Inclusive Stations: Gates into the city of Rotterdam

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Publication date
2021

Document Version
Final published version

Citation (APA)
Triggianese, M., & Söylev, Y. (Eds.) (2021). *Inclusive Stations: Gates into the city of Rotterdam*. TU Delft OPEN Publishing. https://books.bk.tudelft.nl/press/catalog/view/799/908/900-2

CITY OF INNOVATIONS PROJECT

complex projects

INCLUSIVE STATIONS

Gates into the city of Rotterdam

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AR0109
City of Innovations Project,
Spring 2021,
TU Delft

TU Delft BK Bouwkunde

Gemeente Rotterdam

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COLOPHON

M. Triggianese, Y. Soylev (eds.). *Inclusive Stations. Gates into the city of Rotterdam*. Delft 2021.

This book is published by TU Delft Open
Faculty of Architecture and the Built Environment,
Delft University of Technology

ISBN 9789463664868

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City of Innovations Project (*)
Inclusive Stations
Chair of Complex Projects, Spring 2021

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* City of Innovations Project is an education format ideated and developed by dr. Manuela Triggianese for the Master curriculum of the Chair of Complex Projects, Faculty of A+BE, TU Delft. 'City of Innovations Project' connects academic research and education with stakeholders for addressing actual urban challenges. The Spring 2021 edition has enjoyed the partnership of Municipality Rotterdam, Delta Metropool Association, De Zwarde Hond.

CONTENT

INCLUSIVE STATIONS

Gates into the city of Rotterdam

P

About the Work

Manuela Triggianese, Yagiz Söylev

In the Dutch National Environmental Vision 2021, new living and working locations are mapped on existing urbanized sites - mainly at catchment areas of public transportation (PT) nodes or stations[1]. This is the case in the metropolitan area of Rotterdam, where new developments projects are taking place at several station locations. In the Rotterdam Mobility Plan[2] "inclusiveness in mobility" is emphasized by setting several objectives for a PT node. These objectives address the mixité of facilities and attractiveness at station locations with public spaces, accessibility with more bikes (and sustainable modes of transport) and fewer cars in the city centre[3]. How could the station as a node respond to future challenges of seamless travel, inclusivity and the changing intensity of cars and pedestrian flows both in the centre and the periphery of the city of Rotterdam? The following pages intend to answer this question through the narrative of six research-by-design projects, conducted by the students of Complex Projects group and enrolled in "City of Innovations Project" elective, "Inclusive Stations".

Working in close collaboration with the City of Rotterdam, teachers and design professionals, the students were asked to reflect on the importance of transport networks within and extending from the city. Through considering the way these networks have shaped the city by weaving the urbanites of the city center(s) and suburban areas, this elective has been focused on three station locations which act as gateways to the city center of Rotterdam: Meijersplein Airport station, Rotterdam Alexander rail-metro station and Slinge metro station. The '6 Visions X 3 Locations' chapter is a systematization of the work of 27 masters students with input from designers of the City of Rotterdam, Delta Metropool Association and De Zwarte Hond. The research-through-design process consists of documenting and analysing the present urban conditions of selected station locations and proposing design solutions and visualisations of the development of these locations. It shows the methodology of the process that sees the interaction between students-teachers-professionals on a weekly basis through thematic workshops, lectures and site visits in Rotterdam.

The elective "City of Innovations Project - Inclusive Stations" is connected to current research and design studios of Complex Projects group at the Department of Architecture dealing with the role of infrastructure as a catalyst of urban developments. This output is a follow up of recent publications by Complex Projects, such as: "Living Stations" (2020), "Amsterdam 2050" (2019) and "Stations as Nodes" (2018) published by TU Delft open.

[1] More info: https://www.novistukken.nl/english/default.aspx

[2] More info: http://tda-mobility.org/wp-content/uploads/2018/11/Rotterdam_Urban-Traffic_Plan.pdf

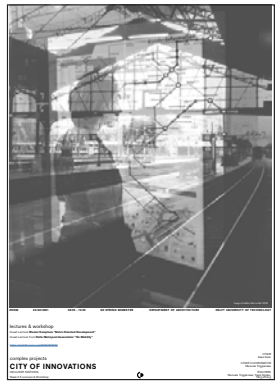
[3] Triggianese, M. (2021). Stations as a lever for inclusive growth. In M. Triggianese, O. Caso, & Y. Söylev (Eds.), Living Stations: The Design of Metro Stations in the (east flank) metropolitan areas of Rotterdam (pp.8-13). TU Delft Open.

LECTURE SERIES

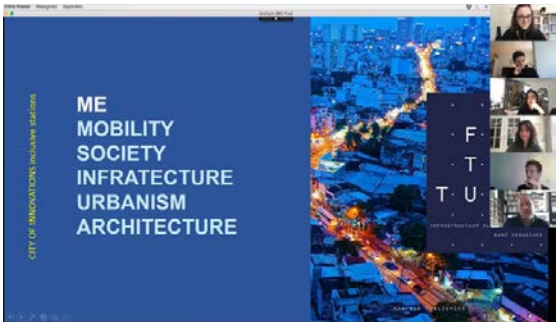
Lectures by
Nacima Baron (University Gustave Eiffel Paris)
Wouter Kamphuis (Gemeente Rotterdam)
Marc Verheijen (Gemeente Rotterdam)
Sigrid van Veen (Gemeente Rotterdam)
Alankrita Sarkar (Delta Metropool Association)
Arjan Smits (Delta Metropool Association)
Rien van de Wall (Delta Metropool Association)
Kjai Tjokrokoesoemo (De Zwarde Hond)

Guest critics at final presentation
Hans de Boer (TU Delft Civil Engineering & Geosciences)
John Baggen (TU Delft Civil Engineering & Geosciences)
Jaap Vleugel (TU Delft Civil Engineering & Geosciences)

*Following the end of the course students presented their final projects to members from the municipality (Mobility Department) on May 3rd 2020 (online).

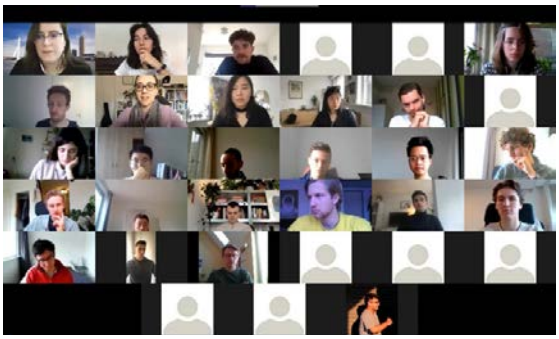


Invitation posters for lecture series and presentations

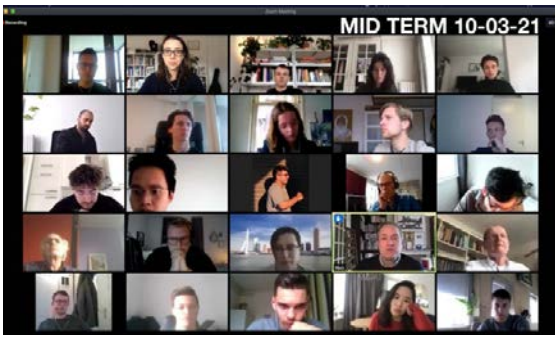


Marc Verheijen Infratecture

Nacima Baron Grand Paris Express



Sigrid van Veen Public Transport Hubs



Midterm presentation

Delta Metropool Go Europe Go Rail

Wouter Kamphuis Rotterdam

Screenshots from online lectures and student presentations

ROTTERDAM:
6 VISIONS X 3 LOCATIONS

Illustrations by Federica Longoni

ROTTERDAM

INTERMODAL URBAN CONNECTIONS

Meijersplein station connection to Rotterdam Airport

OV 2040

*OV: openbaar vervoer (NL), public transport (ENG)

50.000 NEW HOMES, 100.000 NEW TRANSPORT USERS

Slinge Station

ROTTERDAM

DENSIFICATION

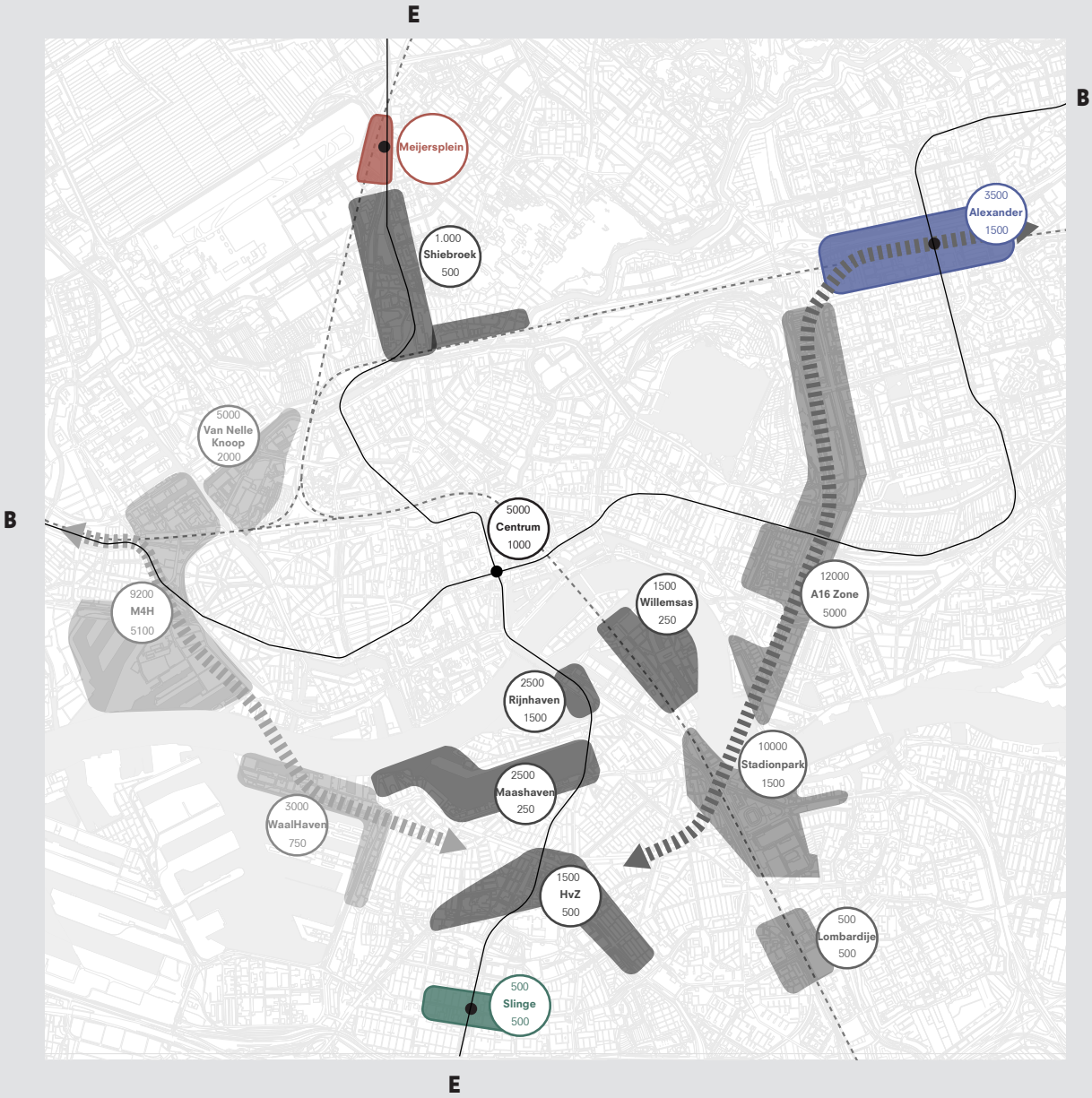
Urban fabric outside Alexander station

OV* 2040

*OV: openbaar vervoer (NL), public transport (ENG)

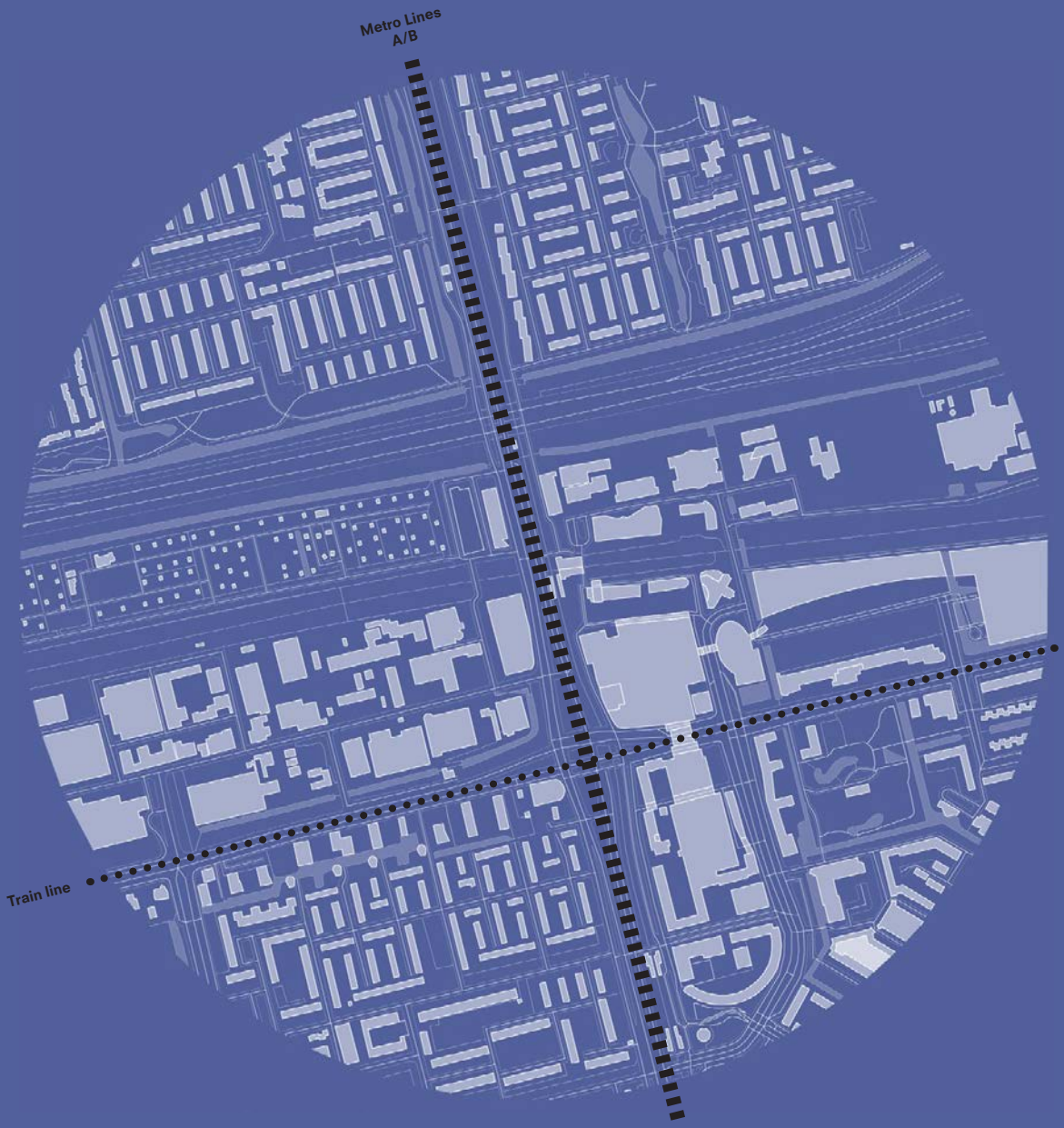
PERIPHERAL URBAN

Stations as gates into the city



Oostflank: development strategy
Westflank: development strategy
Beter benuten
Metro lines: B, E
NS Train Lines
Alexander, metro & railway station
Meijersplein, metro & airport station
Slinge, metro station

Strategy taken from:
Ontwikkelrichting nieuw planaanbod 2019 © Geemente Rotterdam


Metro Lines
A/B
Train line

A

ALEXANDER

METRO & RAILWAY STATION

Aneesh Nandi
Dino Vojvodic
Georgina Giassia
Jorn Beltman
Koen Stam
Pepe Gomez-Acebo
Reinier Kok
Ruben de Leeuw
Sander Meert
Weiyuan He

INTRODUCTION
Rotterdam Alexander Station

Rotterdam Alexander Station is located in Prins Alexander to the northeast of Rotterdam's main city centre. In the 1960s Prins Alexander was transformed from a polder landscape into a residential neighborhood.

During the 1960s and 1970s the large housing demand in combination the new production methods and modernist urban planning shaped Prins Alexander. Modernist interventions, such as urban highways and tall residential blocks in open landscapes can still be observed today.

The site lies at the intersection of major transportation lines. Although they make the area easily accessible, these infrastructures can be described as barriers that fragment the site. These urban barriers still exist today and have gone largely unaddressed. As a result, sustainable modes of transportation, including biking and walking, are not promoted. Since the city of Rotterdam is transitioning into an attractive and healthy city, these barriers pose a problem, not only in terms of mobility but also in terms of social inclusivity.

Since nowadays the area is still focused on the circulation of cars there has been little incentive to remove these barriers. **How can the mobility at Rotterdam Alexander station and its surrounding neighborhoods shift towards a mobility that emphasizes pedestrians and micro-mobility?**

In recent years, the city of Rotterdam has been growing in popularity, employment opportunities are growing, and more people are moving to the city. It is expected that the inhabitants of Rotterdam will grow by 50.000 by 2040. To provide additional housing, several areas have been identified for further densification; the area surrounding Rotterdam Alexander Station is one of those areas. Moreover, the city of Rotterdam aims to evolve into a circular economy. The Alexandrium shopping complex, parking lots and roads dominate much of the space surrounding the station. **How can the area continue to grow in a direction that reinforces the values of an inclusive circular economy?**

Through a multifaceted analysis of the site, we intend to expose the existing fragmentation of the site and propose Alexander as a destination in a polycentric city. Alexander is envisioned to promote inclusivity and diversity, and to have a wide offering of leisure experiences. Moreover, it will enhance the public space to blend the existing boundaries of the neighborhood.

To achieve this goal, we see the train station and its surroundings as a key element capable of spearheading the larger area of Prins Alexander. Therefore, the train station becomes much more than an infrastructural connection but rather **a catalyst for change in the neighborhood as a whole**.

The city's recent renovation has started to transform Rotterdam Alexander from a bi-modal station into a multi-modal transportation hub. The subgroup ALX25 bases its proposal on the area's history and aims to make a new, interconnected identity for the area by integrating the current station design with a new landscape infrastructure around the station. The subgroup ALX40, on the other hand, looks beyond 2040 and proposes a new neighborhood identity centered around furniture.

Rotterdam Alexander Station, Feb 2021

DENSIFICATION STRATEGY

The city of Rotterdam aims to introduce 50,000 new dwellings by 2040[1]. The Prins Alexander district is one of the possible designated areas for further densification (Figure 2). The area is well-connected to existing infrastructure and has a high presence of commercial and retail functions. Adding dwellings to the area will increase the diversity in function.

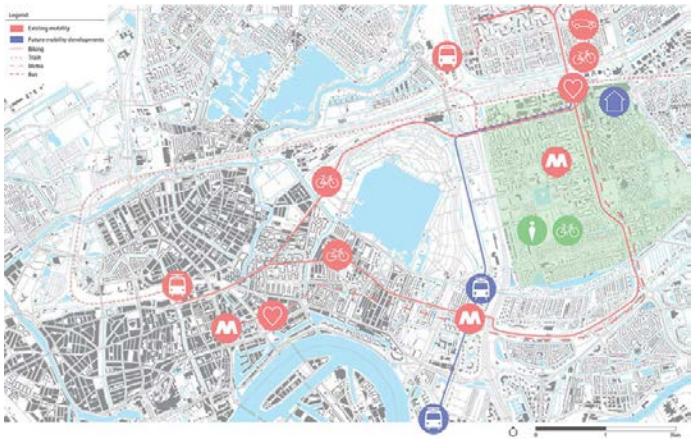
It is estimated that the population of Alexander will increase with up to 3500 new dwellings by 2040[2]. From the future public mobility strategy (Dutch: OV-visie) we can see that by 2040, the public transportation in the Rotterdam region will grow from 15% to 19% of the total mix[3].

The density of public transportation will continue to increase, partially due to an increased densification of dwellings. By 2040 there will be a new transportation route linking Alexander and Feyenoord City/ Stadion Park[4] (Figure 3)

It is expected that there will be fewer private vehicles, and different types of public transportation. Micro-mobility modes will also play a larger role in transportation. There will be more P+B zones available, which will promote micro-mobility.

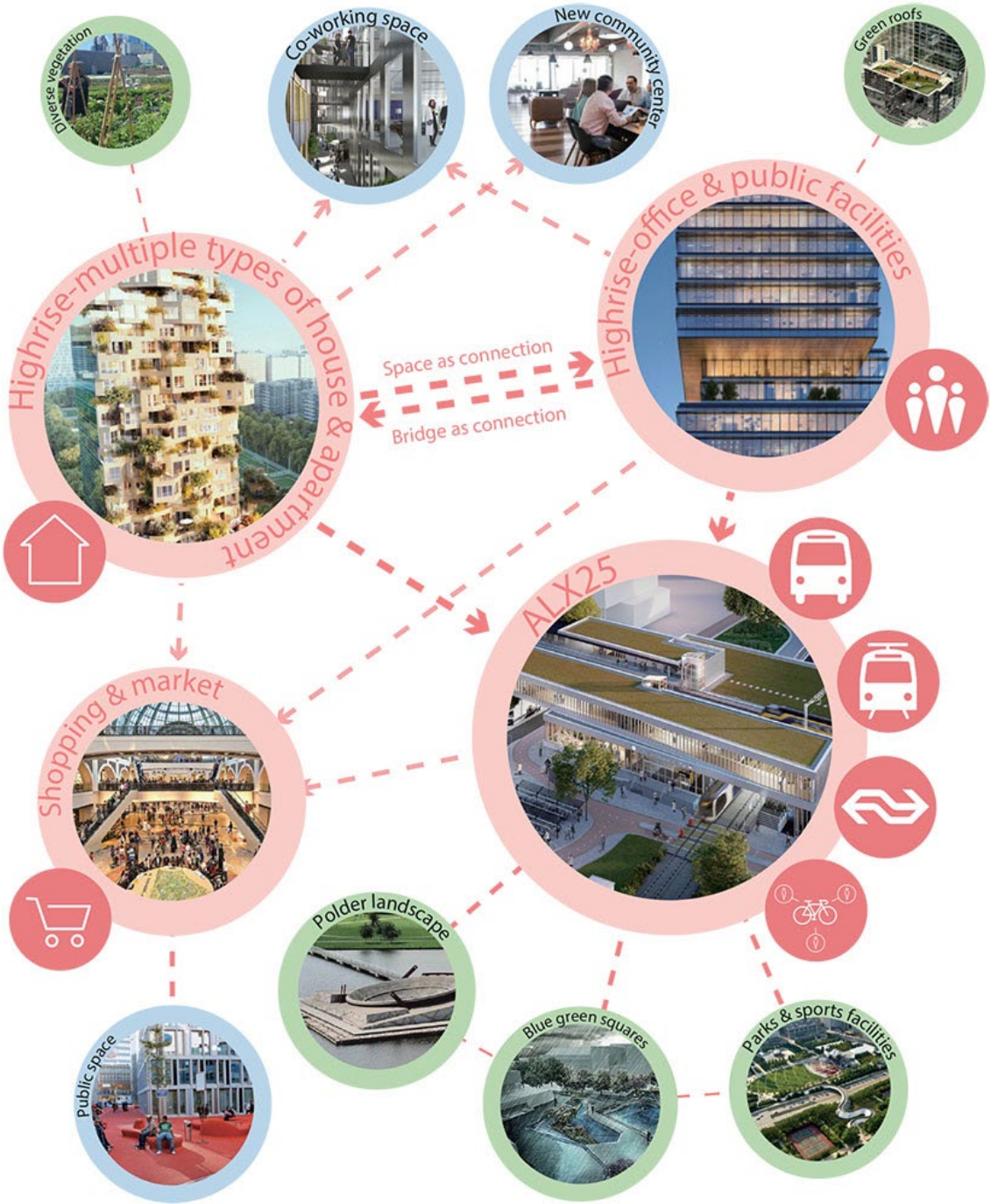
An automated metro-line is also part of the future development plan, which will facilitate the growing traffic needs. Through multiple transportation links, Alexander is planned to become better connect with cities in other regions. Post 2040 the A and B Metro lines connecting Alexander to the city center are expected to become automated[5].

1 Rotterdam Municipality & MRDH, 2017, pg. 33
2 Rotterdam Municipality, 2019, pg. 26
3 Rotterdam Municipality & MRDH, 2017, pg. 67
4 Rotterdam Municipality & MRDH, 2017, pg. 31
5 Rotterdam Municipality & MRDH, 2017, pg. 75



Possible locations for high-rises in Rotterdam, from Rotterdam Municipality and MRDH

Future Strategy Mobility, 1:30.000, from Rotterdam Municipality & MRDH 2017. OV-visie Rotterdam



Summary of the 2060 vision document, based on research by VenhoevenCS architecture+urbanism, 2018

PRINS ALEXANDER
City of the Future 2060 Vision

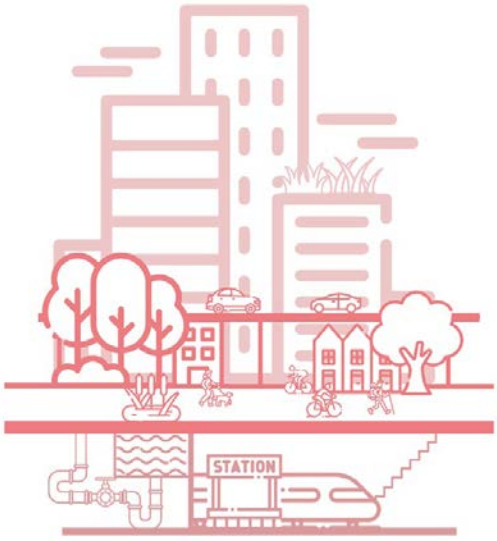
The exploratory conceptual diagram (Figure 3) shows how skyscrapers in the future Prins Alexander district can be combined with the train station and public amenities to create a vibrant and diverse urban center.

High-rises can provide a large variety of residential units and apartments in the future to meet the needs of future population growth. They can also provide a new type of community space in order to stimulate inclusivity and identity. The podium level of the high-rise upper floors can be used as semi-public commercial space or as semi-private gardens for the tower's residents. Moreover, in the future, high-rise buildings can also be combined with station structures.

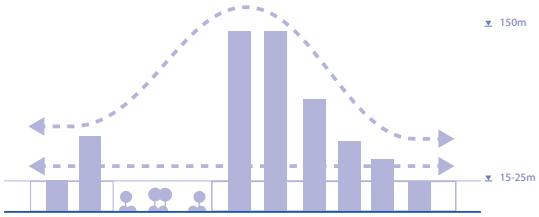
High-rise buildings may also include several layers of commercial spaces, flexible-co-working spaces, and meeting rooms. These spaces will all benefit from a location close to the Alexander mobility hub. Amenities with a cultural or social component may also prove to be suitable for the high-rise typology in the Alexander district.

Through the transformation of the station and the surroundings, the urban area becomes a vibrant and activated space. More parks and playgrounds will appear in the Alexander area, and public spaces will become more versatile. These natural spaces may also be combined with the polder landscape in the Alexander area to strengthen both the identity and the diversity of the area.

The mixed-use high-rise typology (Figure 4) has the potential to bring different people together, where multiple functions can benefit from a high-density city with many amenities in close proximity. The diagram shows how an accessible public space on the ground floor and lower-level buildings at max. 25 m height can be combined with high-rise. Together they form a functional high-density mixed-use district.



Multi-layered urban space concept diagram, based on document by Stad van de Toekomst, written by Venhoeven Architects, 2018



High-rise concept diagram, based on the same document, 2018

FASCINATIONS AND SOFT DATA

"What will the future station look like?" Delving into the topic one image was evident from the start, the need for the future users to move efficiently through the station. In our contemporary fast-paced lives the most factor for mobility is seamless flows between different modes of transportation, without ever causing the feeling of 'getting lost' due to complex spatial configurations and movements.

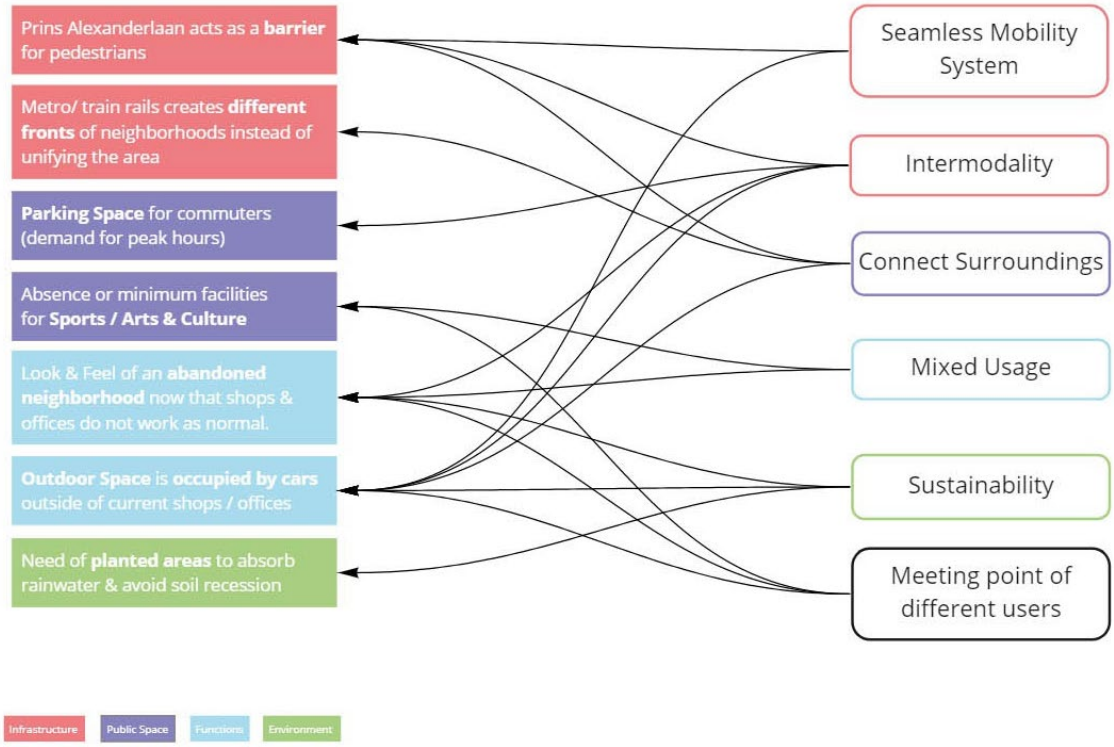
The concepts of intermodality and 'first & last mile' solutions go hand in hand in future scenarios, where sustainability is one of the fundamental goals. Lowering the CO2 emissions, with the use of electric cars, shared mobility options etc., is an ambition that has to be integrated in every station. Access and availability are key elements in changing people's transportation habits and preferences.

Furthermore since public life is arranged and organized around a station, the experience of the users is of utmost importance. When waiting for one's preferred mode of transportation, the surrounding functions and amenities might be the reason to use that particular station. Stations might even evolve into more social spaces in the future. A metro station could serve as a gathering place for the neighborhood; a train station as a social hub shaping intercity connections. Moreover, a station, with its public responsibilities, should be an inclusive space. In our modern society, accessibility is necessary for all, but unfortunately inclusivity is often overlooked.

Lastly, the station is seen as a building that promotes resilience for a city. Therefore sustainable solutions on net-zero energy consumption should be integrated from the concept phase to the construction phase. In combination with new solutions for public transport, stations should accommodate efficient traveling without harming the environment further.

A station becomes a symbol for the area and its development. In the past, station structures were treated by designers as a kind of machine, for which efficiency is the only thing that matters. However stations go far beyond that as they become landmarks and meeting points, while their infrastructures also connect different neighborhoods and communities. Rotterdam Alexander Station provides a great case study into understanding the complexities and opportunities of stations within their surroundings. We developed these criteria to establish a collective methodology in analyzing the area and developing inclusive solutions.

Word cloud of associations with the station of the future



Developed criteria and their priority ratings

HISTORY

The Alexander polder was erected in 1874 and was then used as an energy source in the form of turf (Historische Vereniging Prins Alexander, 2010). Later the land was used for food production and agriculture. During the massive urbanisation in the 1960s the Prins Alexander polder's role changed again as it was converted into a residential neighborhood. During this era the character of the polder structure was broken down by modernist architects, but the metaphor of the polder was still applicable as the area became a fragmented landscape. The landscape was mainly formed by the 14 polders of Alexander. These structures are still visible in the current urban plans, but unfortunately have resulted in fragmented 'islands'. The polder is no longer one united place, but rather a scattered area.

Historical maps, From Topografisch Bureau

Water and peat | **1000**

Peat extraction on a bigger scale | **1600**

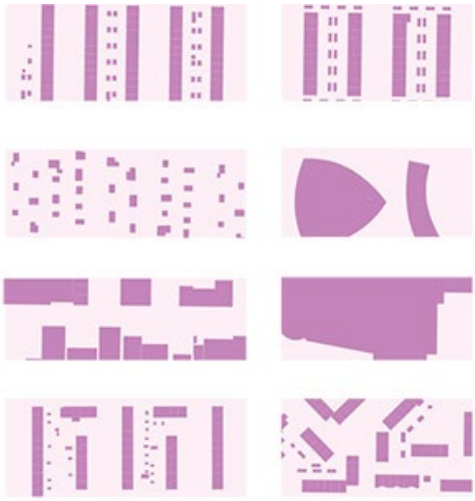
Agricultural and horticultural area | **1874**

Residential area | **1963**

MORPHOLOGY

Urban tissue in neighborhoods surrounding the Alexander area is characterized by orthogonal positioning of streets and row houses. The houses in the northeast and southeast are types of "cauliflower neighborhoods", houses facing each other, enclosing inner courtyards, and following the typology of the area – in this case water bodies. Hangar zone west of the station consists of orthogonal connections, but unlike houses, buildings vary in size. Situated between train tracks and highway, is green area with small mobile houses, grouped in plots containing few of them. Places where urban tissue starts to change is station and surrounding space, containing buildings of different functions.

Materials change together with change in urban tissue. Surrounding neighborhoods were constructed with brick and hangar zone of steel. The central area contains a variety of different materials, brick, concrete, stone, glass, etc. This is because from 1960s to mid-1980s the neighborhoods were developed to facilitate housing and hangar area for shops. The central part however was built in different years, containing different functions. This creates a lack of coherence in building morphology and consequently, fragmentation in the public space.



SEGMENTED URBAN TISSUE

SEGMENTED URBAN TYPES

Urban typologies diagram

DEMOGRAPHICS

The 800m catchment area of Alexander station lies within three neighborhoods: Ommoord, Het Lage Land and Oosterflank (Figure 4.1). The demographics data from these three neighborhoods was collected and combined to get a better understanding of the context. The combination of the neighborhoods will be referred to as 'the service area', which houses 4.6% of the city's population. The demographics in the service area were compared with those of Rotterdam and the Netherlands.

The demographic data itself was gathered from two sources. The data on the city is taken from the municipality of Rotterdam[1] and the data about the Netherlands was gathered from the Central Bureau of Statistics (CBS)[2]. The researched demographic aspects are: age, household composition, income, education, and migratory background.

The demographics of the service area differ from both the Netherlands and the city of Rotterdam in multiple aspects. While Rotterdam overall has a much younger population than the Netherlands, the population in the service area is actually relatively old, especially in Ommoord and Het Lage Land. The data on household composition shows that both Rotterdam and the service area house a large share of single-person households. More than half of households consist of one person in Het Lage Land. Furthermore the service area has a relatively low income average and a less educated population. Lastly, the area has a somewhat less diverse population in terms of migratory background than the city of Rotterdam, although it is still clearly more diverse than the Netherlands' average. In this case, there is a large difference in diversity between Oosterflank and Ommoord.

In short, the population surrounding Alexander station is relatively old, has many single-person households, has a relatively low income and education level and is quite diverse. A comparison between the neighborhoods points towards a division between the surrounding neighborhoods, especially looking at diversity.

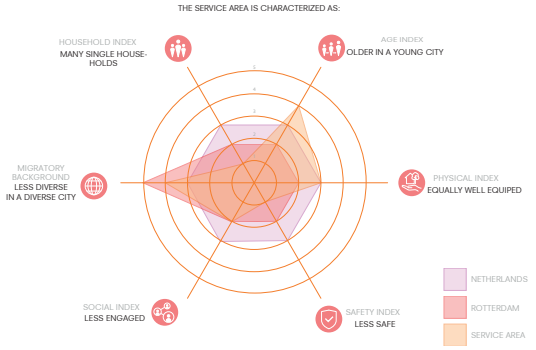
The service area surrounding Alexander station

1 Gemeente Rotterdam, 2020
2 CBS, 2020

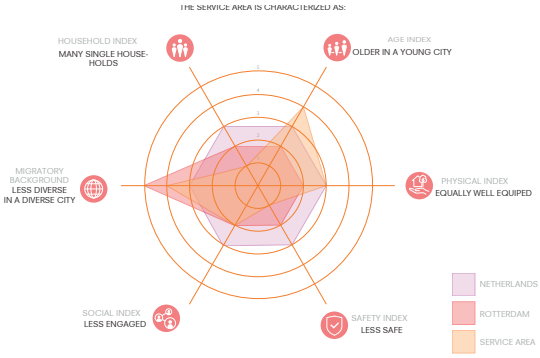
NEIGHBORHOOD PROFILES

The following analysis looks at the neighborhoods surrounding Alexander station, based on neighborhood profiles of the municipality of Rotterdam[1]. These neighborhood profiles are developed from scores given to certain categories, based on both objective and social indicators. Comparing these scores between the three neighborhoods and the average score of the city of Rotterdam reveals some of the main strengths and weaknesses of the area. The neighborhoods have high scores for physical indicators. The only category in which they are objectively lacking is the proximity of amenities, however residents are satisfied with the current situation compared to the average city residents. What should be mentioned though that in Rotterdam itself only about 50% of residents is satisfied with the city's amenities, so also around Alexander station there is room for improvement. Within the safety indicators, a large difference is visible between Oosterflank and Ommoord en Het Lage Land. Oosterflank scores the lowest of the three neighborhoods in general, pointing at the existence of a barrier between the neighborhoods. As for the social indicators, het Lage Land receives low scores for self- and joint-sustainability.

The neighborhood profiles were combined with the demographic data to create concluding diagrams for both the whole service area and the individual neighborhoods (Figures 11 and 12). The service area as a whole appears to be lacking in safety. Also, in some aspects, large differences exist between the three neighborhoods. As mentioned before, this points at a barrier effect causing a division between these areas.



Comparing the service area to Rotterdam and the Netherlands



Comparing the neighborhoods surrounding Alexander station

Physical indicators
- Housing: the quality and monetary value, and residents satisfaction
- Public space: the quantity and quality of public space.
- Amenities: the proximity of amenities and resident's satisfaction with the accessibility of amenities.
- Environment: air and noise pollution.

Safety indicators
- Theft: the amount of theft and resident's perception of theft.
- Violence: the amount of violent crime and the perception of residents.
- Vandalism: the amount of vandalism and the perception of residents.
- Burglary: the amount of burglaries and the perception of residents.
- Disturbances: the nuisances caused by youth and drug users.

Social indicators
- Self-sustainability: the ability of individuals in the population to take care of themselves monetarily and socially.
- Joint-sustainability: residents willingness to help others, such as neighbors or family, or through volunteering work. Also indicates resident's trust in governmental organizations.
- Participation: participation in the labor market, social/cultural activities.
- Connection to neighborhood: the amount of people moving out of the neighborhood and how connected residents feel to the neighborhood and the city.

1 Gemeente Rotterdam, 2020

FUNCTIONS & MOBILITY

The highlight of Prins Alexander, from a user perspective, is the shopping malls. 67.000m² of ground floor space is programmed for retail and commercial use. The Alexandrium shopping center is the largest in the city and consists of three parts: Alexandrium Shopping Center, Alexandrium Megastores and Alexandrium Woonmall. Furthermore the station is located near other important functions, such as the two colleges at the opposite side of Prins Alexanderlaan. Continuing further in this direction one can find many industries dedicated to the automobile sector. The station's Park & Ride facility is located directly above this area, with two floors available for parking. The private garden quarters begin at this point, positioned away from pedestrian access and view. Additionaly the upper part of the station houses big office buildings and an energy factory, which intensifies the difference in scales. These zones are surrounded by the residential urban fabric, again presenting a stark contrast in scale. This condition presents a fragmented area, where spaces are activated and used at very particular times of the day. Apart from the residential area, the neighborhoods are only used during daytime, resulting in empty and unused spaces in the evenings and nights. Cultural programs lack not only around the station but also in the larger area. Sport facilities and community spacesa are also scarcely available. In future development these functions can serve as the area's incubator to attract families with higher income and increase the land value.

The main conclusion of this analysis is that there is a horizontal allocation of functions, followed by the modernist urban design of creating zones, which lead to this fragmented urban tissue. Due to this horizontal division of functions the area gives the impression of an abandoned neighborhood, even during the daytime.

The main roads are the highway (A20) and the parallel road S109, which focus on the neighborhood and the diagonal road, Prins Alexanderlaan.

The area is known for the train station as the tracks connect to the rest of the Netherlands.

The station is used by 8000 people a day. Alexander is mainly a station where people begin their journey and thus requires a lot of parking spaces. Also, the area is known for its furniture stores, which increases the demand for parking options.

