

Summary of Citizen Questionnaire

The purpose of interviewing citizens was to better understand the mechanism of the city, how it is experienced, and how its public spaces are used by its users. The questionnaire also investigates users opinion about the existing connection between Aalborg and Nørresundby, and furthermore where they would locate a new pedestrian bridge and their reason for this.
People often use parks and the waterfront, but mainly the park closest to their home. They did not always know about all the different places available in the city. Most participants used the public spaces 1 - 2 times a week. People find the waterfront to be pleasant and nice to stay in. They enjoy the contact with the water.
When people were asked about the existing bridge, Limfjordbroen, they answered that "it looks too industrial", "It's fine", and "It works. Wouldn't know what else to expect.... more effective separation... can't walk in peace", just to mention a few of the opinions. People rarely stopped on the bridge. Most people replied that they just crossed it. Some answered that they stopped sometimes, just for a moment. Their reason was "just to have a look". Another person described how he had once seen a seal in the water. The possibility for stay with benches and other activities on the bridge, was mentioned by a few citizens. Many participants also described the issue of the powerful wind when one cross the bridge. Most found the wind annoying, though a few people actually enjoyed the refreshing feeling from it.
When the idea of a new pedestrian bridge was introduced, many participants meant that it was not necessary with the existing infrastructure. Though, after explaining some of the proximity advantages this kind of bridge could have, most people changed their initial opinion.
Participants also got to draw on the map where they would locate a new pedestrian bridge. The map above shows how people located the bridges evenly along Limfjorden, though the most dense area was towards the center. Some attention was also put in the 'ends' - west and east. Most arguments for their choice of location included ease of use and good connection. Other viewed the bridge as part of their own running route and would like to be able to run in a circle crossing both in the west and east.
Lastly the participants was challenged to come up with some activities they would like to have on a bridge. They were asked to go "totally crazy", which seemed to be hard for some people, as their perception about a bridge was just changed. However, many participants had some ideas. Sports activities was frequently answered by the youth, and they wanted skating park, a swing under the bridge, being able to bungee jump from the bridge, and be able to dive into the water. Many people wanted more contact with water: "I would like something which is close to the water so you can even touch it...". They also wanted places to sit in the summer for sunbathing, as well as beach area and square with street lights.

Ill. 166: Smummary map of citizen's suggestions of locating a new pedestrian bridge.

General

Gender: F M	Age:	Occupation:
Are you a visitor or a citizen?	Visitor	Citizen
Where do you live in Aalborg? (approx km from center)		
(If you live in Aalborg) How often do you go to Nørresundby and why? (If you live in Nørresundby) How often do you go to Aalborg and why?		

Public spaces

Where do you like to spend your free time in the city?

How often do you go to the parks?

Waterfront

What do you think about the waterfront spaces/areas?

How often do you go to waterfront / fjord?

Bridge

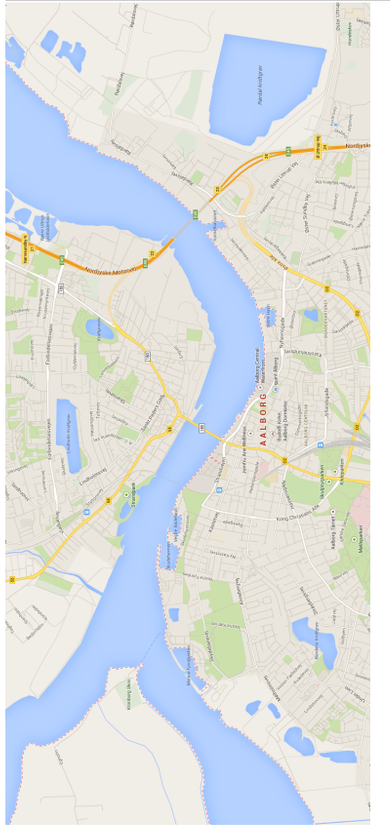
What do you think about / How do you find the existing bridge (Limfjordbroen)? (How do you feel on it while walking / cycling? - Like / Dislike?)

Do you ever stop on the bridge and why / why not?

Do you think there's a necessity of building a new pedestrian bridge and why / why not?

