

Site Analysis: Land & Activity Uses



#### Team:

Joshua Gawne, Russ Greene, Katie Poppel, Rish Ukil

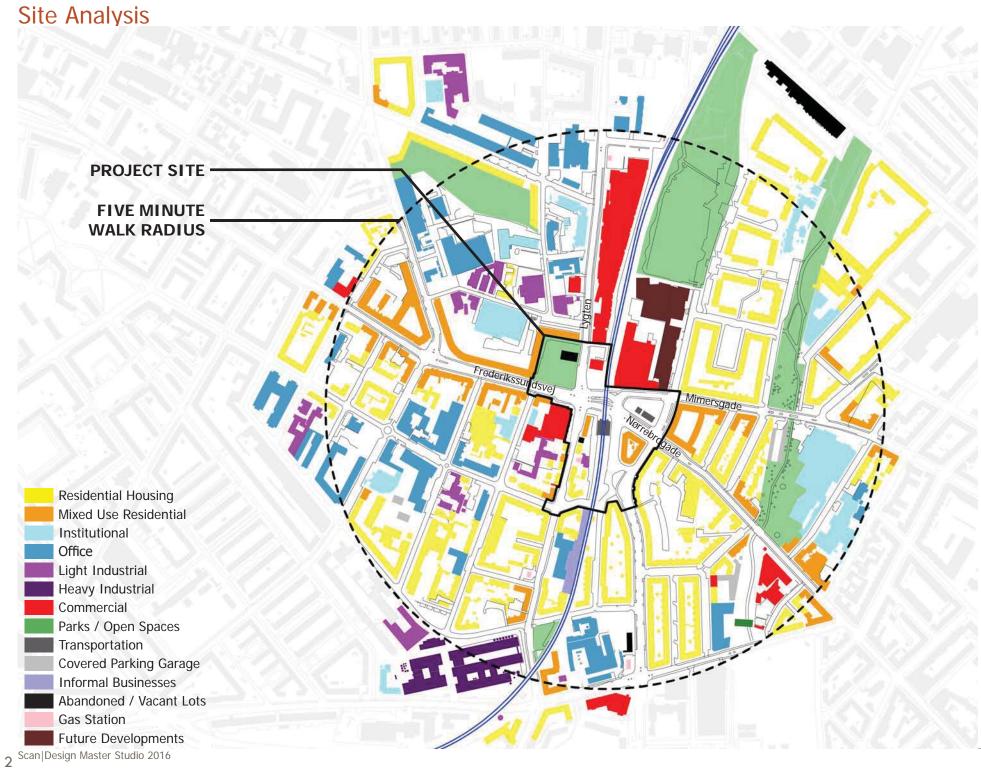
## **Description:**

The land and activity uses of this Norrebro site range from social and market rate housing, mixed use small and large commercial streets, modern industry, a range of park spaces, and a few major commercial businesses.

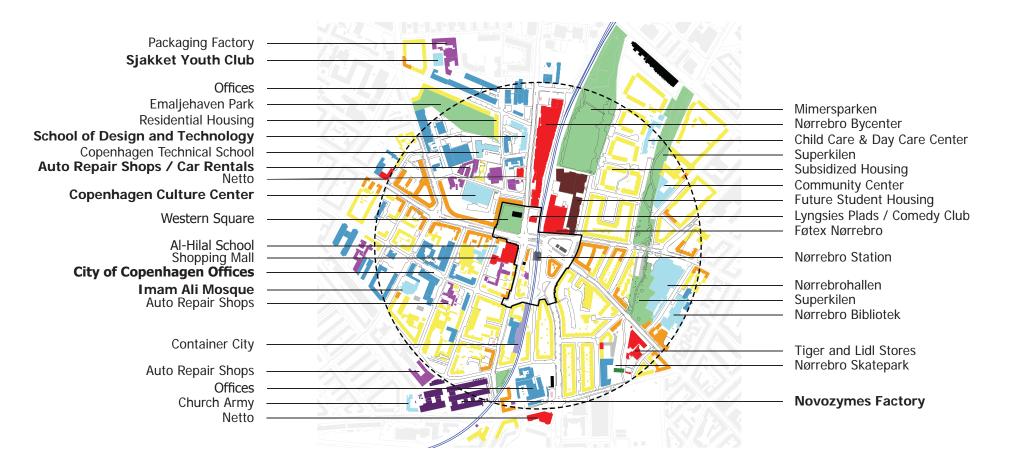
The community character, called out with street typologies, is highlighted by fairly specific land use facade characteristics. The street sections show, based on the street typology, the differentiation of building facades and character.

This site and the surroundings has been heavily delineated via major arterial streets, which, in turn, create edges and patterns seen from above and felt while on the site as a pedestrian. The edges create land use groupings; patterns have been created specifically through open space: public, quasi-public, and private.

There are two points of gravity: present and future. In the same sense, there are two patterns of activity nodes we have highlighted: transportation and (stationary) activity.



# **Land & Activity Uses**





Sjakket Youth Club



School of Design



**Auto Repair Shops** 



**CPH Culture Center** 



City Offices



Imam Ali Mosque



**Novozymes Factory** 



# **Land & Activity Uses**



#### **Primary Streets**

The primary streets near Nørrebro Station offer the most area for public use. There are dedicated bicycle lanes that are separate from pedestrian and auto circulation, but there are no street trees along these major corridors. There is a high concentration of retail shops on these routes.



## **Secondary Streets**

The auto lanes on the secondary streets near our site become much more narrow. There are no longer any designated bicycle lanes. In some areas the sidewalks are much wider than on the primary streets, but they are less populated. There is a greater occurrence of street plantings, and are typically mixed use residential.



## **Tertiary Streets**

The least used of the three streets has the smallest area for public use. The auto lanes and sidewalks are the narrowest of the three streets identified. There are no dedicated bicycle lanes. Tertiary streets in the area of our site are largely in resdiential areas.

## (Modern) Industrial

Modern industrial respects the larger FAR (floor-area-ratios) than one would think for industrial land uses.

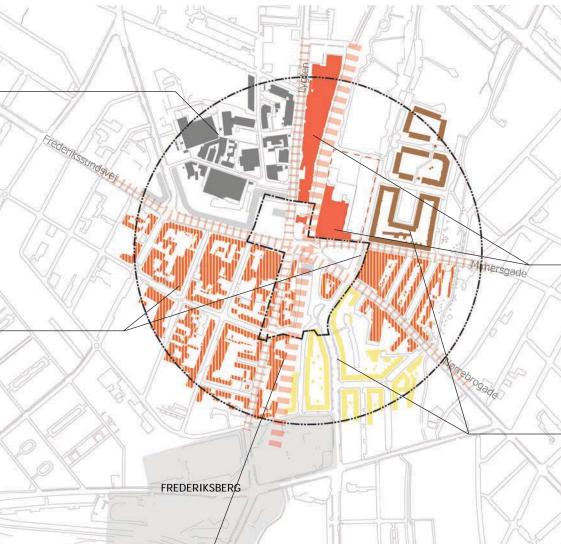


#### **Mixed Use**

Mixed use contains both office + residential and commercial/ retail + residential. The western grouping of mixed use contains more office space, including departments of the Copenhagen municipality. Both groupings contain more residential space than office, retail, or commercial.







## **Land Use Patterns Create Edges**

The dashed red and orange lines denote the edges, or barriers, created by the major street thoroughfares and train tracks. The train tracks are more of a physical barrier than the major street thoroughfares; the tracks have fewer crossings for pedestrians, bicyclists, and motor vehicles. Important to note: these edges created by infrastructure divide the site and its surroundings into four quadrants, which, in turn, has an affect on the land use delineation.



Figure / Ground

#### Commercial

The commerical area contains a large mall, with large, general chain stores and a fotex.





#### Residential

There are two areas of housing highlighted on the map: the brown represents social housing with renovations taking place currently; the yellow represents market-rate housing. Directly to the west of the social housing is the future site of a student housing tower.





Scan | Design Master Studio 2016

**Land & Activity Uses** 



Public / Quasi-Public / Private

In terms of land and activity uses, the classification of public, quasi-public, and private space is delineated informally. The dark green represents the most obviously public, while the lighter green represents private courtyards.















District	Inhabitants	Area hectares	Inhabitants per
			hectares
City centre	48,252	830.5	581
Østerbro	70,908	821.2	863
Brønshøj - Husum	40,402	614.8	657
Nørrebro	74.113	366,9	2020
Bispebjerg	49,163	482.7	1018
Vanløse	37,123	528.6	702
Valby	47,841	755.6	633
Vesterbro/Kgs.			863
Enghave	57,136	661.9	
Amager Vest	57,893	1123.0	508
Amager Øst	50,841	810.9	627
Total	533,672	6996.1	847.2

(Source: Gree	n Accounts 2011	) "Areas"	do not	include	green	areas
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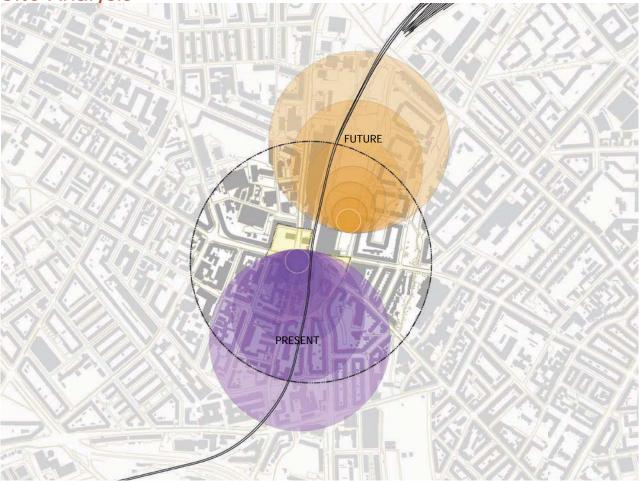
District	Population in district	m² of green areas	m² of green inhabitant
City centre/Christianshavn	48,252	2,065,495	42.8
Østerbro	70,908	949,289	13.4
Brønshøj-Husum	40,402	2,586,926	64.0
Nørrebro	74.113	434,849	5.9
Bispebjerg	49,163	2,006,332	40.8
Vanløse	37,123	1,407,798	37.9
Valby	47,841	1,671,187	34.9
Vesterbro/Kgs. Enghave	57,136	1,638,129	28.7
Amager Vest	57,893	7,961,553	137.5
Amager Øst	50,841	1,885,297	37.1
Total	533,672	22,606,854	42.442.4

Source: Green Accounts 2011

## **Copenhagen Population + Green Spaces**

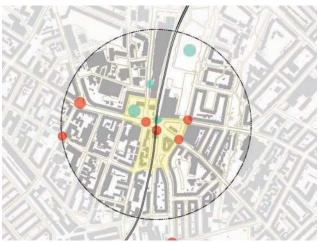
A comparison of population by district (neighborhood), total land area, and area devoted to green space.