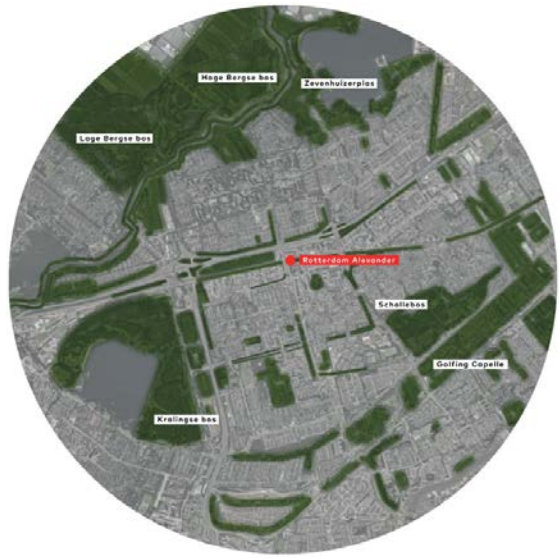
The road network creates isolated islands, limiting circulation and connections across the area.

Ground-use analysis, from https://www.atlasleefomgeving.nl/kaarten

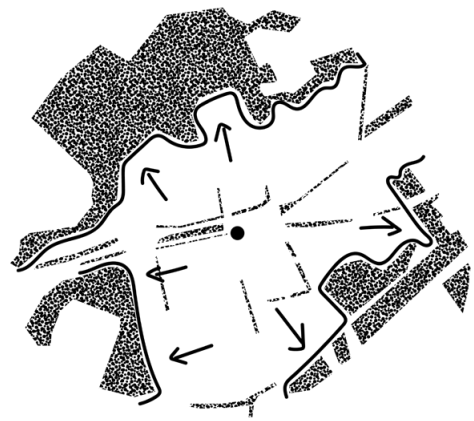
GREENSCAPES
Regional scale

The green fields in the larger regional area are typically forests, golfing areas and agricultural landscapes. The larger fields are outlines of the former polders in Alexander. The fragmentation observed in previous pages continues here as the larger fields are only connected to the center through narrow strips of green.

The organizational diagram on the right helps one better understand the area in relation to greenscapes. The structuring sketch depicts the larger green fields as well as the direction of other critical greenscapes. It can be observed that the landscape outside the former polder is quite structured while the greenery within the polder area is formed in a more natural way. This formation allows the narrow strips of greenscapes to act as a 'green belt'. It can be said that the greenery is mainly available around the area of Rotterdam Alexander, where one can only find narrow and longitudinal green fields that aim to connect to the outside area.



Green structures in Alexander and surroundings, 1:100000



Green scarf around unused central space, only longitudinal green structures connect with ALX station.

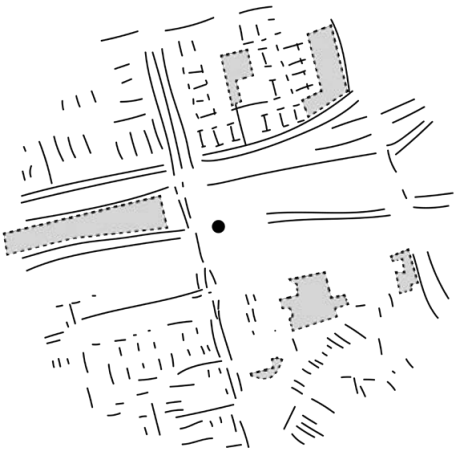
GREENSCAPES
Site scale

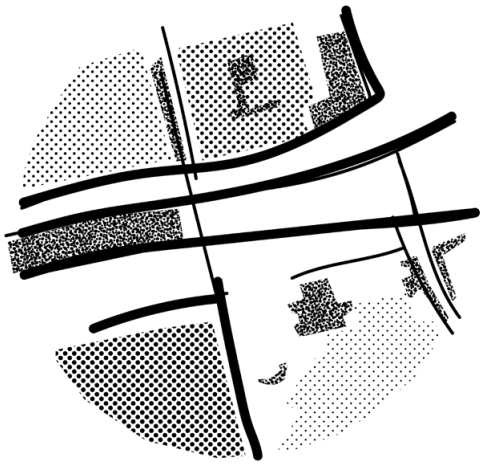
Image 19 zooms into the site get a better insight on the greenery within a 5 minute walking distance of the station. The greenscapes are categorized into three: private, semi-private and public. Gardens and courtyards are an example of private green areas. Semi-private structures are green areas that are accessible in theory, but not in practice, such as the dike on which the train tracks are located or the community garden of a building complex. Lastly, the public green structures are areas that are accessible for most people, like a public park.

The dikes are the bigger green areas alongside the track, but they are inaccessible due to the surrounding gates. The same goes for the green areas in between the roads. The greenery is not really layered, it can mainly be found on ground level as grass fields. Only the dikes are creating a more layered green structure.

In each corner of the Alexander area there is a different type of structure and directionality. These are mainly the private gardens of house owners in the residential areas. Besides that, there are a few longitudinal green structures that divide the area between north and south several times. Those structures are located along the highway and the train tracks. Lastly, the area also contains several free form green structures, mainly one in each divided area.

Greenery around Alexander station





Green scarf around unused central space, only longitudinal green structures connect with ALX station.

PUBLIC SPACES

The broader region surrounding the Alexander station (~2 km radius) lacks meaningful public spaces apart from the occasional neighborhood shopping centre. In the immediate vicinity of the station, one encounters large shopping facilities and offices. While these function as city-level or even regional destinations, they are largely hermetic indoor spaces with limited engagement with the public space.

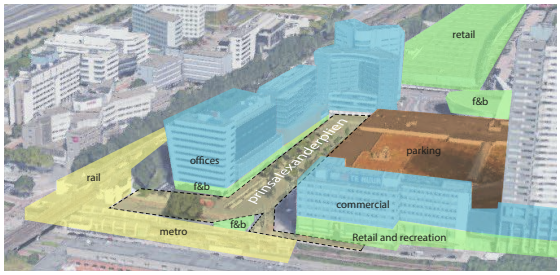
What appears as generous open spaces abutting these large structures in the map are actually large parking lots, meant for the furniture retail customers and commuters. Two squares, Poolsterplein and Alexanderplein, are noticeable exceptions. The former is an intimate square at the main entrance of a shopping mall, acting as a spill-out for these functions. The latter is a larger plaza abutting the station.

Alexanderplein is bounded by the metro station, office buildings and a multi-story parking lot. Various edges and boundaries disconnect the plaza from the surrounding pedestrian and cycling infrastructure. While there is some retail and f&b activity at the ground level, it is inadequate to activate this space.

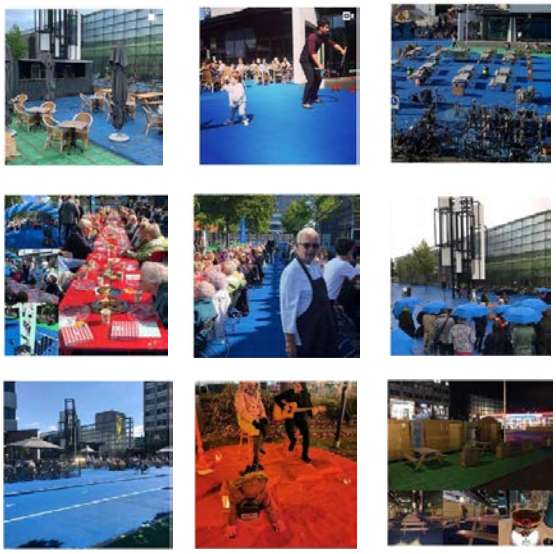
This is observed in a quick social media analysis [1]: in the 102 Instagram posts hash-tagging the plaza (going back 2.5 years); the space is occupied and active in only 10 pictures. In other words, the plaza is apparently empty and abandoned 90% of the time. Also, the 10 images only show intentional appropriations of the space: stages built, tables laid, and events held — as opposed to spontaneous, organic activity.

Apart from the lack of activating program, the scale of the plaza also discourages its use. This is seen in how the new design scheme for the plaza[2] attempts to break down its scale by strategically introducing landscape features and urban furnitures. The ambition of this intervention (and the broader Alexanderknoop development) is to create a 'destination' that engages people to stay and not just pass through.

Alexanderplein needs to be opened up; broken down in scale; and activated with more vibrant uses. It has the potential to become an attractive urban outdoor space that connects local residents, shoppers and commuters.



Alexanderplein bounded by inactive edges


Alexanderplein in use


Alexanderplein proposal: 'Green city', from Gemeente Rotterdam

1 Instagram search: hashtag 'Alexanderplein', Feb 2021
2 Gemeente Rotterdam is re-doing the plaza in 2021. https://www.rotterdam.nl/wonen-leven/alexanderplein, Feb 2021

Public spaces around Alexander station

HIGH-RISE ANALYSIS

Prins Alexander is chosen as one of the few districts in Rotterdam which the potential to become a high-rise area. Figure 27 shows the high-rise boundary zone around in Prins Alexander. Within this boundary, a maximum of 2 hours decrease in sun hours is considered acceptable[1].

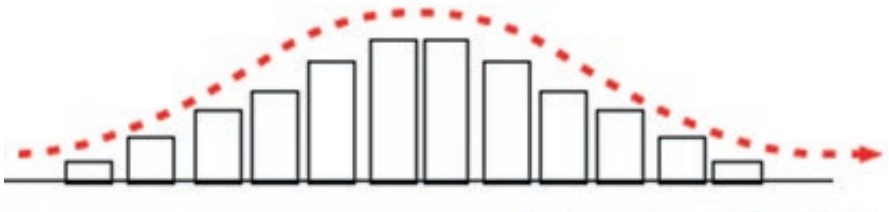
For the light-green area on the map a slight reduction in sun hours is permitted; the city has set a minimum value for number of sun hours. The dark green zones in the image may not be negatively affected in terms of sun hours. These zones are considered public spaces with the potential for leisure, cultural and social activity, therefore it is important that these areas receive ample sunlight.

According to the high-rise vision by Rotterdam city counselor Kurvers, the high-rise around Alexander may not exceed a maximum height of 150 meters[2]. Moreover skyscrapers must be integrated in the surrounding built environment with regards to the enclosure of public space. The ground floor of highrise has to have a high degree of transparency which provides opportunities for businesses and contributes to an increased sense of social security. Parking is no longer an indisputable requirement for high-rise. Exemption can be granted based on the transition to a more sustainable mobility.

The high-rise vision proposes a wind design principle, shown in the image below, which reduces high wind speeds in order to improve the outdoor comfort in public spaces.

According to the UN World Population Review %86 of the current buildings in the Alexander District were constructed before the year 2000[3]. Therefore many existing buildings most likely do not meet modern standards for energy efficiency and indoor comfort.

The high-rise typology in the Prins Alexander district can solve the housing demand in the future by replacing inadequate existing buildings with a short remaining lifespan. This design principle is suitable for a large degree of densification in close vicinity to the Prins Alexander train station.



1 Kurvers, 2019, pg. 41
2 Kurvers, 2019, pg. 60
3 United Nations, 2020

High-rise wind design principe in the city, from Kurver 2019

High-rise analysis, content based on Kurvers 2019, Hoogbouwvisie 2019.

WATER STRUCTURES

Technology and water management have always played an important role in the emergence of the Prins Alexanderpolder. With sinking soil, rising sea levels and increasing water levels in rivers and rainwater, technology and water management will also be essential in the future for this area, located 6.7 meters below sea level. The water level is being showcased in the image on the right. During the last few decades the water has been removed from the area and is only occasionally visible. Mainly small ditches and little waterstructures are the last things that carry some information of the former use of the ground and area. However, the municipality has built a few projects in the district to make the water more noticeable, such as the square island in the water. This is a sculpture located at the lowest point of the Netherlands and aims to raise more awareness of the water identity.

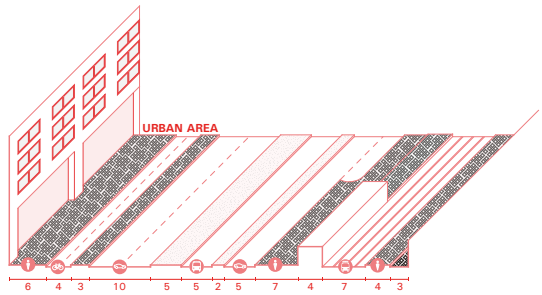
Figure 29 shows the current water structures in the area. In the north there are mainly longitudinal ditches that are covered with greenery on both sides. The highway also has two longitudinal water structures stretching from west to east. On the south the most water structures can be found in the residential area, which flow along the important routes. In addition this residential area contains a park, where also different and more free forms of water have been created.

Water elements in the area

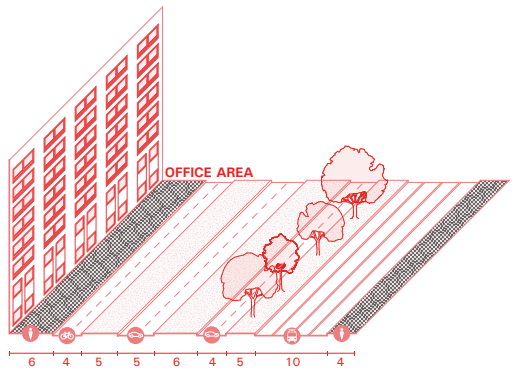
Water structures around Alexander station

SECTION ANALYSIS
Mobility

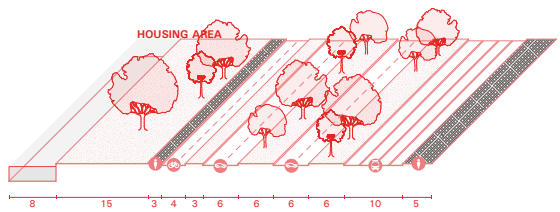
A. The transportation flows around the station are complex and segmented. The wide width of the streets increase this segmentation. The use of green becomes functional as it is only used as the separation between the different flows.

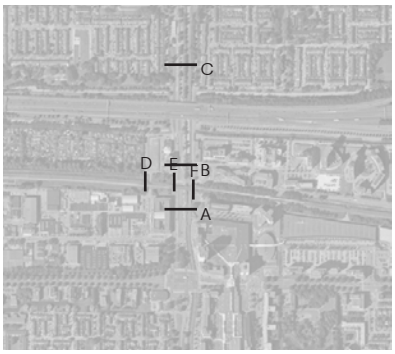


B. The offices are located between the train tracks and the main road. The streets are still very wide, but the different flows are less those than in the urban area. Therefore, there are more ‘green lanes’, but they still have the same use: the separation of the different flows.

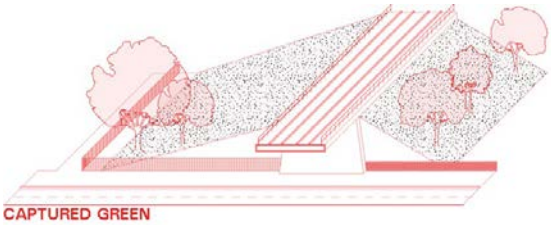


C. In the housing area the situation changes again as the green structures take over. Also the water structure along the street allows a more linear and separated mobility flow.

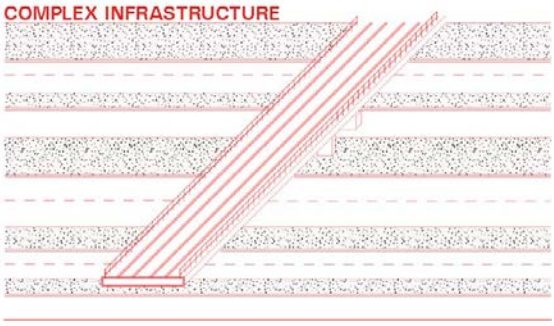




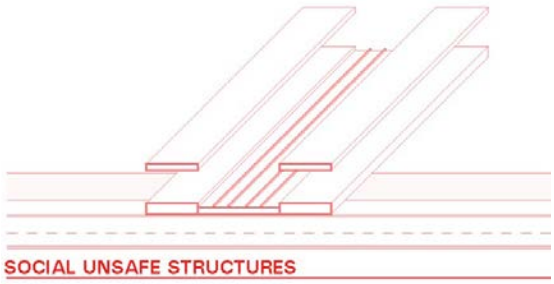
Train tracks



D. The train track is by itself a barrier for the Alexander area because it is above the main roads. On the other hand, it also can be seen that the train tracks connect the different areas. In the 'green captured' section, it can be seen that the green space around the train tracks is not accessible. With other safety measures, the green space surrounding the train tracks can become a better quality space.



E. The green space between the main roads is used for the construction of the train track bridge. This must be considered when proposing a new road design.



F. The train tracks run above the main roads, creating an unsafe environment. The diagram shows the station tunnel next to the Alexander station, a low, narrow and dark space.

THE STATION
History

The first Alexander station (Figure 37) was designed by Dutch architect Cees Douma, who joined the Dutch railways in 1960 and in the next fifteen years was responsible for several small and medium-sized stations. Alexander station was opened in 1968. Shaped like a sextant, the station was indirectly connected to the elevated railway platform through stairs positioned parallel to the tracks.

In 1983, the old building was replaced with a new one (Figure 38) designed by Wladimir Trabsky. The new building had two platforms for train tracks and two platforms for the new metro line on the ground level. In 1998 a plan was developed to tackle the problem of transfer between train and metro lines, where people had to cross the high-speed metro line in order to reach the platform. This plan was not realized until 2010, when it was used as an precedent for the newly approved project, Integral Vision Alexander Knot (Integrale Visie Alexanderknoop).

The process of improving the Alexander node began in 2017 and a year later the station was renovated by architects Marc Verheijen and Flip Luger. The new plan accommodated both train and metro lines, providing an efficient transfer between modes. The renovated station building (Figure 39) opened in July 2020.

Alexander Station in 1976, from Stationsweb

Alexander Station in 1983, from Stationsweb

Alexander Station in 2020, OPL Architecten



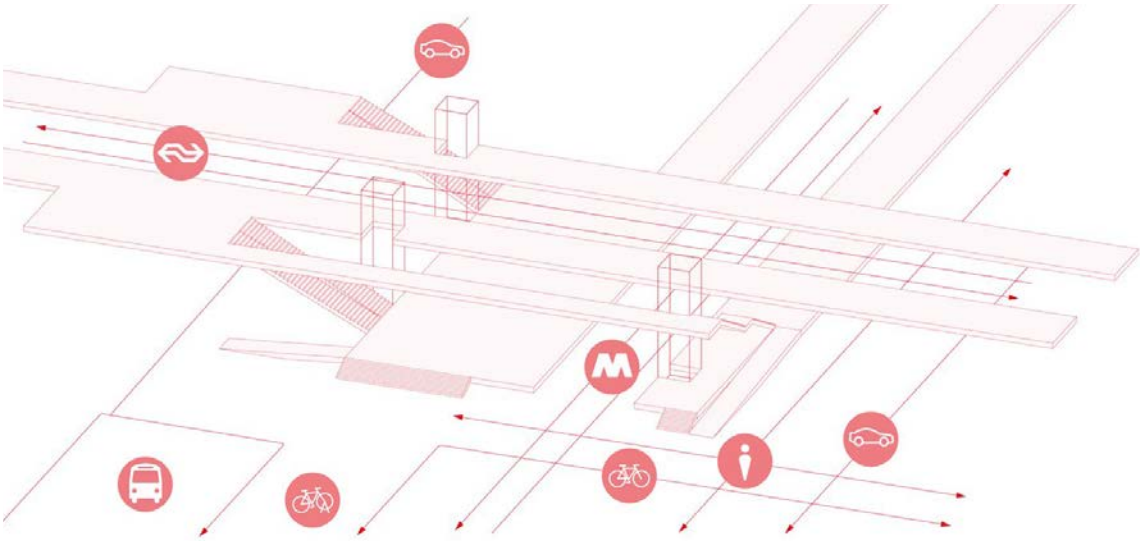

Spot

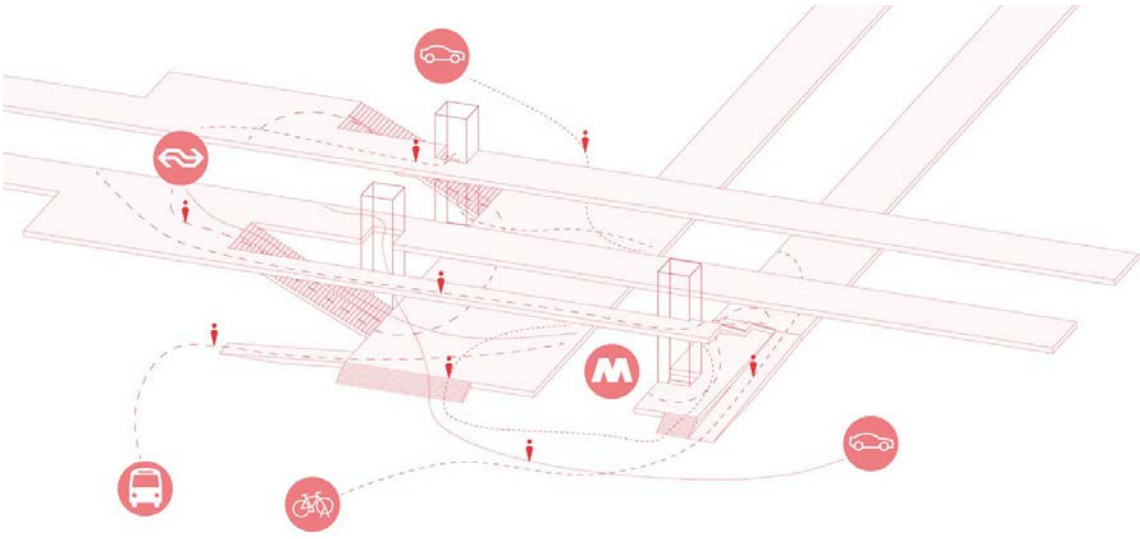




THE STATION
Permeability & Circulation

As seen in Figure 40 the mobility at Alexander station is very diverse and complex. There is an array of different flows, the train track, metro track, bus stop, different bicycle parking facilities, main and smaller roads and a pedestrian road next to it. Currently the connection between different modes of transportation is complex and illogical. The station is used by 8000 travelers a day. The station's critical role as connector to the rest of the city and the country, requires these modes to function more efficiently and pragmatically.

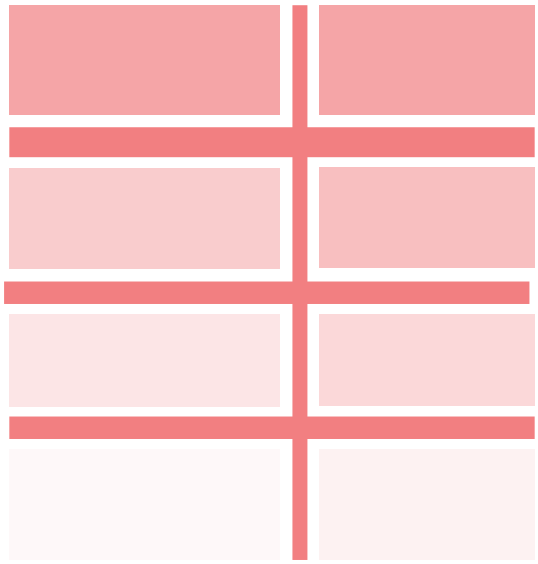


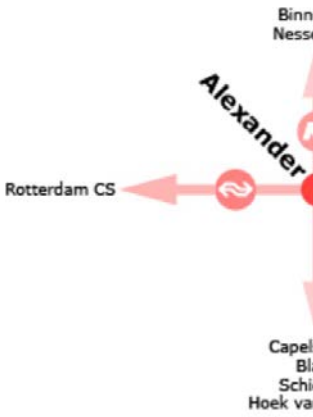


THE STATION
User Profiles

The Alexander station is seen as a destination and as a transfer station. This can be seen in the usage analysis below. Also, the station itself is gate to the rest of the city and the larger territory. The user profiles also highlight the station's role as a commuter destination.

RESEARCH CONCLUSIONS

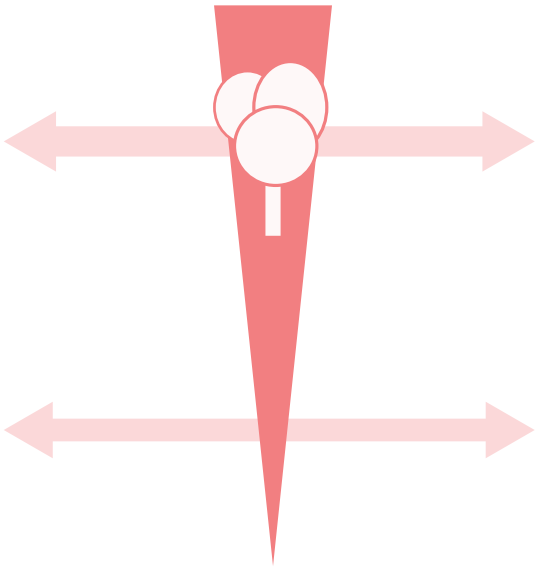




Islands
The infrastructure, water network, greenscapes ands spatial configuration contribute to Prins Alexander's fragmented identity. In the future this mobility hub can become the positive catalyst for the Alexander area: one where the infrastructure does not segment the area, but enhances it.

Connections
The Alexander station is very
of Rotterdam, as well as the
is because it offers a set of t
business for small scale tran
scale transportation and the
transportation. The station's
larger territory need to be ta

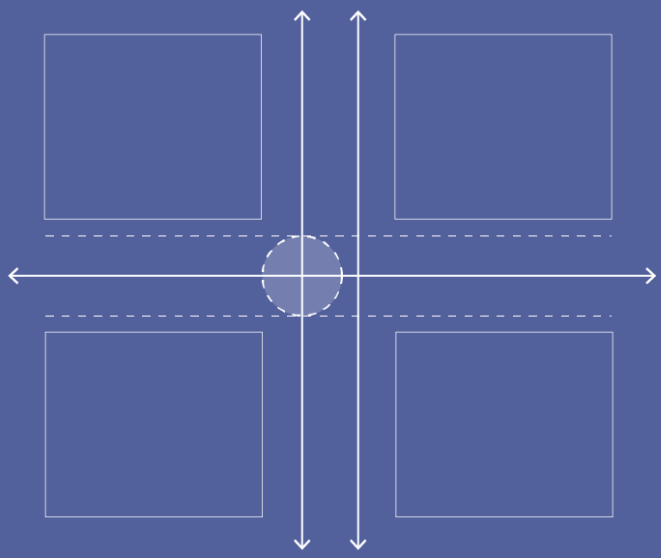
y well connected to the rest
rest of the country. This
transportation systems:
sportation, metro for urban
train for national scale
critical role in the city and
ken into account.



Green infrastructures
Landscape, greenscapes and water structures currently only contribute to the further segmentation of the area. These elements can be used to not only create accessible and inclusive public spaces, but also introduce new functions to the area.

Vision 1

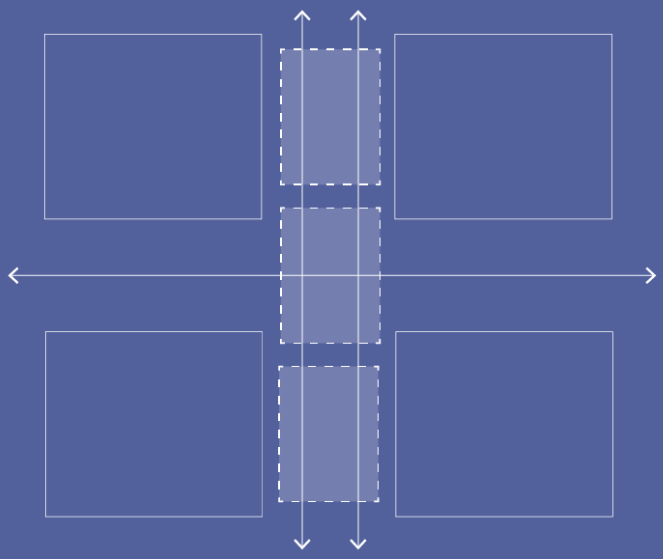
ALX25



ALX25 focuses on a conservationist intervention by keeping the station building. The proposal merges the fragmented areas around the station by rethinking the flows and enhancing the diversity in the area. It will become an inclusive polycentric hub within the city of Rotterdam.

Vision 2

ALX40



ALX40 proposes a new urban identity and masterplan, with significant infrastructure modifications and a redesigned train station. ALX40 aims for a new area identity centered around furniture. The proposal envisions the area as a hotspot in the region for the design, manufacturing, and selling of furniture in a modern circular economy.


Rotterdam Alexander

Blurring the Boundaries

Alexander Station
ALX25

Blurring Boundaries Project Video

Georgina Giassia
Sander Meert
Weiyuan He
Koen Stam

VISION

Prins Alexander has an important role in the development of the area as the transportation hub of the polycentric city. Train tracks and the highway connect to Rotterdam Centraal and the Hague in the west and to Gouda in the east. As seen in the Figures 47 and 48, the metro connects with the center of Rotterdam on the southwest and with Ommoord and Nesselande in the north.

Based on the research and initial analysis, the project positions itself in relation to the historic polder landscape, a water landscape filled with turf defined by dykes to prevent it from flooding, with the currently fragmented islands bordered with infrastructural barriers. The structure of the Alexander Polder is fractured today in multiple levels. First of all, the road structure has created urban islands with different characters and functions. Furthermore the disintegration is also visible in the socio-cultural background as well in its mobility flows.

ALX25 focuses on a conservationist intervention by keeping the station building. The proposal merges the fragmented areas around the station by rethinking the flows and enhancing the diversity in the area. It will become an inclusive polycentric hub within the city of Rotterdam. On an urban scale the proposal aims to create a human-centred and permeable place. The four connected islands will become a human-centred and permeable place where cars are no longer the main mode of transportation. This will happen by introducing new functions, a new green and blue network of connections, and thereby creating a new bold identity for Prins Alexander: one that refers to its history and rethinks the area in the future. Of course, this change cannot be done overnight. Therefore the intervention proposes a set of different phases for the coming thirty years.

Dikes for infrastructure and buildings pose barriers in pedestrian flows

Multiple mobility flows create an unpermeable barrier

The border of Alexander station

Vision collage

ALX 25
Concept Principles

The urban strategy renewal is based on three main pillars: connection; identity; ecology.

Connection is about first rearranging the road section and connecting the fragments around the station itself. It aims to create one continuous urban mesh, thereby making one united identity. This is done by lowering the landscape itself.

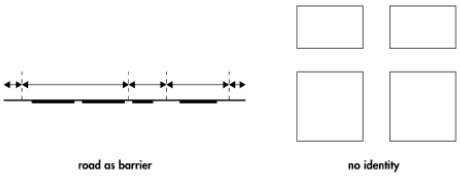
While there is a lack of identity, besides the consumer-based character, one notices an inherent local character based on craftsmanship, which can be seen in the many practice schools at the Prins Alexander Laan. The proposal aims to highlight this part of the existing identity by making its presence stronger and expressed in the urban space itself. Besides the identity of craftsmanship, the character of the blue and green infrastructure is also discreetly present in the area.

The Prins Alexander polder, once known for its impressive water management, which was lost after the modernist urban design, must be revived. ALX 25 proposes a new water structure that ensures that the area is future-proof and can serve as a water buffer. Also, the aesthetical green structure, which is seen in the current area, does not have any ecological value. The station area can be used as a stepping stone for awareness in the area by making a diverse ecological system.

The proposal aims to introduce a new polycentric city centre, structured around the existing Alexander train and metro station. By remaking the Prins Alexanderlaan to the Prins Alexander boulevard ALX25 aims for a slow traffic-friendly area. New east-west connections are also made with new promenades that connect the entire region.

1 CONNECTIONS

BEFORE



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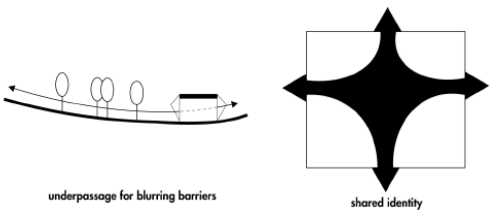
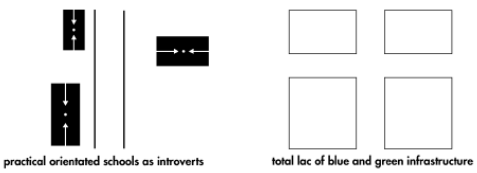


2 IDENTITY

BEFORE



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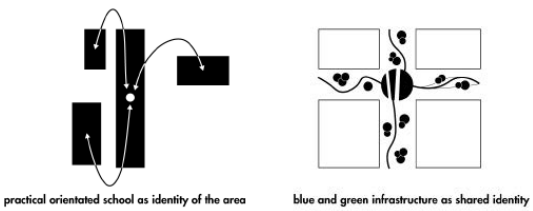

3 ECOLOGY

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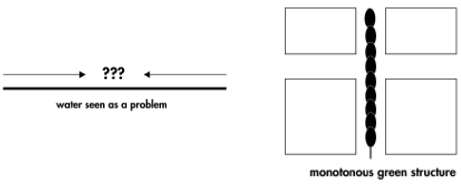

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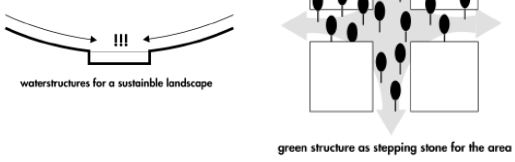


01 Connection principle transforming the area
02 Identity principle transforming the area
03 Ecology principle transforming the area

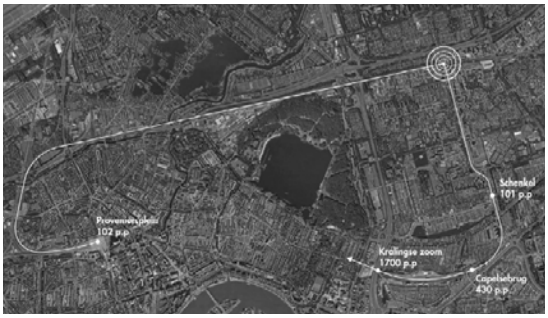
ALX 25
Car connections & P+R transformation

An important conclusion on the car routes and possible passenger scenarios is to zoom out and understand the relationship of Alexander station combining train, metro and bus station with Rotterdam centre, as well as other ones, synthesizing the polycentric city.

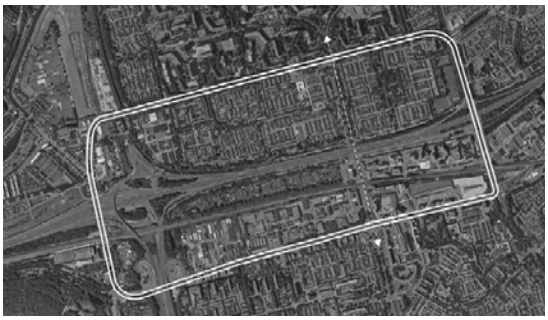
Prins Alexander is becoming a destination in itself rather than a suburban gate to the city centre. There will be a gradual shift from the mobility hub today, which poses many problems to its users and the residents. The intervention proposes to move the P+R to other metro stops, as it is clear that with the future high-rise developments Alexander will become a destination. This decision is based on two observations: firstly, the challenges of the current P+R facility which is not well connected neither to the highway nor the existing station and secondly to the limited need for such a facility in this area. Figure 55 shows all the P+R capacities of the nearby stations. For instance if a user wants to reach Rotterdam Centraal by leaving his car and commuting by metro, this can be facilitated in Kralingse Zoom. As the area is transformed so will the capacity of the Alexander P+R facility until it can be removed.

Regarding the car flow the current 4-5 lane road in Prins Alexanderlaan is simplified with a two-lane highway, as depicted in Figure 56. This is made possible with the introduction of the new ring road around Prins Alexander area. The main structure of this ring road is already there, but it is needed to make the area less car independent. In addition, the previous cyclist paths on both sides of the road are repositioned to one side of the design.

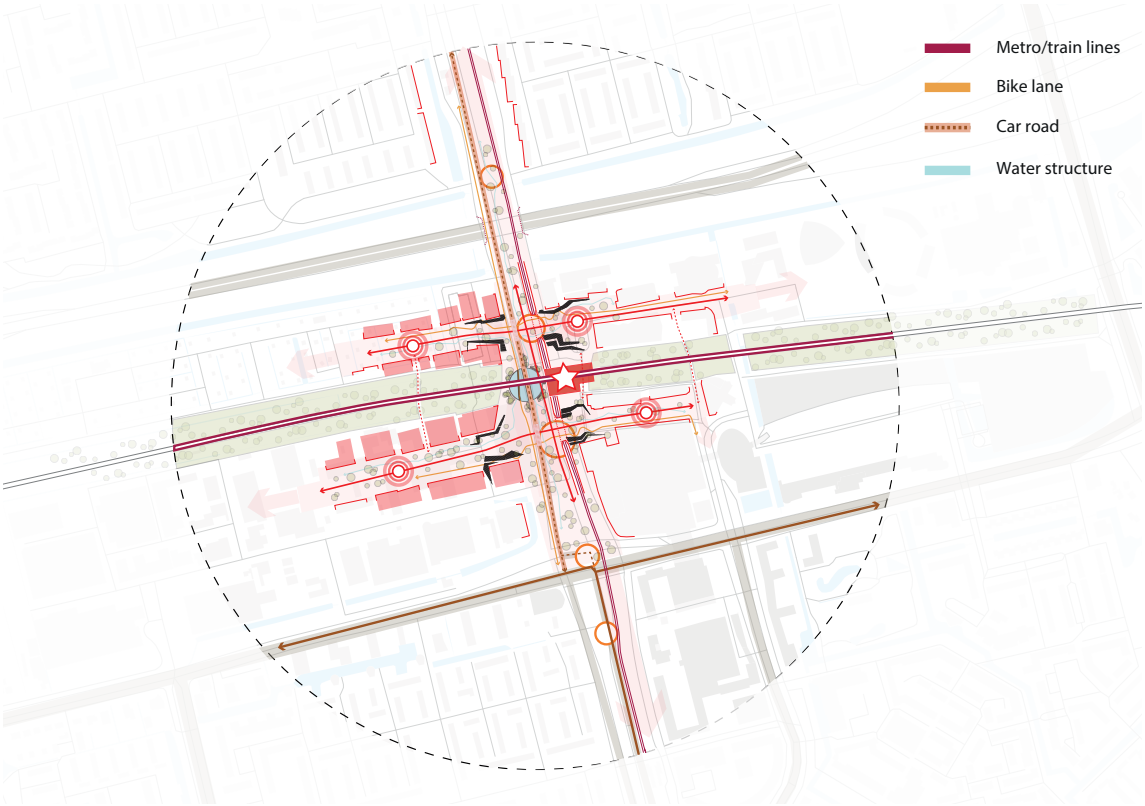
Polycentric city



Nearby P+R facilities and their car capacities



The ringroad as a circular connection & Prins Alexanderlaan



Vision map

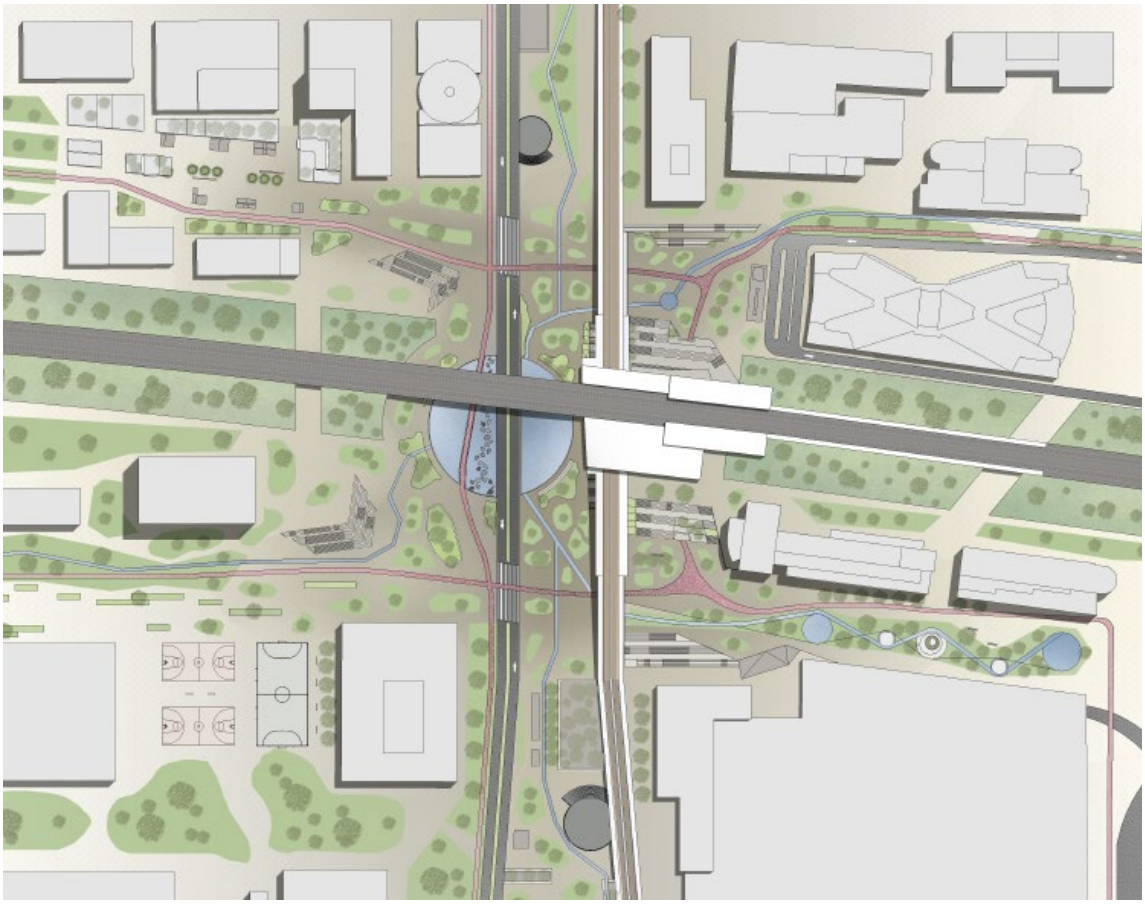
ALX 25
Urban Vision and Masterplan

The masterplan tackles the problematic fragmentation in a layered design strategy. First and foremost, the 'important mesh' of the strategy is evident, by creating an urban plan with new building outlines, in order to draw the needed connections for the area to become one neighborhood.