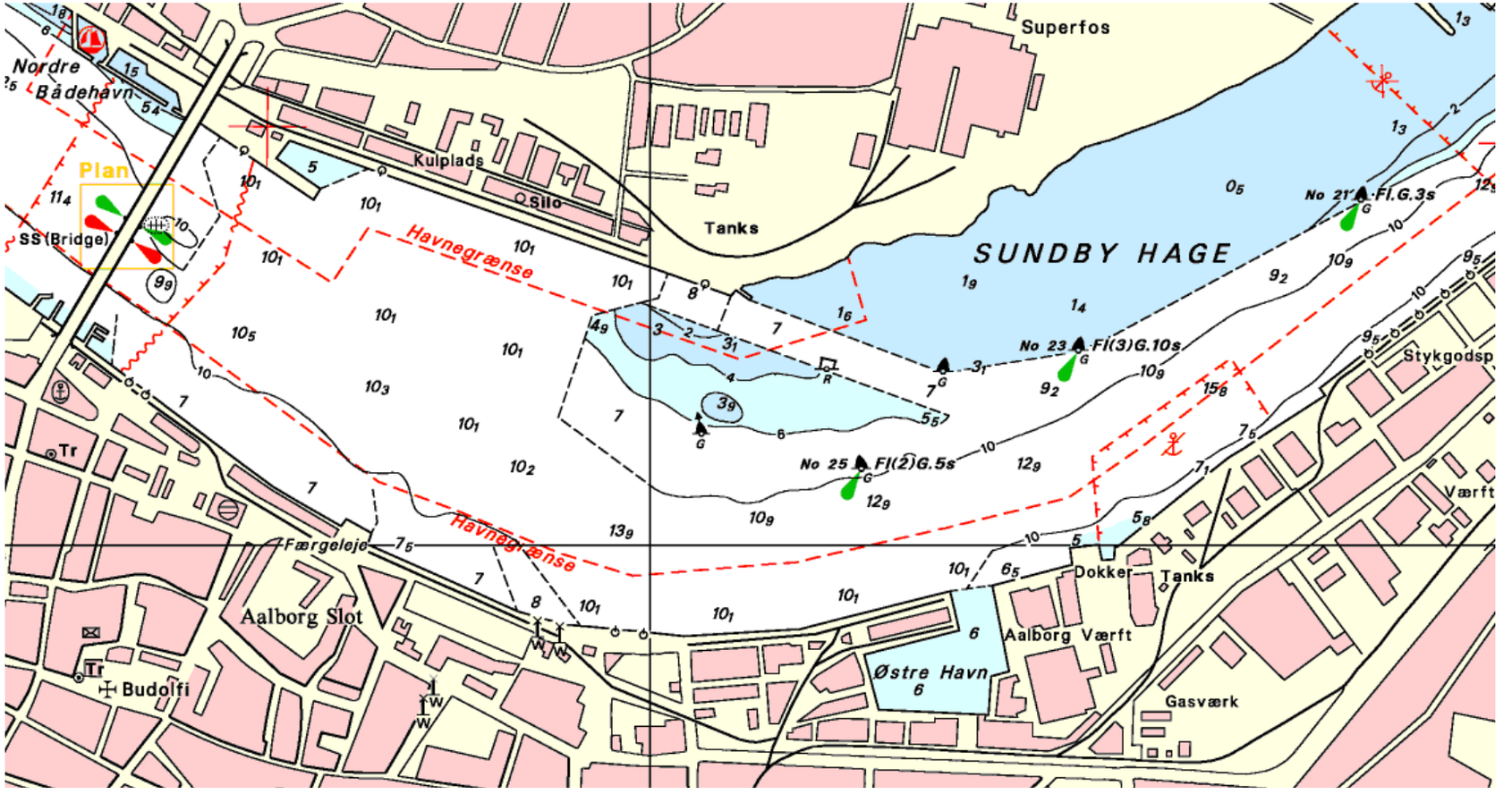
Where would you locate the bridge and why?

Some bridges are more than infrastructure and offer other activities, facilities, events, and spaces. What would you like to have on the bridge?



Ill. 167: Prepared questions.

Sea Bottom Map

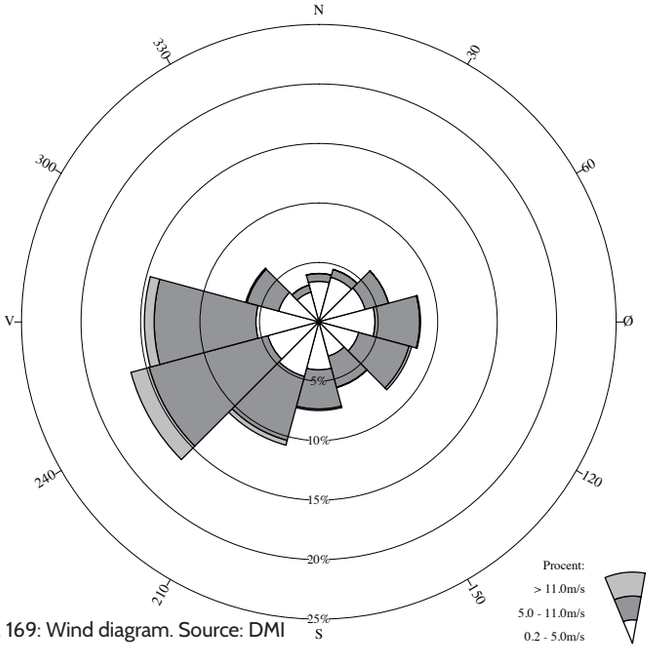


Ill. 168: Sea bottom typography map data retrieved from Geodatabibliteket.