### **Points of Gravity**

The current (major) point of gravity is the intersection of Lygten and Frederikssundsvej (highlighted in purple.) This intersection is where circulation patterns - pedestrians, automobiles, public transit, and bicyclists - cross in one area. We have identified that the pull of gravity radiates from this point southeast towards central Copenhagen. The orange proposed point of gravity is unclear; the future point of gravity for this area/site will potentially change due to the influx of new residents and students just south of Mimersparken.

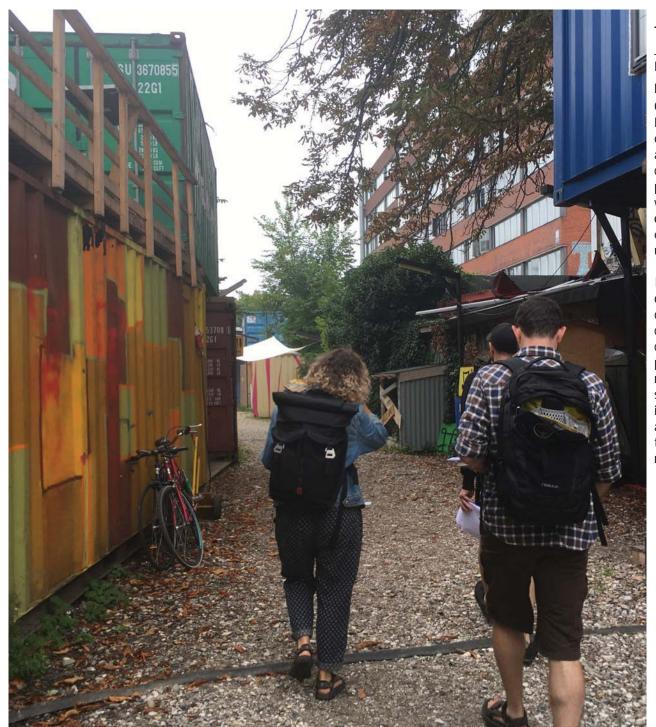


### **Activity Nodes**

The activity nodes diagram represents a Kevin Lynch take on the activity nodes of thhis site and its surroundings. The transportation nodes are highlighted in red and represent major intersections; the activity nodes are highlighted in cyan and represent the nodes of pedestrian gathering spaces.

#### References:

- 1) "European Green Capital, Section 3: green urban areas incorporating sustainable land use," Accessed at http://ec.europa.eu/environment/europeangreencapital/
- 2) "Uptown Norrebro" Accessed at uptown2200.dk
- 3) Maps from Apple Maps and Google Maps
- 4) Arch Daily



#### Team:

Jack Alderman, Drew Badgett, Laura Durgerian, Derek Holmer & Kevin Van Meter

## **Description:**

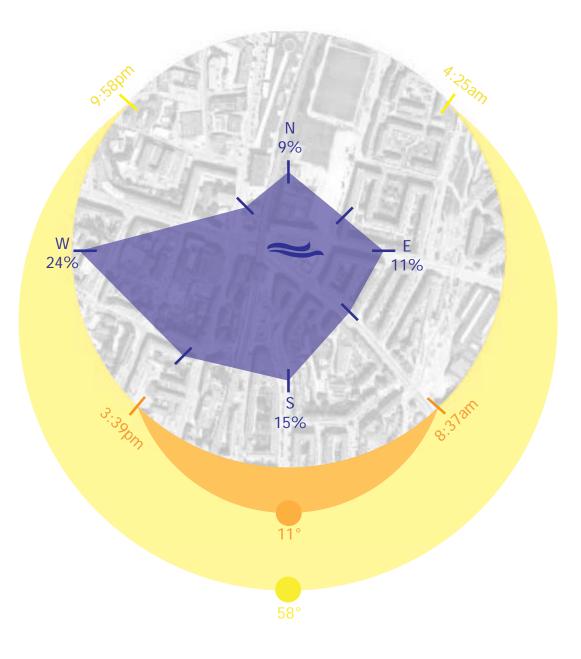
Our team walked a 5-minute radius around the Nørrebro Station site to characterize the extent and qualities of the adjacent outdoor rooms. We looked at the spatial qualities, as well as atmospheric, cultural, functional and aesthetic aspects of these places. As a means of codifying our observations, we then rated each room based on nine carefully chosen criteria: definition, stimulation, human scale, enclosure, openness, climatic exposure, passive uses, active uses, and character.

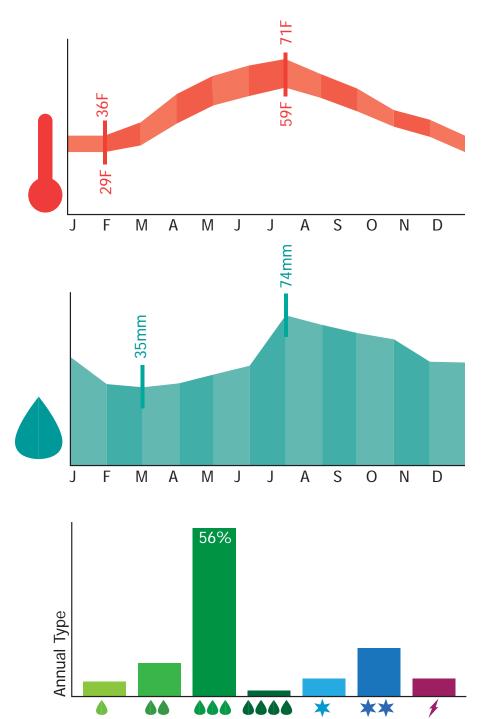
Intentionally avoiding "good" and "bad" judgments of these places, this system intended only to describe the qualities of each place in order to inform comparison. Rated on a scale of 0 to 5 for each criteria, a high rating does not necessarily signify a positive. Together, these ratings form the DNA, or recipe, for each outdoor room. When combined with subjective priorities and preferences, this method informs judgments of what makes a place successful and what kinds of places could further contribute to the fabric of the Nørrebro station and neighborhood region.





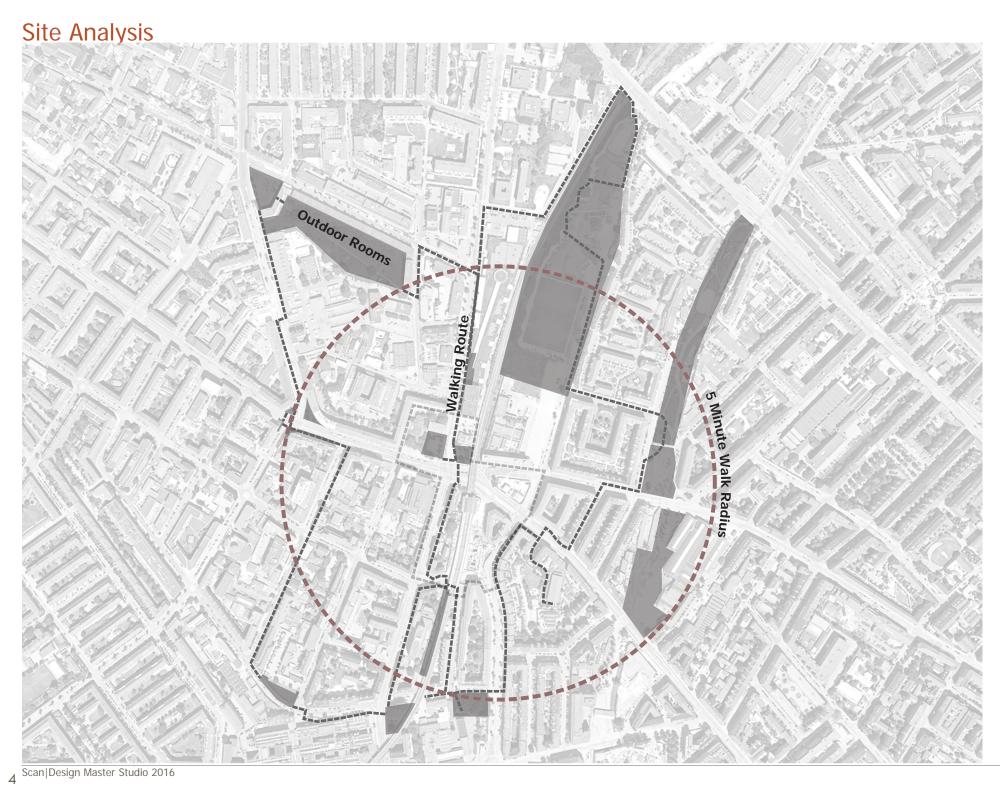












## **Process**

Our team walked a 5-minute radius around the Nørrebro Station site to characterize the extent and qualities of the adjacent outdoor rooms.



## **General Findings**

We found a wide variety of outdoor rooms surrounding our site. These ranged from small and busy plazas to large, grassy expanses. Use of rooms ranged from intense to nearly vacant on the Friday morning we completed our survey.

## **Outdoor Rooms**



## **Neighborhoods Apart**

Nørrebro, to the east of the train tracks, has large outdoor rooms that invite both passive and active uses. To the west of the tracks, Nordvest's outdoor rooms are much more limited in extent.







## Quantifiable Data

For us to interpret and measure all of the information we recorded during our journeys through and around the site we needed a definitive set of parameters. We worked collaboratively to derive 9 measurable qualities that encompassed analyzing a "room" within open space. These qualities were diagrammed as a snowflake measured on a scale of 0 to 5, 0 being an extremely low measurement of that quality. This allowed us to make a comparison across multiple axes and provide a datum across a diverse spectrum of spaces.



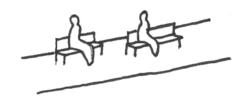
# **DEFINITION**

The space is well defined with clear edges and boundaries.



# **ENCLOSURE**

The space gives a strong sense of refuge and cover.



# **PASSIVE**

The space encourages and/or accommodates rest or stillness.



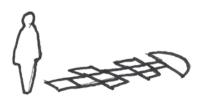
# **STIMULATION**

The space provides sensory stimulation (sight, smell, sound, touch, or taste).



# **OPENNESS**

The space is accessible and provides clear sightlines.



## **ACTIVE**

The space encourages and/or accommodates movement.