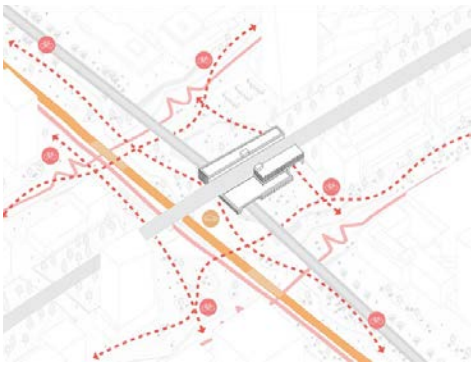
As the existing station and therefore the existing levels of the metro and train must be kept as they are, creating an underpass at two specific locations is the smartest solution for the continuity of all mobility flows. The primary intervention can be seen in Prins Alexander boulevard, which is lowered by 5 meters. The metro is still on the same level and the 2 lane car road is placed on the boulevard itself, and follows the lowering inclination around the station.

The new character around craftsmanship is coming to the forefront of the public space, to create interesting atmospheres and unravel culture. A future proof polycentric city centre is the ultimate goal. To achieve this ambition the masterplan proposes a high-rise typology for the future developments, as well as three case scenarios for rising water levels. Creating parks at different levels, either on the buildings or at the new public ground increases the ground porosity for water drainage, which is a critical aspect for the plan of Rotterdam 2050. These strategies are combined with the sculpting of a new lowered ground level, in such a way that the water is directed to a central element that acts as a water storage filled with hydrophilic vegetation and increases the biodiversity of the area. With these design tools, a major problem of the Netherlands is transformed into a design solution that shapes our green and blue infrastructure.

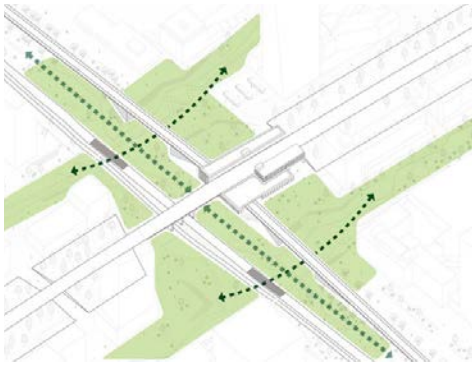
ALX 25 becomes a palimpsest of 5 different landscapes on top of each other: the mobility landscape, public landscape, sustainable landscape, build landscape and finally, the one targeting craftsmanship as the new character. The masterplan demonstrates how the former polders will now transform into a layered city, which shapes and highlights the public space around Alexander station as an incubator for social cohesion and inclusivity, by attracting all the different target groups and offering them a space for interaction.



ALX25
Layered landscapes



Mobility Flows
The intervention establishes a new hierarchy in modes of transportation. The 2-lane car route and the new bike routes form the new mobility grid. Thus the car is not the main focus of the area anymore: ALX25 is focused on slow traffic, mainly the pedestrian and the cyclist.



Public space
Lowering the ground and building the two under passages demolish the barrier of the metro lines. These public spaces are characteristic of their green and blue structures and, therefore, the area's activation. The blue and green networks also connect the entire ALX25 area, thereby making a new place identity.

Water structure
This image illustrates ho
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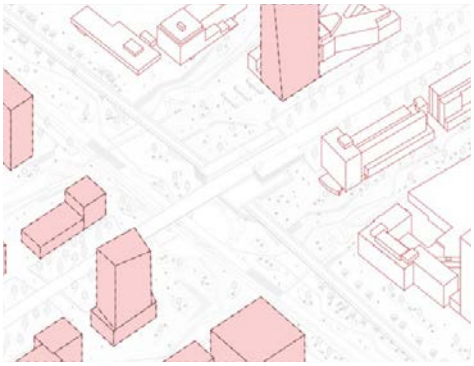
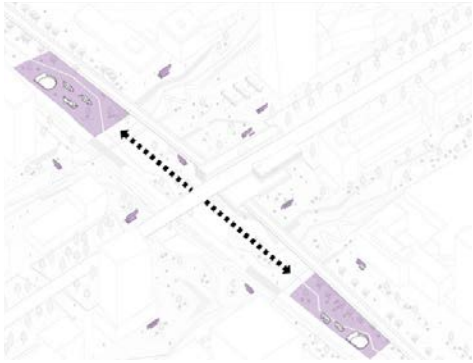


High-rise buildings
The new high-rise developments are specifically planned in plots where the 'important urban mesh' is left unobstructed. In ALX25, the existing buildings are reused as much as possible. The ALX25 plan demolishes only parts of some existing buildings to connect the fragmented islands to each other.



Craftmanship
The new identity of the ALX25 is centered around craftsmanship. This can be seen in the workshops, which are integrated into the boulevard structure itself. Also, there are multiple exhibition spaces placed in the public space on different levels. With this, the Prins Alexander boulevard becomes a campus for craftsmanship.

ALX25
Station Plan

The minor change to the station is that the structure extends to the west side of the current station, under the train bridge. With this expansion the station becomes directly accessible from the lowered public space, which is situated on the new Alexander Boulevard.

Since the station becomes the highest point of ALX 25, the building is surrounded by numerous staircases. These elements are also the facade to the added bicycle parking, located under the stairs. The entrance of the new bicycle parking is visible in the fragment drawing. Besides the practical functions of the stairs, they also become an activated space, because they are mainly used as a seating facility around the station.

The new bus station is located in the north of the city. The station is simplified and rationalized by adding an extra road parallel to the train track. The addition of this road erases the need for a bus-turning point on the square.

The current tunnel is unsafe and feels like an unpleasant place. The intervention proposes extra added functions to the tunnel, such as a new store (for take away coffee's) or an exhibition space for the craftsmanship theme introduced with ALX25.

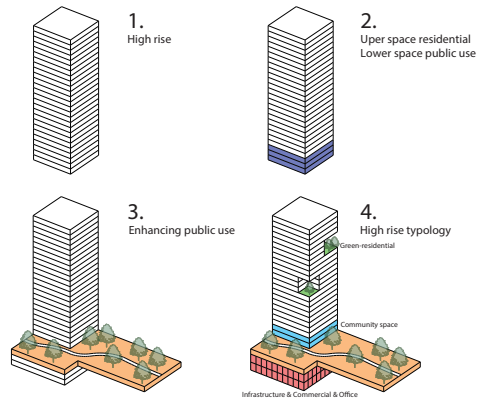
Although the station itself is not changed, the transformations to the bus flows, pedestrian flows, bicycle flows and car flows, the station adapts as well.

Designed areas in a smaller scale - the station

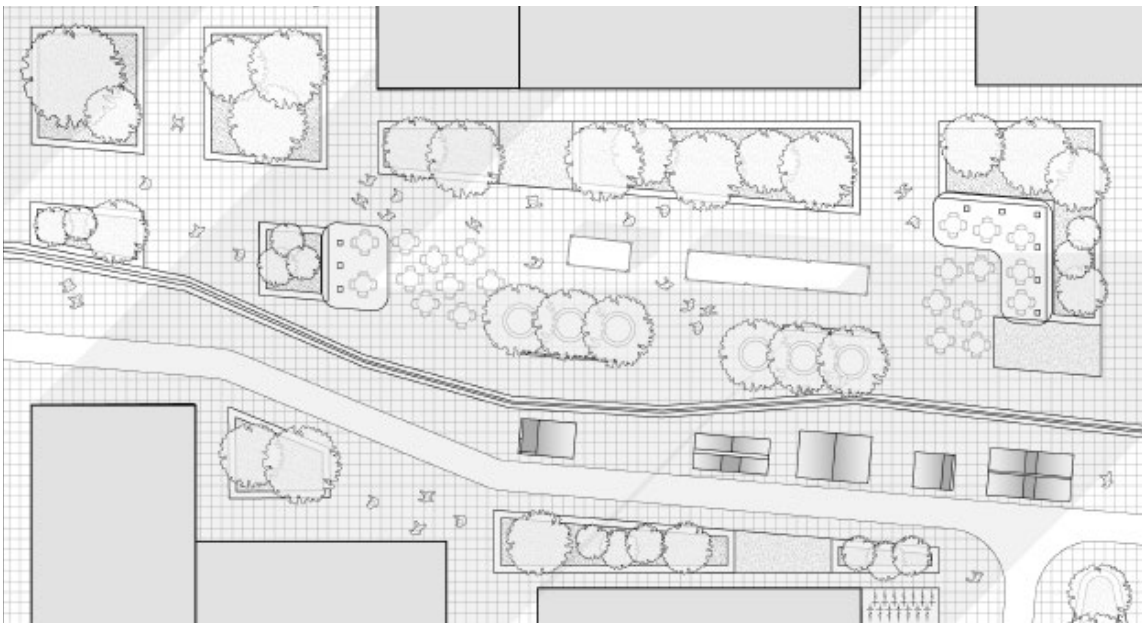
ALX25
Active lane in the northeast

New buildings are proposed along the train tracks. The plinth of all buildings house public functions such as restaurants and stores. The buildings are mainly used for housing and offices. The use of green and blue structures creates different spaces along the buildings, contributing to a more human scale experience of the area.

On the west part of the fragment there area different elements introduced for sports activities. On the other side of the square, several exhibitions spaces are placed to show the craftsmanship theme.



Highrise typology

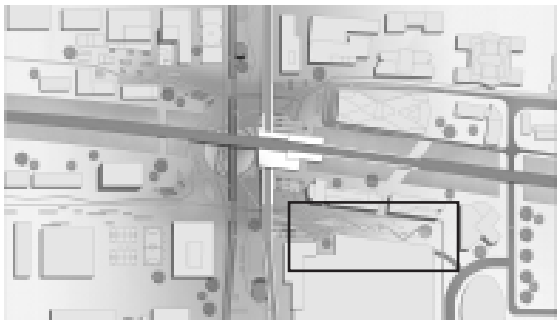


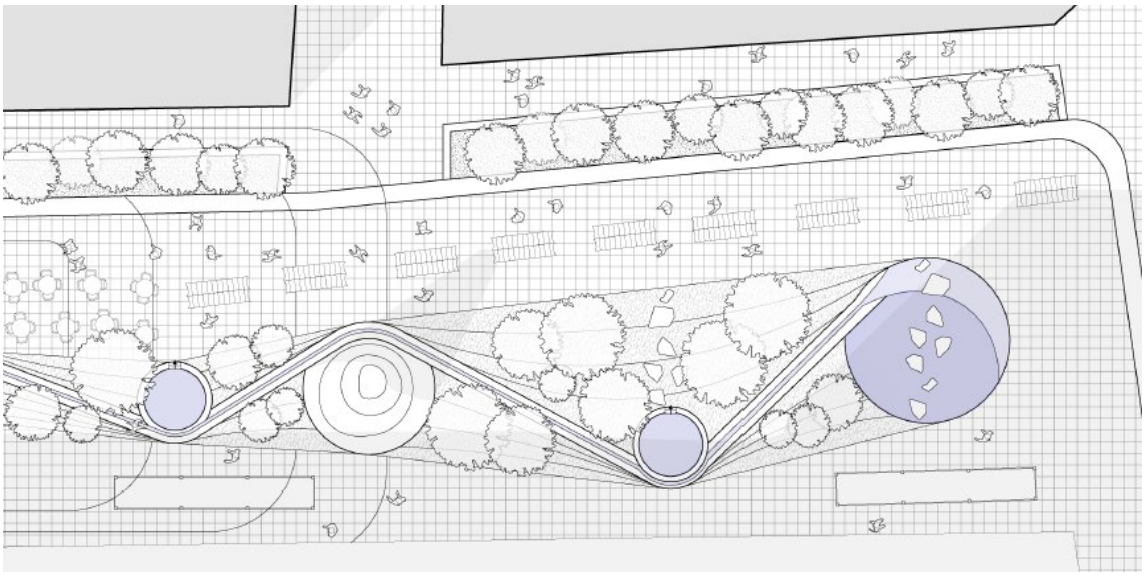
Designed areas in a smaller scale - active lane

ALX25
Active lane at the southeast

A new ecological landscape is placed in the middle of the Prins Alexander Plein to give it a green character. The space is also used for markets and cafes. The current Prins Alexander Plein is overtaken by its blue color, whereas the proposed Prins Alexander Plein is identified by its blue function, the water square.

The new square is used as an ecological landscape with a new water system in the middle. The system consists of three main basins and a water connection in between. In heavy rainfall the soft landscape floods, reducing peak discharge. The square still has a lot of unprogrammed space, where several markets and events can occur.



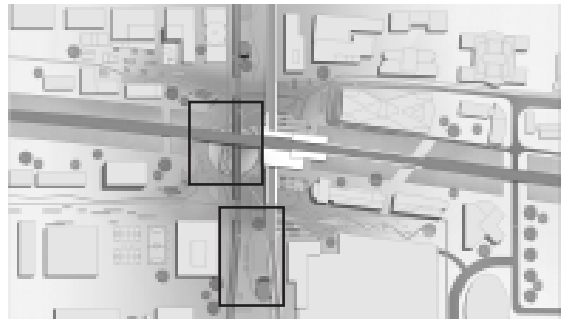


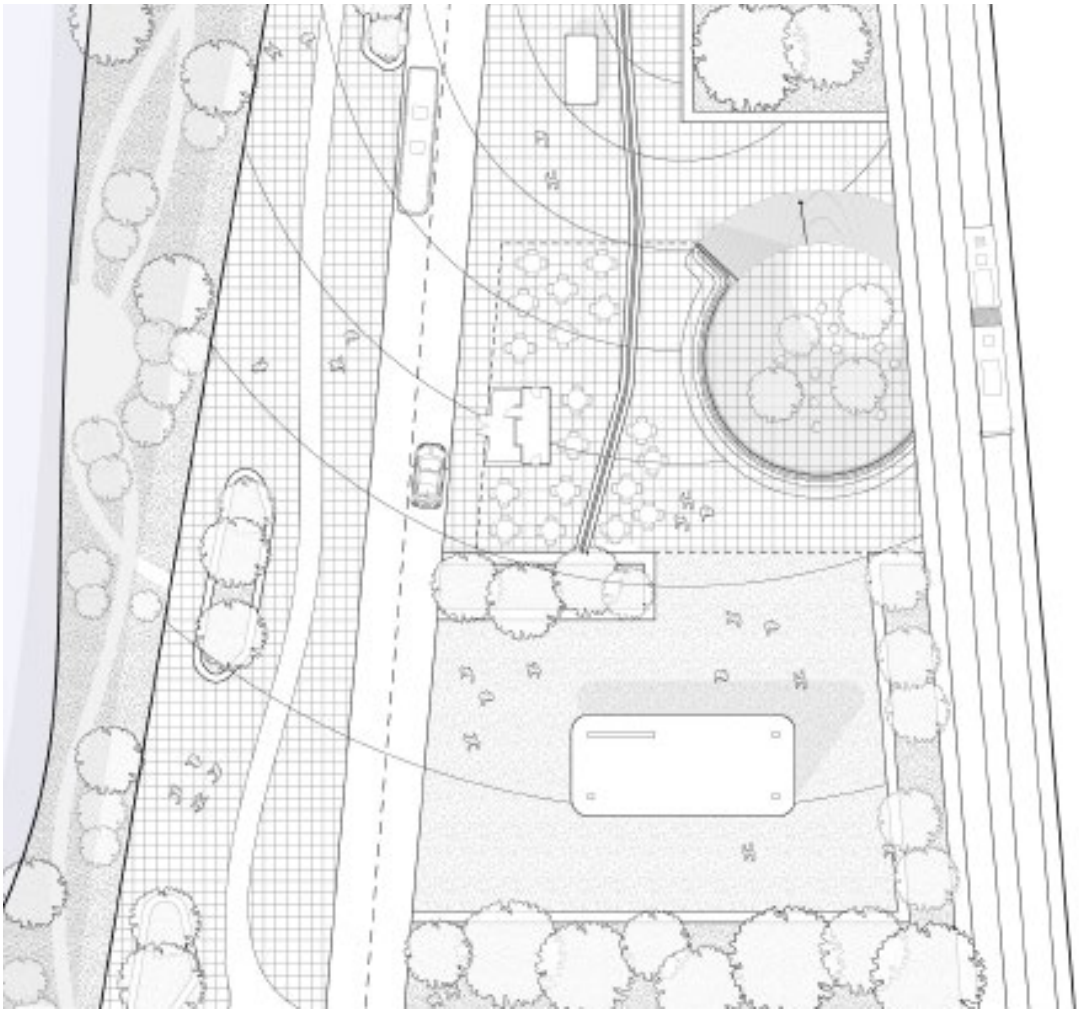
Designed areas in a smaller scale - the polder lane

ALX25
Craftmanship boulevard

The new Alexander Boulevard is characterized by the theme of ALX25: craftsmanship. This is seen in the integrated workshop spaces for the practice orientated school. Spatially the Alexander Boulevard slowly descends towards the lowest point of the boulevard: the pond under the train bridge.

A new pavilion for public shows stands in the beginning of the boulevard. It is 'protected' from the area by its several rows of trees. Thus the space around the pavilion feels small and intimate. A coffee spot stands above the pavilion, next to the integrated workshop. The workshop leads to a new level 4 meters under the boulevard.

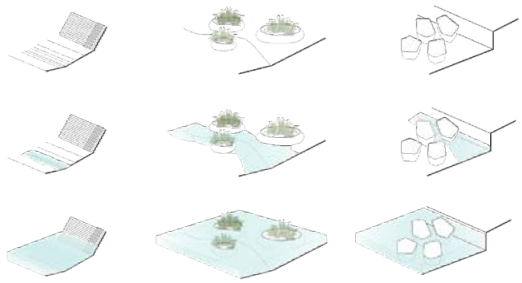




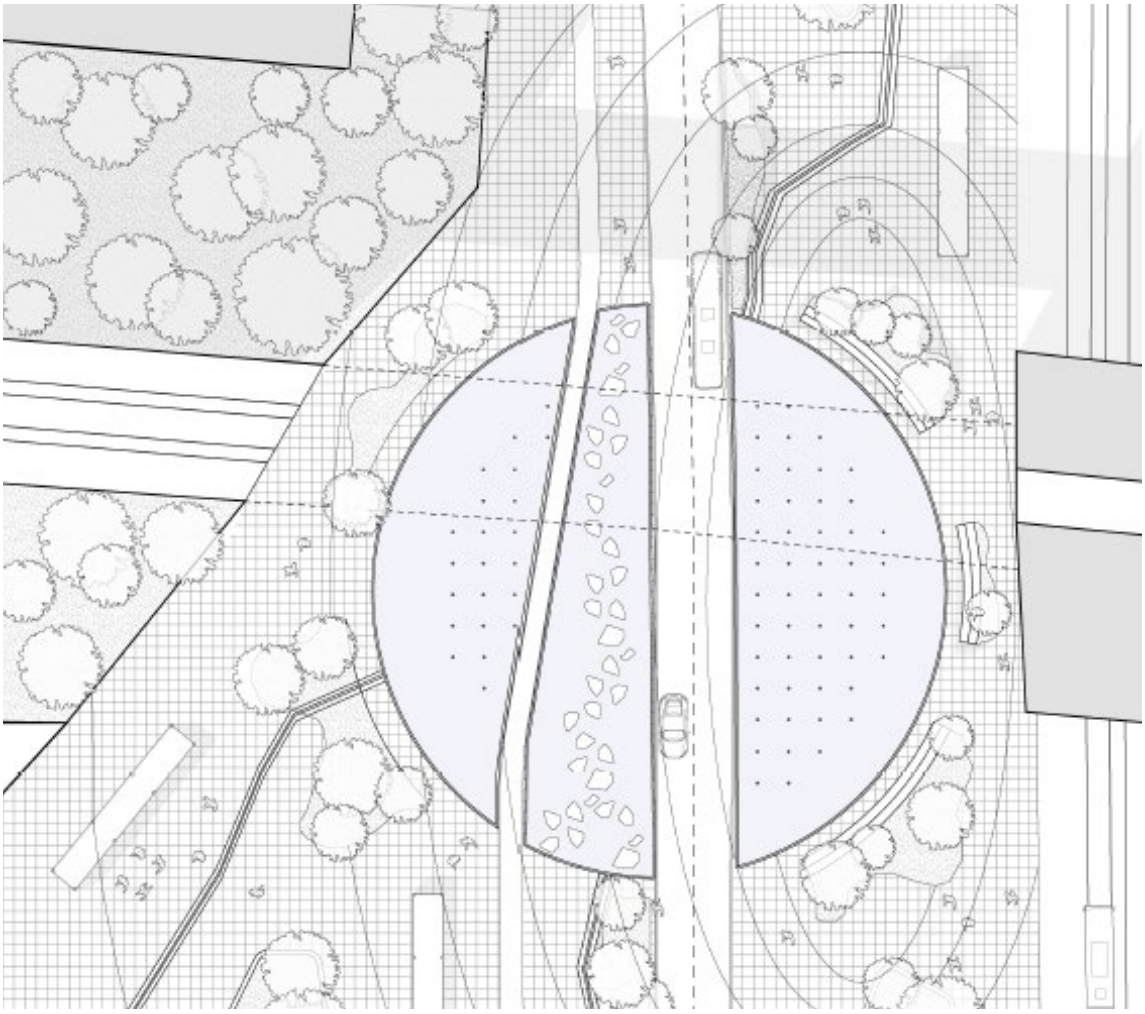
Designed areas in a smaller scale - craftsmanship boulevard

ALX25
Watersquare

The lowest point of ALX25 is located under the current train bridge. This area is used as the central point for water storage. All the streams are connected to the water storage. The water storage can also be used as a public space, when there is no water in the basin due to the lack of rainwater, the space is open and be used for several activities. Around the water basin, several exhibition spaces are made to make the craftsmanship character visible.



Water resiliency design for different water level scenarios



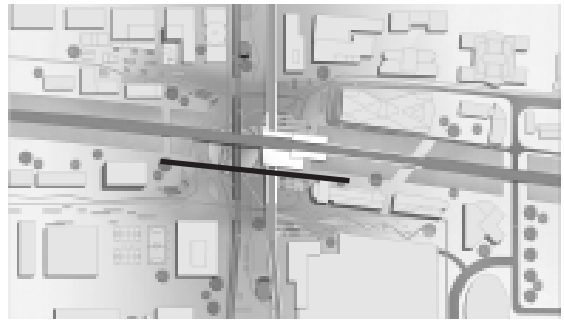
Designed areas in a smaller scale - watersquare

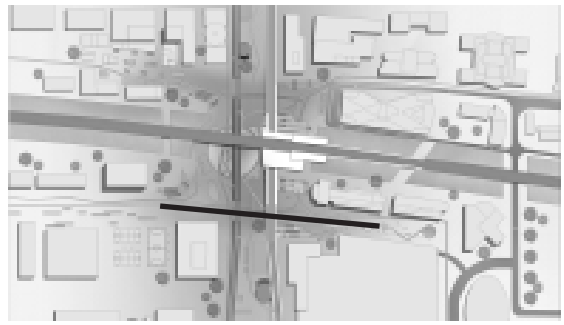
ALX25
Sections of the new polycentric hub

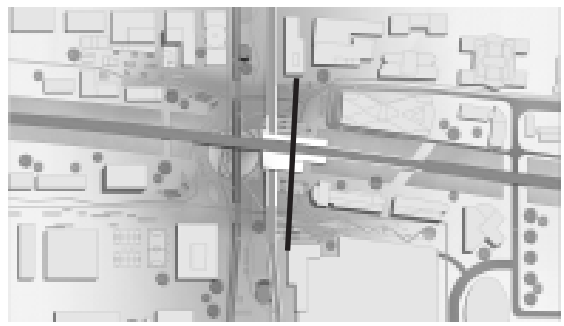
The proposal aims to connect all four sides around the station by lowering the area around 4-5 meters. The first section on the right visualizes how well the east and west area could be merged with each other. Instead of an empty place, it becomes a vibrant urban area. Creating such a space is essential to develop a new polycentric hub. The centric urban fabric functions as a connector between the fragmented islands and the newly added high-rises.

The second section focuses more on the area closer to the station. A new bike storage is added and the metro tracks remain the same. In addition, the section shows the potential of the lowered area underneath the train tracks. Besides connecting the north and the south the new height creates a great potential for this area.

The last section visualizes the section from the other direction. New bike storages are added underneath the stairs connecting the station with the lowered urban space.







BEFORE
The north side of the station is almost fully covered with pavement. The metro track forms an big barrier, as well as the 5 road lanes behind it. Also the bike storage on ground level is troublesome.

AFTER
The proposal merges the areas around the station by lowering the public space and connecting it underneath the metro tracks. Also new green structures have been added in order to create a new identity and to improve the area's sustainability. In addition, water structures are implemented to ensure storage and re-use.

Station square - before
Station square - after

BEFORE
The roads form a barrier between the west and east of Alexander. Thus the space underneath the train tracks doesn't feel welcoming. In addition the greenery that is already there has no function and cannot by used by the public.

AFTER
The proposal merges the urban space and adds important green and blue structures. Thereby new functions, layers and materiality are implanted in the design, making it more human scale. Another essential design element is the changes in the amount and placement of roads, creating less of a barrier.

Figure 10.1 - Watersquare - after

Watersquare - before
Watersquare - after

Furniture City

Alexander Station
ALX40

Project Video

Ruben de Leeuw
Jorn Beltman
Aneesh Nandi
Pepe Gomez-Acebo
Reinier Kok

ALX40: FURNITURE CITY

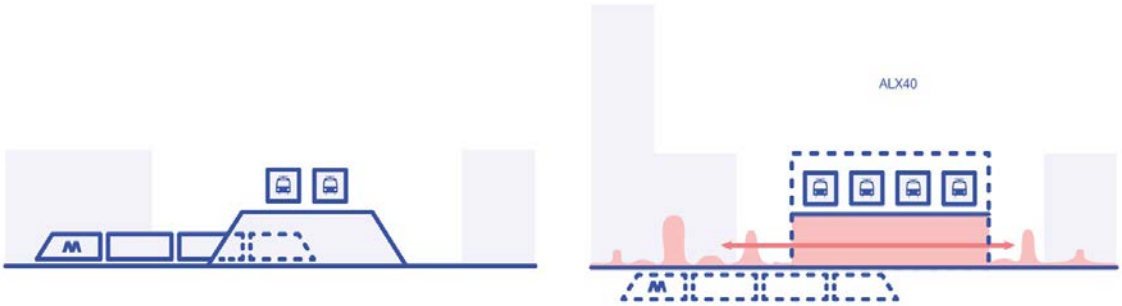
ALX40 aims to solve the fragmentation of the district by looking into the future, the year 2040, and aiming for a new area identity centered around furniture. The proposal envisions the area as a hotspot in the region for the design, manufacturing, and selling of furniture in a modern circular economy.

The area currently is an important destination for furniture retail. However, with the rise of online shopping the traditional model is at risk. The area can use its existing identity as an opportunity to further expand on it and diversify its reach.

Districts such as the Strijp-S district in Eindhoven have successfully transformed from a mono-functional district to a vibrant cultural, commercial, and residential center. Inspired by these precedents, the proposal aims to develop on the place identity to attract a diverse audience including young professionals, students, and cultural visitors.

To achieve this vision, ALX40 intervenes both at the urban and station scales. Existing monofunctional areas are densified and transformed into mixed-use neighborhoods with high-rise residences. The proposed street facing commercial spaces together with the public space provides a collective furniture-centered experience. The urban space prioritizes the presence of furniture, biodiversity, and the human over that of the car.

In this context, the station becomes the activator of the Prins Alexander, knitting it together with an emphasis on micro-mobility. Increasing the train tracks from two to four allows for further densification following the morphology of the neighborhood: adding new street-facing amenities under the platforms, and enclosing them with an enclosed building envelope. Additionally, submerging the metro increases the permeability across the neighborhood. At the intersection of the tracks with Prins Alexander is the main entrance of the station, a light vertical connector that acts as a gateway to ALX40.



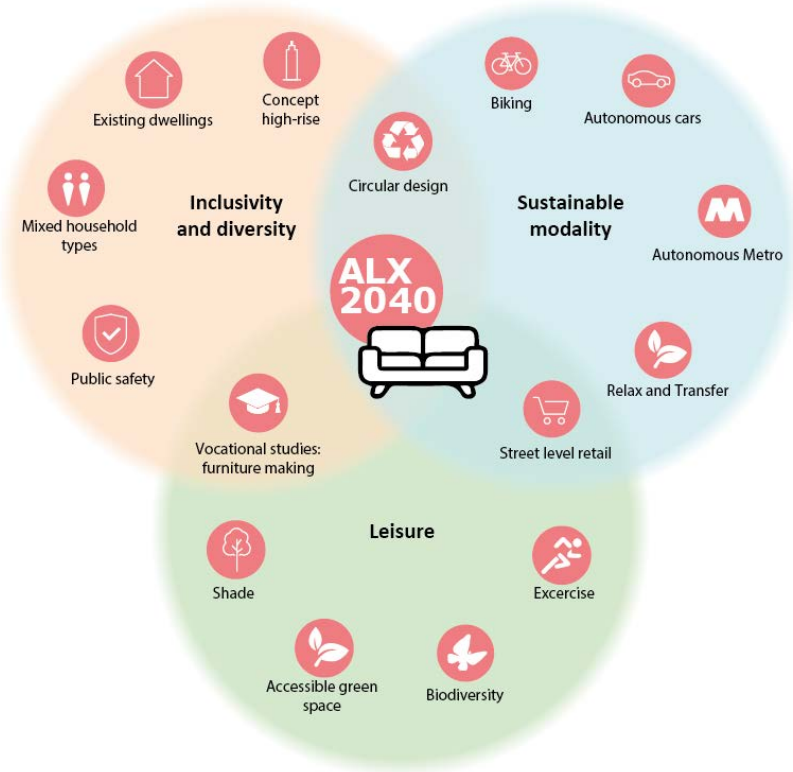
Diagrammatic transformation of the site proposed for ALX40

CONTEXT

The current furniture retail spaces in Alexander exceed 50.000 m2. It is only rivaled in size by other large spaces in the Hague and Utrecht, as well as Haarlem and Amsterdam. However, given its central location in the Rotterdam–The Hague metropolitan area, Alexander has the potential of becoming a dominant player in the furniture business.

Moreover the risk posed by online shopping could be a major opportunity in creating a new place identity. The commercial function of the area is ripe for an identity reinvention, one that takes the essence of the existing condition and adapts it to the multiplicity of a circular furniture-centered economy.

Therefore, the area will no longer just be a retail center, but a district where design and manufacturing will take the center stage. New and reinvented functions will diversify the neighborhood, create employment opportunity, and stimulate cross-disciplinary initiatives. In turn, these will add to a shared place identity. The furniture place identity will transform the area will from being functionally homogeneous to becoming a diverse and unique experience.



ALX40 furniture concept

URBAN PROCESS
Tools

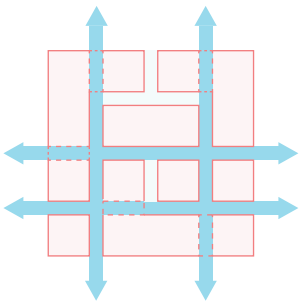
The design of ALX40 includes an almost completely new urban plan. The goal for this urban plan was to design a new future-proof, inclusive, mixed-use, high-rise district, that solved the current fragmentation of the area surrounding Alexander station. It also needed the vision of the Alexander district as one of the centers in a polycentric Rotterdam. In order to accomplish this, four main tools, were used that would help with the integration of the new urban plan within the city, as well as the integration of a new mobility-hub within the urban morphology.

The first tool used was the reinforcement and creation of long urban lines. These lines create direct physical and visual connections between the existing urban blocks within the station area, and also connect the station area to its surroundings. As such, these lines facilitate strong connections and help to eliminate the current fragmentation, creating a single district out of smaller fragments.

The second tool used is the concept of Hush, Buzz and Fuzz, as proposed by De Zwarte Hond[1]. These are three types of urban atmospheres and are associated with certain functions, public spaces, street profiles, and residential typologies. Hush spaces are more quiet and relaxing spaces. These spaces include parks, canals, schools, neighborhood facilities, and more suburban-type housing, and are more neighborhood-oriented. Buzz spaces are more active and outgoing. They consist of shopping avenues, restaurants, cafés, active plinths, and mostly paved public spaces and plazas. Buzz also needs visitors to support its active character. Fuzz also has an active character, but is more oriented towards modern and light industry, or other work spaces. Fuzz spaces house offices, creative industry, art studios, event spaces, and for example residential types with included office space or studios. Thus, fuzz spaces also need more logistical access. These three characters were used to indicate program, and building and public-space typologies in the urban plan. They do not have hard borders, but slowly transition into each other.

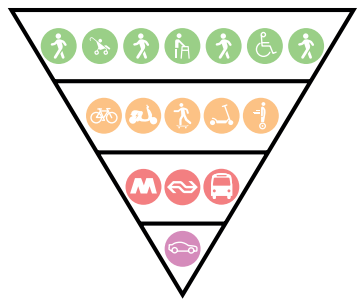
Thirdly, the station, or rather mobility-hub, played an important role as a central element within the urban plan. It is both the gateway to the new urban center of ALX40 and an important gathering space due to its central location within the district. Thus, the connection to, and public space around the station were focal points within the urban design. In order for the new program to be successful, it needs great accessibility, for which the station is the main facilitator.

Lastly, as ALX40 looks into the future, its urban space needs to be designed around future mobility. As advocated for by the municipality of Rotterdam, our current way getting around the city will be turned upside-down. Pedestrians will have priority in the Alexander area, while personal vehicular traffic will be discouraged. Pedestrian traffic, micro-mobility and public transport are all part of a single mobility strategy. They need to work together and be well-integrated in order to facilitate easy door-to-door movements. As a result, access to public transport and shared mobility, combined with pedestrian and micro-mobility routes were important considerations.



Urban Lines

Station as the Center



Mobility Pyramid

1 Tjokrokoesoemo, 2021

URBAN HISTORY AND PLAN

In the 19th century Prins Alexander was developed as a polder landscape[1]. In the second half of the 20th century, starting in the 1960s, the Prins Alexander polder area started to be developed for housing, private gardens. Towards the end of the 20th century industrial and retail functions were added.

Many of main routes indicated in Figure 83 are remnants of the 19th century polder landscape. As shown in figure 84, the new urban design of ALX40 takes the existing urban lines and extends them to promote the continuity across the neighborhoods.

1 Kadaster, 2021

DENSIFICATION

The Prins Alexander district is one of the possible designated areas for further densification of the city of Rotterdam[1]. 3500 new dwellings are placed within the high-rise zone. Adding dwellings to the area will increase the diversity in function; the area around the station will also include housing besides the currently prevailing industrial, office and retail functions.

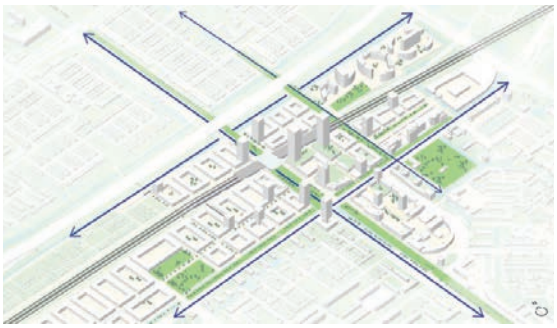
The ground floor of highrise has to have a high degree of transparency which provides opportunities for retail experiences, cafes and other amenities that diversify and activate the public space, and contribute to an increased sense of social security. Furniture-centred amenities are well-suited to be implemented in the skyscrapers' plinths - in line with the highrise strategy.

The current prevalence of the car and its parking space is replaced with green and blue public spaces, which are based on the existing polder model and green landscape.

The plinth-highrise typology is designed is such a way that they enclose and define the important public spaces, including the blue and green landscapes.

1 Rotterdam Municipality & MRDH, 2017, pg. 33
2 Rotterdam Municipality, 2019, pg. 26
3 Kurvers, 2019, pg. 60

Urban design and main routes



Blue and green landscapes

URBAN FUNCTIONS, SPATIAL QUALITY AND MICRO-MOBILITY

The monofunctional quarters are replaced with neighborhoods designed to promote a variety of different urban qualities: the relaxed Hush, the outgoing Buzz, and the active Fuzz (Figure 85).

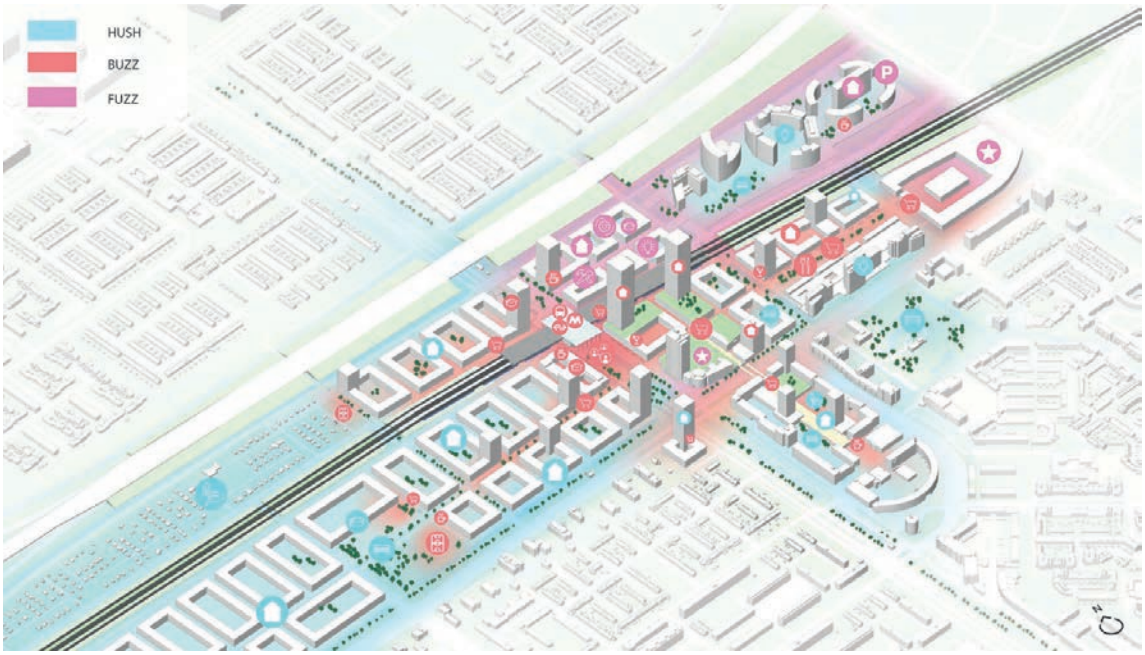
The Hush, Fuzz, and Buzz zones extend beyond the formerly fragmented neighborhoods in order to bring the different neighborhoods together and bridge the fragmentation.

The Buzz zones are primarily located close to larger squares, stations, and event spaces. Hush zones are located further away from the stations and busy squares. Although they are primarily located in residential and office areas, the hush zones are still accessible from the busy streets and squares. Fuzz zones are located primarily to the north-east of the station. Here different furniture-centred activities can happen across different disciplines and among different stakeholders.

By adding a diversity of functions, including design hubs, collaboration spaces, and street-facing retail experiences, the area becomes a mixed-use district with a furniture identity.

The Hush, Fuzz, and Buzz zones around the station and the main pedestrian axes, as indicated in figure 86, are located in the micro-mobility/pedestrian zone. This zone ensures sustainable mobility forms are stimulated, and that the majority of amenities and function can be accessed by foot.

The new urban transportation network is designed for sustainable and healthy modes of transportation: walking, micro mobility, and public transportation are prioritized over privately-owned cars.



Urban function and spatial quality

Pedestrians and micro-mobility

MOBILITY

It is expected that the public transportation in the Rotterdam region will grow from 15% to 19%[1]. The density of public transportation at Prins Alexander will increase due to its densification strategy. By 2040 there will be a new transportation route linking Alexander and Feyenoord City/ Stadion Park[1] (Figure 87).

The vehicular traffic in Prins Alexander is significantly reduced in the ALX40 urban plan as traffic is rerouted to the main existing arteries, kiss and ride vehicles are rerouted to run north-south, and destination vehicles for the parking are relocated to the northwest for its proximity to the highway.

Buses will still be able to drive north-south along the Prins Alexanderlaan past the station. This allows for an easy and fast transit from bus to other mobility. Prioritizing buses vehicles over privately owned cars promotes more sustainable modes of transportation.

According to the high-rise vision, parking is no longer an indisputable requirement for high-rise[2]. Taking this strategy into account, parking is limited and the proposal focuses on sustainable modes of transportation, including micro-mobility and car-sharing.