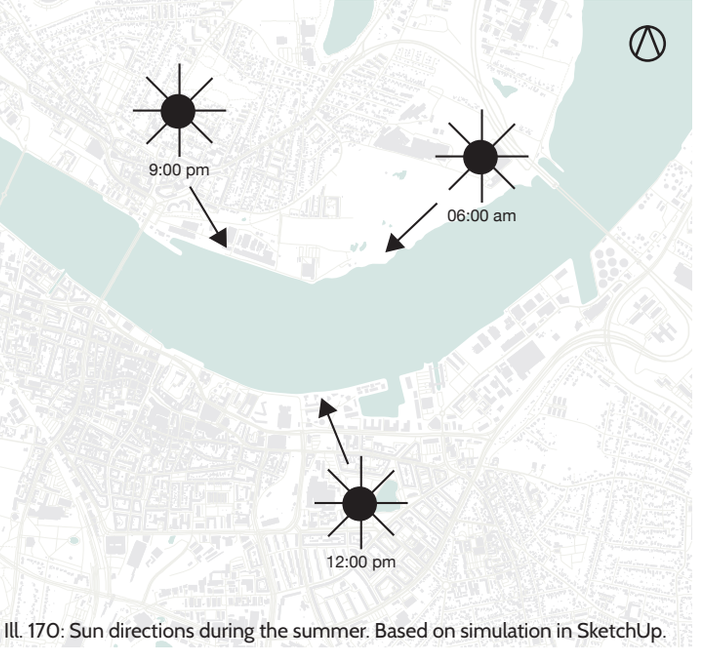
Wind- and Sun diagram

The wind diagram shows the average wind measurements from 1989 to 1999. The wind in Aalborg is most dominant from the west. Based on a personal experience, the wind by the fjord can be experienced in mainly two directions - from west and east. The wind is very noticable when crossing the fjord, as many people answered in the questionnaire.

The sun diagram shows the main directions the sun comes from during a summer day - from morning to evening.



Ill. 169: Wind diagram. Source: DMI



Ill. 170: Sun directions during the summer. Based on simulation in SketchUp.

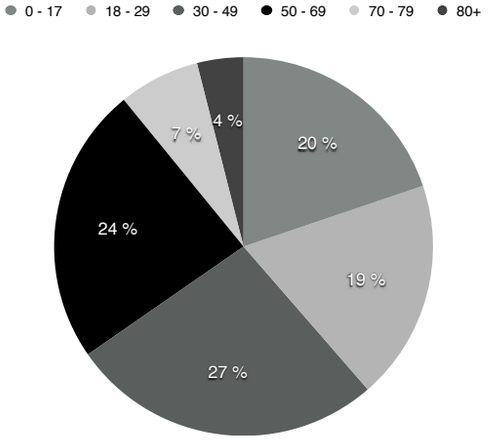
Demography

The statistics from Aalborg Municipality and Danmark Statistik, show the demographic composition of Aalborg center and the whole of Aalborg.

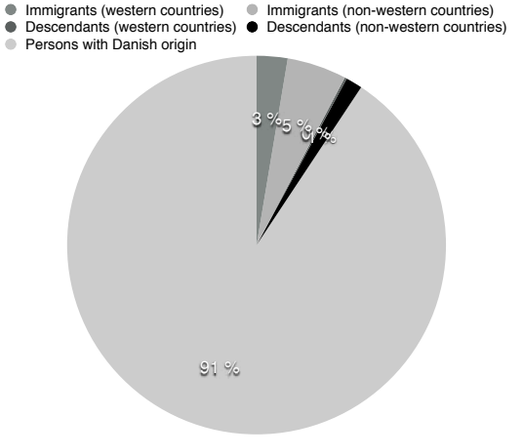
Data shows a variyed user group in the whole of Aalborg. It should be mentioned that approximately 2000-3000 student apartments are located on the waterfront.

The center consists mostly of persons of Danish origin. Immigrants are mostly from non-western countries.

Data retrieved from http://www.aalborgkommune.dk/Om_kommunen/fakta-om-kommunen/Sider/Statistik-og-noegletal.aspx



Ill. 171: Diagram of user groups in Aalborg. Source: Aalborg Municipality (Bosætning, 2012), Danmark Statistik.



Ill. 172: Diagram of nationality and origin in Aalborg center. Data from 2008. Source: Aalborg Municipality, KÅS Danmark Statistik.