## **Outdoor Rooms**



## The space is comfortably proportioned to the user.



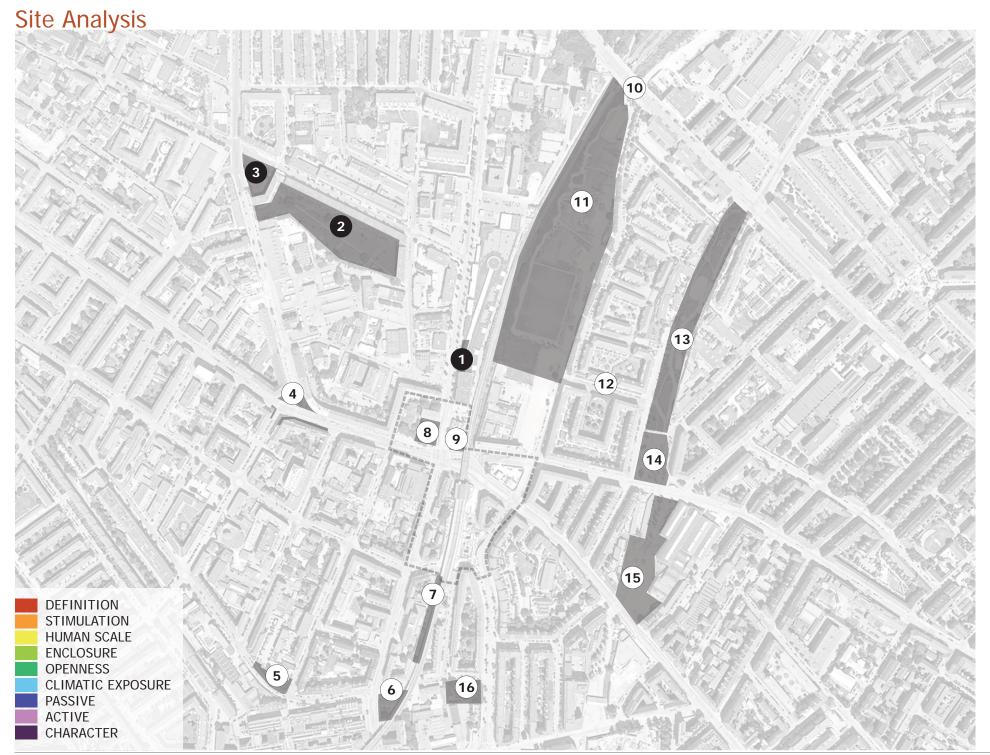
# **CLIMATIC EXPOSURE**

The space is exposed, lacking protection from the elements and leaving visitors no place to find shelter.



# **CHARACTER**

The space has an inherent identity.







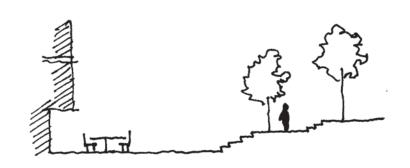


























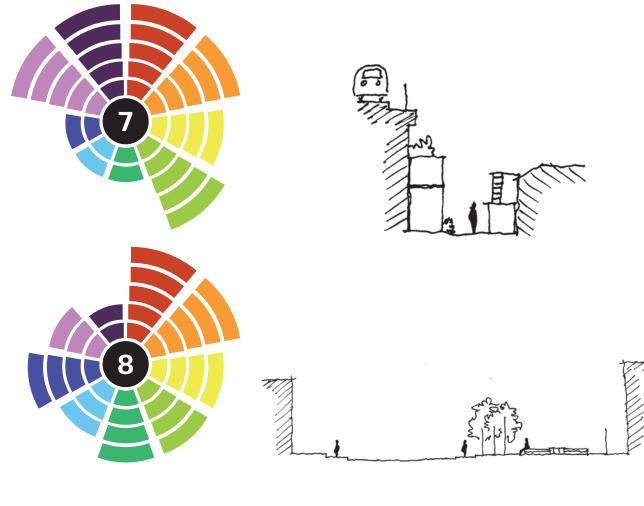








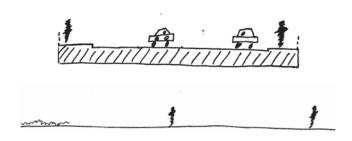






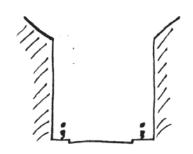












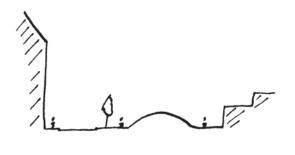








# 13



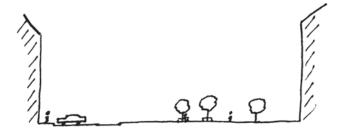










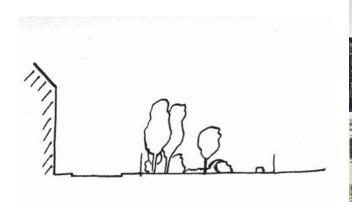














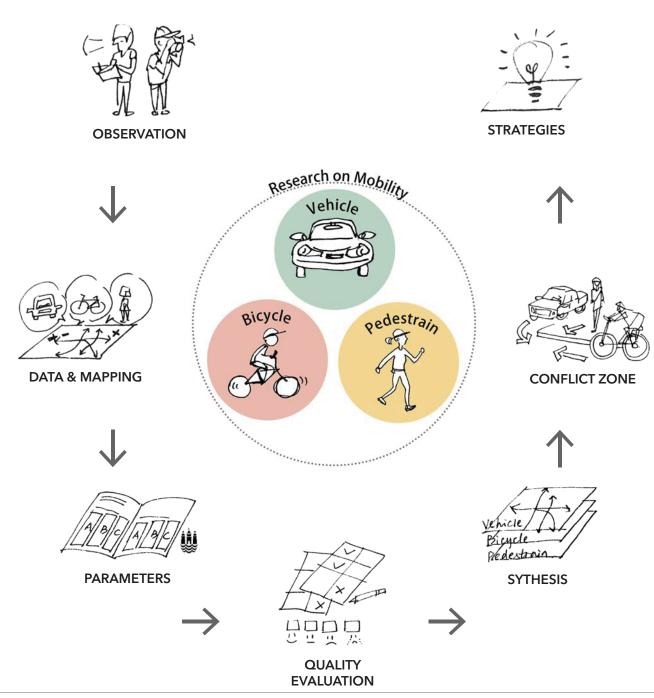
## Sources:

https://weather-and-climate.com/average-monthly-precipitation-Rainfall,copenhagen,Denmark

http://www.timeanddate.com/sun/denmark/copenhagen?month=6&year=2016

https://weatherspark.com/averages/28823/Kastrup-near-Copenhagen-Capital-Region-of-Denmark

# **Moving Patterns & Features**



#### Team:

Robin Croen, Kameron Selby, Jian Shan, Sujing Sun, Hanyu Wang

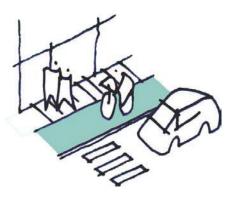
#### **Description:**

Through 7 processes this evaluation system concentrates on mobility research with 5 min walking distance of Norrebro District, especially on Pedestrain, Bicycle and Vehicle. Based on field observation with counting, tracing, photographing and diagramming, research datas are collected and caculated, and sample sections are drawn. Following with the guidline of parameters for good mobility from SCHULZE GRASSOV, quality evluations for each street in Norrevro District are gathered in 3 levels of parameters, which are physical framwork, modal split and daily traffic. Then sythsis is integrated by 3-layer parameter superposition to output a comprehensive evaluation, from which to highlight conflict zones, guiding strategies for next steps of design.

## **PHYSICAL FRAMWORK**

## **MODAL SPLIT PERCENTAGE**

## **DAILY TRAFFIC**







12.600



18.750

Infrastructure for all road users

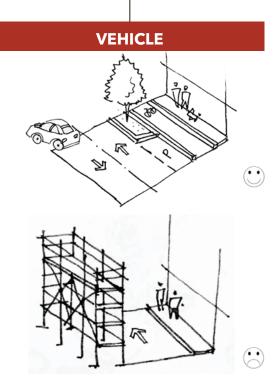
Percentage of road users

**BICYCLE** 

Total volume of users per day a year

## **PEDESTRIAN**

••

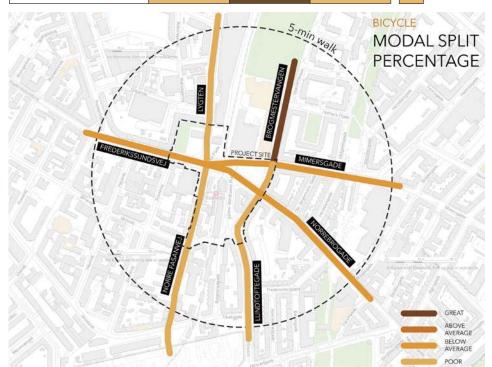


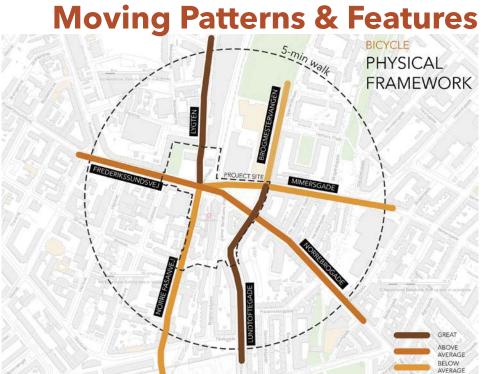
- · Width of pedestrains with transitioning accessibility · Friendly pattern index for cyclists with blue pave- · Width of vehicle lanes with two-way, single-way, or features as a guide
- · Safety index for seperation from other traffics
- ment, bicycle signs or vegetation shades
- · Safety index for seperation from other traffics
- a forbidden lane
- · Space organization, such as temporary parking

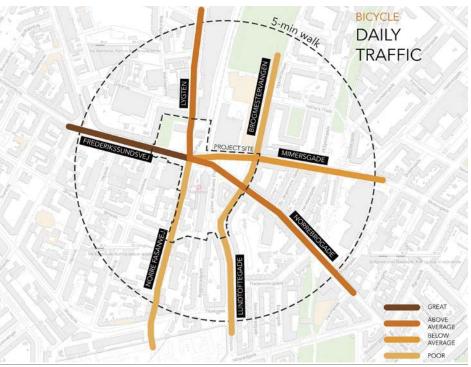
#### **Bicycle Mobility Evaluation**

Lygten and Lundtoftegade are graded as the greatest, because they provide wide bicycle lanes along with enough street green canopy, lane curves separating from vehicles and protecting people passing by. Although other streets seem to be in a similar situation of bicycle uses, the fact is that main roads have huge total number. Among them, the north to south direction roads are least crowed. According to the cyclists counting data from the Kobenhaven Kommune spatial map, Frederikssundsvej contains the largest number of cyclists.