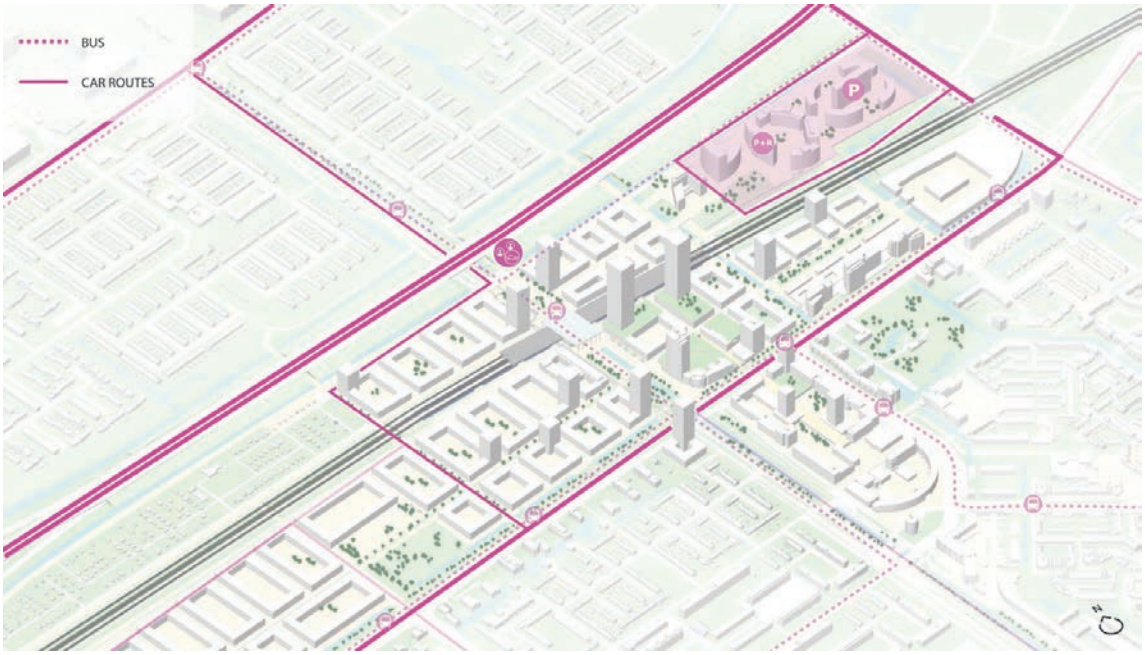
METRO AND TRAIN

The AB metro line is submerged (Figure 88), which is done with a cut and fill tunnel running adjacent to the current tracks, allowing for an autonomous metro while leaving the ground level open for a new green and blue Alexanderlaan. The autonomous metro-line is part of the future development plan for Rotterdam[1].

Placing the new metro line west of the current metro-line allows the current metro line to stay in use, while the new metro line is under construction.

The Alexander train station is positioned in between Rotterdam Centraal and Gouda/Utrecht. The larger mobility goals of the Randstad include connecting major cities through a double set of tracks, allowing intercity trains to overtake “Sprinters”, something which is currently not possible between Rotterdam Centraal and Gouda.

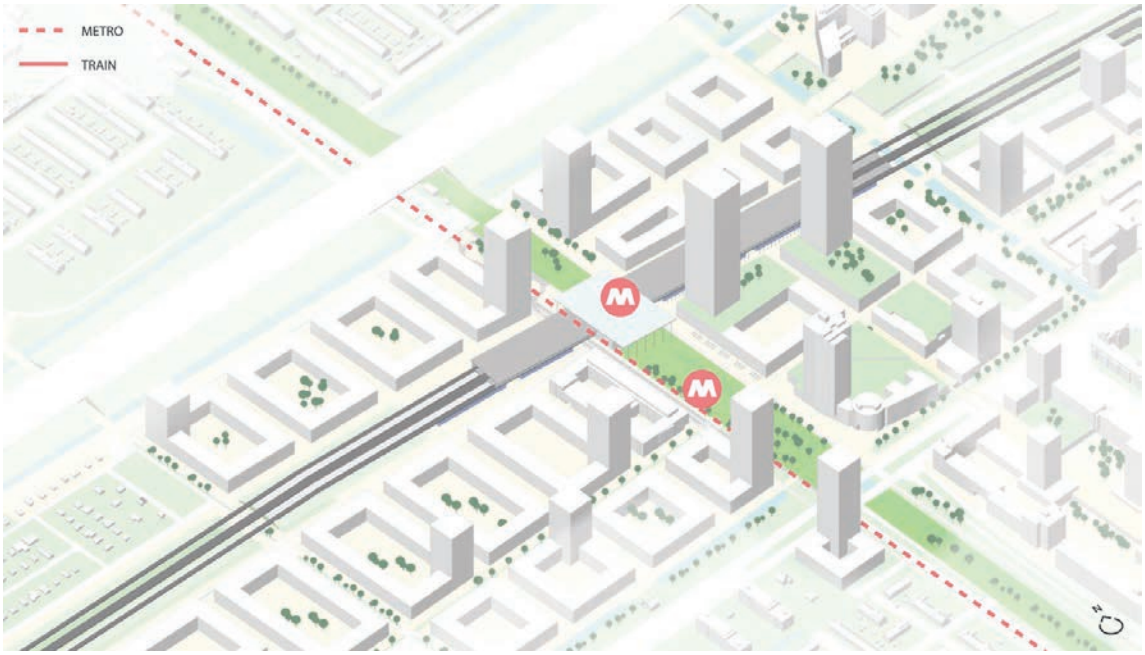
Therefore, ALX40 proposes to increase the number of train tracks from two to four, shown in figure 89. These additional rail tracks also open up the possibility to connect Alexander to the Feyenoord district via the planned public transportation connection across the Maas-river known as the “Nieuwe Oostelijke oeververbinding”[2].



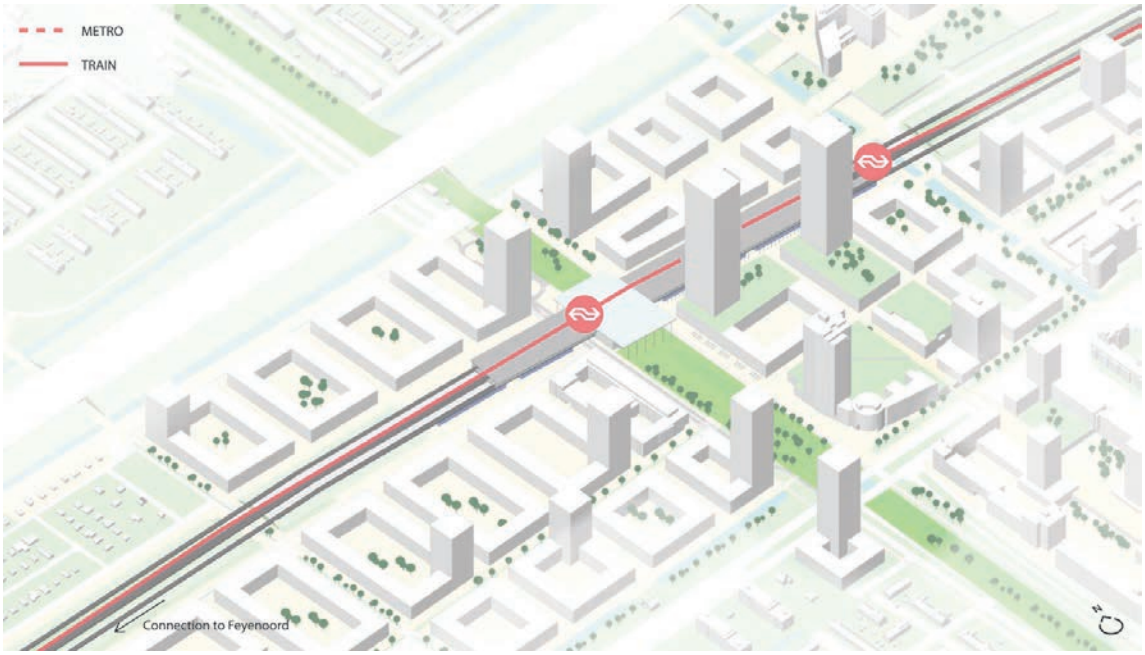
Primary vehicular traffic

1 Rotterdam Municipality & MRDH, 2017, pg. 67
2 Kurvers, 2019, pg. 60

1 Rotterdam Municipality & MRDH, 2017, pg. 75
2 Rotterdam Municipality & MRDH, 2017, pg. 76



Metro line



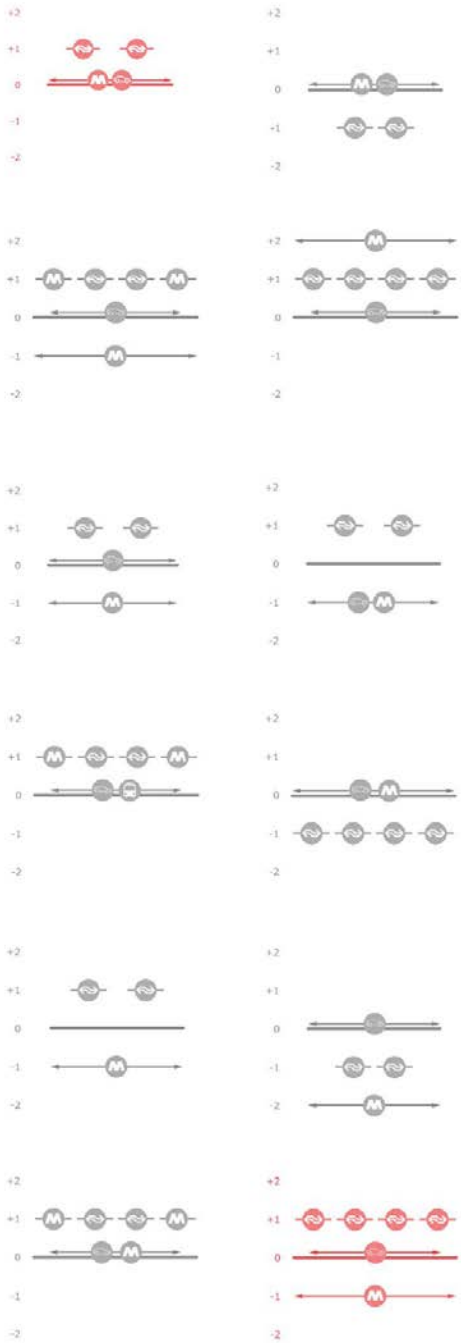
Train tracks

STATION
Process

This sub-chapter looks at key moments and decisions in the development of the station building's architecture. The design process began by diagrammatically exploring the permutations and combinations possible with the various modes of transport. In Figure 90, the existing situation (top left) is compared to options where the rail, metro, and roads are submerged, raised, or combined. By the process of elimination based on parameters of practicality/ cost on one hand and urban quality on other, we arrived at the proposed section (bottom right) which moves the metro underground and places four rail tracks at the +1 level.

Next we queried the urban nature of the station building and its impact on the city around. Broadly, three directions were identified: the 'side station' that merges the infrastructural elements with the city fabric, leaving the centre open; the 'light centre' that celebrates the site's prominent centrality by occupying the space with a porous structure; and finally the 'heavy centre' that makes a statement by emphasizing the centre with a larger, more monumental building.

As we gravitated towards 'light centre', the station started to resemble a large welcoming green roof encompassing an enclosed plaza. The area below the rail tracks was allocated to amenities and bike parking, and interrupted at key locations to connect the urban flows. Multiple study models were prepared to analyse the impact of elevational details such as louvers, glazing, planting and signage. Wood was adopted as a sustainable material for the station's structure.



Diagrammatic exploration of ALX transport modes in section

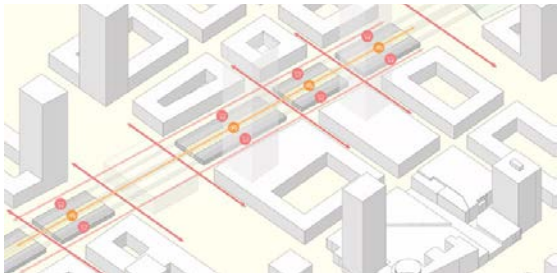
STATION
Urban tissue & Program

ALX40 further densifies Alexander by utilizing the space underneath the railway tracks (Figure 91). Opening up the ground floor under the tracks allows for better North-South mobility while giving space to new functions: bike storage in the middle, and street facing amenities on the sides.

The facades and green roofs, which define the station's inner volumes, improve the environmental, visual, and acoustic performance of both the station building and its surroundings. The result is a street level space adjacent to the tracks that is an active part of the city.

The urban building block typology is continued in the station building itself, becoming a clear part of the larger urban fabric. Where the station hall forms the exception, located in the middle of Alexander Laan. But offering the same permeability through its urban lines and transparency.

On the inside, the underground metro connects with the train tracks through an efficient and light vertical connector that allows for easy way finding. The station building and its transparent facade connect the traveler with furniture-centred amenities and buzzing streets within the diverse mixed-use district.

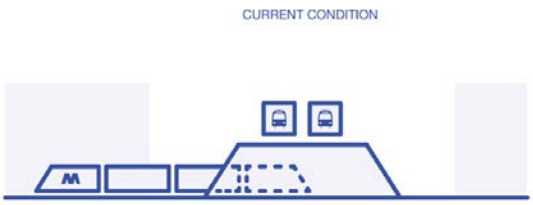


ALX40 integration in urban tissue

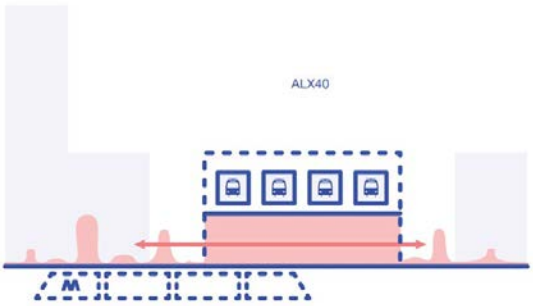
STATION
Accessibility

Submerging the metro line and hollowing the train tracks allow for permeability across the neighborhood, while increasing the street level amenities activates the urban space (Figure 93).

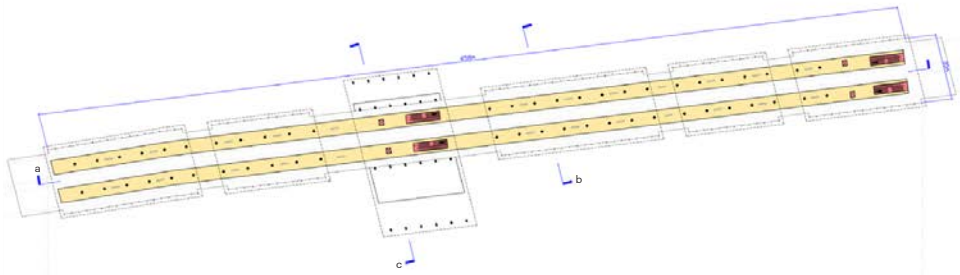
The station has three points of access to favor an efficient distribution of flows tailored to different target groups: the one on the East is for the train, and is given new emphasis as the preferred access for the park and ride users. The one on the South is dedicated to the metro, and connects to the main buzz avenue of the site. Finally, the main entrance is located at the intersection of the metro-line and the train tracks. It is celebrated with a large roof which permits favorable flows of pedestrians, cyclists, buses, and emergency vehicles along the Prins Alexanderlaan.



Station Alexander's current barriers (section)

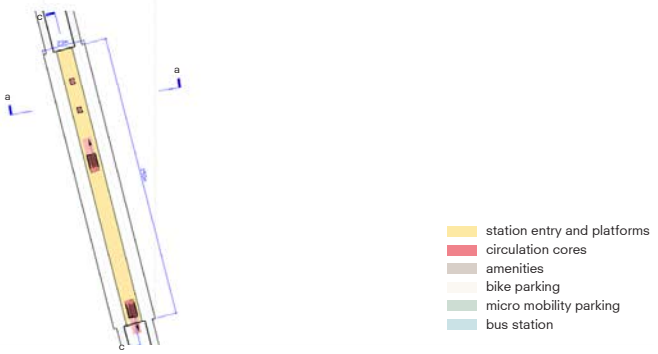


ALX40's permeability (section)

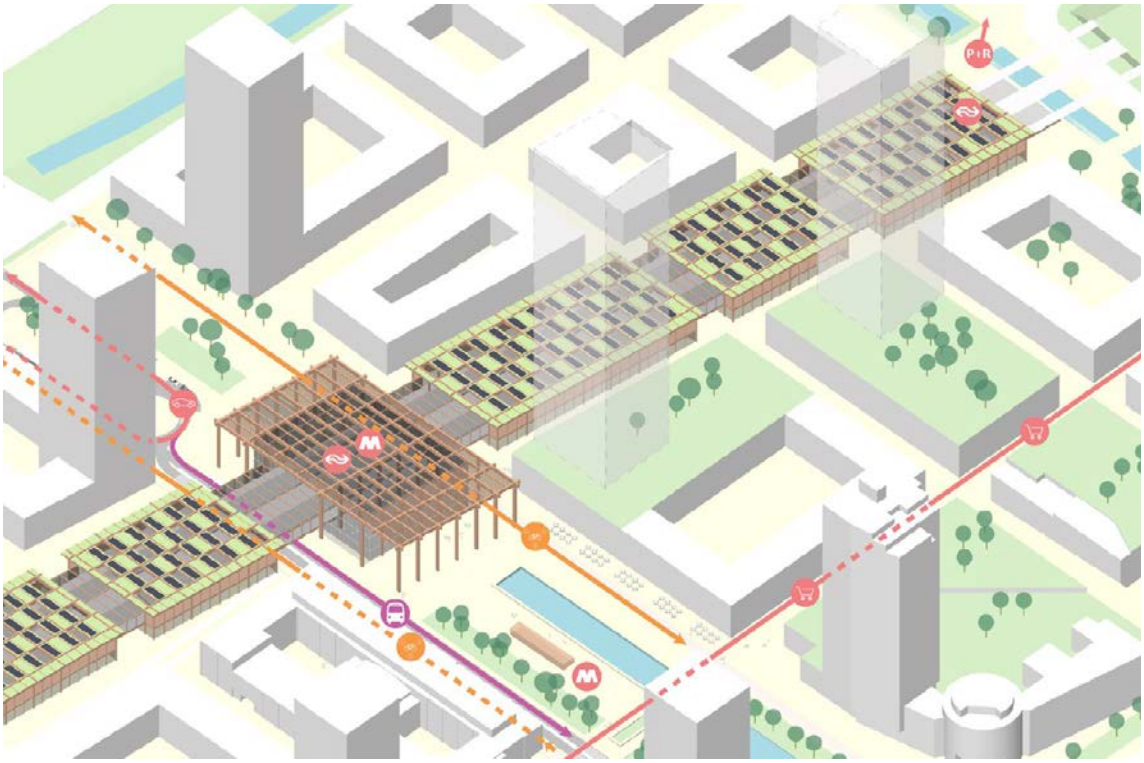


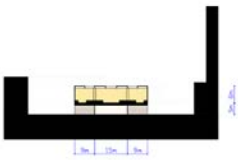
First floor plan - Train station

Ground floor plan - Amenities and entries

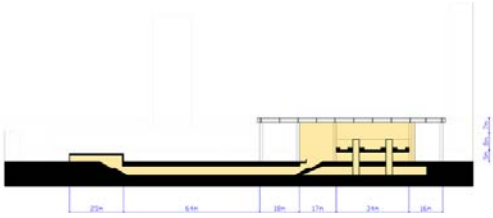


Basement floor plan - Metro station

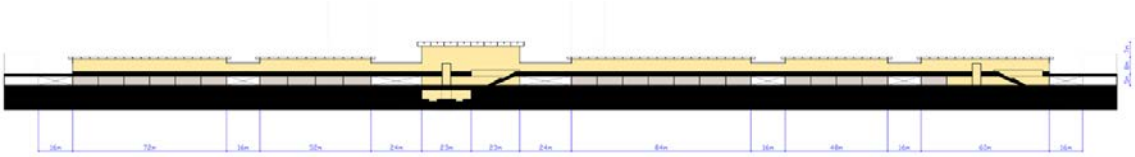




Section AA - Section through main hall and train platforms



Section BB - Transverse section through amenities block



Section CC - Transverse section through the main hall

station entry and platforms
amenities

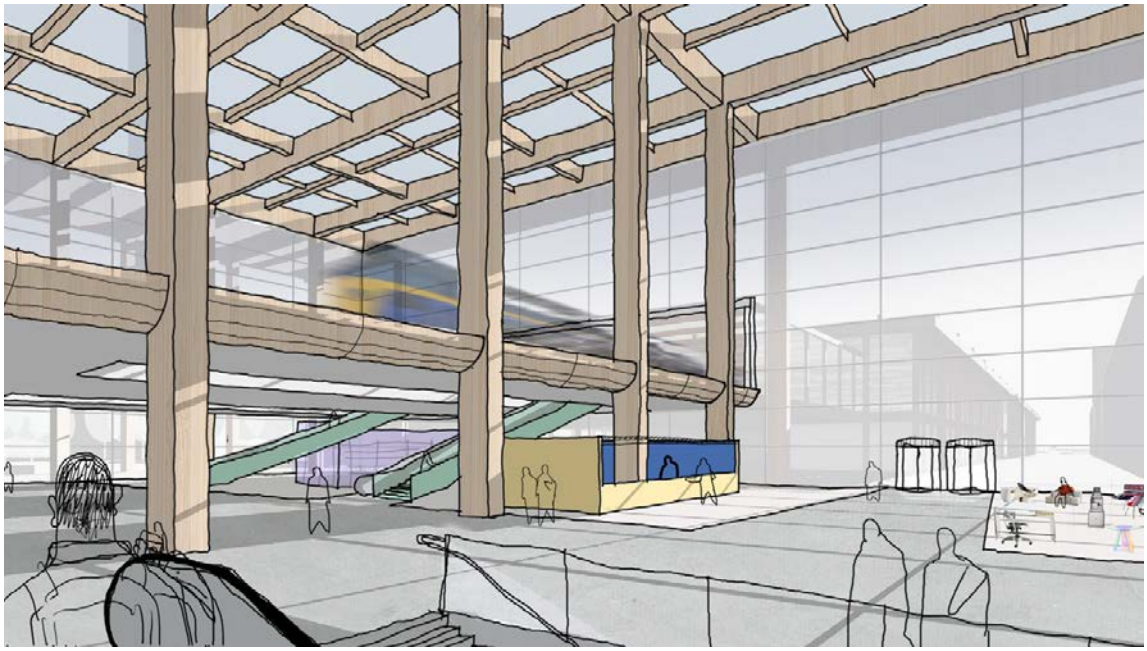
CONCLUSION
ALX40

The reinvented furniture identity of ALX40 favors the human scale. A new urban plan prioritizes micro-mobility options and activates the urban street level to diversify the area and turn it into a destination within the larger region.

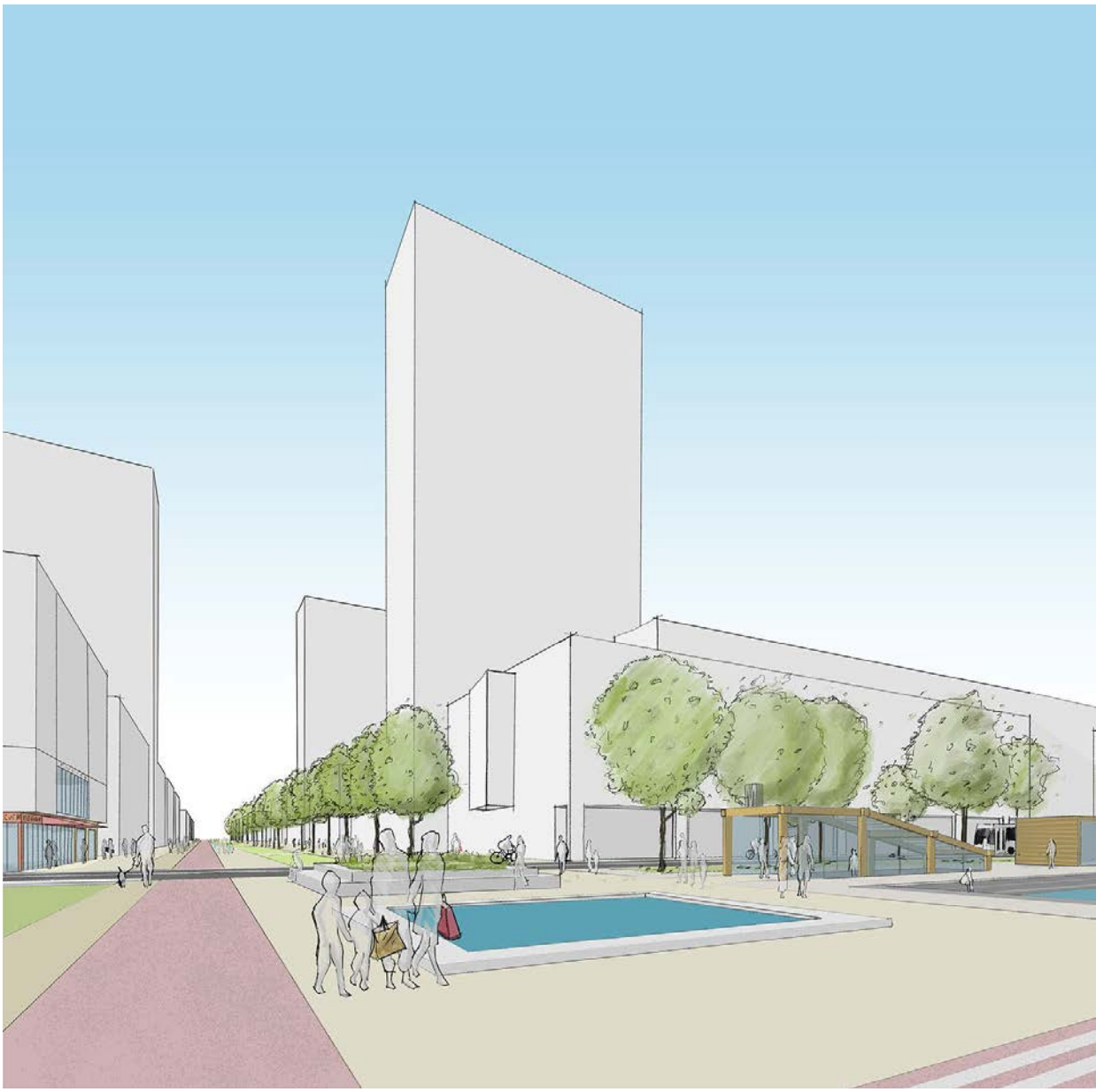
The train station becomes the driver of the change for the area. Hollowing out the train tracks allows to densify the area following the morphology of the surrounding buildings. This blends the station with the neighborhood and improves its environmental, visual, and acoustic performance. Moreover, adding the street level amenities creates buzzing streets adjacent to the station. Similarly, submerging the metro line and reducing the traffic in Prins Alexander drastically increases the green and blue infrastructure in the area while allowing for better micro-mobility.

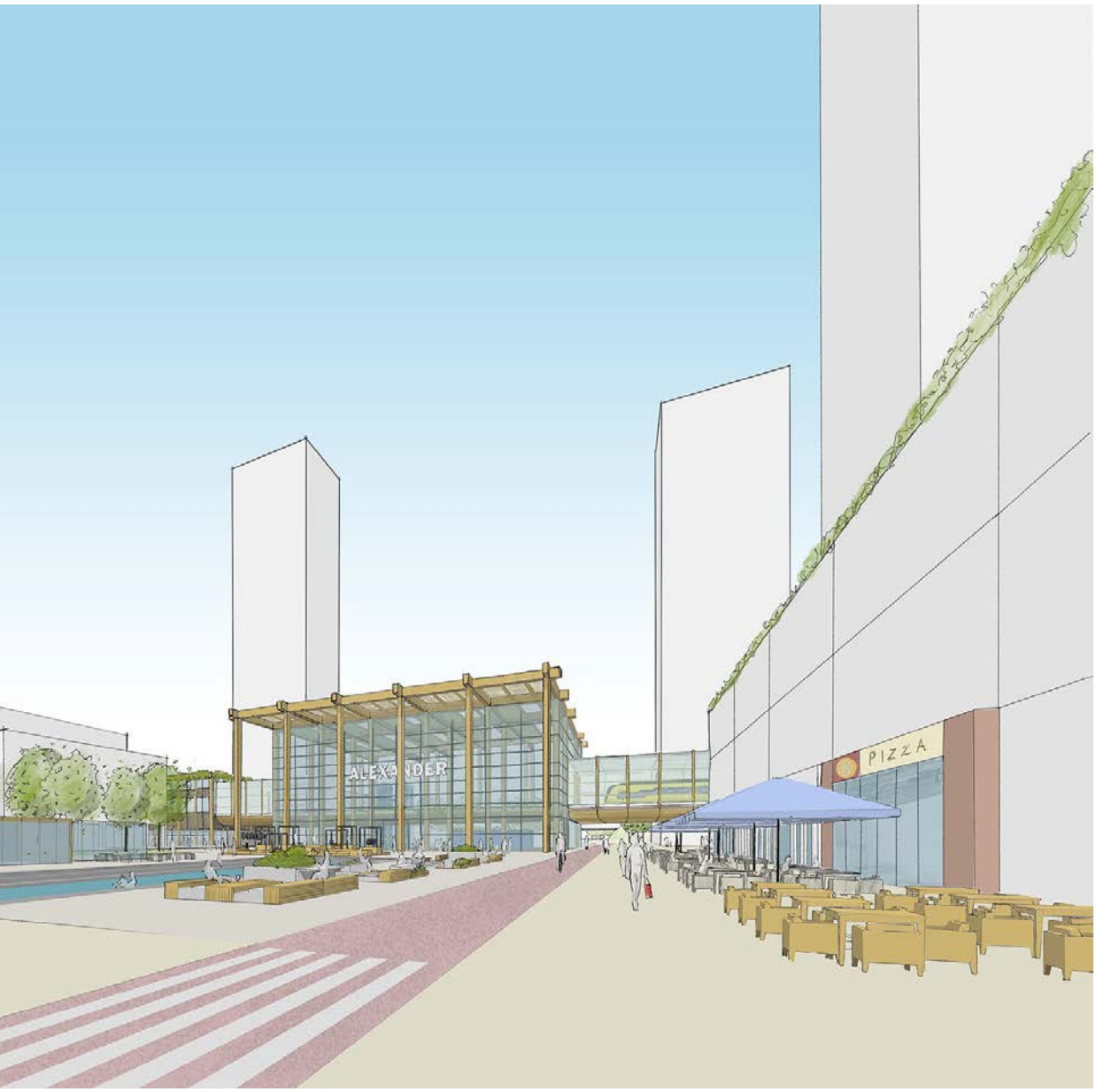
While the train tracks are disguised in the urban fabric, the main entrance to the station celebrates the furniture city. It is a light vertical connector that is highly permeable. Its design solution permits to occupy the center of the Prins Alexander while reinforcing the strong connection of its adjoining areas.

In conclusion, in ALX40 the station becomes the activator of Prins Alexander, a polycentric node where shopping, culture, living and leisure go hand in hand. The previously fragmented Prins Alexander is unified through a reinvented identity; resulting in the socially inclusive, diverse, and sustainable ALX40 Furniture City.



ALX40 as a liveliness catalyst (perspective)




PIZZA

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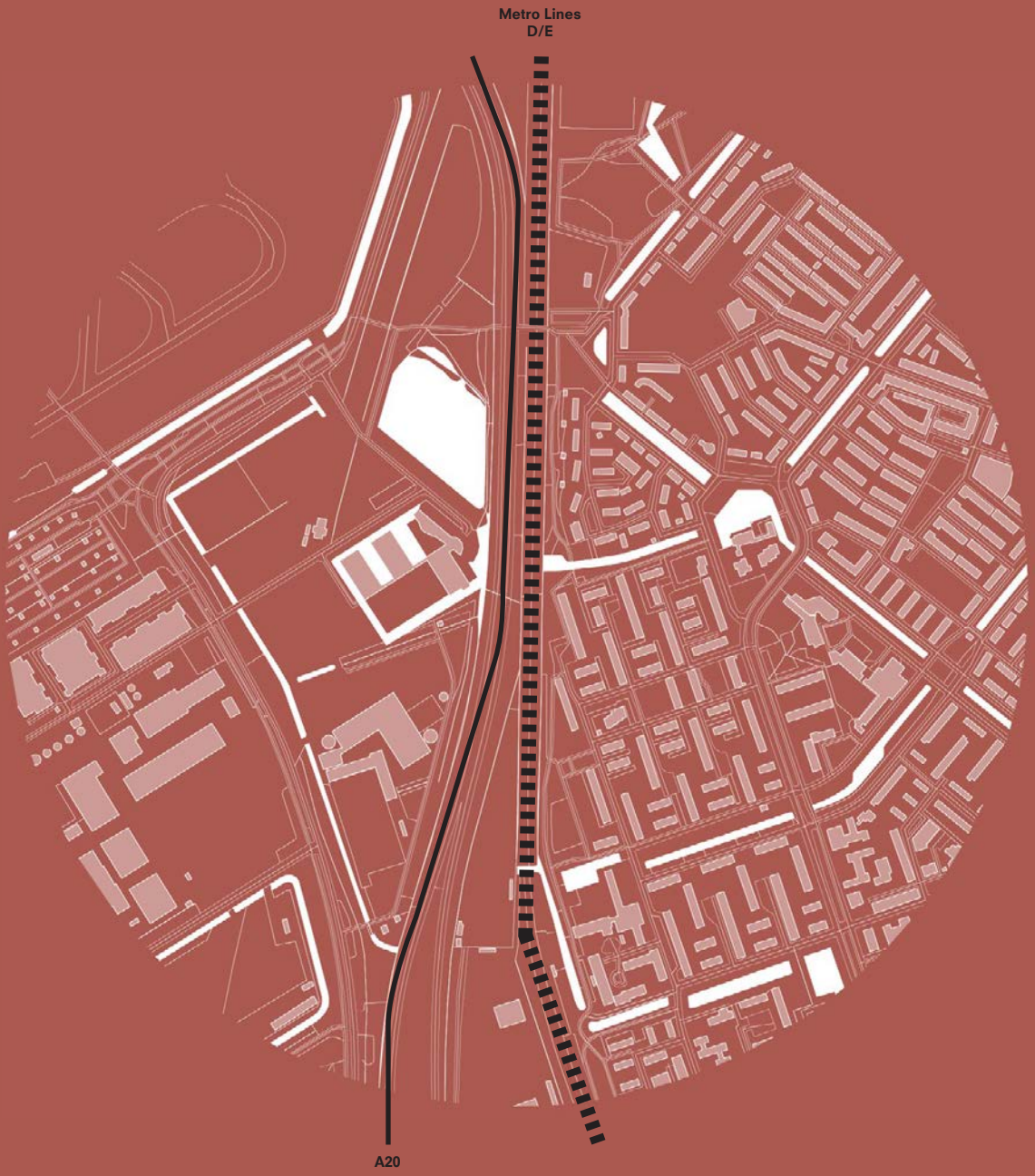
Metro Lines
D/E
A20

M

MEIJERSPLEIN

METRO & AIRPORT STATION

Dimitrije Milic
Douwe de Jager
Joep Biemond
Lisa van Vliet
Minh Nguyen
Moritz Kistenfeger
Sanad Soukkari

HISTORY
Meijersplein

Rotterdam started in the late middle ages as a small port city. It grew rapidly in the Dutch golden age due to the increasing port activities. In the 1920s the city built their own airport to the south of the river Maas[1].The airport was only used for small commercial flights between Rotterdam, Paris and London. However because of its strategical location the Nazis destroyed it.

After the Second World War it became clear that a new Rotterdam airport was necessary. During this time Overschie and Schiebroek, both small agricultural communities to the north, became a part of Rotterdam [2 3]. Because the new airport needed to cater both to Rotterdam and the Hague, the historic Waalhaven airport was moved the this new obtained part of Rotterdam, situated in the Zevenhovenpolder in Overschie, bordering Schiebroek. The location was also next to the Hofplein railway line that opened in 1906 but this line did not have a stop by the airport at the time. The new airport was finished in 1956 and since then its been used for commercial flights within Europe.

The transformation from a regular polder into an airport influenced the urban structure in the area. Overschie grew in population, but mostly at the border of Schiebroek, where industrial sites were built. While Schiebroek grew into a residential district.

The Hofplein railway line changed into the RandstadRail in 2006, which is a metro and tram network connecting The Hague, Rotterdam and Zoetermeer. With this change in mobility the railway got disconnected from the central railline of the Netherlands. Only in 2010 the metro station Meijersplein was built to be the closest metro station to the Rotterdam and The Hague Airport.

1 De geschiedenis van Rotterdam Airport. (2018, 16 april). Rotterdam Airport. https://www.vliegrotterdamairport.nl/geschiedenis-van-rotterdam-airport/#:%7E:text=Na%20de%20tweede%20wereldoorlog%20werd,Rotterdam%2DDen%20Haag%20steeds%20duidelijker.&text=Pas%20in%201956%20werd%20Rotterdam,naar%20de%20huidige%202200%20meter.
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3 Stichting Historisch Hillegersberg. (z.d.). Geschiedenis - Stichting Historisch Hillegersberg. https://www.shhs.nl/. Geraadpleegd op 9 maart 2021, van https://www.shhs.nl/geschiedenis/#:%7E:text=SCHIEBROEK-,Zelfstandig%20tot%201941,Schiebroek%20335%20inwoners%2C%20voornamelijk%20boerenfamilies.

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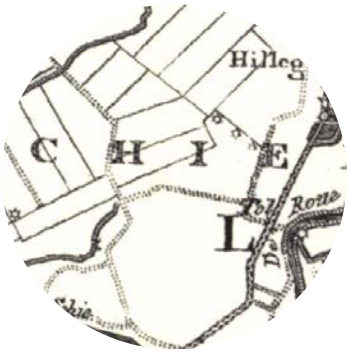
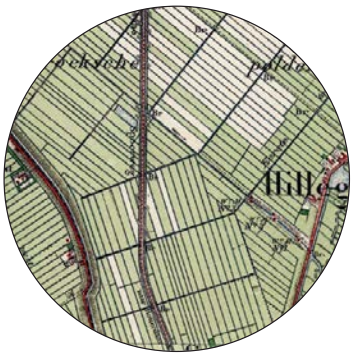


1815

1875 Polder formation



1915

1945

1975 Airport addition

2020 Now

Historic maps
From Topotijdreis, 200 jaar topografische kaarten

FUNCTIONS & AGRICULTURE

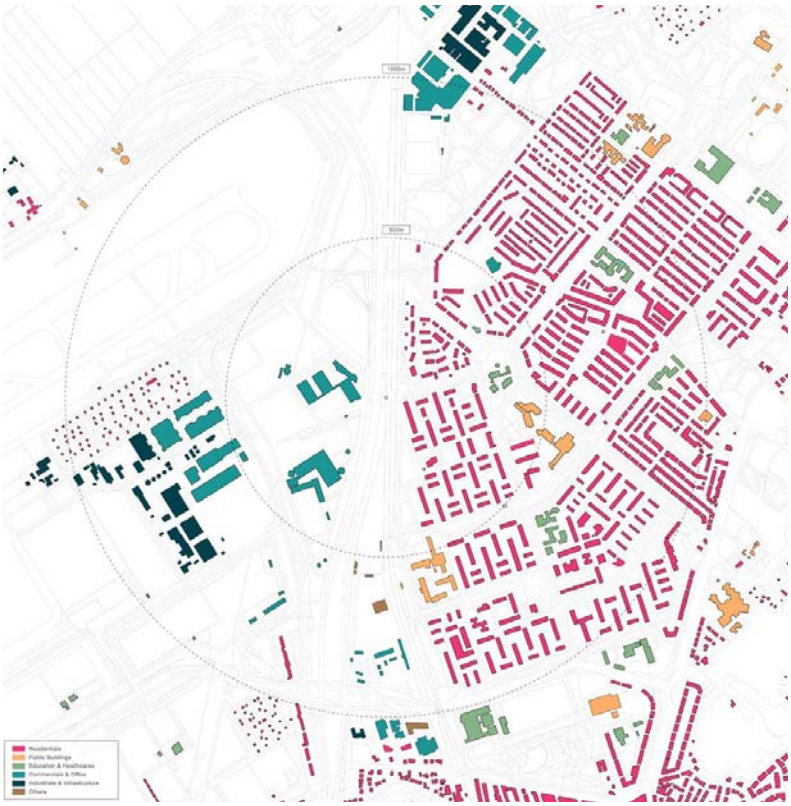
Functions
Meijersplein station is located between two different areas. This creates a clear functional separation between the two sides of the station. The west of the site, Zestienhoven, is largely industrial buildings, infrastructure, and offices and a little further northwest is the airport and rural farms. Meanwhile, the east side of the site is identified by housing areas of moderate density and height, along with public facilities and services serving the residents. As can be seen in the map of functions, the western region acts as a provider of resources and infrastructure to the east. The green belt stands between the two areas including a green land, parts of northeastern park, a metro route, a highway (N471), and Meijersplein station.

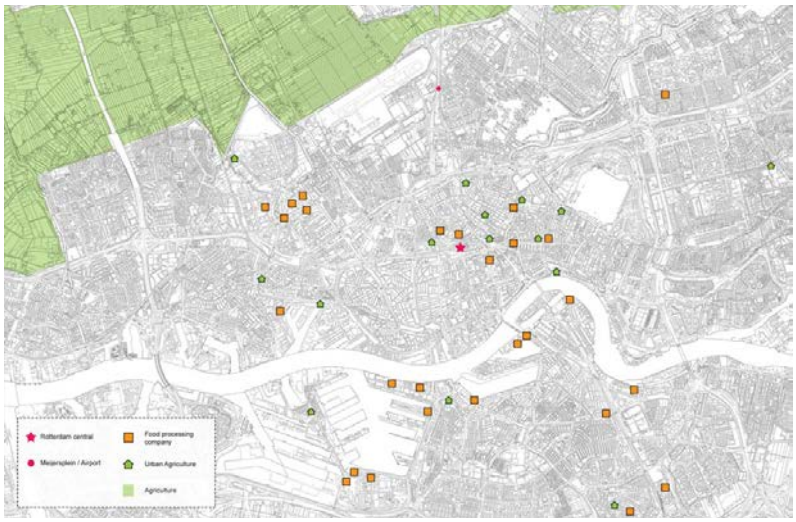
Therefore besides serving as a connection between the south (Rotterdam) and the north (Den Haag), Meijersplein has the potential to be a connection between the east (the existing residential area) and the west (agricultural area, or the potential new residential area in near future)

Agriculture Context
As can be seen from the map of food related areas in Rotterdam, this city and its surrounding municipalities have a particularly low level of self-sufficiency and mostly depend on products that are produced outside the region. Although the region around Rotterdam produces food and many agricultural products, the core urban areas focuses more on agricultural services and logistics. Particularly, 96% of food and drink must be imported from outside (green) to the food companies (orange), before transfering to the consumers. A low percentage of food production within a city is common and not necessarily problematic, but it does lead to major shifts in impacts: water (41,123,000 m3), and antibiotics (122 million doses); and also outputs such as manure (587,000 tons) and emissions, especially from vehicles that delivered food (160,400 tons) (Van Odijk et al., 2016).

Rotterdam already has an active community of agricultural producers and iconic urban farming projects (green icons). The survey of Metabolic & Circular Economy in 2015 shows that these urban agriculture projects in Rotterdam have a very high productivity per square meter, and therefore, can help avoid a wide range of food-related impacts mentioned before. Additionally, the peri-urban areas are often the most suitable for urban farming, according to Metabolic & Circular Economy. Thus, the site located in-between the core residential area and the sub-urban industrial areas, could be a feasible place for a food production or a greenhouse, which can avoid some impacts mentioned before, and support the network of urban food production of the city, and, potentially join hands in selling their products through initiatives such as local food cooperatives (Metabolic & Circular Economy, 2015).

As can be seen on the map of transport routes, there is a possibility that the station could also play the role of a marketplace, which is located on the daily transportation way of the people (who has moved by bikes, cars, buses, trains). Through this initiative these ‘travelers’ can buy fresh produce while the city minimizes packing and transporting time in the food production process, as well as the movement of vehicles (such as trucks) in the city.





Top: Functions of buildings surrounding Meijersplein
Bottom: Food related areas in Rotterdam

SPATIAL ANALYSIS

Materiality

Cold and transparent is a good way to describe the appearance of the Meijersplein station. The architect possibly created the transparent 'box' to enhance the views around the site. Even though the design of the station is in line with other stops linked to the metro line, there is a severe lack of place identity.

Meijerspoort has the same material qualities and style as other stations of metro line E. The area itself, however, does not have a specific architectural style. This creates an opportunity to design the future station in a way that establishes a spatial identity for the whole area.

Circulation

Users can get to the metro station by car if they use the P+R located on the west side of the N471. From this provincial road the A13 to The Hague and the A20 circle line around Rotterdam can be easily reached. But when going from the P+R to the metro station, users have to walk outside over a big road, which doesn't encourage people to use this facility as much as they might otherwise.

The accessibility by bus and tram is not ideal. The tramway and a few bus lines do not stop exactly at the station, but about 200m from it. In addition, the station is also not very visible from these stops as buildings and trees form a visual barrier. From the car park the station is visible, but faces a different type of barrier: the busy N471-road. The station itself is elevated, which provides long fields of view on both sides. The empty plains around the station contribute to this and make it easy to expand if that is necessary in the future. The downside is that there is no means to block the strong wind from the southwest.

A

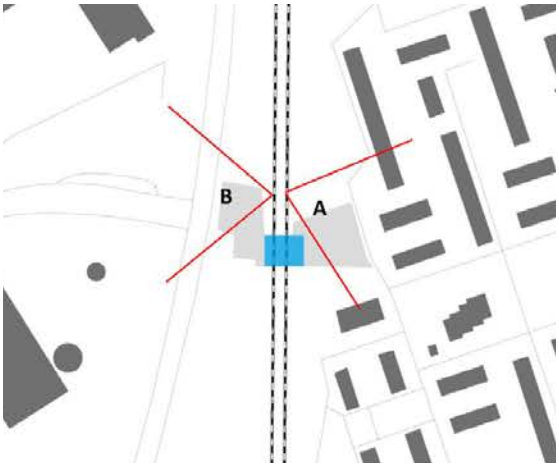
The building and trees pose a visual barrier

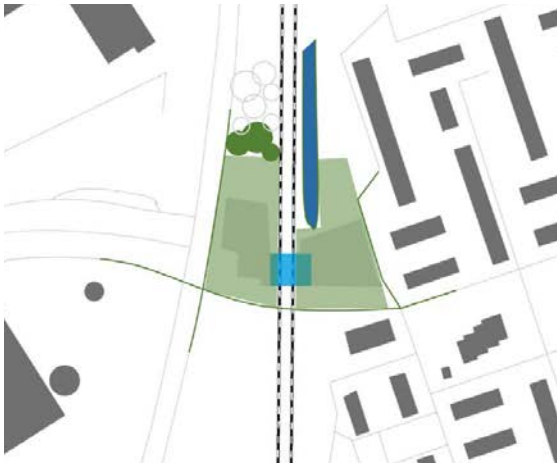
B

The houses and trees pose a visual barrier

C

The busy street poses an accessibility problem



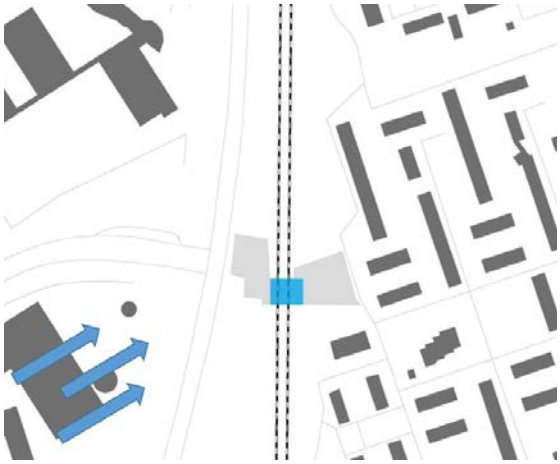


There is enough empty space around the station for expansion

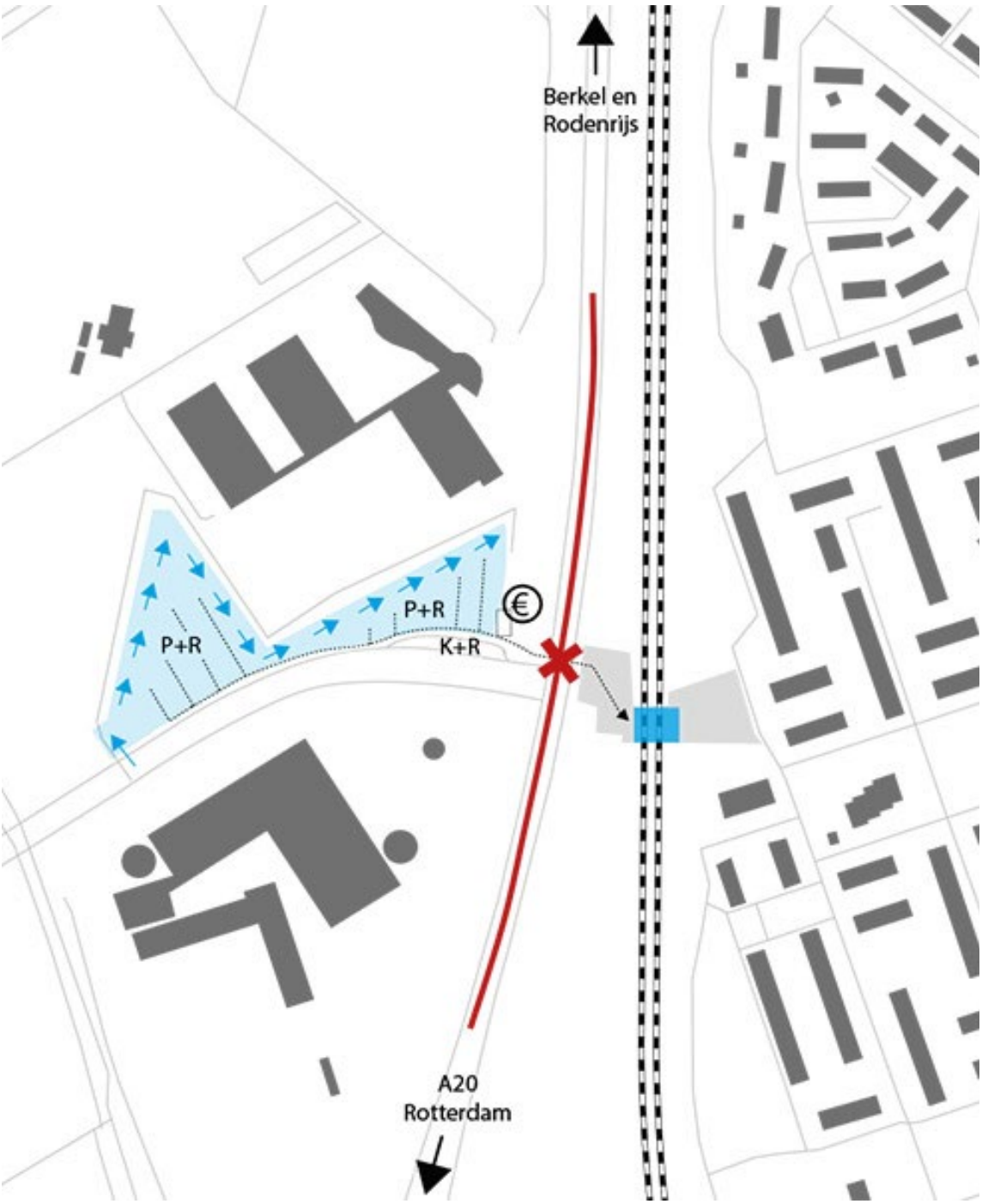
A

B

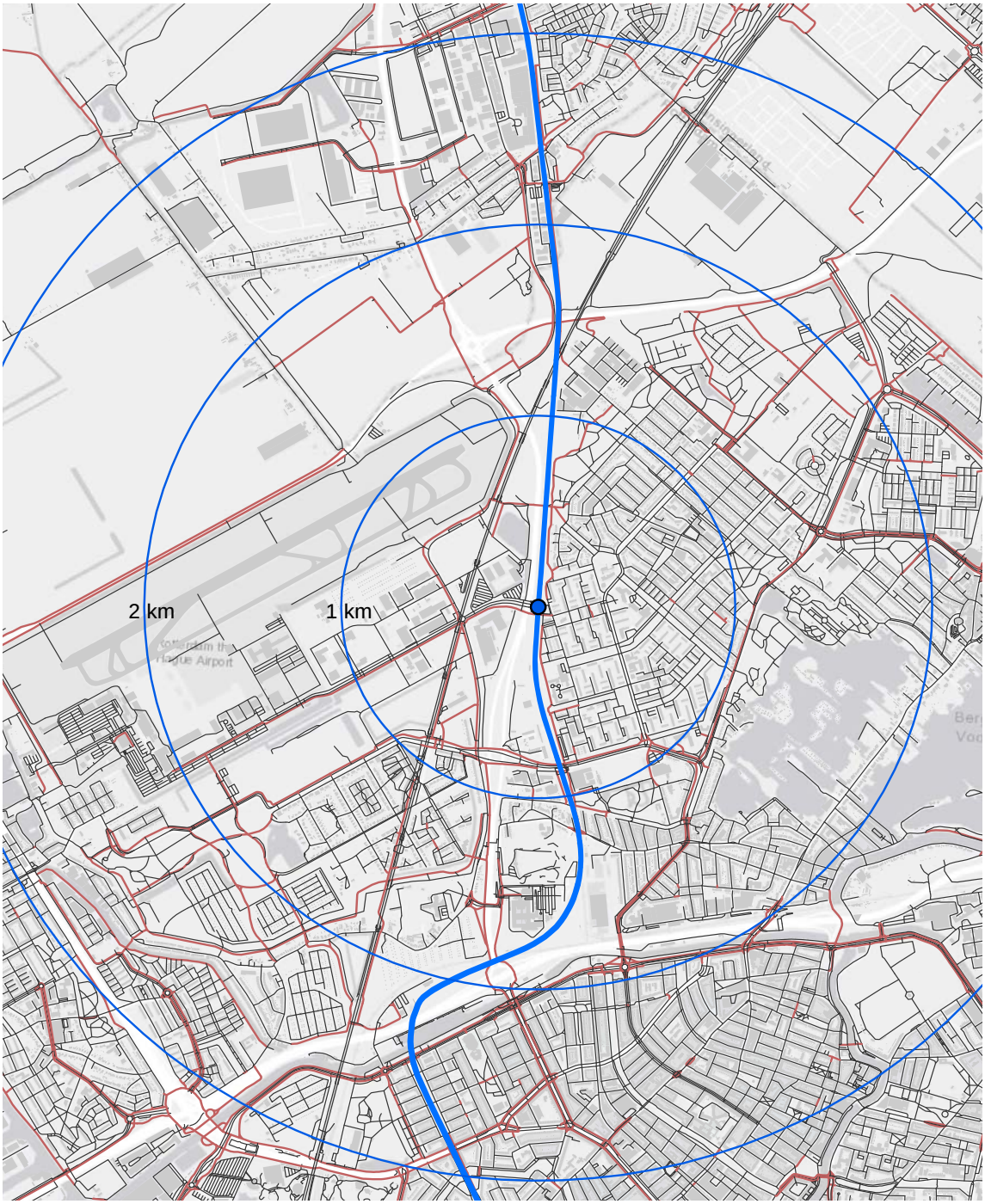
The elevated station and unbuilt plains around it provide long fields of view over the area



There are no means to block the strong wind from the southwest



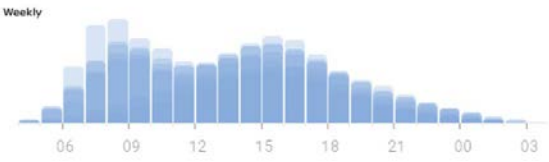
The N471-road makes it hard to reach Meijersplein from the P+R spaces



Infrastructure bikes
1:5000

TARGET USERS

A small scale interview was conducted at the metro station itself on the 15th of February 2021. From this interview six current users were identified. The most important conclusions are that the current users either come by car and use the P+R facility or they live very close by the metro station and walk or bike to the station. Moreover most users only travel either to Rotterdam or The Hague and only a small portion travels further to other cities. Rush hours at Meijersplein (7:00-10:00 and 14:00-17:00) seem to be more centered in the middle of the day than the hours RET use as rush hours (6:00-9:00 and 16:30-19:00).



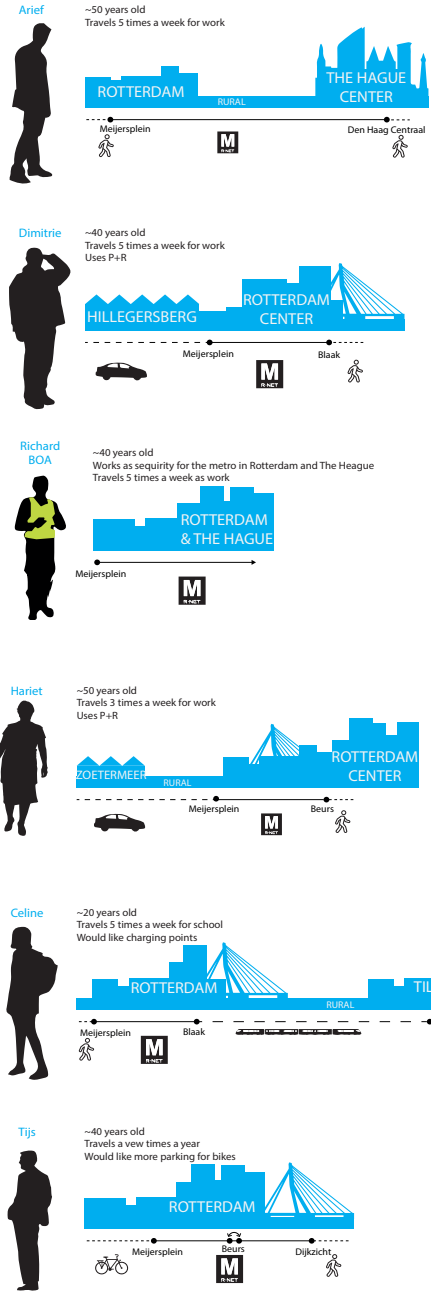
Metro
Each direction: 4878 passengers per hour (daytime)

Bus
To Airport: 800 passengers per hour (daytime)
To other places: 480 passengers per hour (daytime)

Car parking
Normal parking spaces: 500 cars
Parking spaces to charge electric cars: 2 cars

Bicycle storage
Covered storage: 250 bicycles
Fietsdock lockers: 55 bicycles

Rush hour and facilities
RET net figures



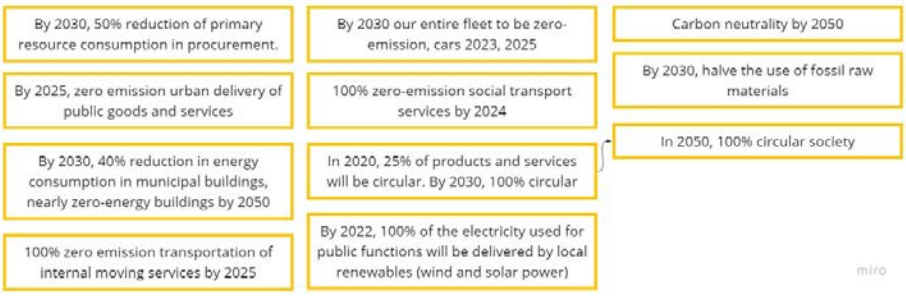
Current users analysis

SUSTAINABILITY GOALS ROTTERDAM

Rotterdam is a part of the Global Lead City Network on Sustainable Procurement, a group of 15 cities committed to drive a transition to sustainable consumption and production by implementing sustainable and innovative procurement. Among their many achieved and scheduled goals are some that concern new structural and urban developments as well as the appropriation of building technologies to reduce any negative factors information of a sustainable environment.

Our proposal aims to create concepts for further development of the Meijersplein station in accordance with set sustainability goals. Based on the presented list of the city's goals, we reshaped our initial visions to allow some of the most important achievements: zero-emission, circular building, and an inclusive and healthy environment.

Target Goals



Achieved Goals

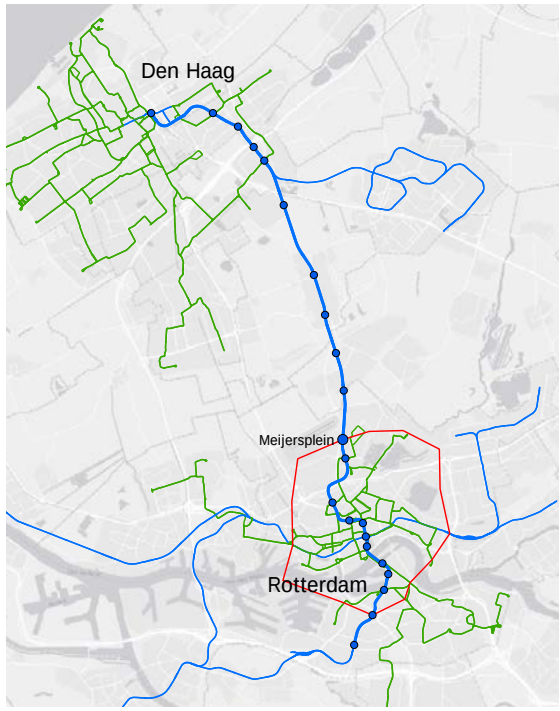
[1]Global Lead City Network on Sustainable Procurement
www.glcn-on-sp.org

FUTURE PLANS
Ring line and Airport

Ring line
This project includes the idea of a new ring line for Rotterdam, connecting the existing metro lines outside the city center. The ring line was outlined with about 10 stations, 6 of which connected to existing metro lines. Meijersplein would be an important node in the north of Rotterdam, connecting the ring line to the existing E-Metro line.

The concept of the Grand Paris Express metro ring line has been cited as an inspiring reference for the vision of a Rotterdam ring line. In the Paris example, it is particular that the new stations are specifically designed for the quality of their connections with the public space, in what is called the 'sensory station concept'. This could be an approach worth exploring for the Rotterdam ring line as well.

Airport
The future of the airport is still unclear and the views on it are divided in two groups. One group, politicians and other involved actors, want to expand the airport and take on thousands of flights from Schiphol. The other side, containing politicians, activist groups and other involved actors, is against this expansion. They believe the expansion will cause too much nuisance and pollution.



Metro line E with circle line

https://www.ad.nl/Rotterdam/vrees-voor-verdere-groei-rotterdam-airport~a8cc99fa/?referrer=https%3A%2F%2Fwww.google.com%2F

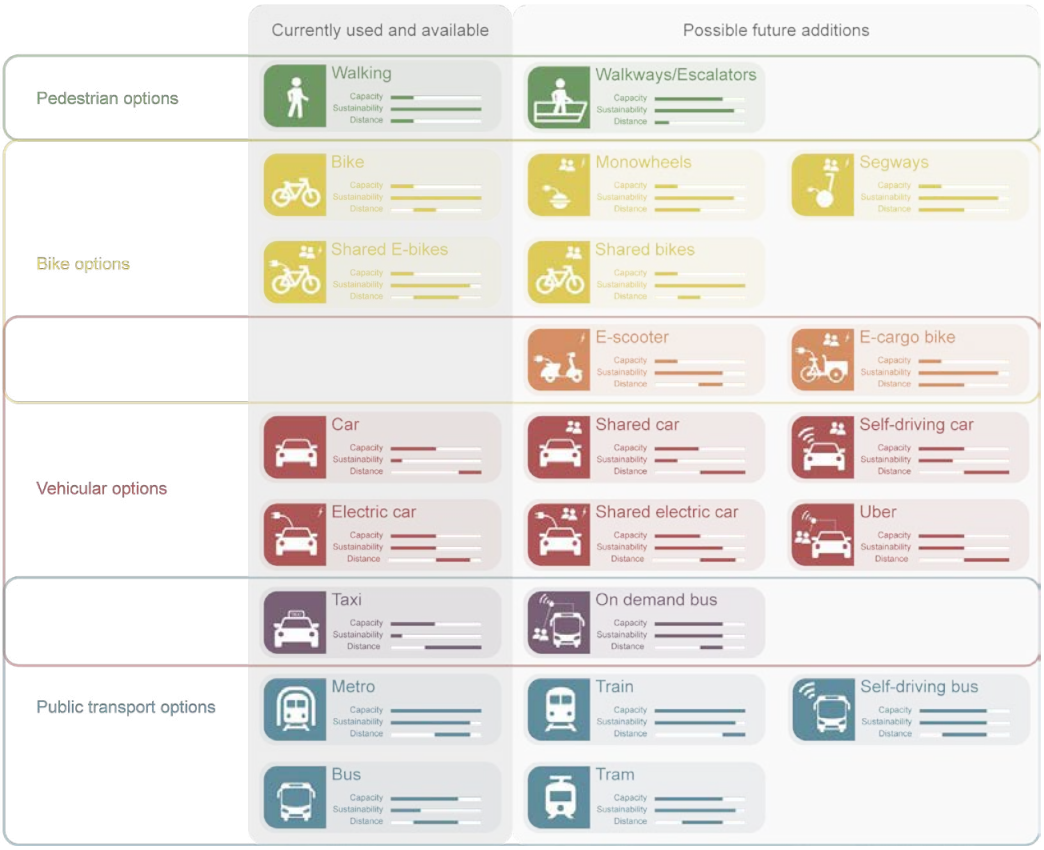
https://denhaag.raadsinformatie.nl/document/7782565/1/RIS302395%20Beantwoording%20SV%20Verstandige%20groei%20van%20Rotterdam%20The%20Hague%20Airport

MOBILITY HUB

The diagram on the right shows a series of possible transport modes, including the ones that are currently available and used at Meijersplein station. The metro station provides a metro connection between Rotterdam and The Hague. Another public transport option at this station are the buses that go to Rotterdam-The Hague airport and Rotterdam Central station. For vehicular transport, individual cars and taxis are used. At the P+R next to the station charging parking spaces can be found for electric cars as well. Space for bikes and shared e-bikes can be found right next to the station on the east side.

Besides the division between the currently used and the possible additional future transport modes, there are four sections made including four different types of traveling. Based on a concept, it might be relevant to take one of these sections into account specifically. The pedestrian options may be relevant when focusing on traveling within a radius of less than one kilometer. When focusing on a radius between 1 and 10 kilometers, it will be relevant to take the bike options into account. The vehicular options will be important when looking at a radius between 3 and 30 kilometers. When expanding this radius closer, to 1 to 30 kilometers the public transport options may be more relevant.

Based on the concept including a focus on a certain radius, the currently available transport modes and the transport modes that might be available in the surroundings, the mobility can be expanded with the desired transport modes provided in the diagram.



Transport modes at Meijersplein

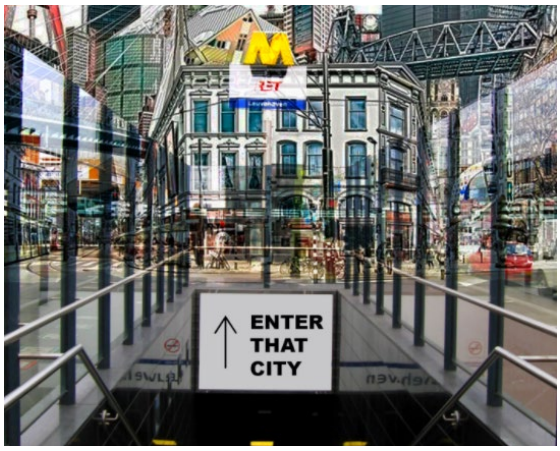
NS, Mecanoo Architecten, ProRail, Bureau Spoorbouwmeester, & Springtime. (2019). Journey to the future. https://www.mecanoo.nl/Projects/project/248/NS-Journey-of-the-Future

INSPIRATION POINTS

Airport focused
One of the concepts is to make Airport Rotterdam and The Hague much bigger then it used to be to take some of the pressure of Schiphol. And to have facilities at this metro station in service of this new bigger airport. Such as an tourist information or a hotel.

Home of the Neighborhood
The Meijersplein area can be the home of the neighborhood. The area will be a place providing much more houses to fill the needs of Rotterdam to build more housing units for the future. The metro station will be the main connection point of the inhabitants of the area to connect them by public transport to both the center of Rotterdam, as well as other places, such as The Hague, on a much bigger scale.

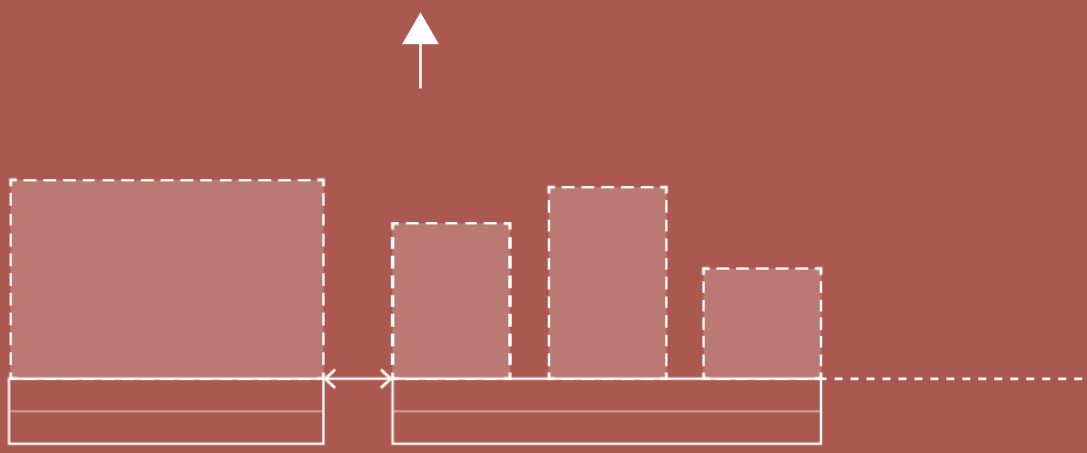
Metro transfer point
A fourth concept would be to make this station not a big hub but making it an easy tranfer point. By doing so crowds could be avoided



Entrance of the city
If more people would use this P+R to come to Rotterdam this Station would start to service as an entrance to the city. This could be used as part of the design.

Vision 1

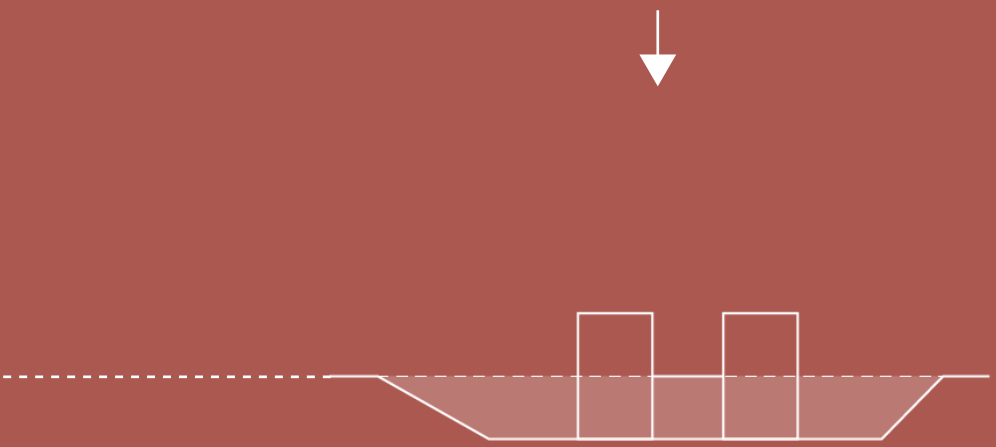
Tomorrow's Garden City Station



Besides serving as a joint between southern points (in Rotterdam) with northern points (in Den Haag), Meijersplein has the potential to connect the east (the existing residential area) and the west (agricultural areas, or the potential new residential area in near future).

Vision 2

re-IMAGINE



What Meijersplein metro station really needs to become for the city is a well integrated hub. By adding new useful functions for the neighborhood such as a playground and a panorama view over the city and airport combined with sustainable solutions this metro station will gain it's own identity.

Tomorrow's Garden City Vision

Meijersplein Station

Tomorrow's Garden City Project Video

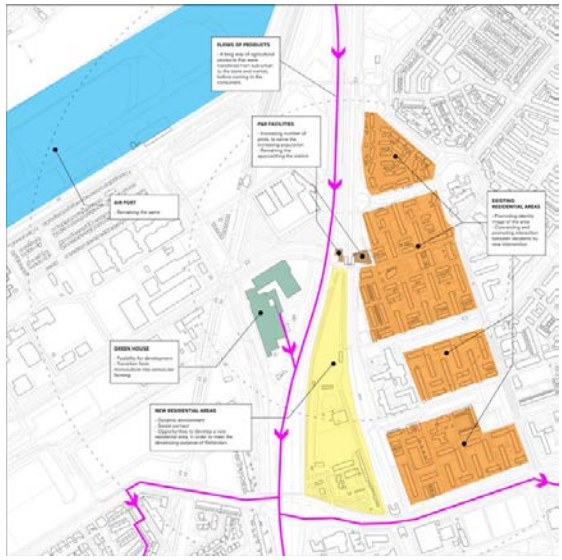
Joep Biemond
Nguyen Binh Minh
Douwe de Jager
Sanad Soukkari

METHODOLOGY AND POSITION

Moving towards an inclusive metro station

Applied research methodology

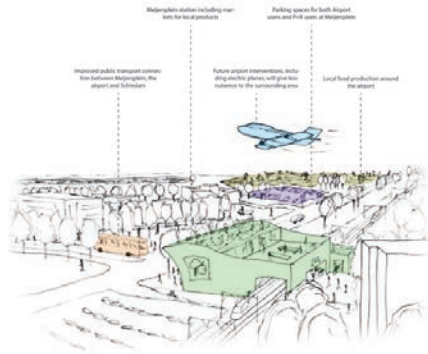
The research started with finding out the very basic layers of Rotterdam. We first looked into the functions, flows, infrastructure, users of the station and identity of the location. The functionality, capacity and future use of the nearby airport were further examined. After we came to know that the original idea for the neighborhood was to make it a garden city, we researched the principles and looked into how this might be applied to the area in the future. After creating different scenarios we looked into the pro's and con's of these ideas and focused on the one that appealed the most to us, in which the garden city principles, food flows and local production were the main aspects. We therefore divided the area into four districts. For each district we set up a list of needs and opportunities based on the research and point of interest. Based on that we scored all districts on different aspects, which led us to designing the station, but also the surroundings in a certain way.



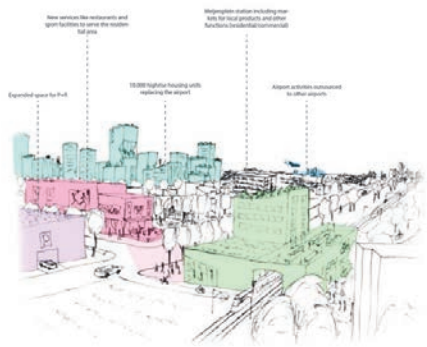
Position on the Hague Airport

True in the definition of urban regions and agglomerations, administrative boundaries play an important role in a metropolis, the functional relationships are central. In this light, the metropolis calls for different policy agendas and planning choices in favor of the intentions to act as a whole, and therefore stimulate and coordinate regional developments. These types of processes mainly take place in cities that have been experiencing a lot of economic growth and economic-, mobility-, sustainability- and liveability issues. Therefore Rotterdam and Rotterdam The Hague airport take space in this broader network, but one can wonder, how efficient is a small to medium size airport?

The relative distance in four out of five researched options are in favor of international travel through Schiphol Airport instead of Rotterdam The Hague Airport. Even though this theoretical research is depending on much more variables than portrayed now, we declare the future of the use of the airport is unknown. The usefulness of the airport is debatable. Therefore the area of the current airport could be used for redevelopment. Since the city of Rotterdam needs to make space for housing in the near future, for which the airport area itself, but also the surroundings could be used. The activities of the airport could potentially be moved to another airport, most likely Schiphol. We envision growth of the city above that of the airport.



Scenario 1

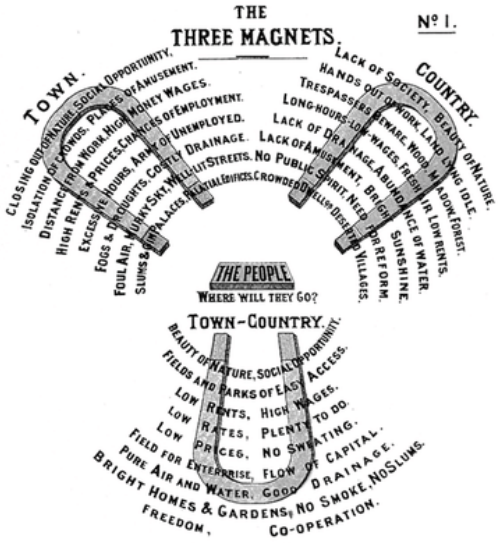


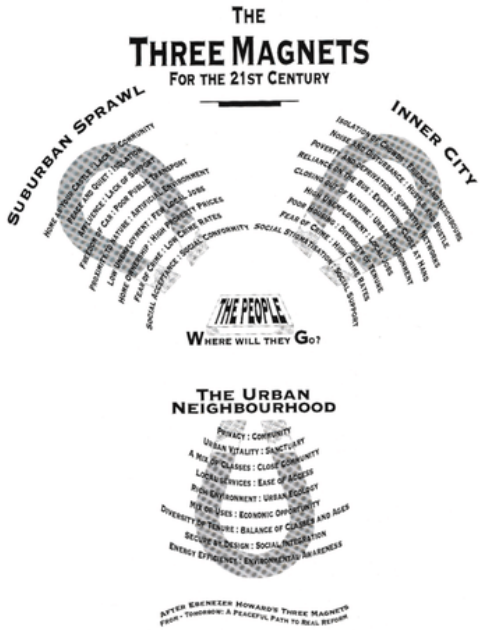
Scenario 2

TOMORROW'S GARDEN CITY

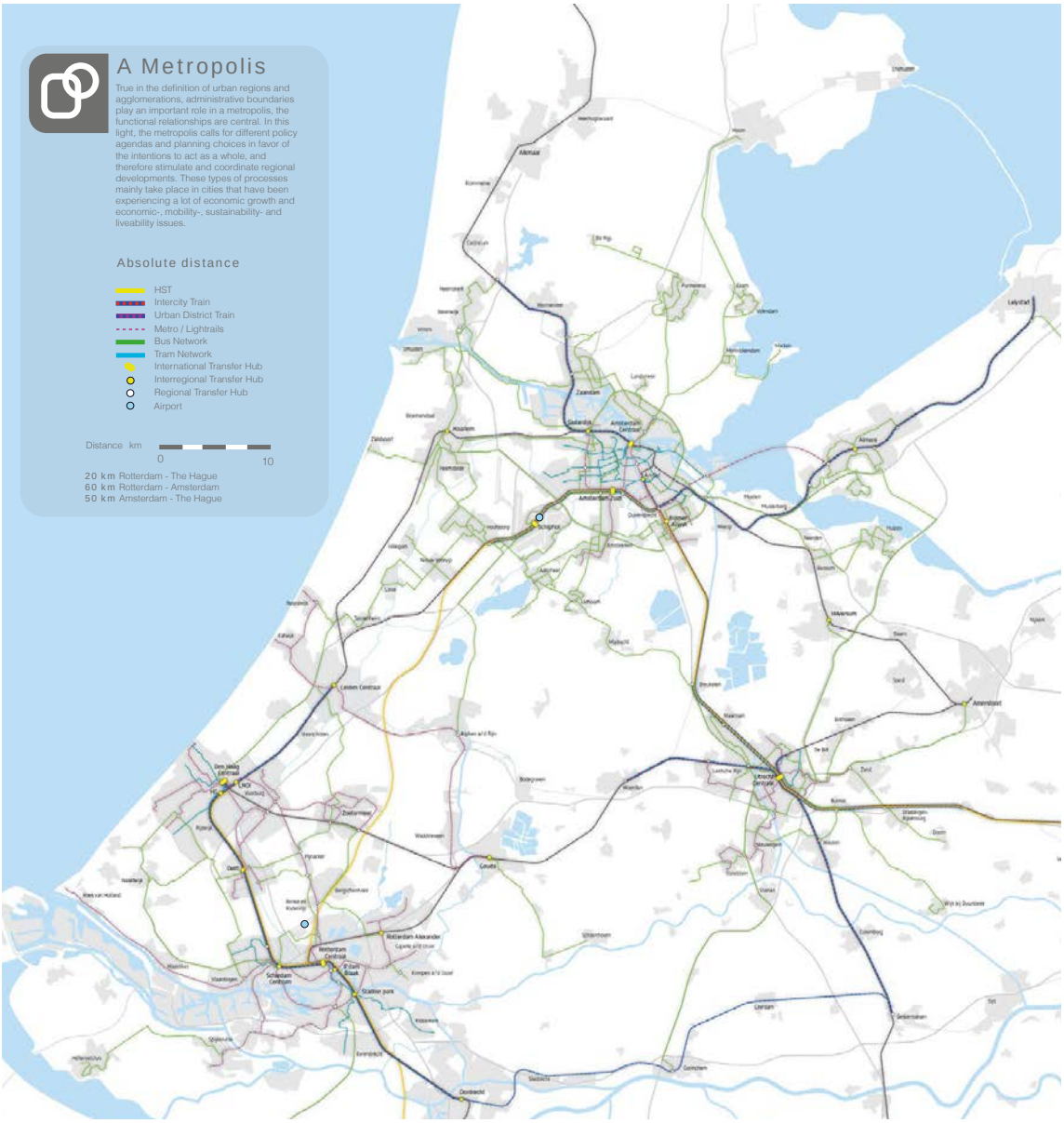
The green/urban city

The neighborhood close to the station, Schiebroek, was originally meant to be a garden city. In our opinion it could be of much relevance to bring this back. There are several principles that make the garden city a successful concept. A Garden City is a settlement which enhances the natural environment and offers high-quality affordable housing. Furthermore it provides locally accessible work in beautiful, healthy and sociable communities. The principles of a Garden City are very interlocking. First of all it will give the area a higher land value, which benefits the community. Moreover, it will provide mixed-tenure homes and housing types that are affordable. Small scale agriculture to create a healthy community with imaginatively designed gardens and development that enhances the natural environment, providing a comprehensive green infrastructure network and biodiversity do also add up the garden city principles. By applying these principles to the existing neighborhood, we have a chance to bring this identity to the city as it was originally meant to be.