	PHYSICAL FRAMEWORK	MODAL SPLIT PERCENTAGE	DAILY TRAFFIC	
LYGTEN		18.75%	8100	
NORRE FASANVEJ		16.26%	9450	
LUNDTOFTEGADE		23.37%	1800	GREAT
NORREBROGADE		26.05%	19700	   ABOVE
MIMERSGADE		28.43%	5700	AVERAGE BELOW
FREDERIKSSUNDSVEJ		27.63%	13900	AVERAGE
BROGMESTERVANGEN		43.81%	2000	POOR



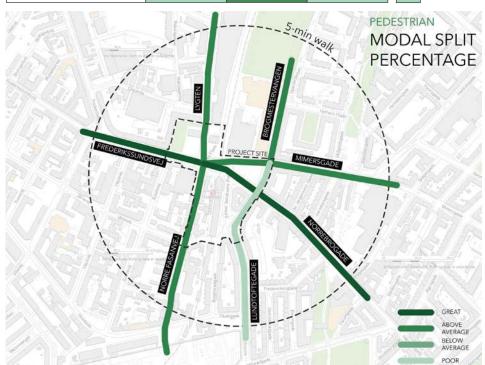


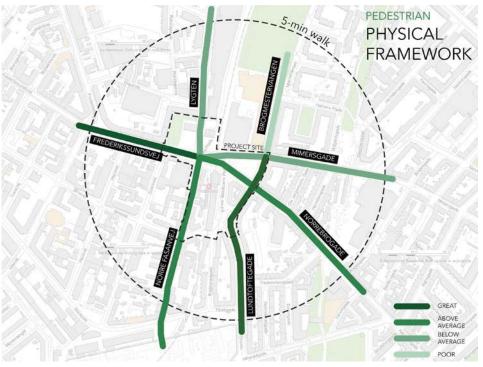


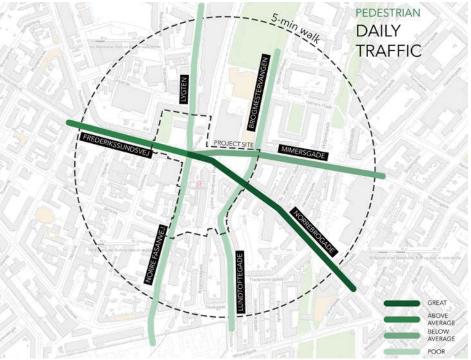
## **Pedestrian Mobility Evaluation**

Among all 7 analysed samples of streets on site, Frederikssundsvej and Lundtoftegade have the most complete and integrated physical framework for pedestrians, while Brogmestervangen has the poorest condition of pedestrian framework mainly because of the construction. In terms of modal split percentage, Norrebrogade and Federikssundsvej are the most pedestrian-dominated streets, while the quality of the walking environment of Norrebrogade is not in accordance with the amount of pedestrians.

	PHYSICAL FRAMEWORK	MODAL SPLIT PERCENTAGE	DAILY TRAFFIC	
LYGTEN		33.05%	4600	
NORRE FASANVEJ		33.44%	4603	
LUNDTOFTEGADE		15.43%	2729	GREAT
NORREBROGADE		43.25%	11944	I   ABOVE
MIMERSGADE		32.13%	5045	AVERAGE BELOW
FREDERIKSSUNDSVEJ		43.25%	8895	AVERAGE
BROGMESTERVANGEN		32.11%	2700	POOR



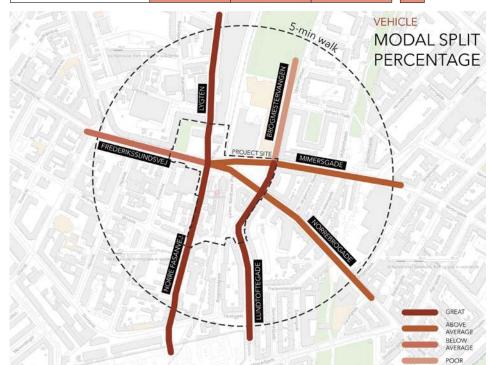


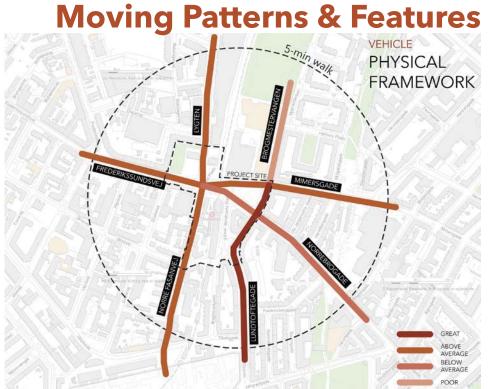


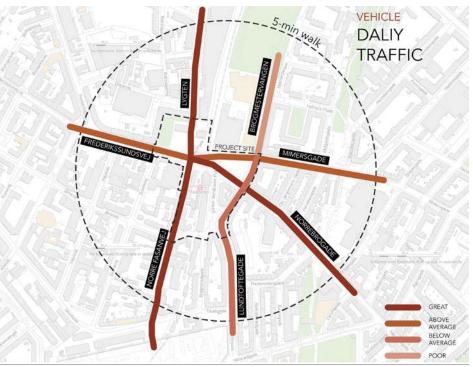
## **Vehicle Mobility Evaluation**

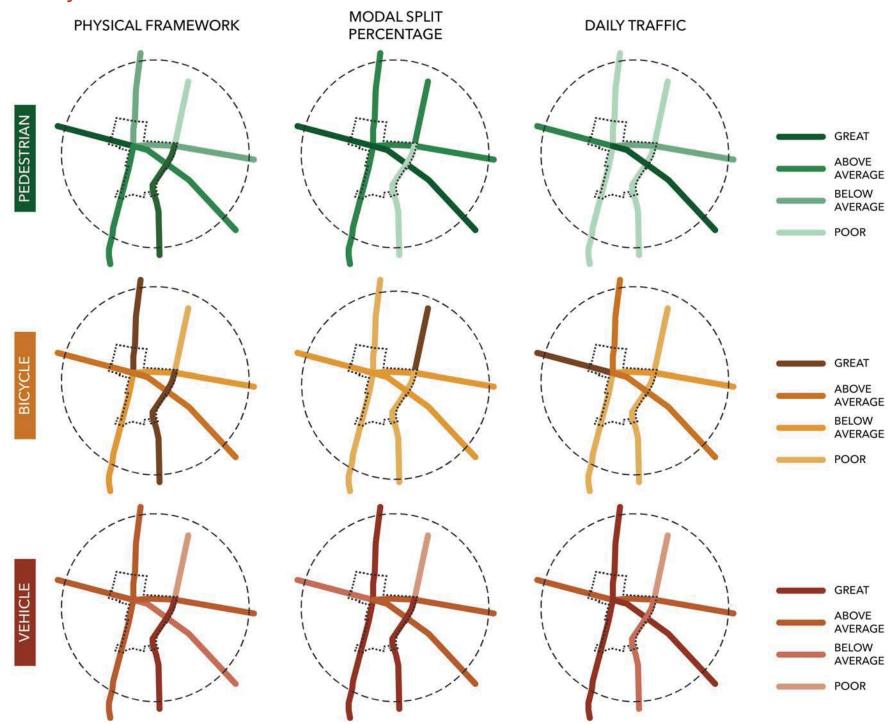
Most of the vehicle traffic flow into the project site through Norrebrogade, Lygten and Norre Fasanvej, the traffic flow on Frederikssundsvej is also quite large. However, Norrebrogade and Frederikssundsvej are also very pedestrian and bicycle oriented streets according to the analysis before, so there are a lot of conflicts between all three kinds of transportation.

	PHYSICAL FRAMEWORK	MODAL SPLIT PERCENTAGE	DAILY TRAFFIC	
LYGTEN		48.20%	11850	
NORRE FASANVEJ		50.30%	14250	
LUNDTOFTEGADE		61.20%	7150	GREAT
NORREBROGADE		30.70%	14200	I   ABOVE
MIMERSGADE		39.44%	7000	AVERAGE BELOW
FREDERIKSSUNDSVEJ		29.12%	9400	AVERAGE
BROGMESTERVANGEN		24.08%	1500	POOR