Ebenezer Howard's three magnets


A Metropolis
True in the definition of urban regions and agglomerations, administrative boundaries play an important role in a metropolis, the functional relationships are central. In this light, the metropolis calls for different policy agendas and planning choices in favor of the intentions to act as a whole, and therefore stimulate and coordinate regional developments. These types of processes mainly take place in cities that have been experiencing a lot of economic growth and economic-, mobility-, sustainability- and liveability issues.
Absolute distance
HST
Intercity Train
Urban District Train
Metro / Lightrails
Bus Network
Tram Network
International Transfer Hub
Interregional Transfer Hub
Regional Transfer Hub
Airport
Distance km
0
10
20 km Rotterdam - The Hague
60 km Rotterdam - Amsterdam
50 km Amsterdam - The Hague

A Metropolis

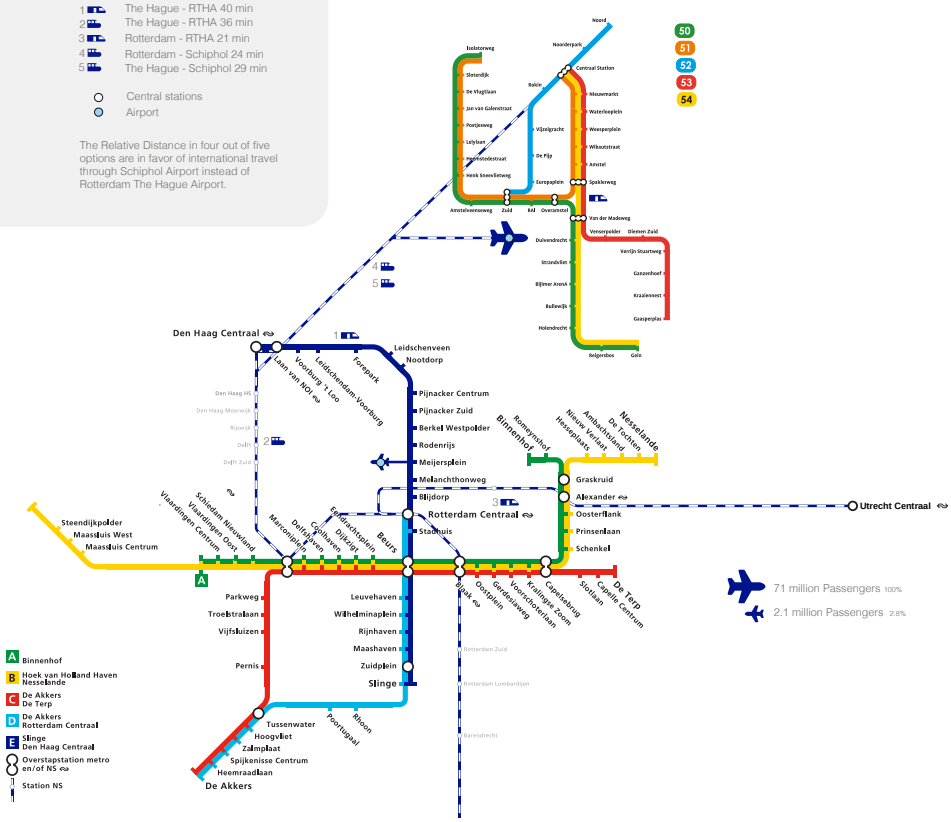
True in the definition of urban regions and agglomerations, administrative boundaries play an important role in a metropolis, the functional relationships are central. In this light, the metropolis calls for different policy agendas and planning choices in favor of the intentions to act as a whole, and therefore stimulate and coordinate regional developments. These types of processes mainly take place in cities that have been experiencing a lot of economic growth and economic-, mobility-, sustainability- and liveability issues.

Relative distance

1 The Hague - RTHA 40 min
2 The Hague - RTHA 36 min
3 Rotterdam - RTHA 21 min
4 Rotterdam - Schiphol 24 min
5 The Hague - Schiphol 29 min

Central stations
Airport

The Relative Distance in four out of five options are in favor of international travel through Schiphol Airport instead of Rotterdam The Hague Airport.



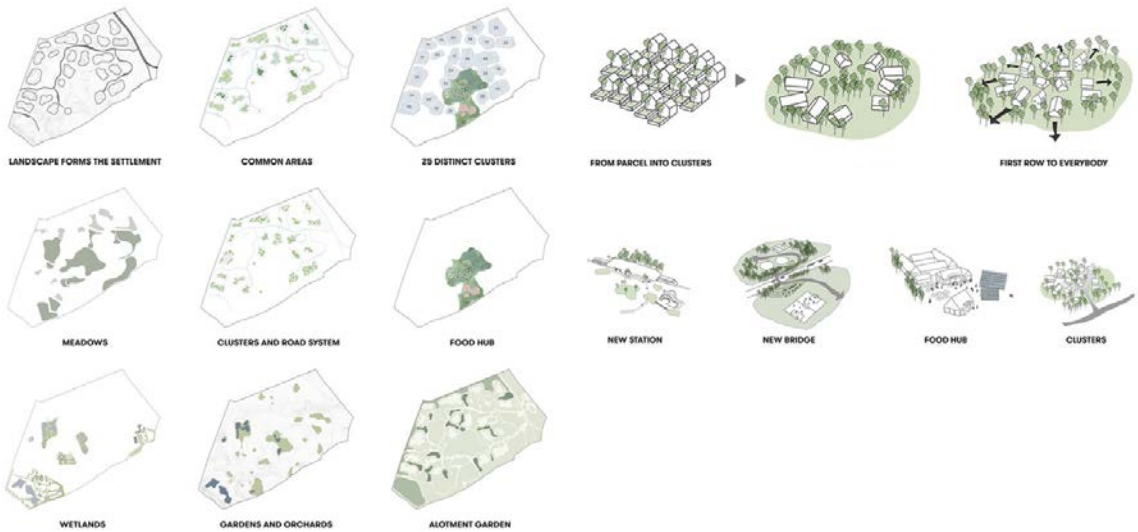
OPPORTUNITY & NEEDS ASSESSMENT

Tomorrow's Garden City is an inclusive metro station design that corresponds to the original design proposal for Schiebroek polder while answering the 21st century needs of its current and future users. The dual nature of the location, a rural hinterland and a massive connection point between two major cities, makes Meijersplein potentially a site for new social, spatial and environmental development.

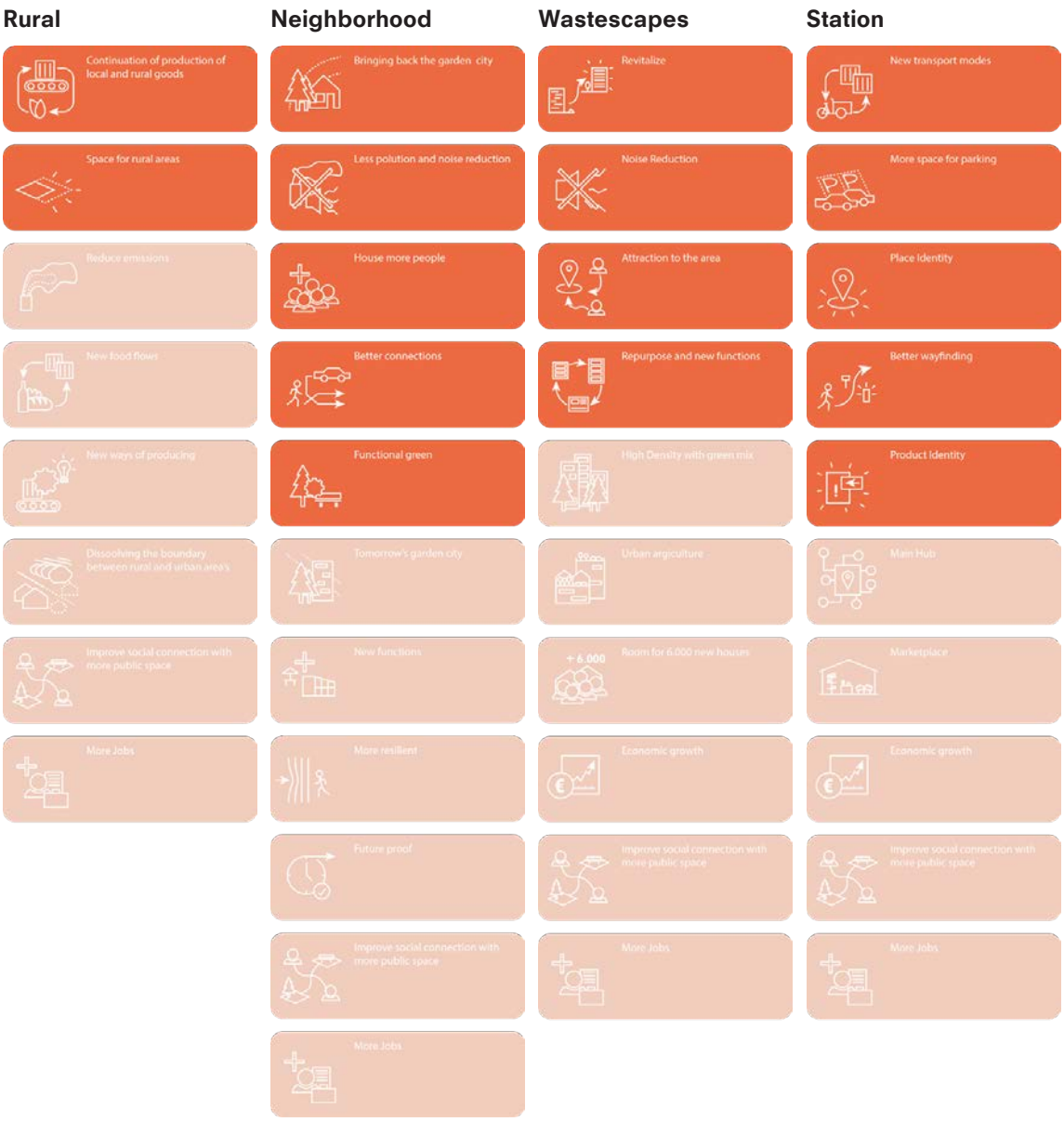
In order to get a grasp on the different flows, users and needs we divided the area in four districts that all have promising opportunities. The project's title, Tomorrow's Garden City, refers back to multiple changes the proposal envisions to accumulate over the span of 10 years.

- A new proposed chain of food distribution for the existing and new residents in the area
- A more resilient neighborhood answering to future climate scenarios
- Introducing new neighborhood districts at wastescape areas
- A hybrid station serving as a connector of the garden city area

We did a "need and opportunity assessment" for all four districts that resulted in the butterfly diagrams in the following pages.

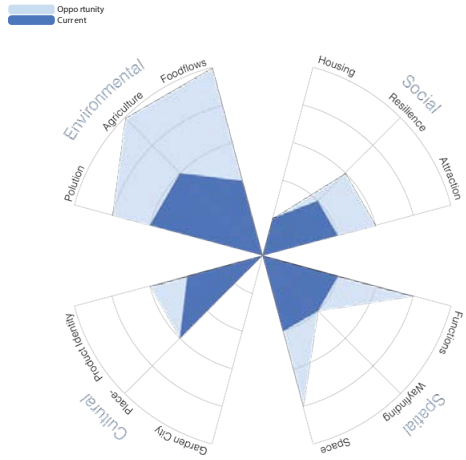


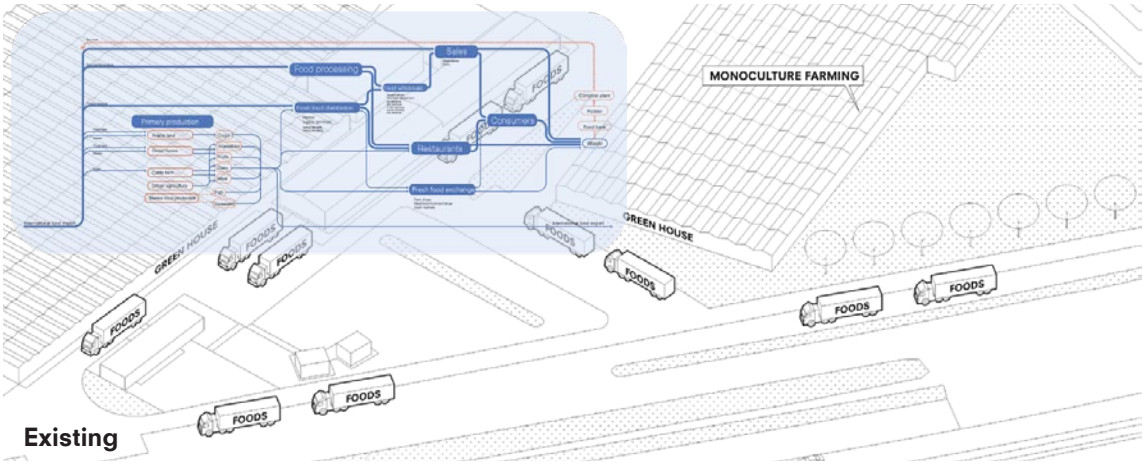
Helsinge Garden City - Karres en Brands


Rural
Continuation of production of local and rural goods
Space for rural areas
Reduce emissions
New food flows
New ways of producing
Dissolving the boundary between rural and urban area's
Improve social connection with more public space
More Jobs
Neighborhood
Bringing back the garden city
Less polution and noise reduction
House more people
Better connections
Functional green
Tomorrow's garden city
New functions
More resilient
Future proof
Improve social connection with more public space
More Jobs
Wastescapes
Revitalize
Noise Reduction
Attraction to the area
Repurpose and new functions
High Density with green mix
Urban arrgiculture
+ 6.000
Room for 6.000 new houses
Economic growth
Improve social connection with more public space
More Jobs
Station
New transport modes
More space for parking
Place Identity
Better wayfinding
Product Identity
Main Hub
Marketplace
Economic growth
Improve social connection with more public space
More Jobs

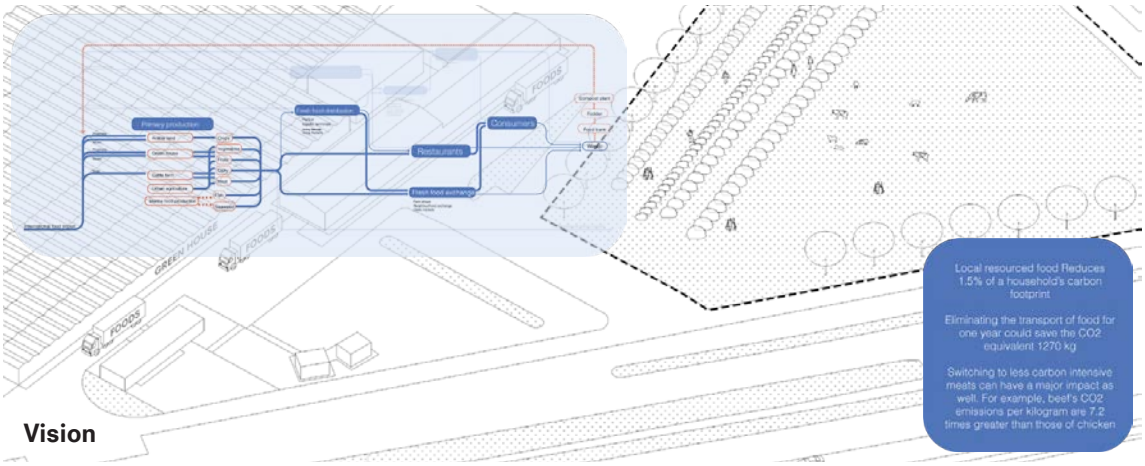
RURAL
Product Flow

Meijersplein is positioned in the middle of two opposite worlds, yet both worlds are heavily dependent on each other. The product flow coming from the harbor of Rotterdam provides the rural hinterland with substances for food production, one part goes back for international trading, the rest is distributed over wholesale companies throughout the Netherlands. This makes the Schiebroek polder not only part of a transportation corridor for people but also for goods. Responding to the ambition to have 10.000 more residents in the area, making a total of 30.000 people, Schiebroek can benefit from the direct impact this food chain provides, by taking part in the locally sourced fresh food exchange focused on more vernacular ways of producing.





Existing

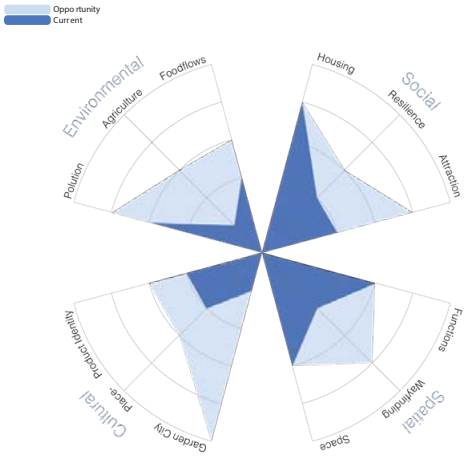


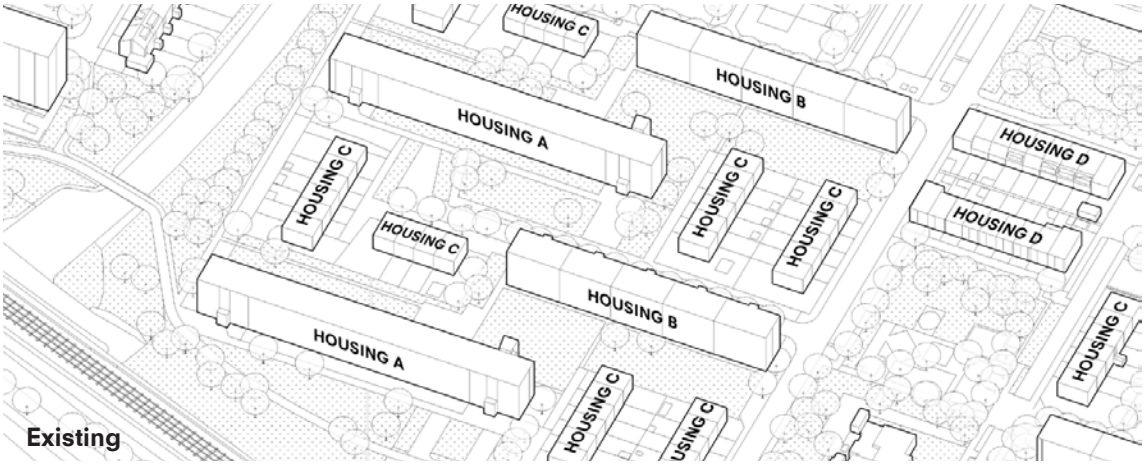
Vision

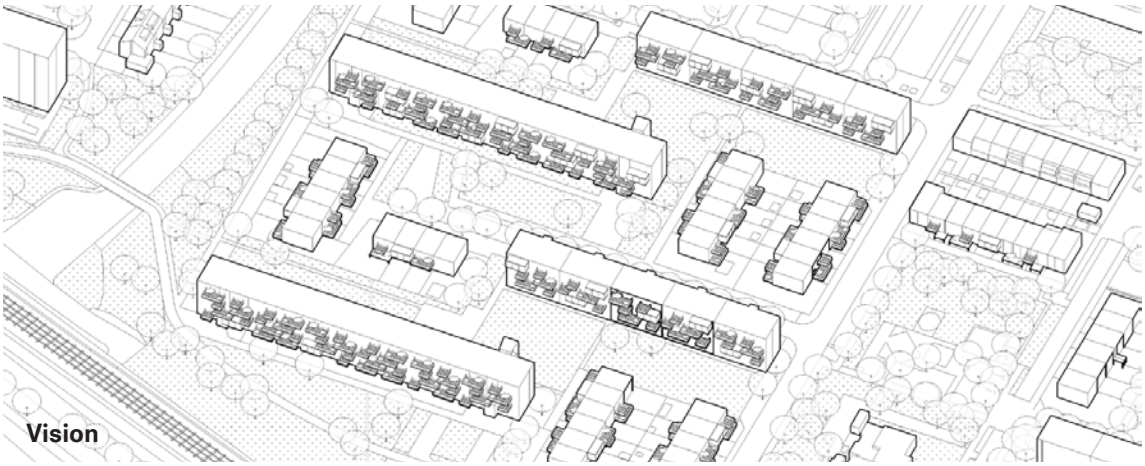
Opportunity & Need butterfly diagram

NEIGHBORHOOD
Resilience

The neighborhood design, originally planned as a modern garden city, was overshadowed by the arrival of the airport and larger social housing flats. These will be made more resilient, by adding new functional green, water storage solutions and more individual outdoor spaces. The existing multiple singels will be used as entrance points to the new station.



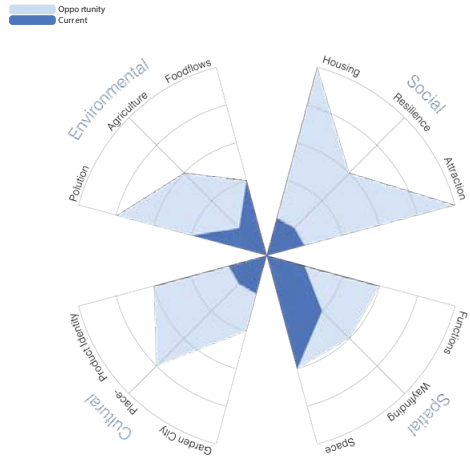


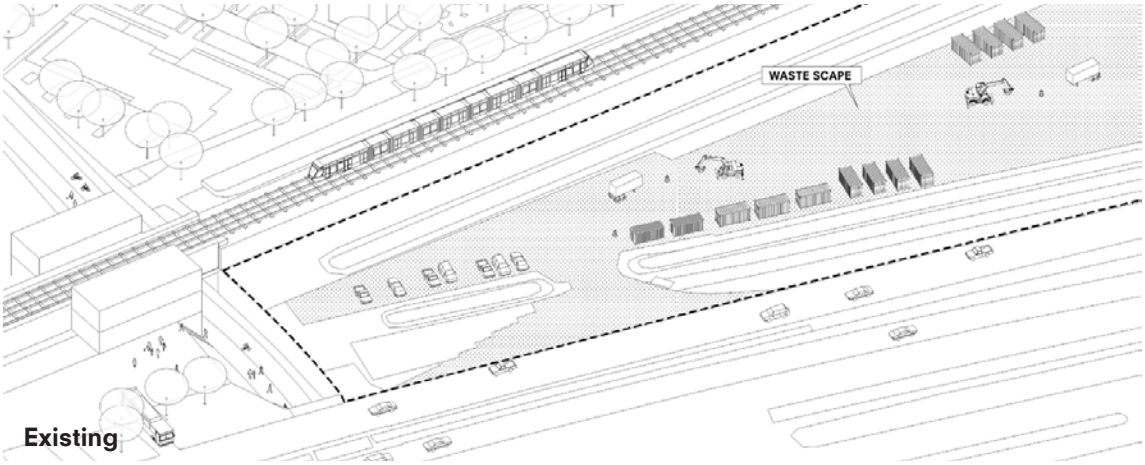


Opportunity & Need butterfly diagram

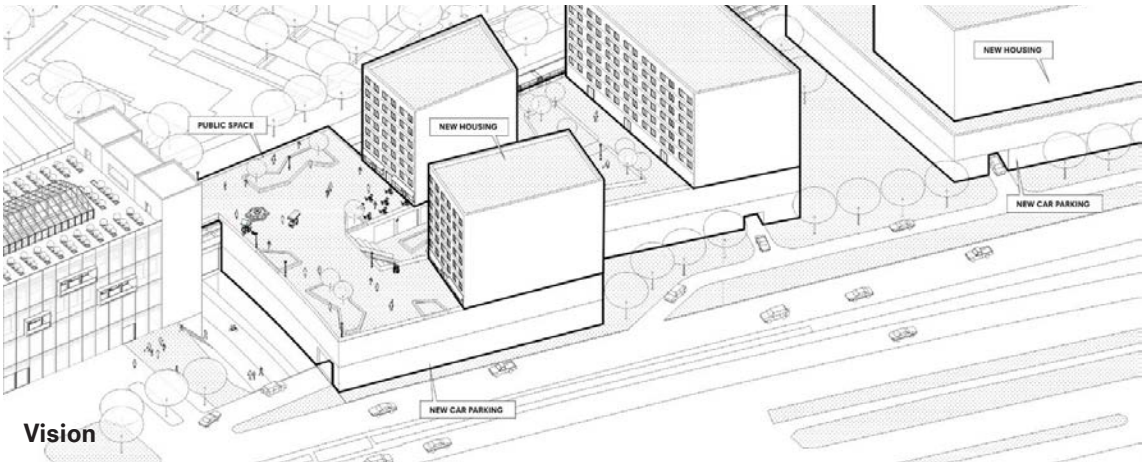
WASTESCAPES
Revitalize

From old oilfield to milieu park to residential area, a regeneration of waste space will be the first step to answer Rotterdam's ongoing housing challenges. Creating a new high dense lifted residential area in between two nuisance boundaries will make space for a new public space, function, urban agriculture and public and private gardens. A new large car parking facility on ground level will serve residents and commuters.





Existing



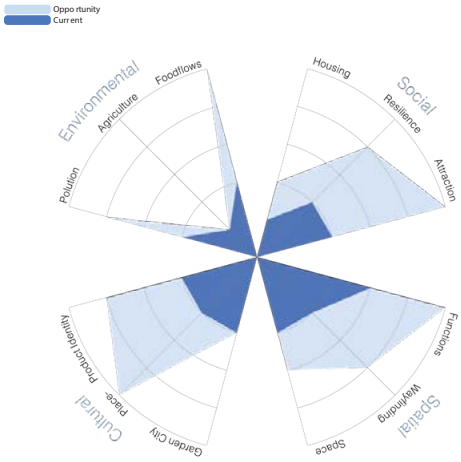
Vision

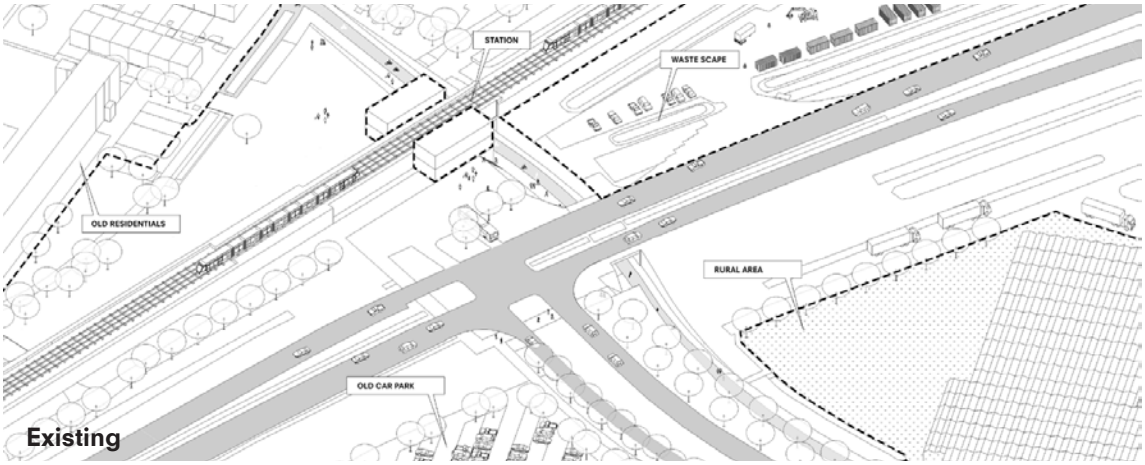
Opportunity & Need butterfly diagram

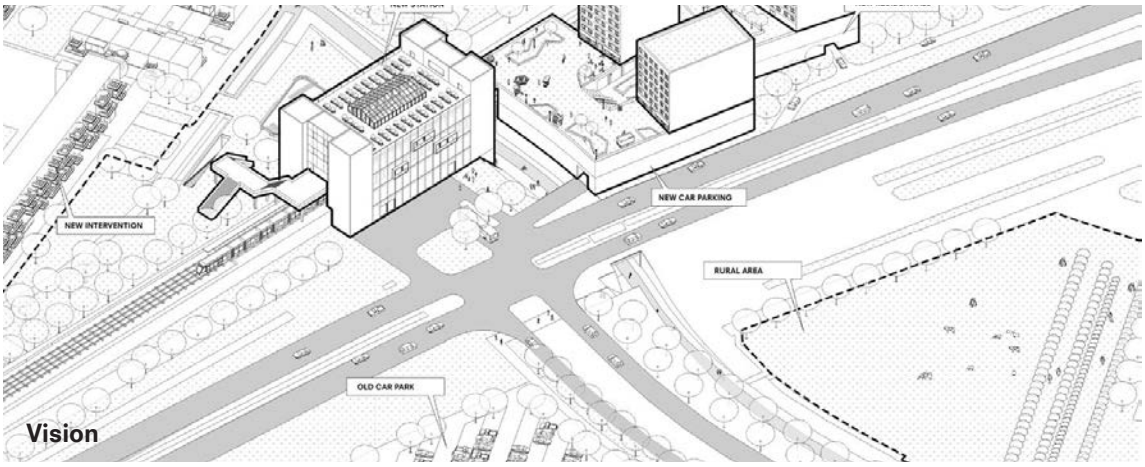
STATION

Connecting the detached

Meijersplein metro station, a small transportation node with no place identity, will be transformed into a hybrid station serving as a physical and logistical connector between all districts. Tomorrow's Garden City station is an act of connecting individual patches of land into a rural inspired urban fabric that serves a purpose locally as well as for the city of the Hague and Rotterdam.







Opportunity & Need butterfly diagram

THE MARKET HALL STATION

Inclusive Station Design

The redesigned Meijersplein station is a hybrid station that houses not only traditional and modern ways of transport, but also offers an experience. By combining the station building with a market hall, we wanted to realize a new way of station usage. Instead of consuming packaged- and processed food, Meijersplein, with its strategical location, serves as a pilot project for a locally grown and processed market. It is important that both product and human flows work simultaneously, which results in a higher passenger flow, more product flow and a higher process rate. The market becomes visible and accessible from the metro platforms as well as the public spaces around it. The market's first floor is connected to the ground level of the newly introduced residential area at the former Milieu Park. The market not only serves as a connector for cities like Rotterdam and The Hague or agglomerations such as Bleiswijk and Berkel, but also functions as an autonomous small scale food distribution center for the new and existing neighborhoods.

We propose a modest structural design that only expands the existing structure towards the north. The original station building has three additional new levels, housing the market hall and the urban agricultural rooftop garden. This additional construction is lightweight timber framing, providing more transparency. The exposed framing can be seen at every level of the building, creating a strong new material identity. Since a market hall and a station have different user patterns, the design makes it possible to switch into two separately controlled structures when necessary.

Tomorrow's Garden City Station becomes an act of connecting individual patches into a rural inspired urban fabric that serves a purpose locally as well as for the Hague and Rotterdam.

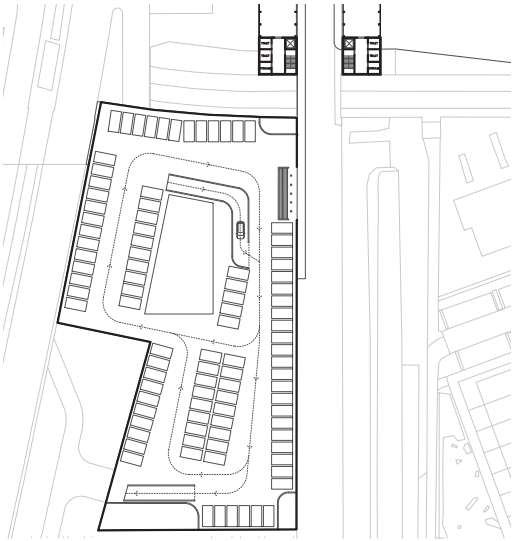
The Market Hall Station cross-section

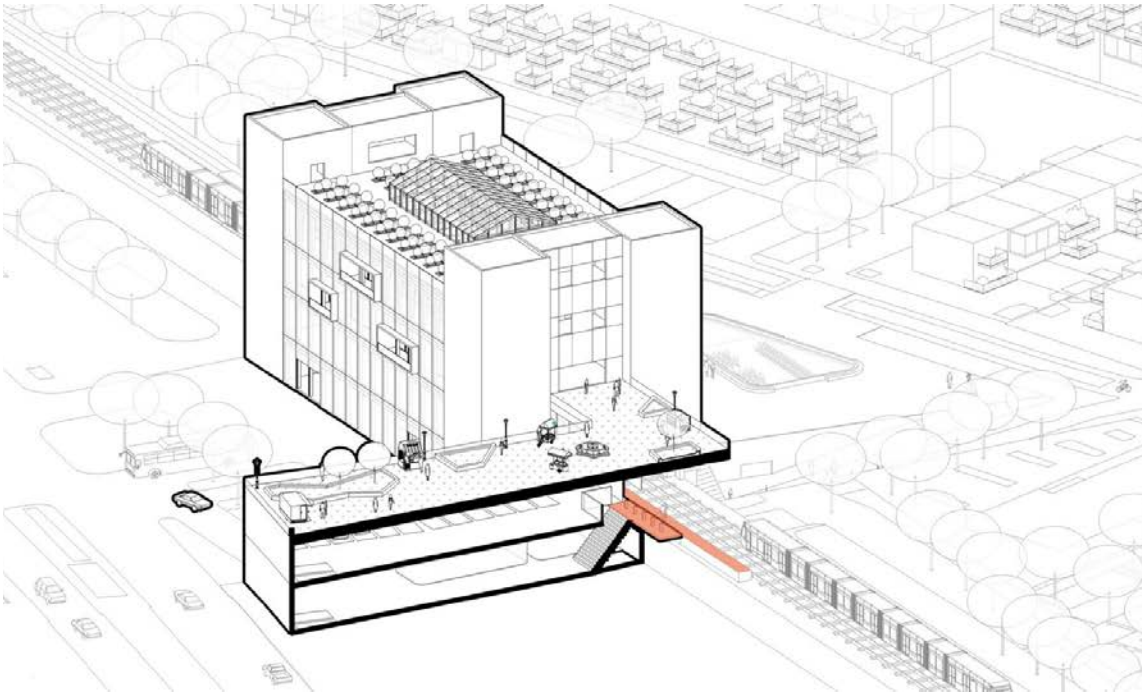

MEIJERPLEIN MARKET

PARK & RIDE

New residents in the area means more logistical spaces for transportation purposes. Introducing a new car park and P&R route under the new residential area not only answers the needs of the neighborhood but also solves the problematic crosswalk travelers currently have to take from the existing P&R location. The proposal also adds a new transportation flow for goods, which results in space making for an additional bus stop and the new food flow to be able to enter the building easily.

The new P&R is directly connected to the extended platforms of Metroline-E, thus ensuring a smooth change in use of transportation methods. On top of the garage a public park, with lots of greenery and food stands selling locally sourced products, connects the new residential area with the station.

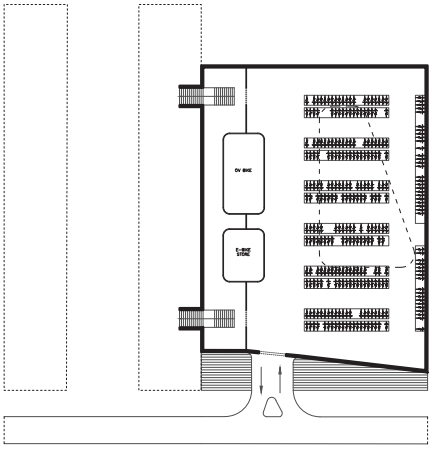


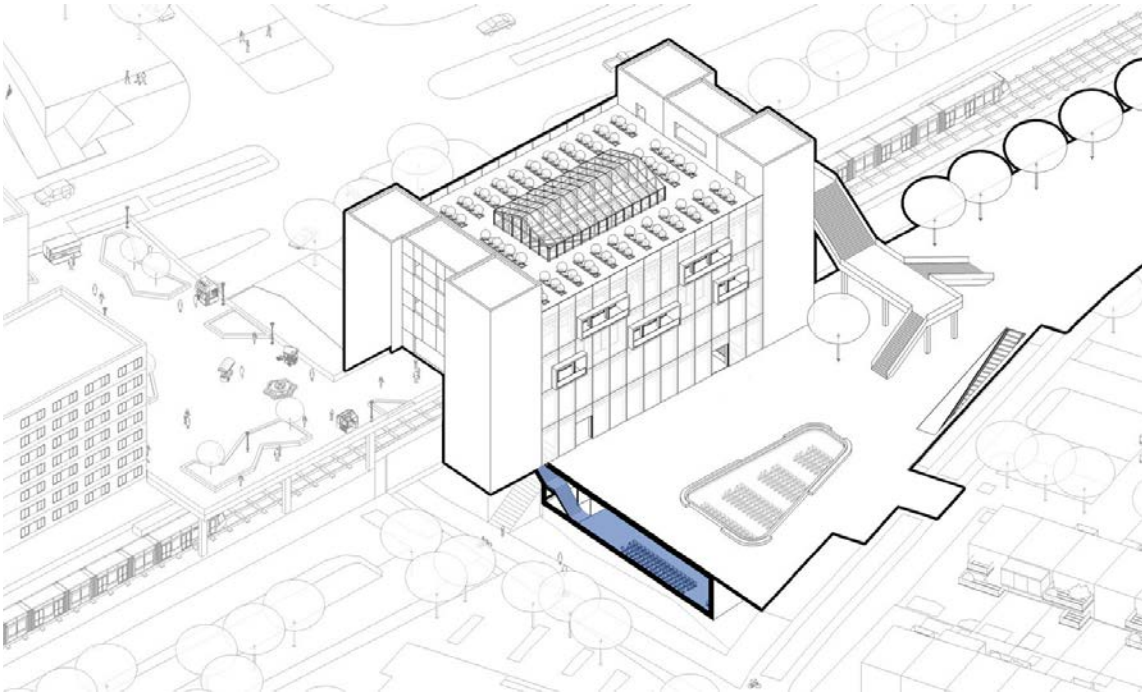


Platform extension & new Park and Ride

BICYCLE BASEMENT

We used the existing cyclist tunnel in our advantage and connected it to an underground bicycle, -storage, -shop, -repair and Share Point. One can access the basement from the north side connecting to a beautiful singel leading them to the village center. The bicycle basement is also connected from the west to east side by ways of a cycling tunnel. The basement is connected to the entrance hall leading the travelers to the Metro line platforms, creating a smooth change in use of transportation methods.

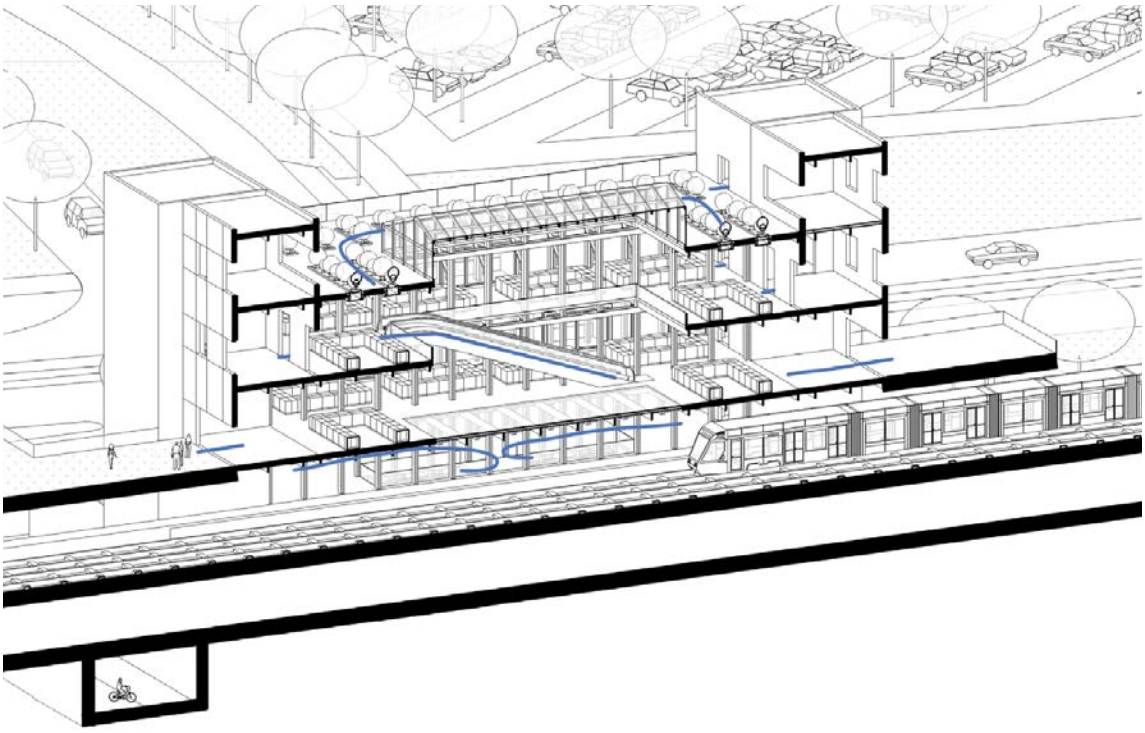




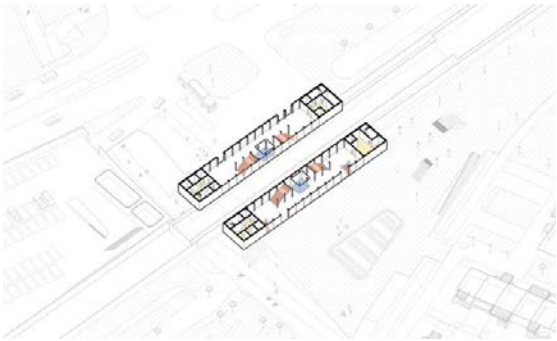
New bicycle basement

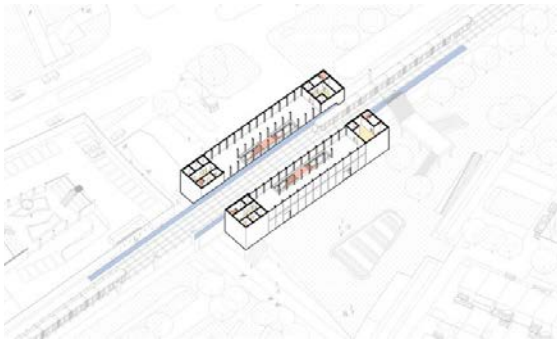
USER FLOWS

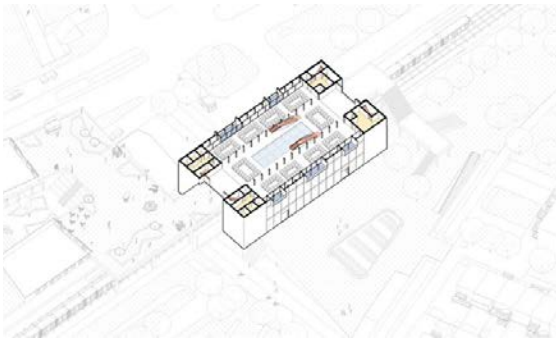
The proposed metro station houses the functions of a market hall and an urban agricultural garden throughout the building. From the bicycle garage the user can reach the entrance hall leading them up to the extended platforms where they can move through the two vertical service cores leading to the two story floor market and rooftop garden. In plan the new addition follows the footprint of the original metro station, yet is expanded towards the north. The first market hall floor is connected to the new residential area on the south side as well as through a staircase to the existing neighborhood on the north. Through the second floor one can reach the top produce garden. To create a visual connection between the proposed market and the platforms a glass core shaft is placed in the middle of the building making it possible to look up and down depending on one's position in the building. In terms of technicalities we looked into the characteristics of a greenhouse and implemented ways of natural ventilation from the metro platforms all the way up to the top garden, which houses a restaurant and a café that will process left over products from the market. To showcase the user flows in the station, a greenhouse inspired polycarbonate façade with indoor balconies opens up to the south and the west.

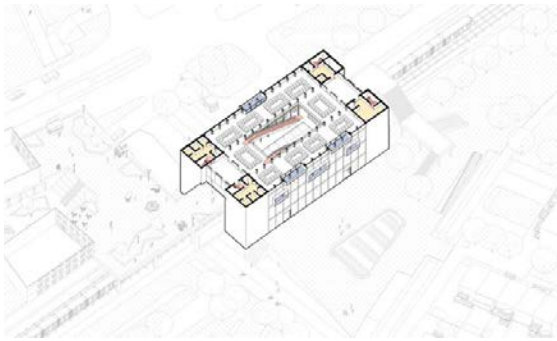


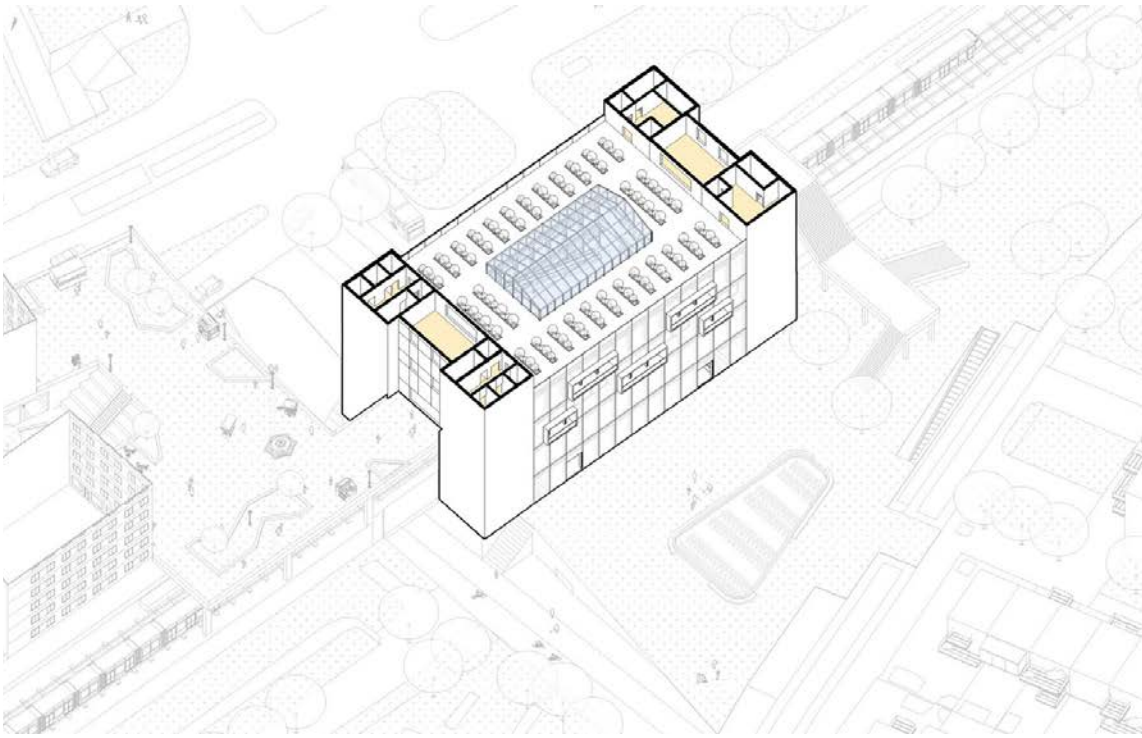
Flows



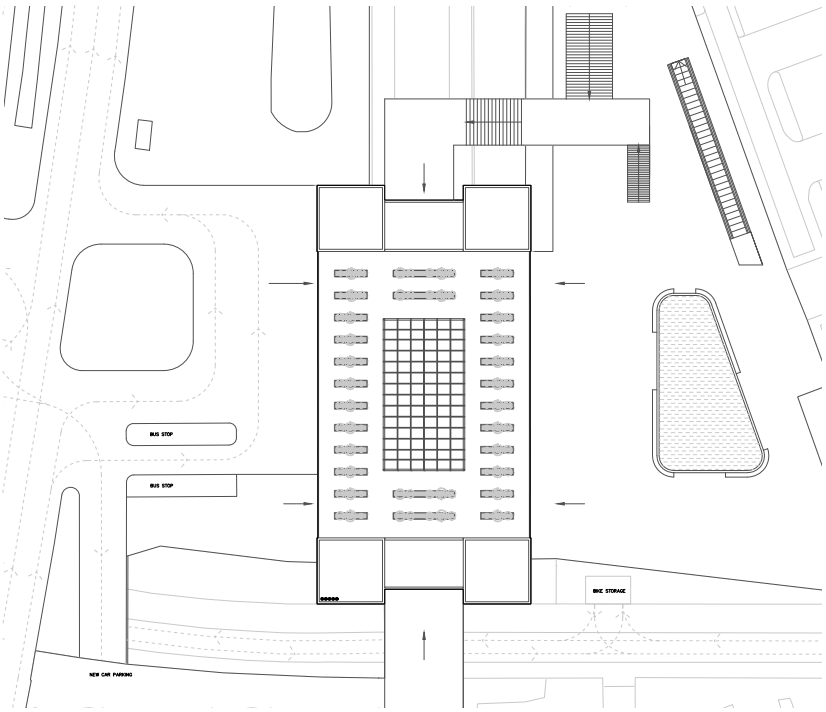




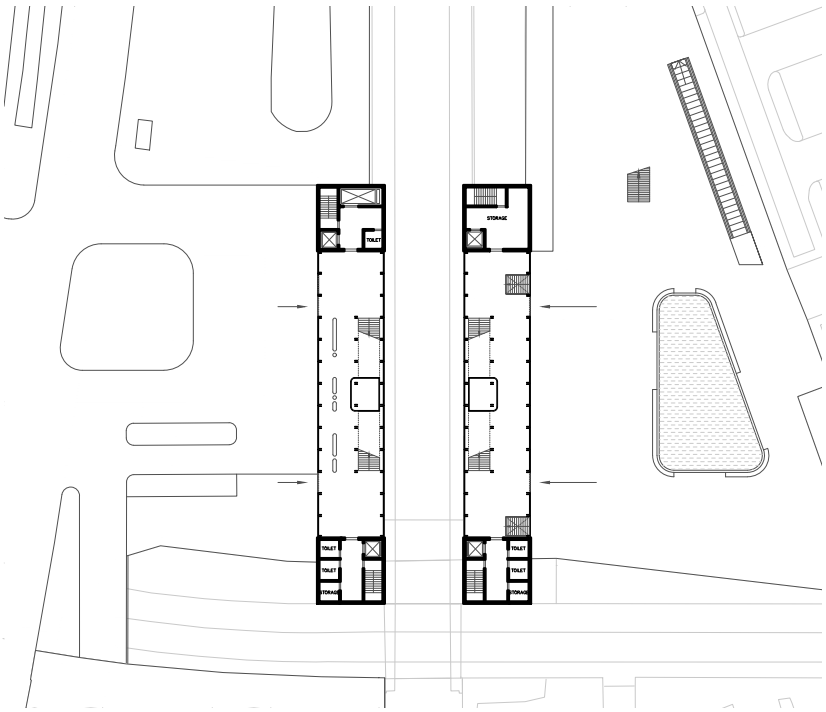




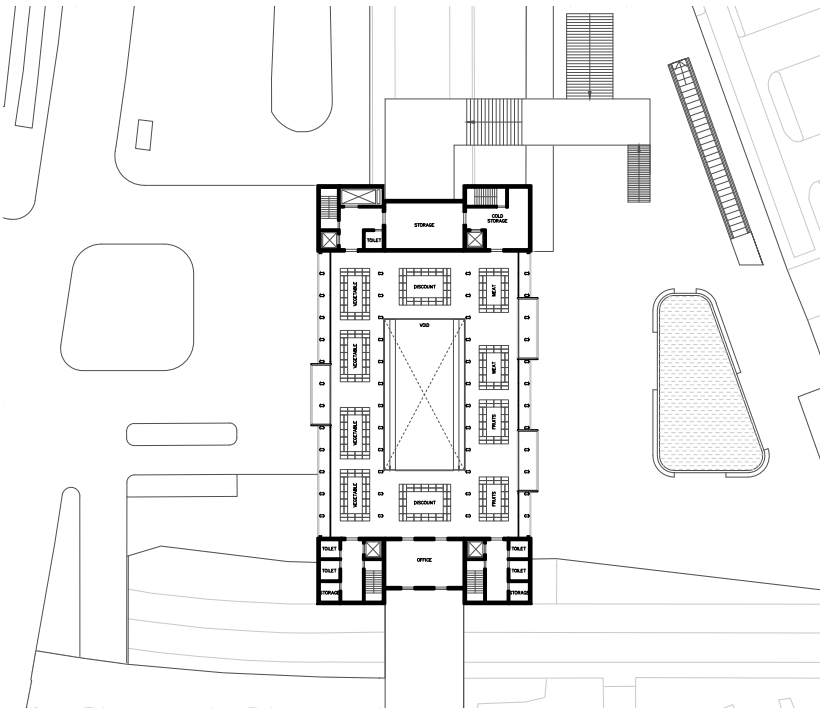
Zoning



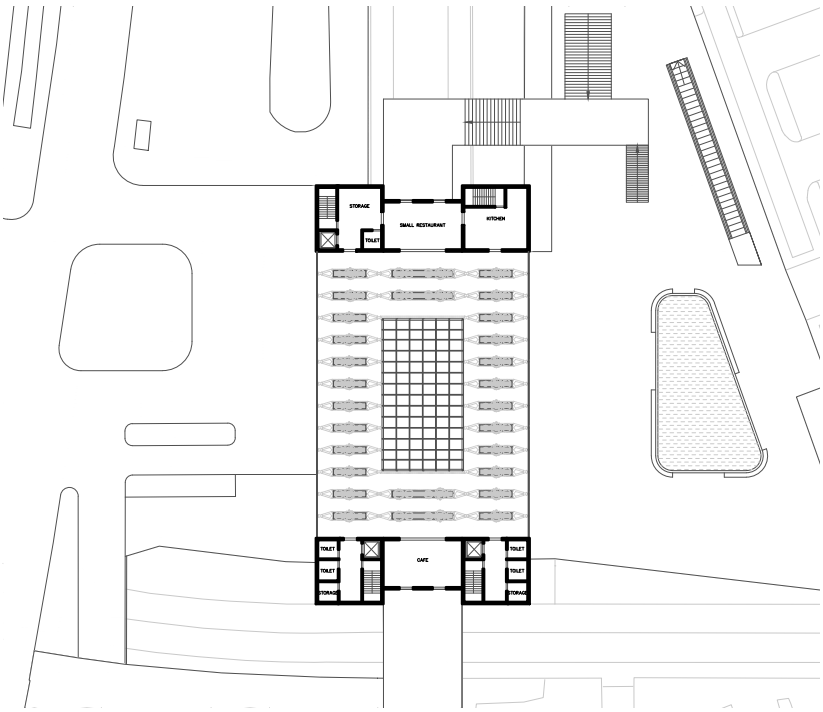
Ground floor



First floor

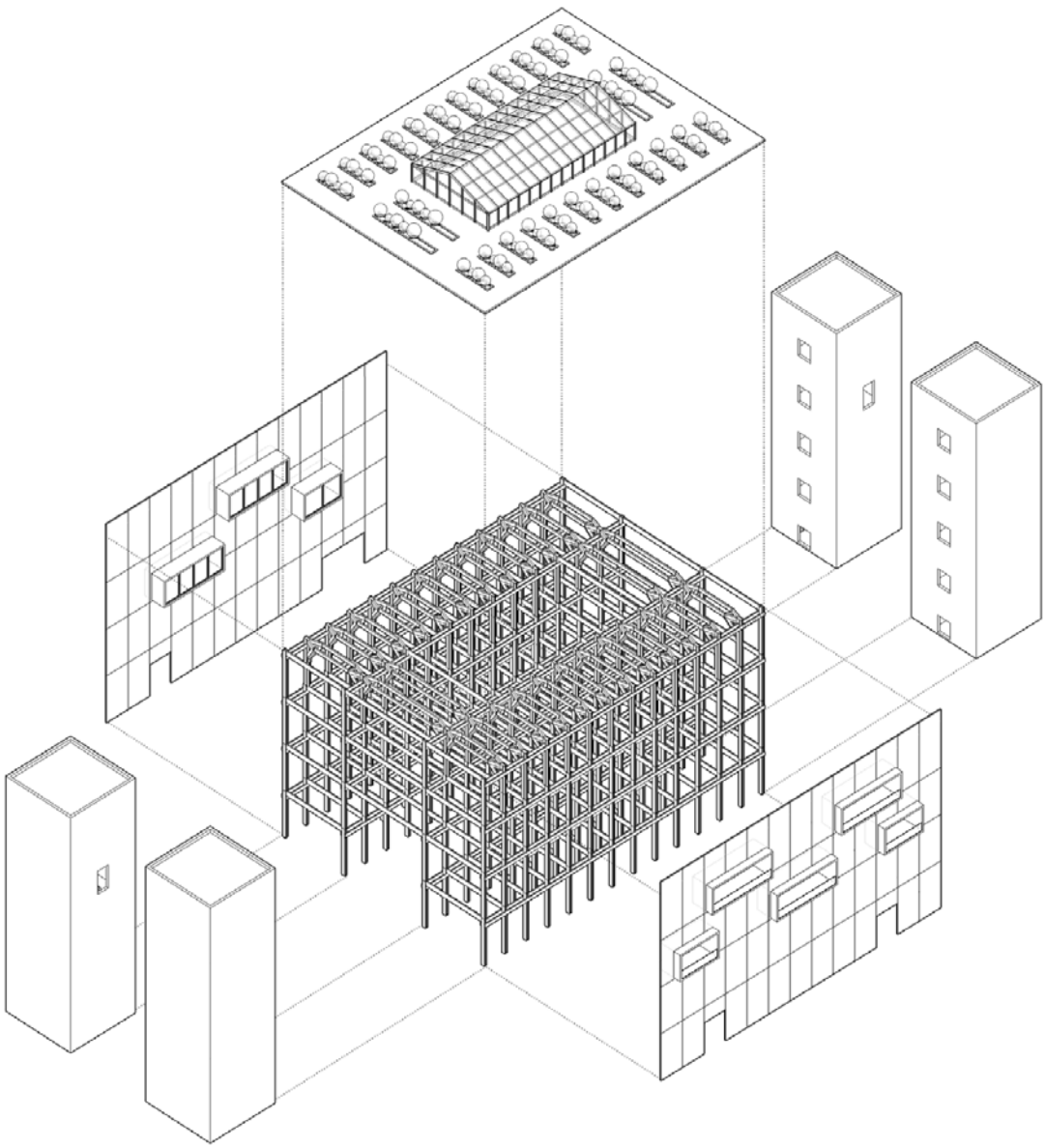


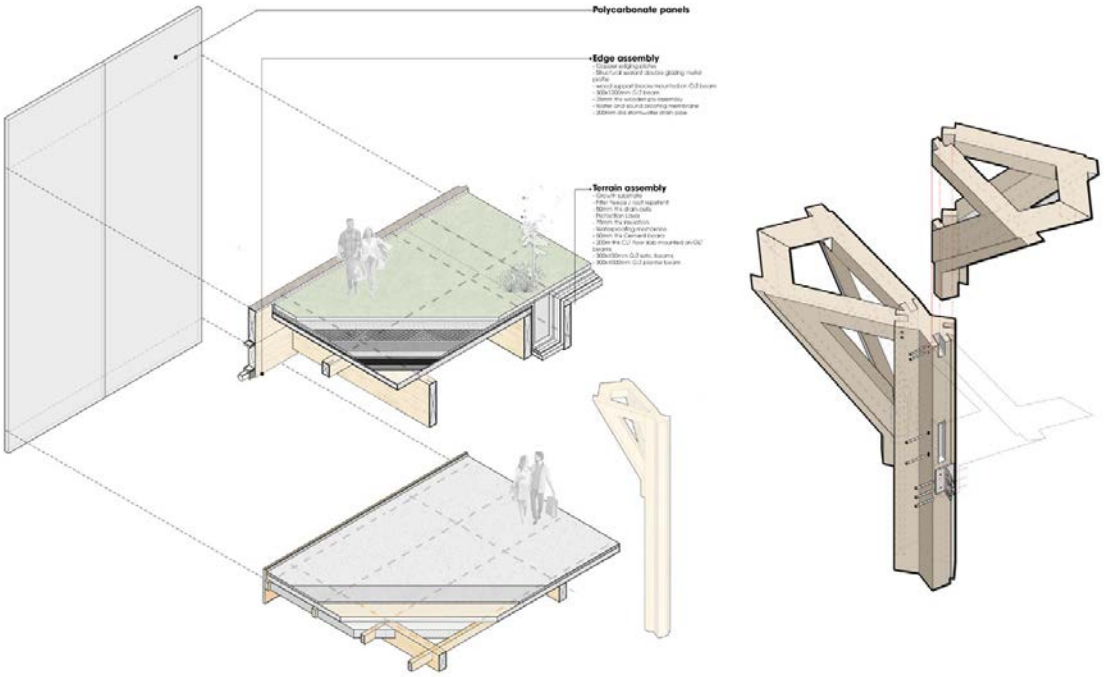
Fourth floor



Rooftop plan

Structural Detail
The exposed wood structure, is a feature used throughout the building. The columns support a three story high building with a rooftop that houses different types of suitable trees. The integrated structure is made stable by a interlocking Japanese joinery system.




Polycarbonate panels
Edge assembly
Terrain assembly

PUBLIC SPACES
Introduction

The public space around the existing station are also rethought to reflect the new vision and serve the new functions of the station. This means redesigning the intersection, the milieu park and the station square. With the new proposal the intersection gets more complicated, as it will serve new flows, which include a flow of goods to the market hall. The area on the west side now contains two bus platforms and an unloading area. The traffic flow gets easier and safer by removing one of the crosswalks on the north side of the existing station. The tunnel under the south side provides a safe connection for both pedestrians and cyclists to the other side of the highway. Another addition to this intersection is the lane towards the new park and ride location underneath the new housing at the waste scape area. On the other side the station square together with the rematerialized streets will provide a safe public space for pedestrians. This also contributes to better wayfinding. The greenery on the square is a subtle hint to the rural area, with small plants and trees.

A new residential area is developed in the existing Milieu Park to tackle the current housing problems in the city and the neighborhood. This intervention is also a means to stimulate the use of the metro station and the market. The new neighborhood is elevated to minimize the effect of the barriers and nuisance that the metro tracks and car road create. The space between the buildings and the station provides a semi-private environment for the inhabitants and the users of the station. The space on the side of the station is public and includes new facilities. The space between the buildings is semi-private and includes a garden for the residents. Underneath this new neighborhood, a double-story parking accommodates the new car flows towards the station. This new parking location also makes it easier and safer for the travelers to reach the station as they do not have to cross the busy road.

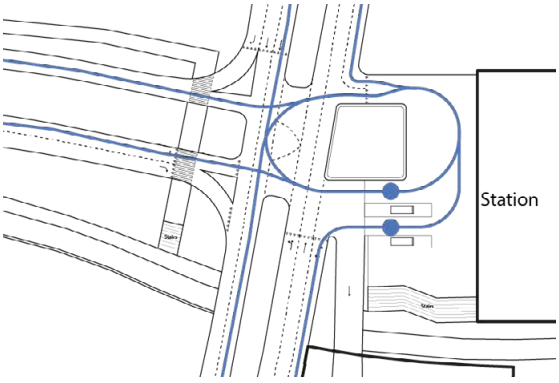
Station Square

Exiting the station towards the new residential area

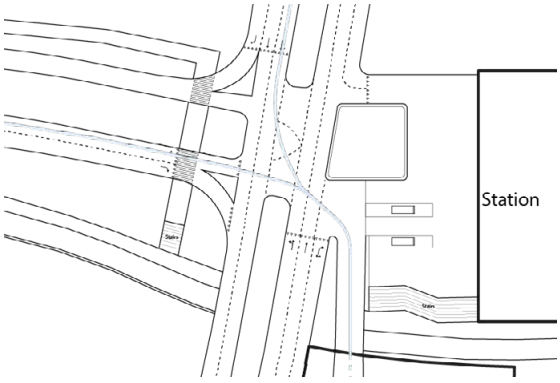
Public Spaces

RENEWED INTERSECTION

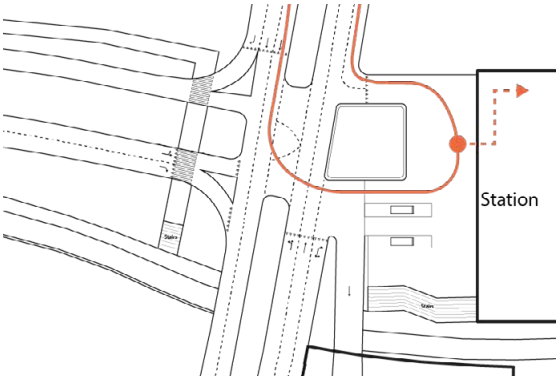
The intersection on the west side of the station currently needs changes to make it logistically compatible with the new design of the station. First of all, the bus stop at the station is transformed into a square with two bus stops in order to serve more travelers in the future. Secondly there is a need for unloading goods at the market hall. The trucks can make use of the bus square and unload goods. Infrastructurally this is possible, due to the time of unloading, which is typically early in the morning. Thirdly, an entrance to the parking garage is added under the new housing block, which is only accessible for cars coming from the north and west. Lastly the existing pedestrian crossing on the north side is removed and the bike tunnel can also be used by pedestrians. This existing pedestrian crossing is needed less, since the P+R is moved to the other side, under the new housing block. This removes a dangerous pedestrian crossing.



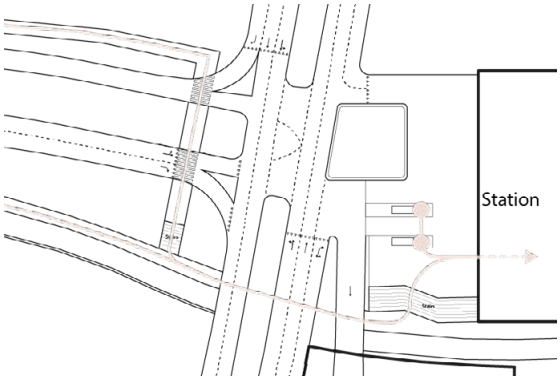
Routing Buses



Routing Cars



Routing Cargo Trucks

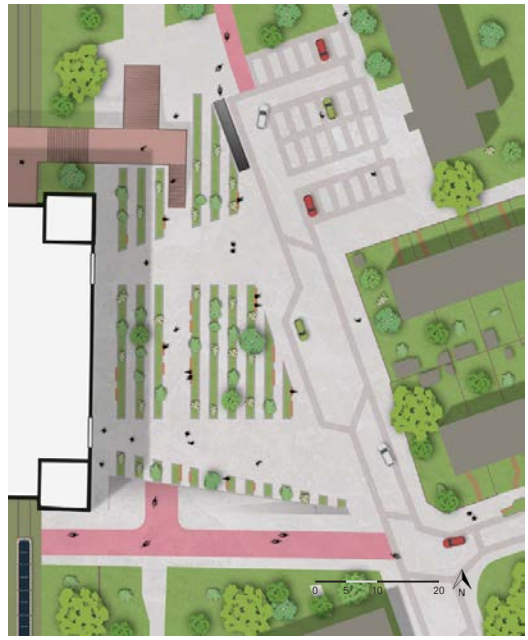


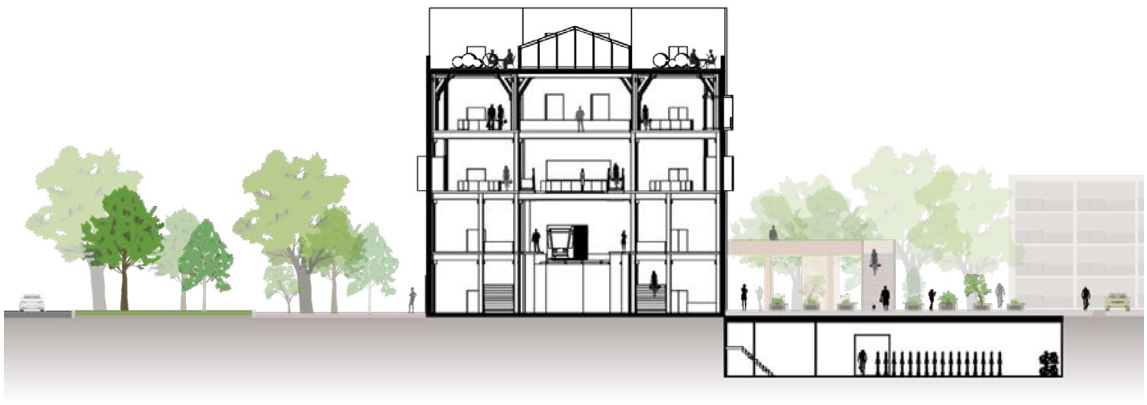
Routing Pedestrians

Public Spaces

STATION SQUARE

The square on the east of the station is redeveloped. Greenery is added on top of the new bicycle storage to signal to agricultural rural land outside the site. The two entrances are reachable through the square. On the north side of the square, next to the connecting bridge to the market level, an entrance to the bicycle storage is proposed in order to make it more accessible for cyclists coming from the north. The existing road infrastructure is retained, although the materialization is proposed to change. The distinction between the sidewalk and the street is obscured by using the same material qualities and removing the height difference. Only the different colors point out the street. This is proposed to slow down the car traffic. The wayfinding is also improved by removing some high trees and using only small bushes.





Plan and Section West to East Station and Square

Public Spaces

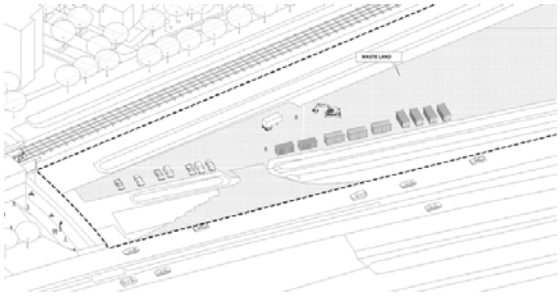
REGENERATED WASTELAND

The proposal aims to regenerate the existing wasteland to help with Rotterdam's ongoing housing problems. Creating a new high density residential area between two problematic boundaries creates space for new public spaces, urban agriculture and public/private gardens.

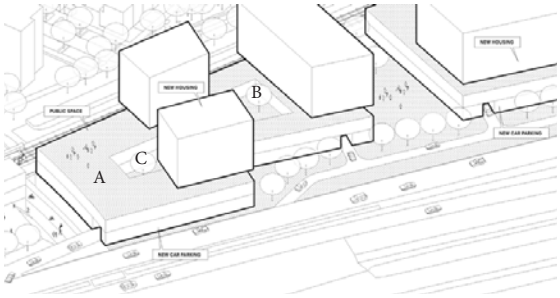
A: The public square between the station and the new residential block is designed as a dynamic environment which functions as an entrance to the station as well as a meeting spot for users and residents. The square provides new facilities like a restaurant, food stands selling locally sourced products, and planters with seating to enjoy food, interact and enjoy the elevated view over the neighborhood.

B: The square between the residential blocks is designed as a quiet, semi-private environment for the inhabitants. The large garden in the center provides opportunity to meet and relax.

C: The lowered space between the two squares functions as a green barrier to separate the active area from the quiet semi-private area. This space also includes an entrance to the parking garage beneath the public square.



Current condition



Proposed condition

Birdview
19 April 2021
Produced by: Joep Biemond & Nguyen Binh Minh

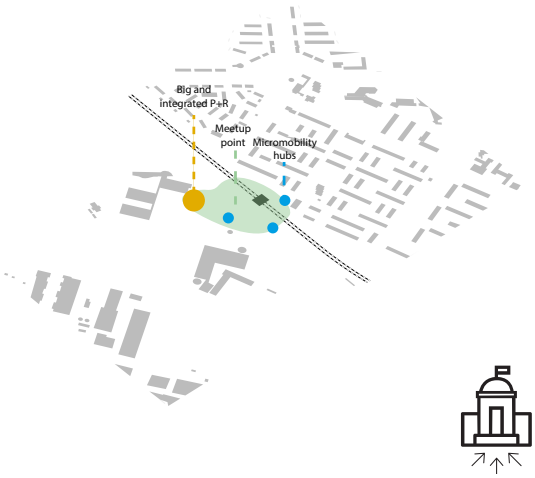
re-IMAGINE

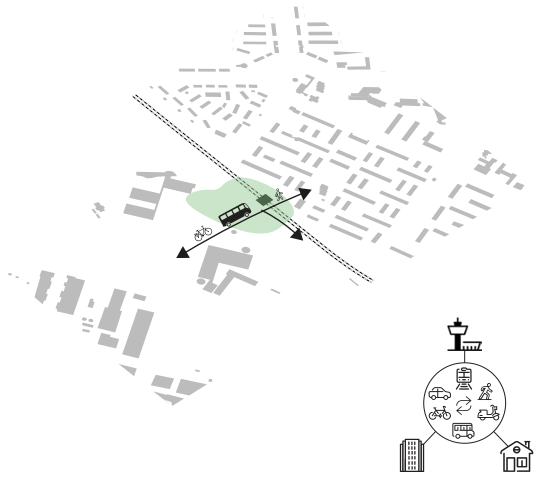
Meijersplein Station

Re-Imagine Project Video

Moritz Kistenfeger
Dimitrije Milic
Lisa van Vliet

VISION



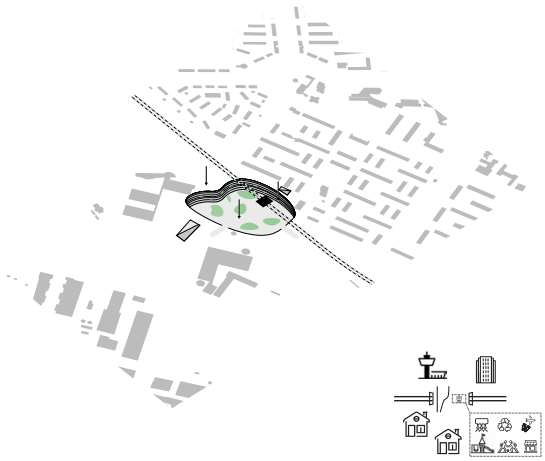


RE-IMAGINE

A car-free city center, a ring line operated by buses, an increased importance of the airport, and a fundamental change in urban mobility through mobility-as-a-service (Maas) solutions form the underlying framework of this longterm vision. Today, Meijersplein station is insignificant on the urban scale. We imagine the future station as the northern "Gate to the City" for various modes of transportation. The station would become an attractive meeting place at the city level, changing the importance of the station in the transportation network and redefining the perception of the area. While the surrounding of the Meijersplein station is currently characterized by suburban housing and industrial use, a shift to urban high-density housing can be expected in the next decades.

RE-CONNECT

The current design of Meijersplein station mainly serves its function as a transit point. The station provides metro access to the area, a park-and-ride facility for residents from nearby towns and the bus connection to the airport. The station has the potential to grow beyond its focus as airport station by the integration of a new ring bus line and therefore become a multi-modal mobility hub for the larger area. A compact station design ensures effortless switching between modes of transport such as metro, bus, bicycle, scooter and car. The station is a major hub for future Maas offers, as a variety of shared vehicles and ride-hailing services allow spontaneous travel planning, either independently or in combination with public transport. Today Meijersplein station already offers parking spaces for cars, but these are limited, separated from the station and consist only of an open field parking. As the city of Rotterdam aims for a car free city center, large scale Park and Ride stations will be required at major public transport nodes outside the city center. These stations must allow easy and convenient switching between the car and other modes of transport to facilitate a change in mobility behavior. These stations will not only serve daily commuters, but also day tourists arriving by car. Therefore, Meijersplein station will include a large and integrated P+R, offering private parking, charging stations as well as shared cars.



RE-VITALISE
A north-south barrier by the parallel highway and metro separates the neighborhood around Meijersplein station. With a spacious and attractive public space, the future train station can serve as a bridge and spatially connect the areas. The station can become the center for the community, as it provides functions such as a playgrounds, green spaces, stores as well as a recycling facility. The station thus serves not only as a transit point, but also as a place to stay even for residents who don't intend to travel. The plaza design is based on pedestrian walking routes, giving them clearly defined fast paths and more relaxed slow spaces, with opportunities to rest. The slow spaces offer green areas, benches and water features, defining the human-scale appearance of the plaza. The surrounding stairs function as entrance, as well as resting places.

RE-DUCE , RE-USE , RE-CYCLE
Rotterdam wants circular economy models as standard until 2030 and aims to be a fully circular city by 2050. This far-reaching and long-term concept leaves many residents with questions. The current Meijersplein station has no theme or reference to sustainability, while the future station can incorporate sustainable principles in various ways. To reduce the impact of the construction, parts of the station elements will be built from recycled building materials such as glass, metal and wood. An example can be the reuse of old airplane wings in the design of station entrances. In addition, the station can enable various high-tech solutions for energy generation through solar, wind or hydrolic energy. A milieu park will be closely integrated with the Park and Ride building, allowing for convenient disposal of special waste during daily commutes.

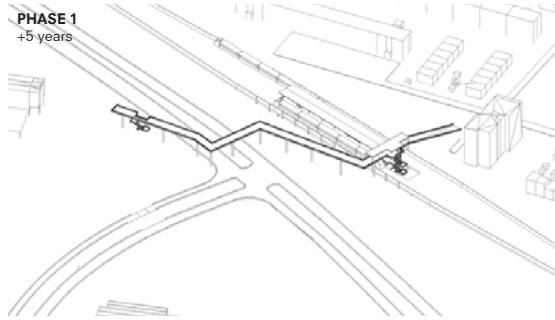
PHASES OF DEVELOPMENT

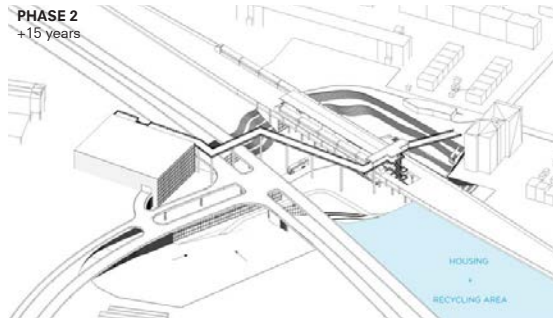
The redevelopment of the Meijersplein station is conceptualized through three phases. The governing problem in the redesign process is the inability to connect the two sides, east and west, due to their separation by the train tracks and the street. This is currently only solved by a pedestrian/bike tunnel but we consider this will be inadequate in the future, considering the potential development of the whole neighborhood.

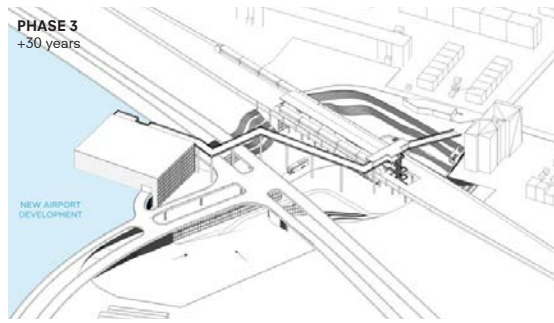
Phase 1
This part of the design is imagined to happen in the next 5 years and it consists of a design for a pedestrian bridge that will connect the east and the west side of the area. In this phase, we do not recognize the development of the whole area to progress to a stage that would require a larger area of communication between the two sides.

Phase 2
This part of the design is imagined to happen in the next 20 years and it consists of a design for a larger, pedestrian area that would allow various forms of mobility flows under the existing train tracks and the road. Phase two also envisions residential developments to the south, located at the farmer industrial area between the train tracks and the road. This is imagined as high-density affordable housing that needs to be connected to the older part of the neighborhood through a large, green public space. This design was founded on the idea that the existing modes of transport must not be affected in the process of making the new space in order to avoid unnecessary costs. The idea is to dig and implement prefabricated tunnel-like structural elements that will be positioned under the newly formed train and car bridges. This area will consist of fast connections between the train station and the bus station located directly below, bike and pedestrian paths as well as 3 mobility hubs that also serve as large covered bike parking. The area also predicts a large park+ ride building as part of the complex that connects the new station to the area predicted for the expansion of the Rotterdam The Hague airport.

Phase 3
The expansion of the Rotterdam The Hague airport is imagined to happen in the next 30 years and therefore influence the third phase of the Meijersplein development. When this happens the large intervention area will not only be used for the station but also as a shared landscape used for connections between train, bus, pedestrian, bike and air mobility.





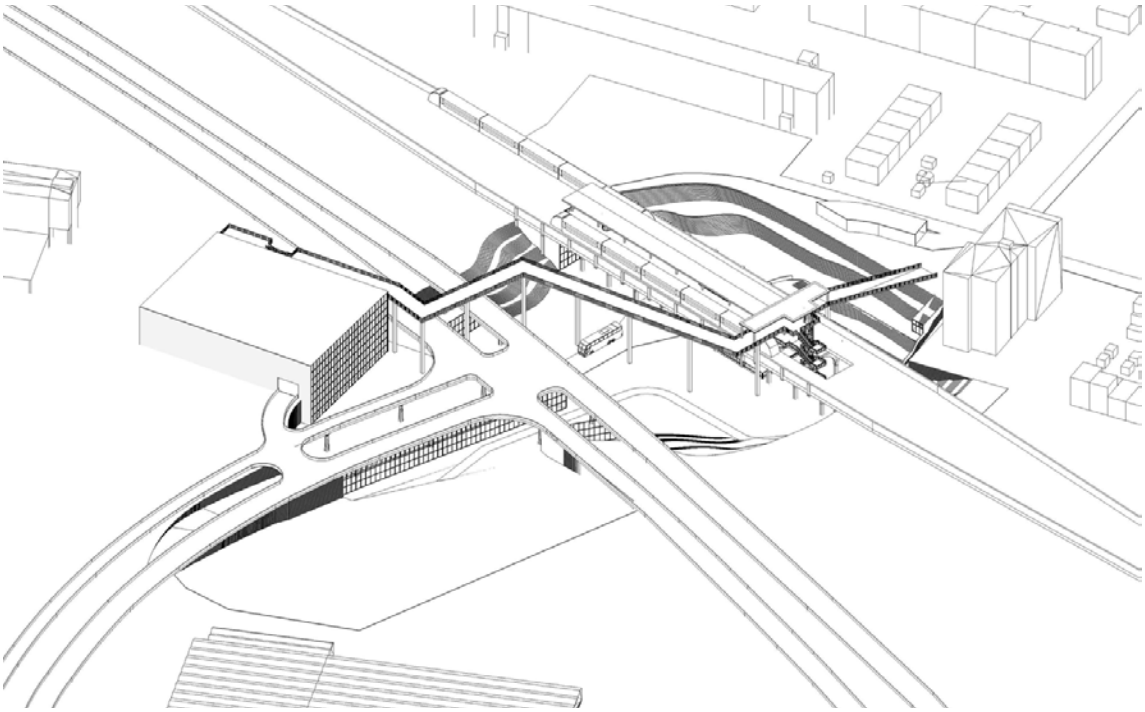


MOBILITY AND FUNCTION

The complete design allows multiple easy connections between pedestrian, bike, bus, train, car, and air mobility. Our idea is that because of its various users this area has to be a wide welcoming place where people may also rest and enjoy their time before continuing their journey.

The pedestrian bridge built in the first phase could still be used after the complete redevelopment but considering most convenient and fast routes will now be in the open -1 level, the bridge could become a more relaxed path, transformed into a green resting path that provides views over the busy area below and the landing planes above.