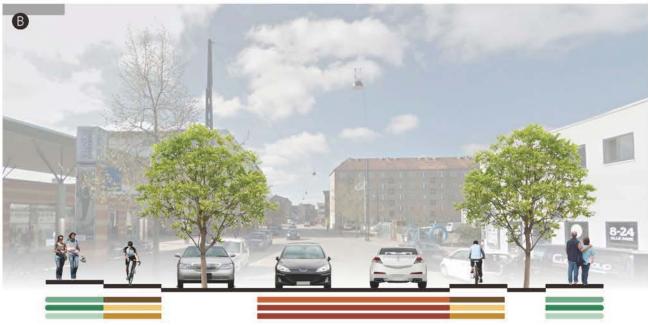


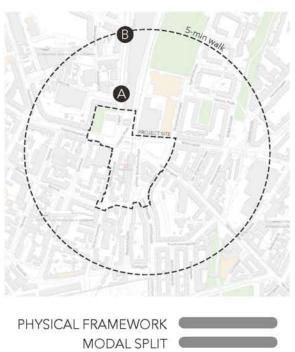


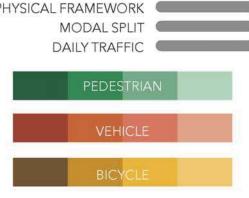
# **Moving Patterns & Features**

## Lygten Street: Southbound







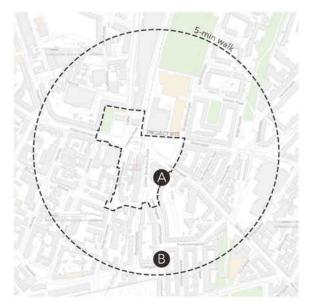


# Site Analysis Lundtoftegade: Northbound











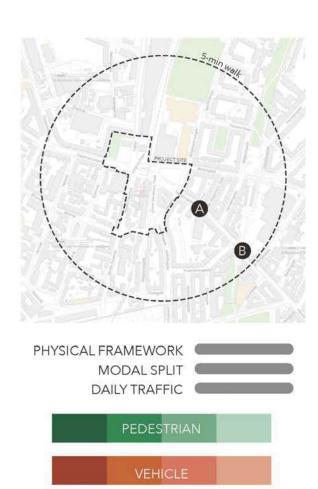
BICYCLE

### **Moving Patterns & Features**

#### Norrebrogade: Westbound





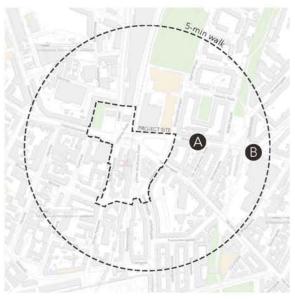


BICYCLE

# Site Analysis Mimersgade: Westbound



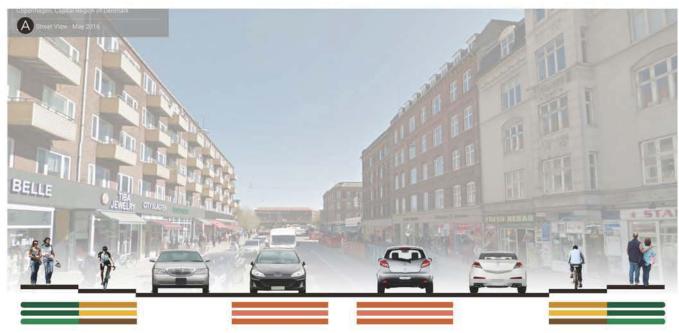


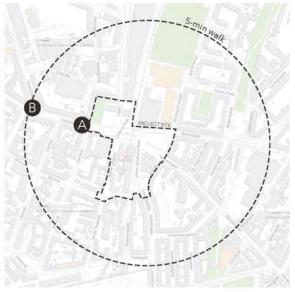


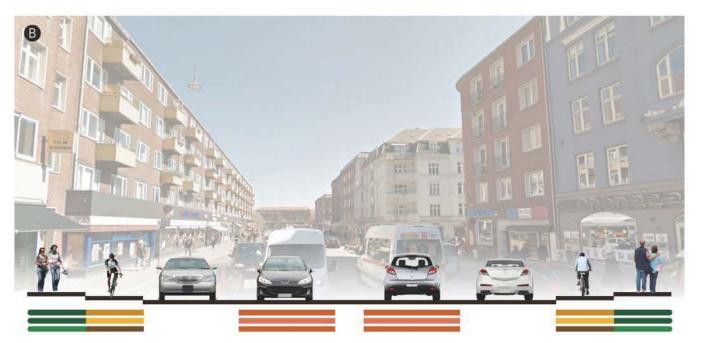


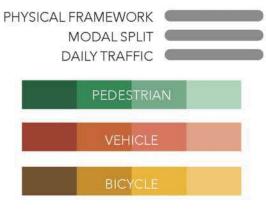
# **Moving Patterns & Features**

#### Frederikssundsvey: Eastbound





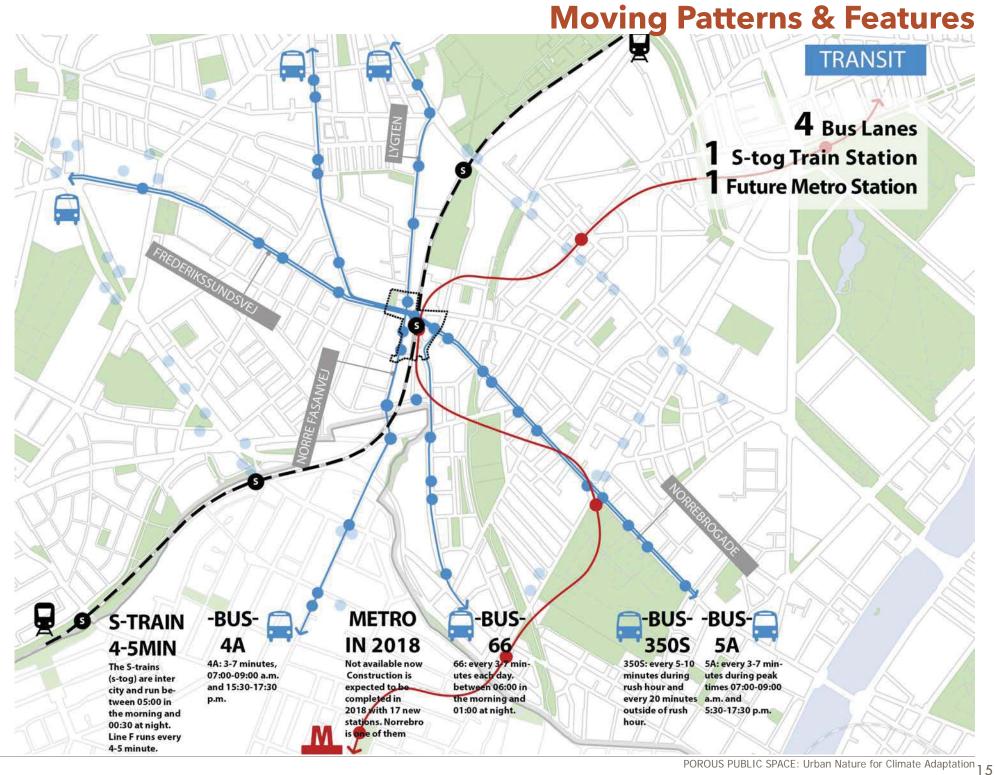




Site Analysis **BICYCLE** FREDERIKSSUNDSVEJ 13900 / 19700 

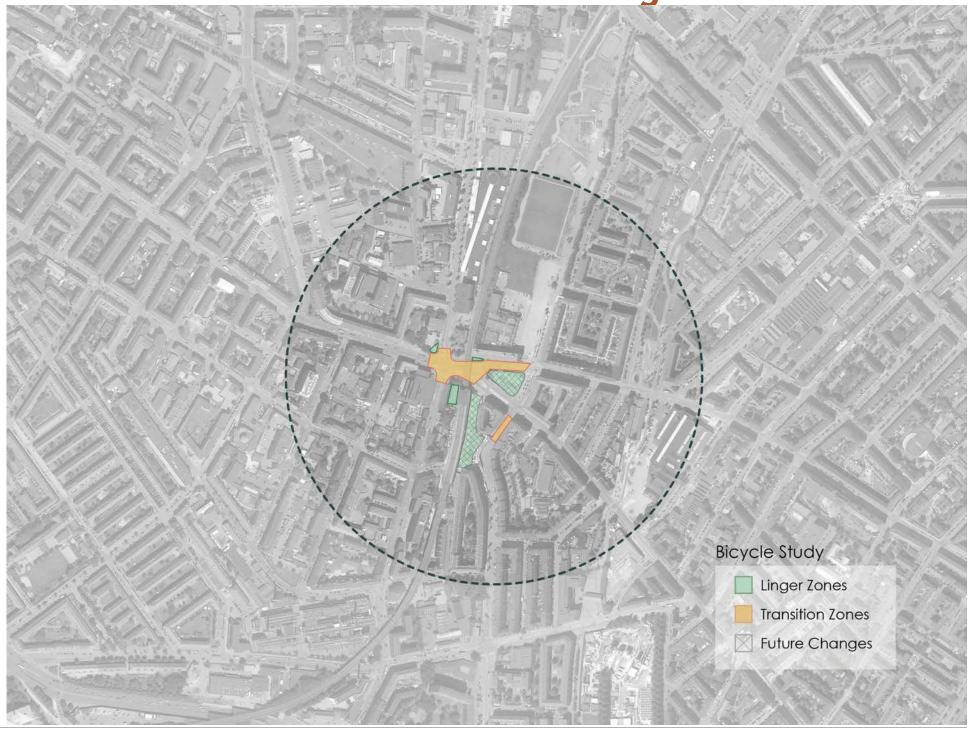
**Moving Patterns & Features** PEDESTRIAN FREDERIKSSUNDSVEJ NORRE FASANVEJ 

Site Analysis **VEHICLE** FREDERIKSSUNDSVEJ NORRE FASANVEJ 





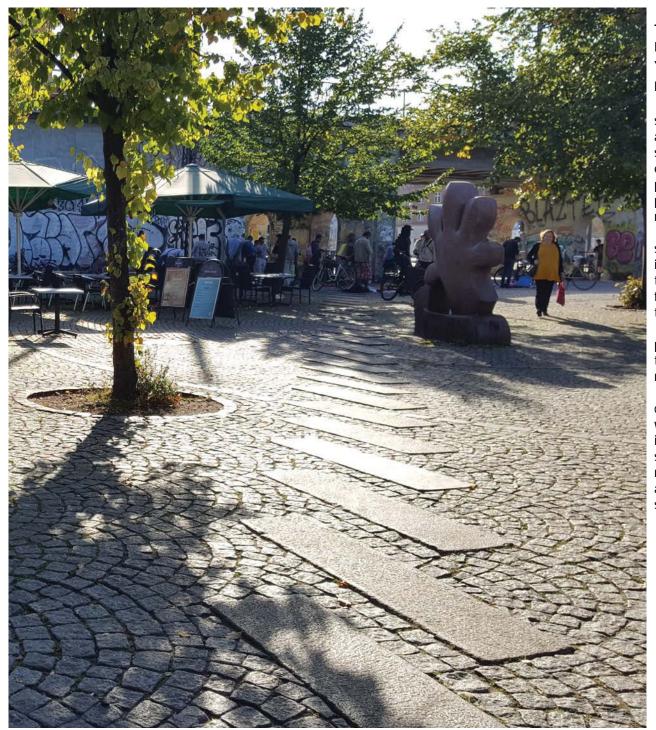
**Moving Patterns & Features** 





#### **References:**

- 1) Parameters for Public Spaces in Copenhagen, Schulze+Grassov
- 2) Københavns Kommune Københavnerkortet: http://kbhkort.kk.dk/spatialmap



### blue/green systems

#### Team:

Kun Lyu, Sierra Druley, Tatyana Vashchenko, Yu-Chia Jian

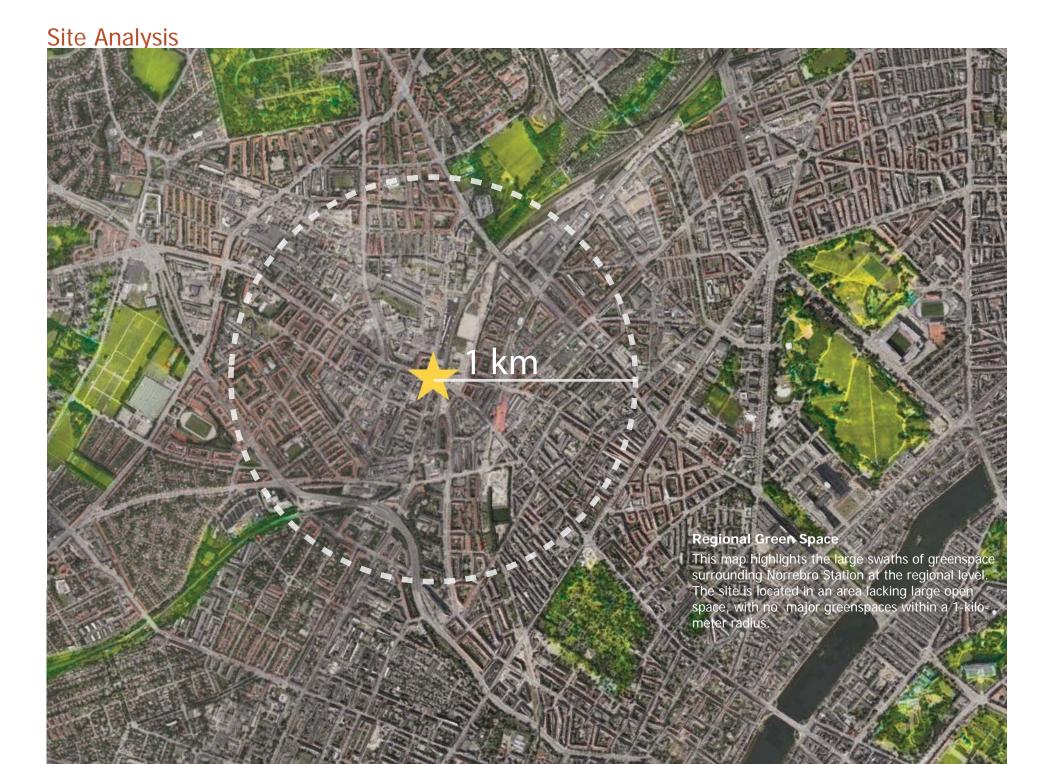
#### **Description:**

The district surrounding the Norrebro Station site is a highly urban area dominated by hardscape and characterized by a lack of large, public green spaces. The vast majority of green space in this area exists in private courtyards. However, urban nature is present in many unexpected forms in this area, and potential opportunities for making new green connections exist.

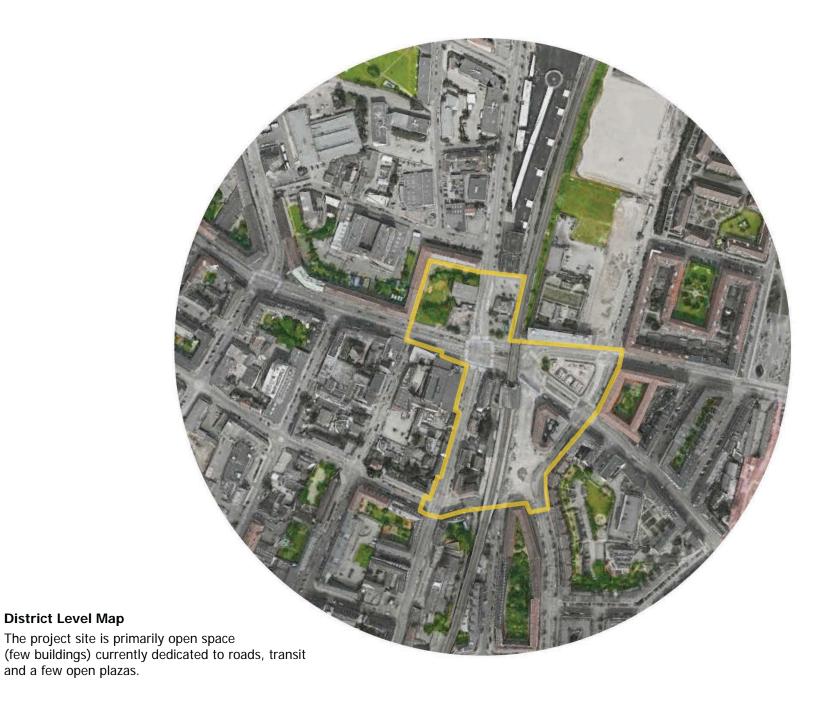
At the site scale, the large amount of open space provides opportunity for potential urban greening. Streets on the site are largely devoid of street trees or other vegetaiton, and green spaces take the form of pockets or patches which are well used by the community.

Native wildlife has been recorded on the site, particuarly in the wild strip of vegetation that borders the railtracks. Hedgehogs, foxes, pigeons and squirrels have all been identified on site.

In terms of hydrology, the site contains exclusively conventional draining and sewage systems, with runoff directed into underground pipes. The site is relatively flat, with all of the terrain falling between seven and nine meters above sea level. The site has no significant green stormwater infrastructure or adaptive infrastructure to handle 10, 20 or 100- year storm events.

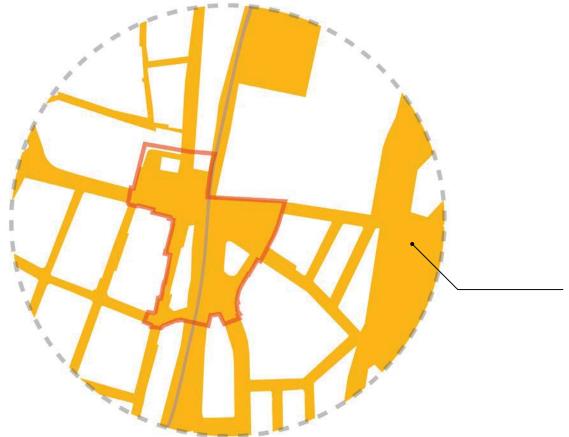


### regional to district scale



**District Level Map** 

POROUS PUBLIC SPACE: Urban Nature for Climate Adaptation 3





#### district scale **PUBLIC SPACE**

The project site is mostly public space, though it is currently dominated by transit use. Only a small fraction of the site contains any planting. When private green space is included in the district level map, the 5-minute walkign radius contains a significant amount of vegetation. Very little of this site vegetation is accessible to the public.

#### public green space



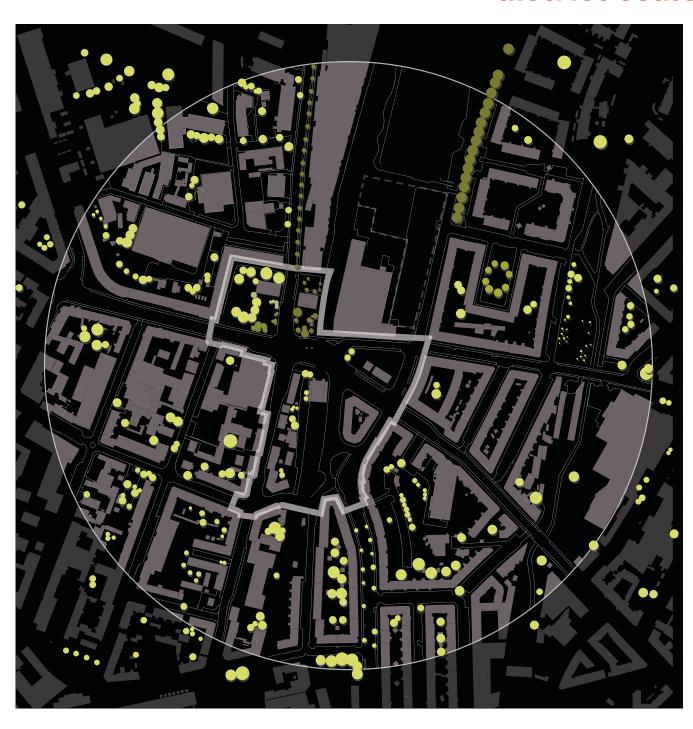
private green space



district green space combined



### district scale

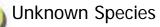


#### **District Canopy Cover:**





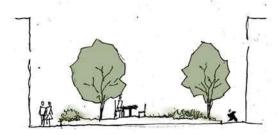






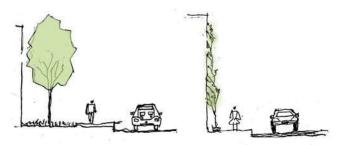
#### high ecological value:

contains a wide range of species diversity; features an understory, mid-story and canopy



#### medium ecological value:

planting situated within a pervious, soil substrate, allows infiltration, less species diversity

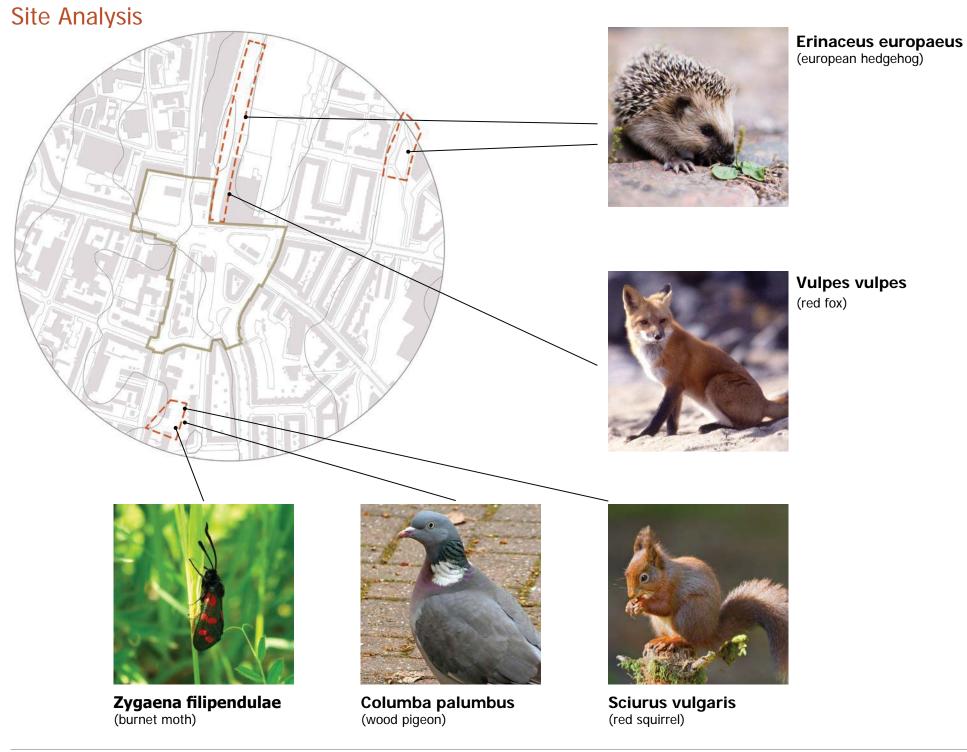


#### low ecological value:

contains some planting, usually a monoculture, surrounded by impervious surface, such as concrete

### district scale green space





# regional flora + fauna









Oxalis acetosella





#### Canopy:

Acer campestre Acer glutinosa Acer platanoides Alnus spp. Betula pubescens Carpinus betulus Fagus sylvatica Fraxinus excelsior Pinus sylvestris Populus tremula Quercus robur Quercus petraea Tilia cordata Tilia platyphyllos

#### Mid-Story:

Corylus avellana Frangula alnus Salix spp. Sorbus aucuparia

#### **Under-Story:**

Carex arenaria Dryopteris dilatata Holcus mollis Oxalis acetosella Pleurozium Vaccinium myrtillus











**Green Experience :**The Norrebro Station site and its surrounding district is a highly urban area with little street vegetation. However, distinct, multi-sensory experiences in urban nature can be found throughout the site. From a remant grass field on the side of the rail tracks, to an immersive garden in a shipping container villiage, there are spaces on the site where respite from the urban hardscape can be found.

### experiential nature





Emergent Nature:
A primary typology of vegetation on the site and at the district scale is emergent nature--plants that grow spontaneously in-between buildings and in leftover spaces.







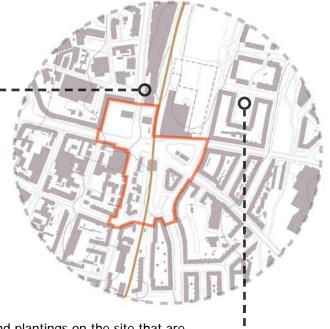
#### **Colloquial Nature:**

Small-scale interventions by groups or individuals are evident throughout the site. From vegetable beds to climbing vines and flower pots, colloquial nature is cultivated and personal.



### experiential nature

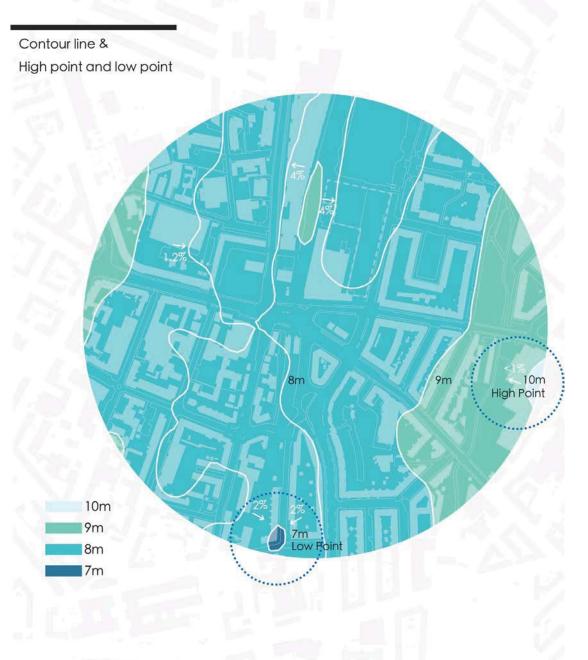




#### **Official Nature:**

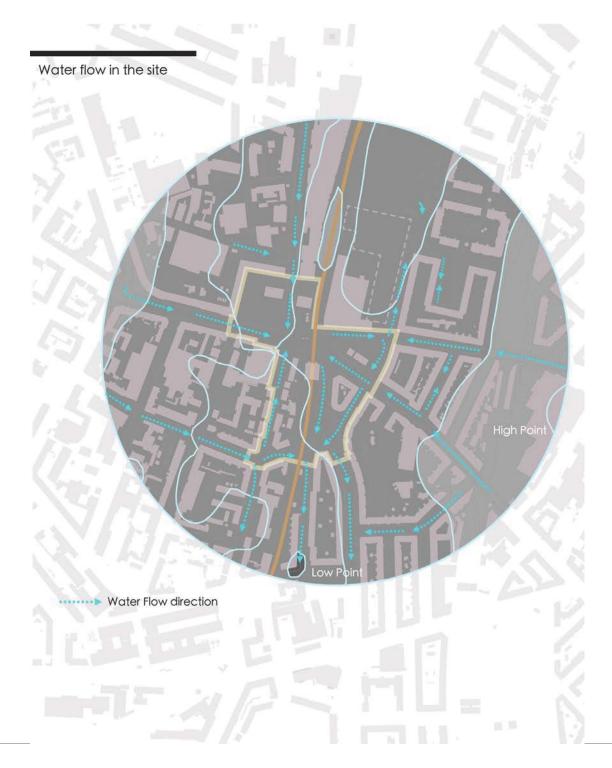
The green spaces and plantings on the site that are clearly part of a formal program include street trees and formally designed courtyards. This nature typol-ogy is established and maintained based on a set of guidelines





We can easily discover which is the highest point and the low point in this area according to the contour line, and choosing the potential water basin place in our site.

## hydrologic systems

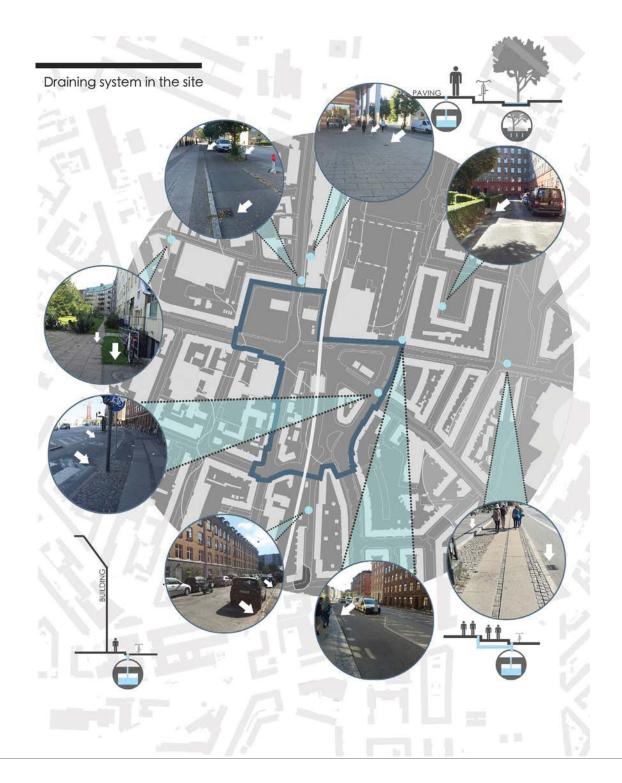


We can easily discover which is the highest point and the low point in this area according to the contour line, and understanding the direction of water flowing in the site area and five minute walking radius zone.



According to this depress map, we can figure it out where is the potential flooding area in the site. Moreover, use this prediction map, we can decide where is the most required place to allocate the water collection-system design.

## hydrologic systems



Here is the location of the draining system in the site and five minute walking radius. We can easily figure out everal types of the draining system according to this map.



#### **SOURCES:**

Danmarks Fugle og Natur, www.fugleognatur.dk

Det Store Naturtjek, www.biodiversitet.nu

Hannon, G. E., R. Bradshaw, and J. Emborg. "6000 Years of Forest Dynamics in Suserup Skov, a Seminatural Danish Woodland." Global Ecology and Biogeography 9.2 (2000): 101-14. Print.

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Lawesson, J. E. "Danish Deciduous Forest Types." Plant Ecology 151.2 (2000): 199-221. Print.

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### **Local Narratives**

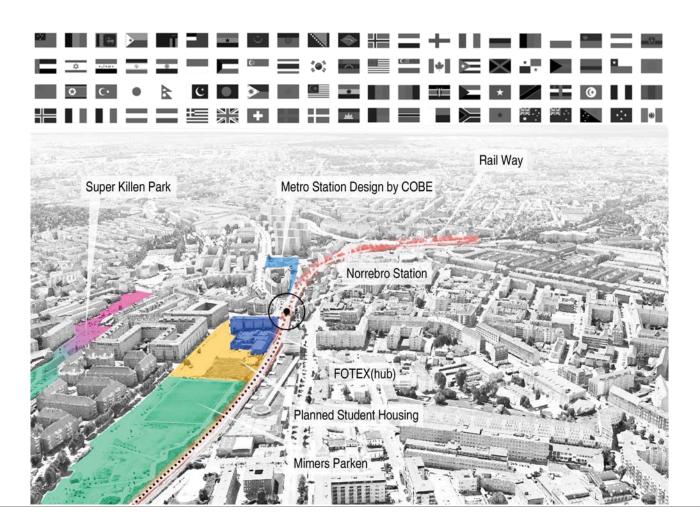
#### Team:

Joanna Kaiserman, Yan Li, Jesce Walz

Yue Yu

**Description:** Our study site is a place born from the influences of the immigrants that have settled here over history. This is evident in the amalgamation of ethnicities, languages, surfaces, and materials found throughout the neighborhood.

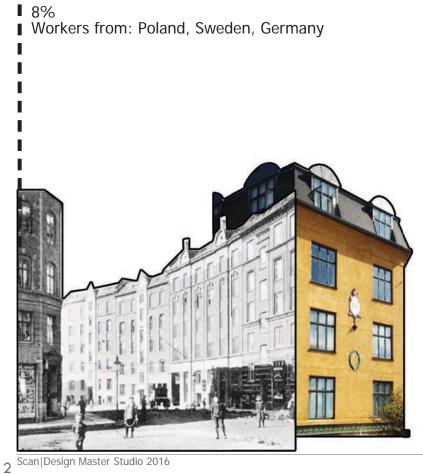
Future development of the site, including a metro station and new student housing will continue to shift the changing character of the neighborhood.



₁ 1880s

#### **Timeline of Immigration**

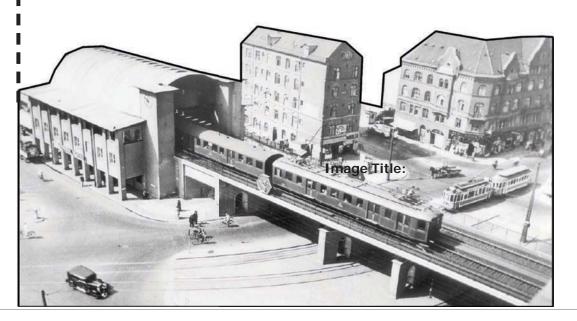
The following pages chronicle the major moments of immigration into Copenhagen, with images of the Nørrebro site from these time periods.



### 1930s

9%

Refugees from: Eastern Europe, Germany



### **Local Narratives**

#### **Residents of Non-Western Origin** (1995)

The map to the right shows the percentage of residents in the neighborhood not born

in Western countries.



Guest workers from: Turkey, Pakistan, Morocco 1%

Refugees from: Chile, Vietnam





1990s

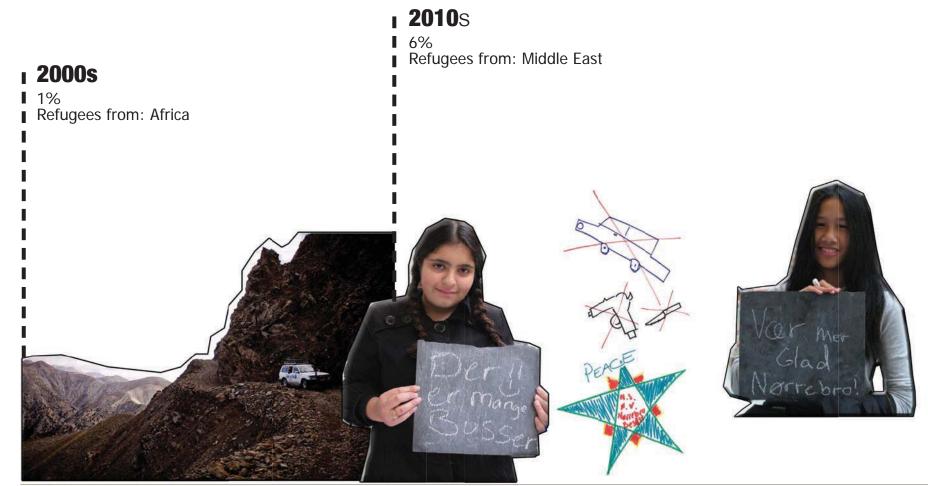
3%

Refugees from: Soviet Union



#### **New Millennium**

The beginning of the 21st century brought political refugees and refugees of war into Copenhagen.

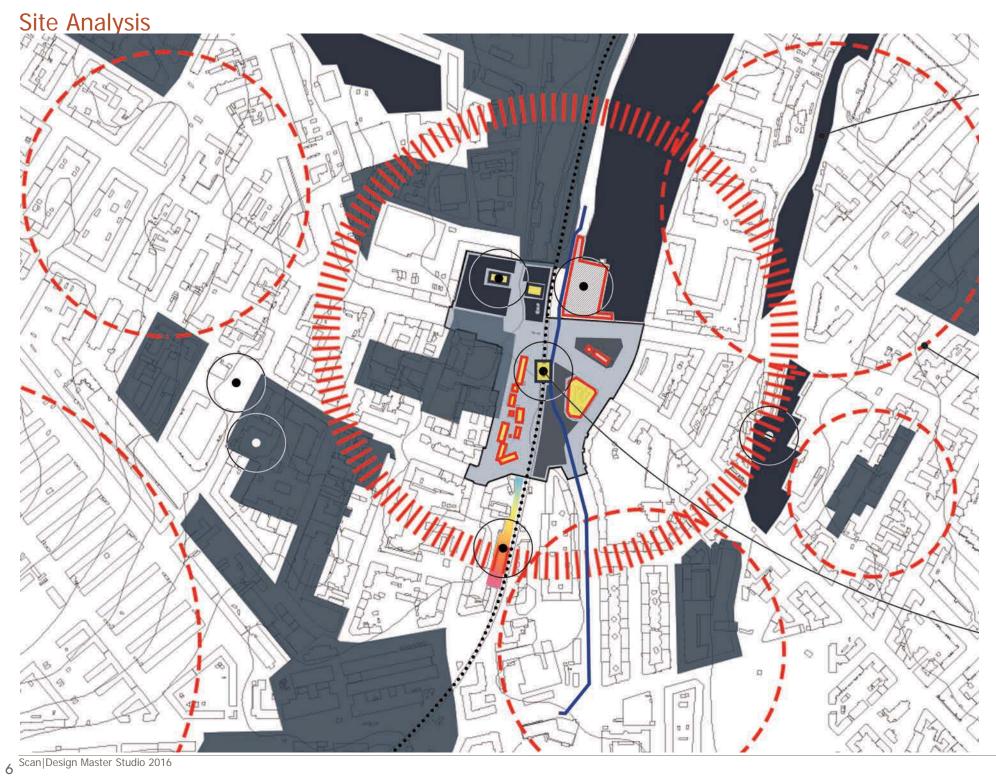


### **Local Narratives**

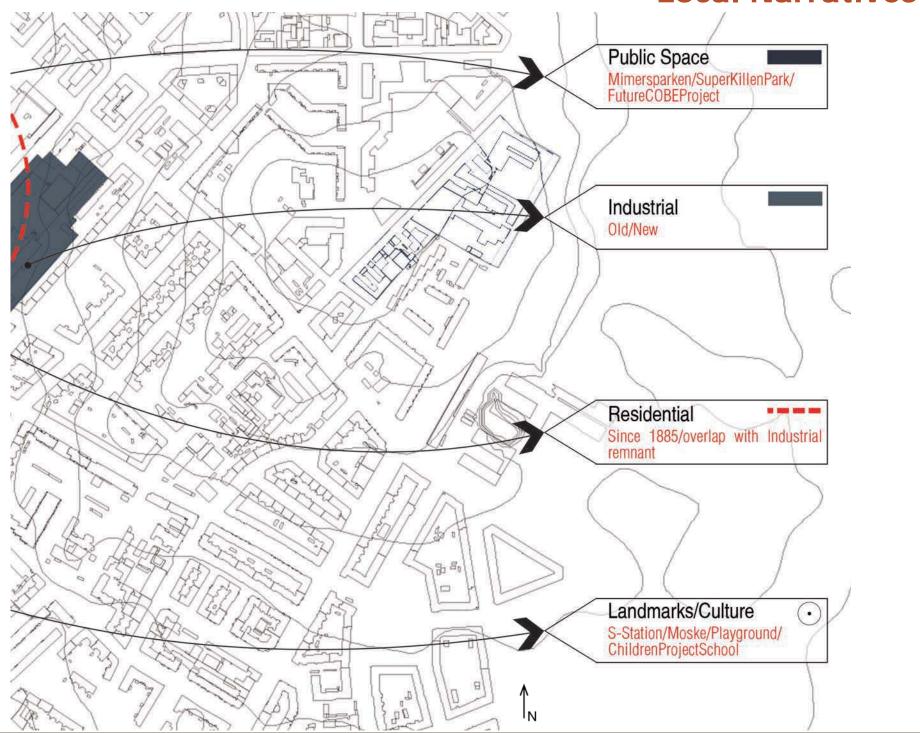
#### **Into the Future**

With the greatest diversity of cultures in its history, modern-day Copenhagen faces many challenges in accepting and integrating these new cultures into the fabric of the city.

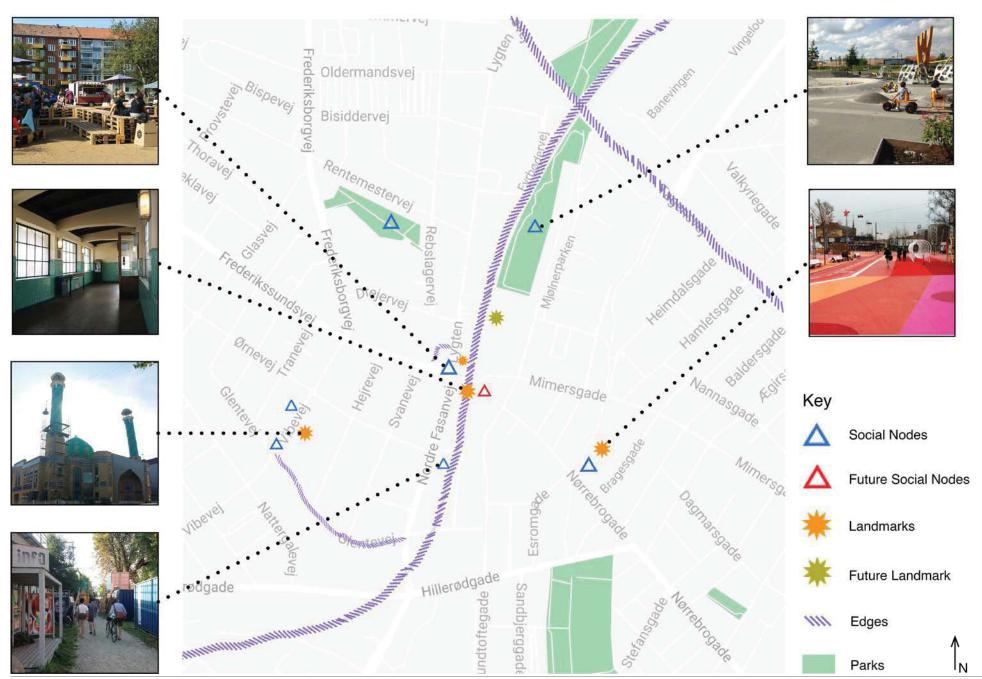




### **Local Narratives**



#### **Elements of the Neighborhood**

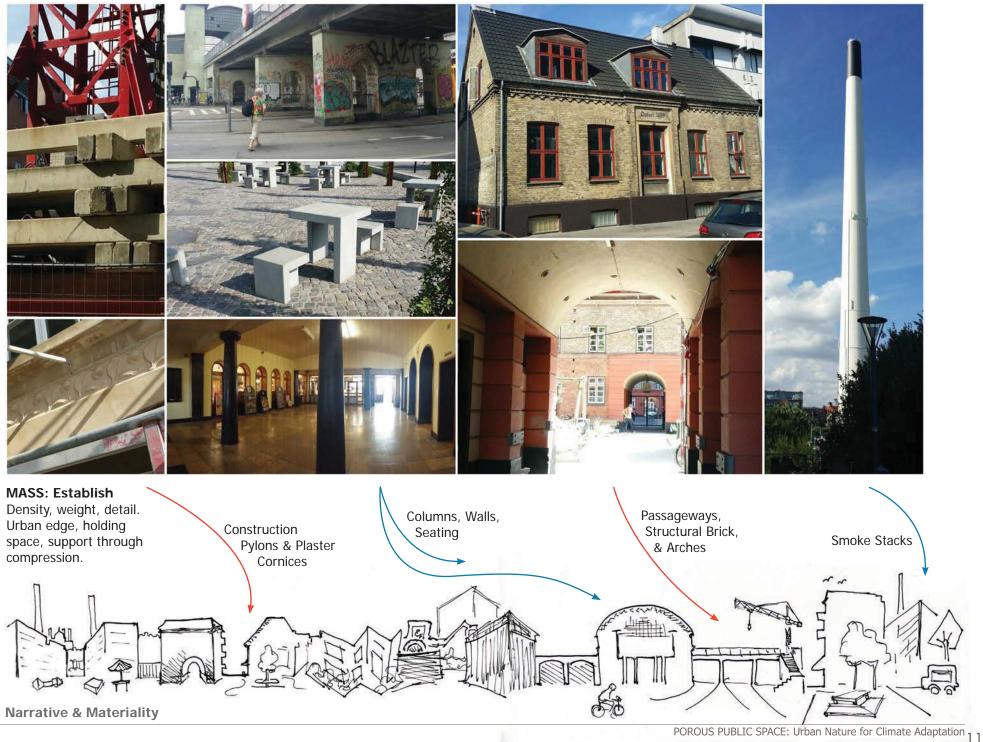


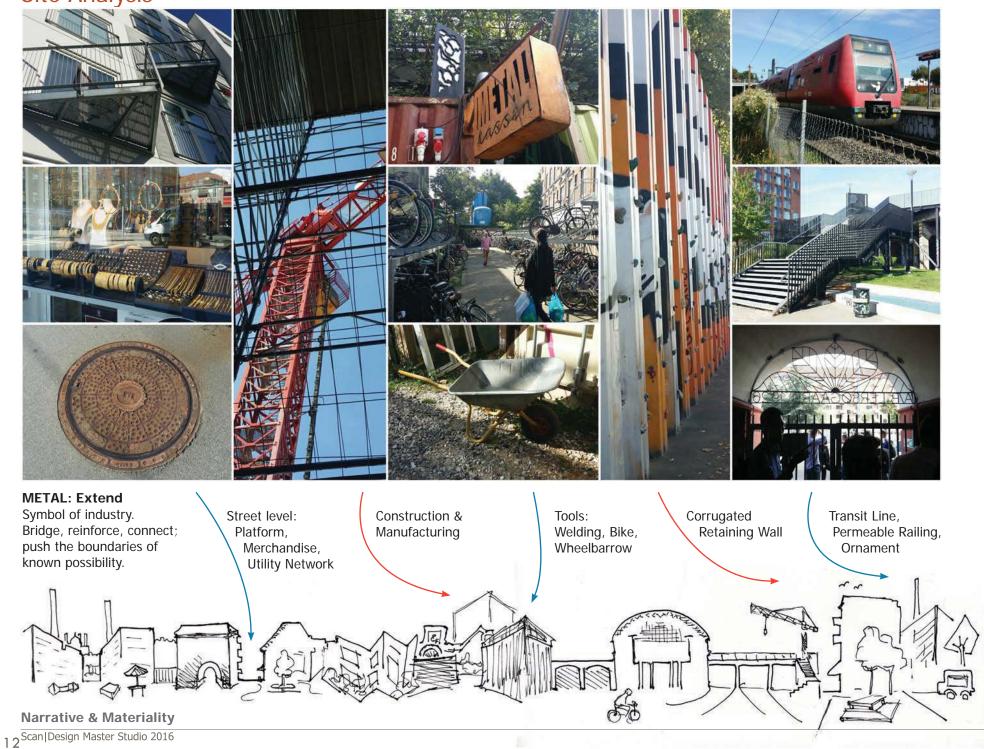
### **Local Narratives**





### **Local Narratives**





### **Local Narratives**





#### References:

- 1) http://aasarchitecture.com/2015/03/arkitema-architects-selected-for-the-new-plan-faste-batteri.html
- 2) http://www.cobe.dk/
- ${\it 3)} \quad http://www.folketshus.dk/byggerbogen/Byggerbogen-webudgave.PDF$
- 4) http://kbhkort.kk.dk/spatialmap?
- 5) http://kortforsyningen.dk/
- 6) http://vaeggen.copenhagen.dk/
- 7) https://drc.ngo/60years
- 8) Narrative & Materiality Photos: Jesce Walz