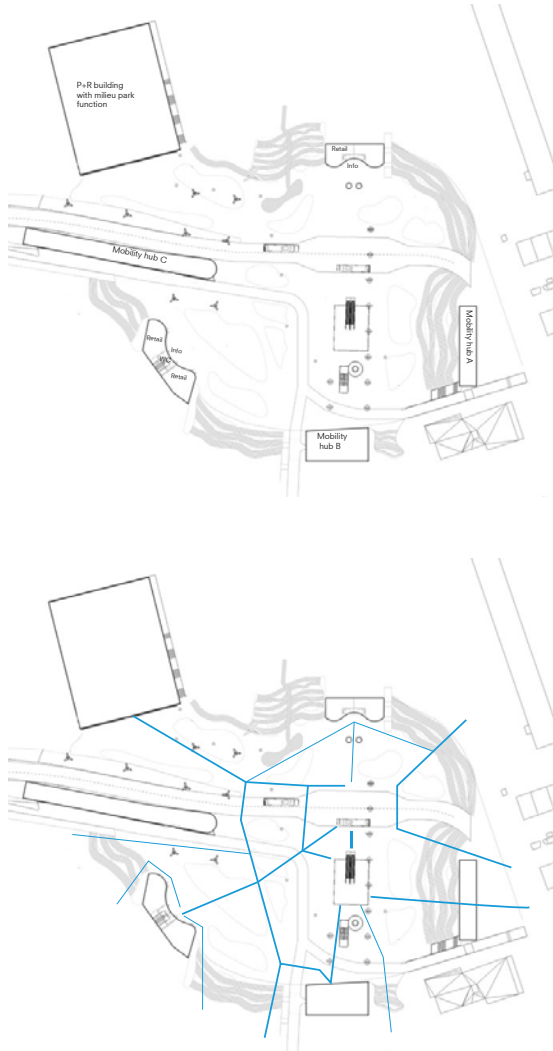
The new area also includes a ramp that connects the newly introduced Rotterdam circle line to the bus station located directly under the train platform. The remaining free spaces in the new Meijersplein landscape could be used for three larger retail/technical areas as well as for pop-up hospitality or commercial kiosks



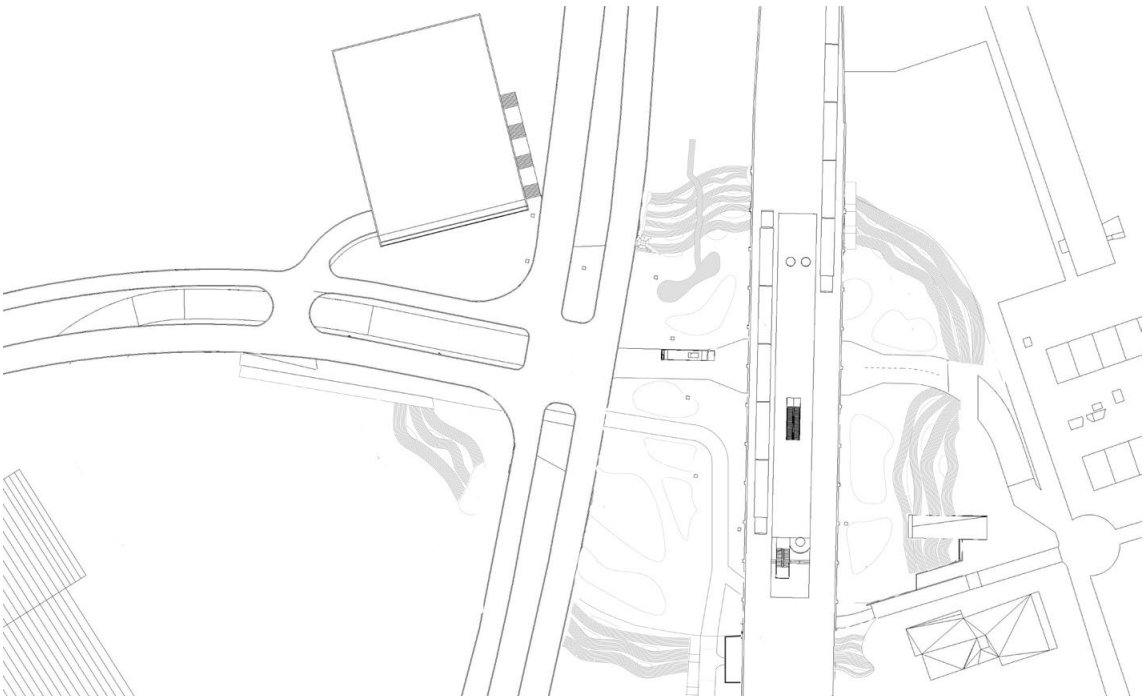
THE BELOW GROUND PLAZA

Node value
The west-east connection needs to be improved to create a better transition between Overschie and Schiebroek. This is necessary both for pedestrian safety and accessibility but also for buses to be able to cross the metro tracks. While moving the tracks is also a possibility, this construction would mean that the metro E would stop running for some time, creating more challenges for the network. So we propose to put buses, pedestrians and bikes underneath the metro tracks, creating a hub below street level.

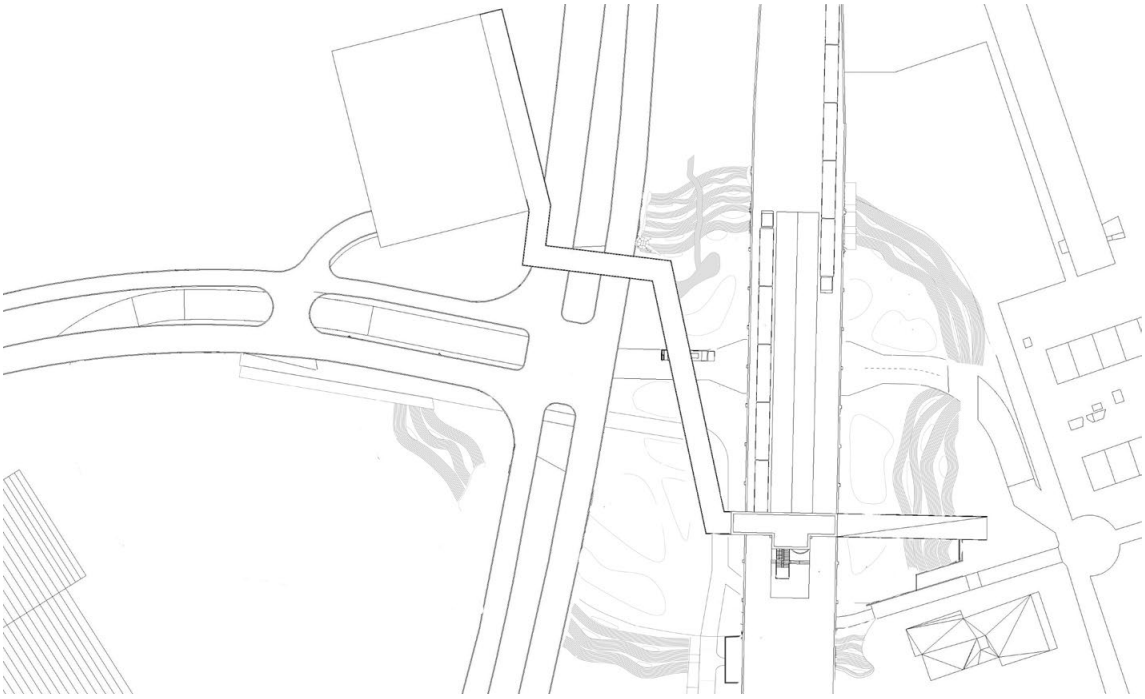
Place value
The most critical floor plan becomes the design of the -1 level plaza because even though this level is underground it is supposed to feel like ground level. With staircases and ramps all around the border of the plaza everyone would be able to enter this level easily. Most visual barriers are also removed to make sure that this level has enough light and space to feel welcoming and safe. Greenscapes and waterscapes are implemented between fast walking routes to make these spaces feel more approachable. The plaza becomes a big public space for the current residents of Schiebroek and the incoming inhabitants of the area to the south. It also helps connect this new neighborhood to Schiebroek.



Diagrams on the underground plaza level

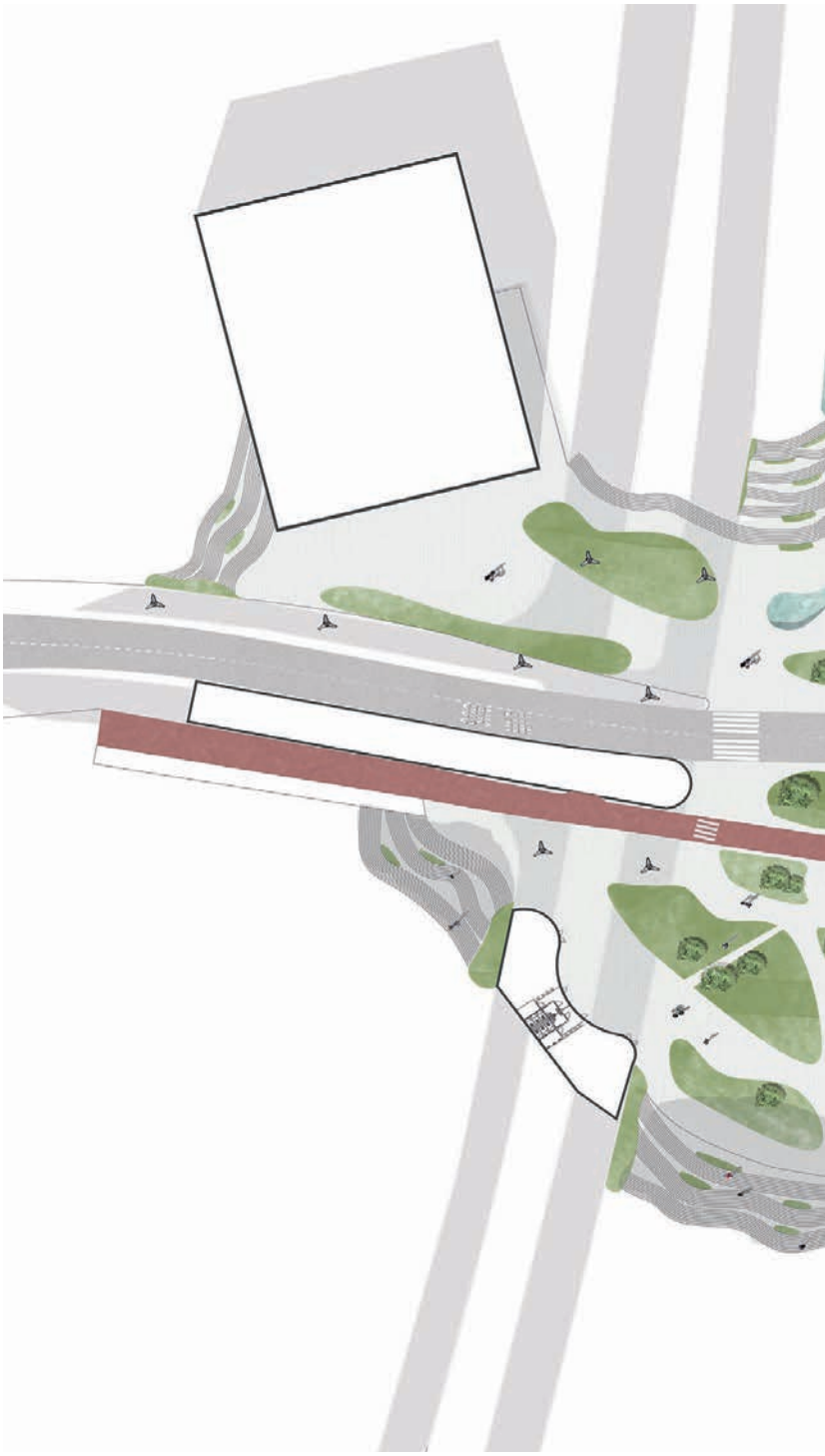


Ground floor plan



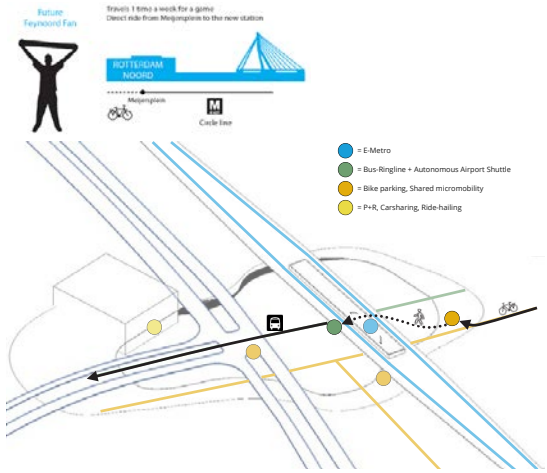
First floor plan

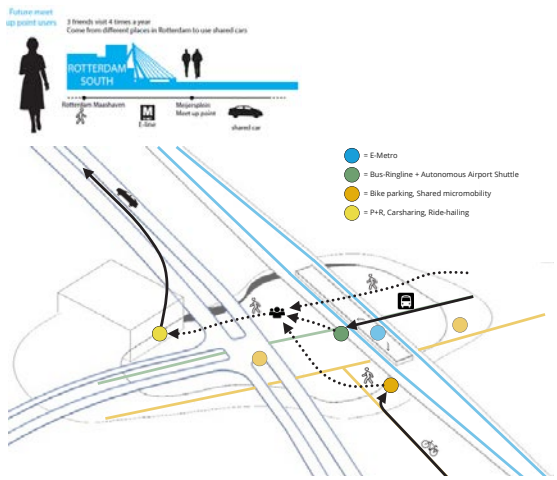
On the ground floor level the road and metro tracks cross over the plaza. Level one, above the ground, is occupied by the pedestrian bridge used for slow-paced movement from the P+R to Schiebroek.

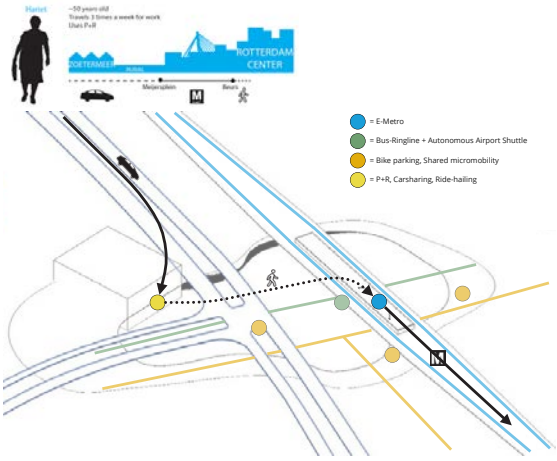


TRANSFER USER CASES

The images on the right depicts how different users can move through and use the plaza. The design facilitates easy intermodal changes, allowing direct walking routes based on clear visible access points for different modes. P+R users are now able to switch quickly between car and public transport modes. No strong barriers such as the highway or the metro line have to be crossed to take a connection towards the Hague. The airport is closely connected to the station by various modes, even providing an airport information desk directly at Meijersplein. Visitors can reach the airport easily using a free autonomous shuttle. Travelers without luggage can also utilize shared micro mobility options. Additionally, the new bus ring line establishes an east-west axis in the larger area. This attracts more passengers via Meijersplein, potentially using the station during daily commutes and changing their travel mode through the plaza. Wide staircases create open connections to the nearby neighborhoods, giving the station a high accessibility by foot. With its multiple travel options, Meijersplein becomes accessible for everyone and the perfect starting point for a day trip.

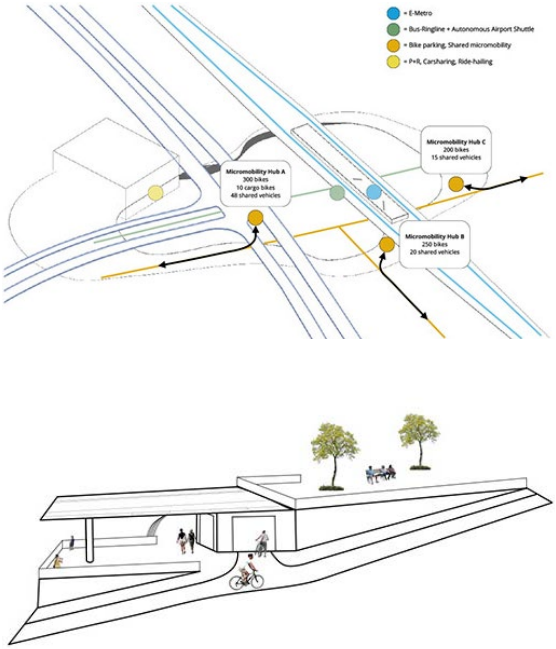




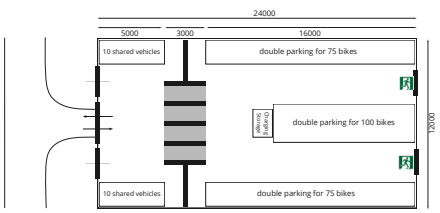


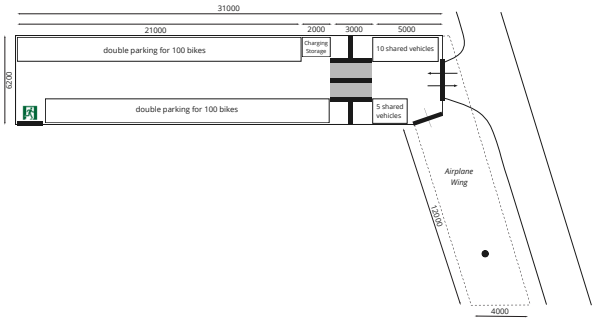
MICRO MOBILITY HUBS

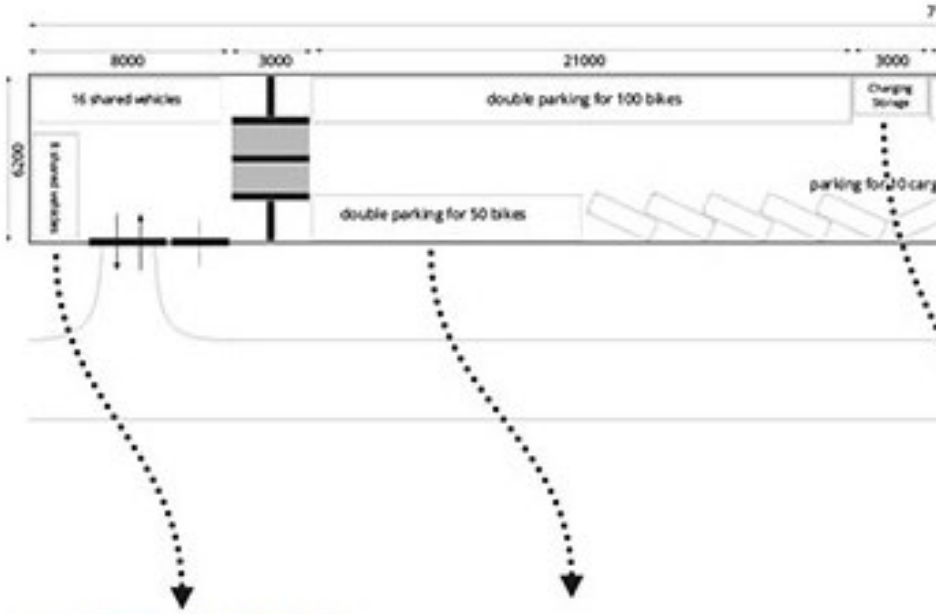
One of the critical points of the design proposal is the accessibility to the plaza with micro mobility possibilities. A micro mobility hub at each plaza entrance allows for fast and convenient changes between micro mobility modes. Compared to the current condition these hubs will provide triple the total amount of bike parking. The prominent placement of old airplane wings at the hub entrances is inspired by the 747 Wing House (David Hertz). It also aims to draw the attention of the passengers riding in the metro and bus. The micro mobility hubs provide safe storage for private bikes of commuters, cargo bikes of families, as well as parking space for a range of shared vehicles such as e-bikes, e-scooters and e-mopeds. Each hub is equipped with charging possibilities and access control. The design focuses on a quick modal change from cyclist to pedestrian or vice versa.



Concept drawing for a micro mobility hub



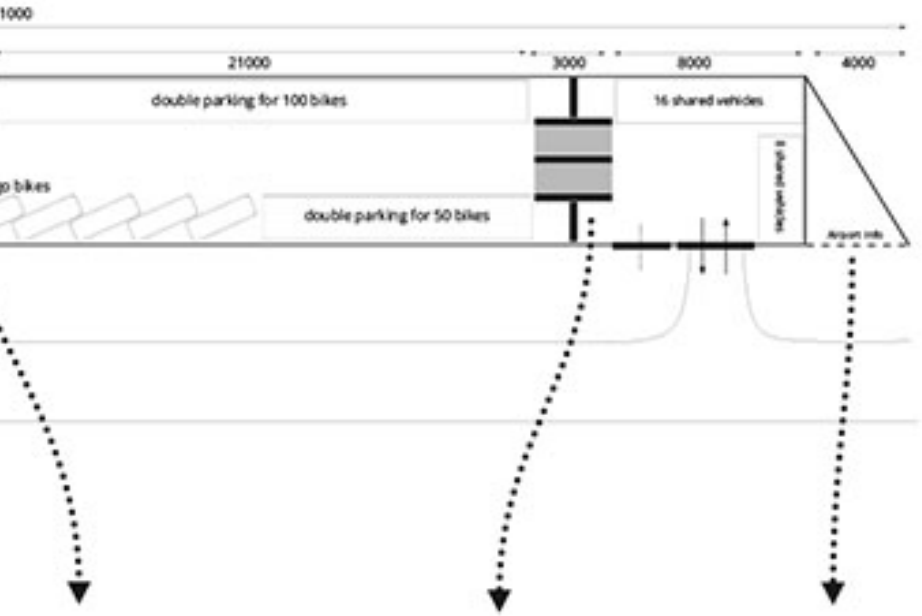




Vehicle sharing stations
A variety of shared micromobility vehicles are expected to be available in future. This includes shared e-Bikes, e-Scooter and e-Mopeds. Every micromobility hub at Meijersplein allocates parking spaces for these new modes in the entrance area. A larger number of shared vehicles at Hub A allows a flexible connection to the airport.

Two level bike racks
Doubling the capacity, two level bike racks are already the standard at most Dutch train stations. This allows a significant increase of secure bike parking spots at Meijersplein, whilst reducing the spatial impact of the parking infrastructure.

Charging point
Secure lockers al
the removable b
during the day. T
with a long trip t
bike instead of th
metro.



for electric bikes
llow commuters to charge
attery of their e-bike
his favours commuters
o the station, using the e-
he car, before taking the

Access control
Bike parking facilties can only be accessed with OV chipcard. This allows storage of high quality bikes and reduces bicycle theft or damage. Parking is free of charge for a limited amount of time, e.g. 48h, favouring commuting users.

Airport Information
How do I use public transport in the Netherlands? Can I still reach this flight? Airport passengers can now seek for information directly at Meijersplein, reducing the felt distance to the airport.


Metro Lines
D/E

S

SLINGE

METRO STATION

Benas Vencevičius
Casper van Duuren
Chi Liu
Daniel Mcnally
Jin-Ah Duijghuisen
Ramon Poot
Sophie Soenen
Timo van Dalen

HISTORY

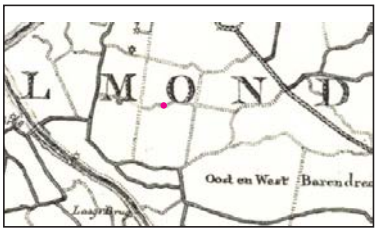
The focal point of this project is the improvement of Slinge Station. Slinge is a station in the Rotterdam metro network, and part of Line E and D. The station was built in 1970 after the extension of the E line. The first metro line, the North-South line was open in 1968 but was rapidly extended to Slinge.

Slinge is located in the south of Rotterdam, on the other side of the Maas, the river crossing the city. The station is set in between the districts of Pendrecht and Zuidwijk, which are two lower-income neighborhoods. The outskirts of Rotterdam, which were previously farming land, were developed after the Second World War when the city was practically completely devastated by the bombing and the new neighborhoods were built to accommodate an increasing number of immigrants. A large number of dwellings were built quickly in 1950, mostly consisting of social housing units. Because of the lack of activity, younger people left their neighborhood to find work in the city and the population aged. The elevated rate of crime around the station and in Pendrecht and Zuidwijk has built a bad reputation for the southern part of the city. Even though the district is surrounded by the Zuidenpark in the north and Drechterweide in the south, the two neighborhoods and the direct surroundings of the station are lacking green areas and qualitative public and urban spaces.

Slinge station is considered a regional transition hub. In addition to the two metro lines, a number of buses have a stop at the station with connections to the Waalhaven and the STC Campus in the west. In the east there is the Lombardeijn train station and in the south Brabant and Limburg are places, from which a lot of people commute for work. The station includes a P&R and is flooded by people passing through the station going into the city without staying for a long time. The connection to Zuidplein, which is a transport hub is really strong and better served than Slinge.

The mono functionality of the area, the lack of quality spaces, the absence of adequate lighting and the presence of a busy road and intersection make the station environment unsafe and unpleasant. The lack of security in the area led to a renovation of the station in 2009, when they added the existing blue corridors, connecting the station to the parking lot. Despite this attempt, the safety issues continued and still remains today.

The future plans for the city and the progressive gentrification of the South of Rotterdam bring new opportunities to this neighborhood and the station to redefine its place in the transportation network. The following analysis explores the area with the opportunities and difficulties the site brings. This research led to the design of two alternative scenarios. One project focuses on the neighborhood scale and the second one attempts to connect the station to the wider district.



1815


1850


1875


1900


1925


1950


1958


1963


1976


1990


2000

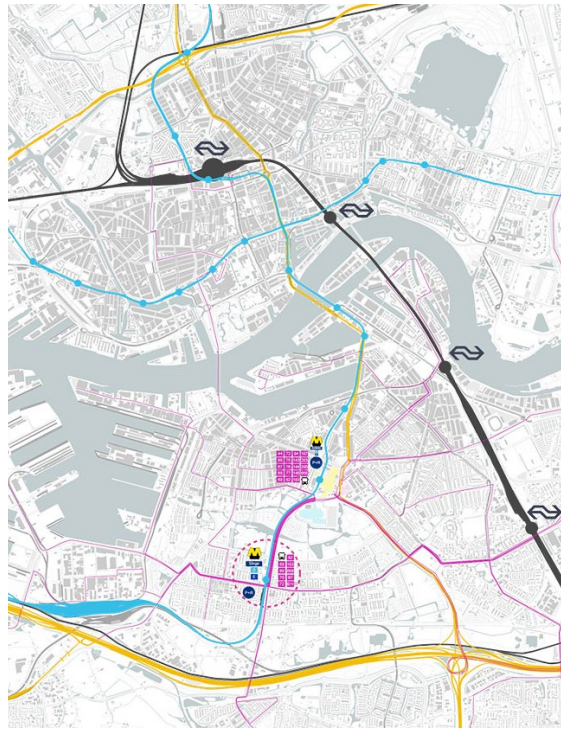

2020

POSITION IN THE TRANSPORT NETWORK

Slinge is a well connected station within the Rotterdam network. It has direct connections between the metro lines E and D, a multitude of buses and the P&R (Park and Ride) parking lot. The access from the highway by car is easy and buses link the nearest train station to Slinge.

Despite this network, the station is only considered a regional transit station. The lack of functions in the surroundings doesn't give a lot of opportunities for businesses to develop. Travelers use it as a connection spot without staying in or around the station. Even though it's supposed to be a regional hub the station also isn't safely linked to the bus network or the highway infrastructure. Slinge station needs to be redefined in the context of the development of the south of Rotterdam.

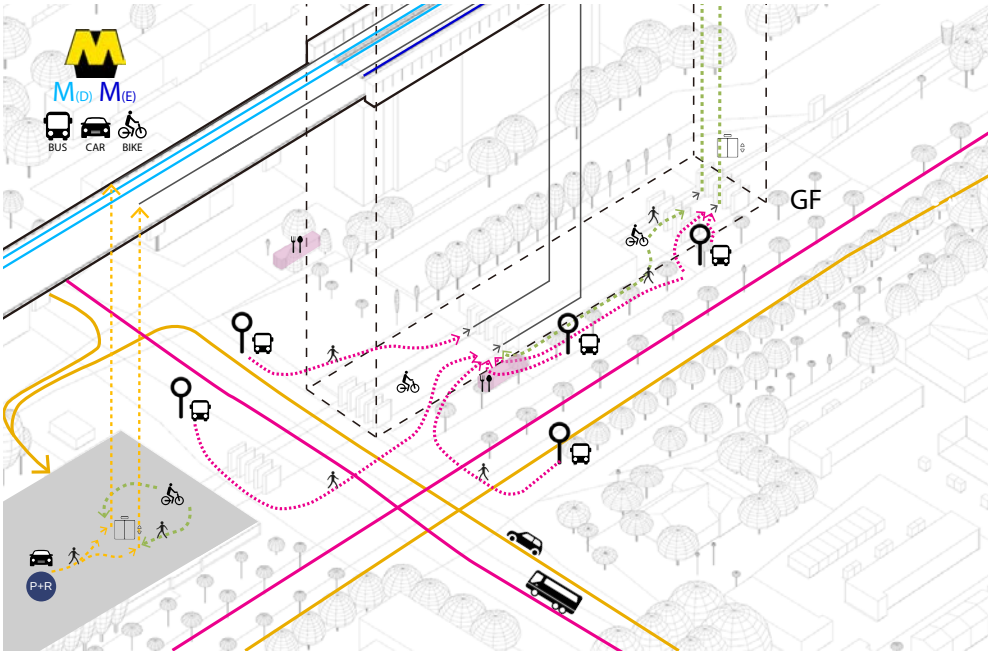
The station as a transition hub in Rotterdam south needs to cater to a lot of different traffic flows. The digram on the right highlights the five bus stops around the station, which bring and take a great amount of passengers who come here to transit into the city center. Due to the large number of users and inadequate route planning for pedestrians, passengers tend to cross the street directly without going through zebra crossings, which generates chaotic and unsafe conditions. P&R accounts for a huge part of passengers as well. During rush hour cars will come into the parking area across the station. However that area is dark and quite empty, which contributes to the feeling of unsafe.



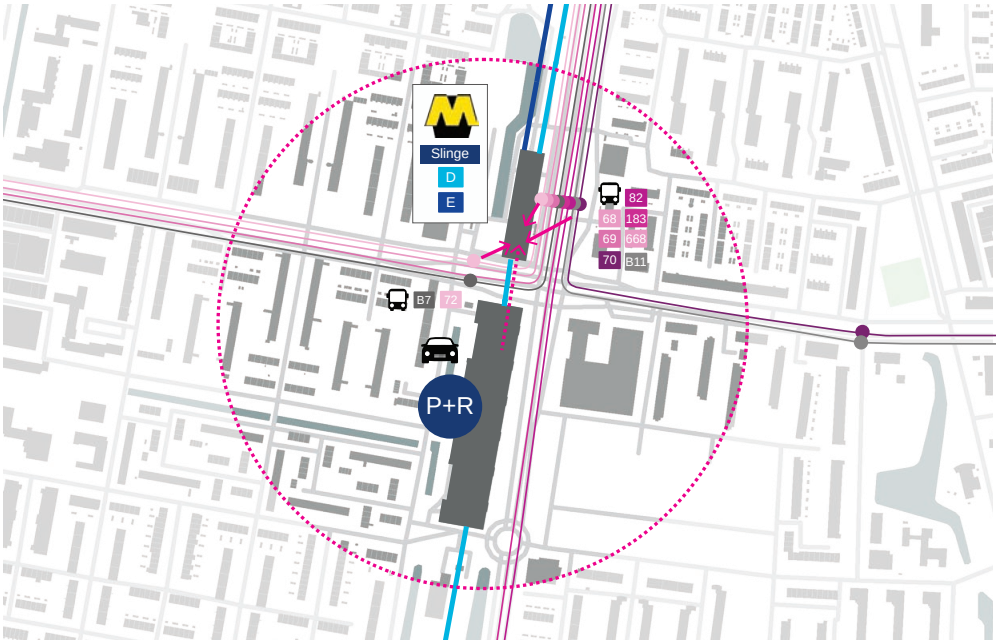
Connections in the south. Source: RET, Google Maps.

Rail connections between Rotterdam and the surrounding towns

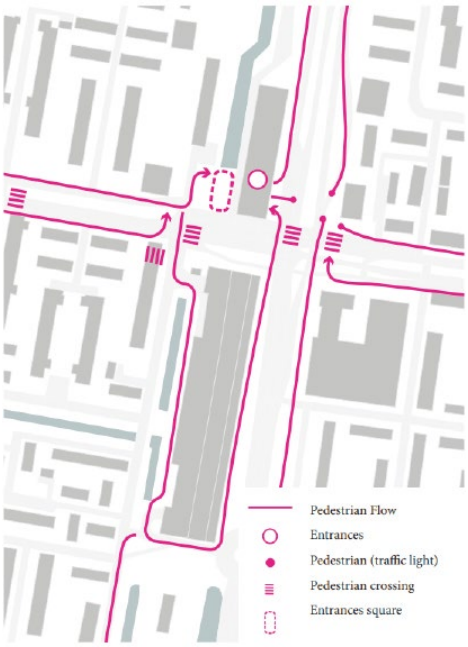
- Metro line
- Train line
- Main train station
- Train station
- Important intermodal station
- Potential Intercity station
- Nodes with a potential for urbanisation
- Urban alliance stations



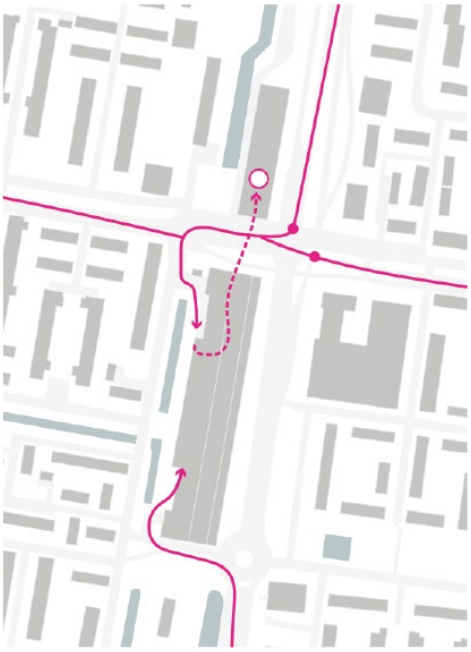
Current circulation paths within and outside the station



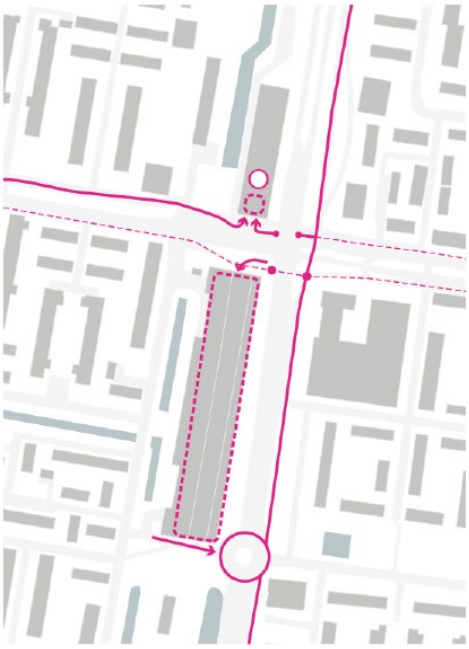
Accessibility from multiple transport



Pedestrian routes



Car routes



Bicycle routes

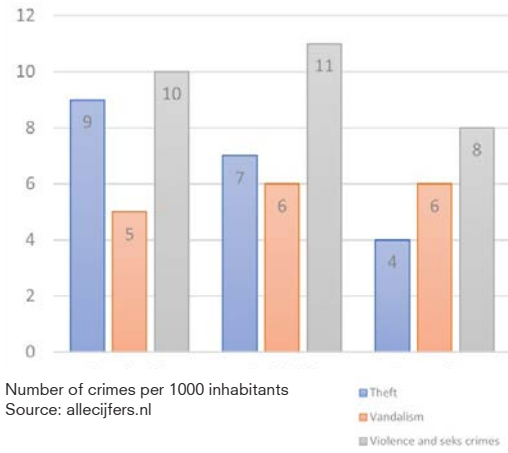
Crossroads

DEMOGRAPHICS

The Slinge metro station is located on the edge of two neighborhoods, Pendrecht and Zuidwijk. The following text is a summary of our research into the characteristics of the population in these neighborhoods and more regionally in the borough Charlois. These characteristics are compared with other neighborhoods in the surrounding area and with averages of Rotterdam to get a good insight into the existing socio-economic challenges.

Charlois has the second highest crime rate compared to the surrounding neighborhoods, with 26 crimes per one thousand inhabitants, coming only after the city center of Rotterdam with 38 crimes per one thousand inhabitants. This condition is probably due to two reasons. First of all the city center has a lot of visitors compared to the other neighborhoods. Apart from that these large groups of people and tourists tend to attract pickpockets etc. Secondly the city center has a lot of nightlife such as bars and clubs and thus a high alcohol usage, which might increase the frequency of vandalism and violence. The other neighborhoods are more comparable to Charlois with ten to twenty crimes per one thousand inhabitants. Considering these numbers Charlois sticks out as an unsafe neighborhood. This problem is further elaborated in the chapter on safety. Comparing different types of crime to the averages in Rotterdam theft, violence and sexual abuse is especially high in Pendrecht and Zuidwijk while vandalism is more comparable to the average. This is shown in the graph down on the right.

The annual income per inhabitant in Charlois is only €19.200, which is the lowest in Rotterdam. Most surrounding neighborhoods have an average between €25.000 and €30.000. The map on the right shows the relation between the amount of crimes discussed in the previous paragraph and the average income per inhabitant. It can be concluded that the lower the income in a neighborhood, the higher the amount of crimes, with Rotterdam center as exception.



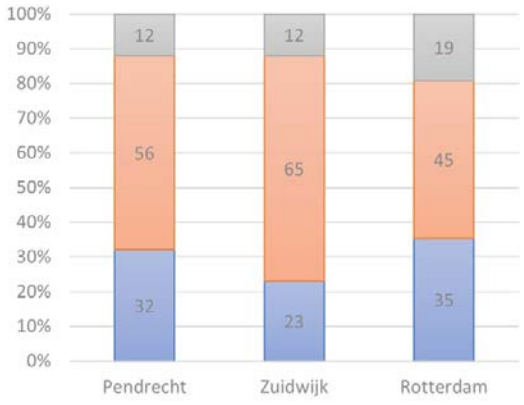
Number of crimes per 1000 inhabitants
Source: allecijfers.nl

HOUSING

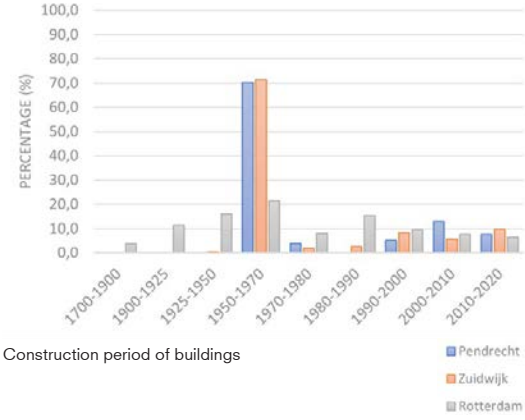
The low income in the neighborhood is linked to the average value of the dwellings being only at €118,000. The second lowest is Ijselmonde with an average of €146,000, which presents a large gap. Most surrounding neighborhoods have an average of around €200,000 with outliers over €300,000. The map on the right shows this relation between the average income per inhabitant and the average value of the dwellings in the neighborhood. It can be concluded that if the housing prices are lower so is the average income.

The low housing values can be explained by the fact that the majority of dwellings in the neighborhood is social housing. In Pendrecht and Zuidwijk, respectively, 56% and 65% of the dwellings are owned by a housing association and 12% rent. The graph on the right shows that this only leaves 32% and 23% owner-occupied housing.

Apart from the dwellings being cheap most buildings are also very old with only 10% built since 2000. Most of the buildings in Pendrecht and Zwijndrecht are post war architecture, dating from 1950 to 1970. Overall in Rotterdam the buildings were constructed more evenly over time.



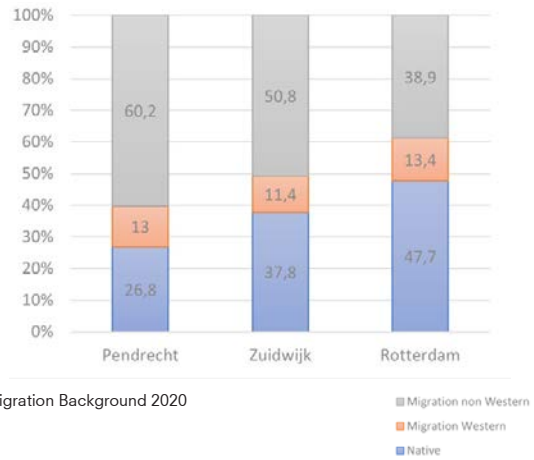
Housing ownership



Construction period of buildings

PEOPLE

The people in Pendrecht and Zwijndrecht area have a diverse range of backgrounds. The graph on the right shows that respectively only 26,8% and 37,8% are native, which is low from the 47,7% average in Rotterdam. From the people with a migrational background 60,2% and 50,8% are non-western with people originating from Morocco, Dutch Antilles, Suriname, Turkey and more.



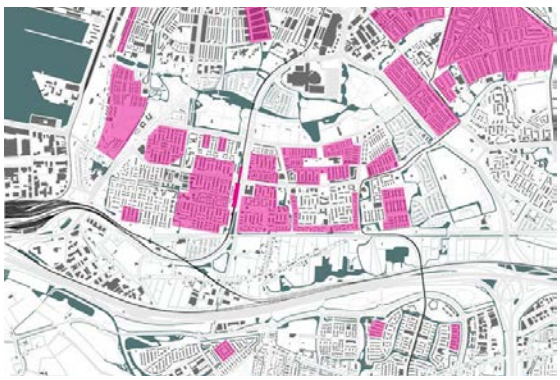
Migration Background 2020

SAFETY

The news headings are just a glimpse of the actual number of incidents happening in and around the station. While the neighborhoods are not known for their good quality, the station design also doesn't contribute to the safety issue.

By far the most incidents have to do with some sort of incident involving violent attacks. What's interesting to see is that these incidents were already happening before 2010, and since then the they continued happening. The municipality installed some cameras around the station but this didn't help much as there are still in between, quiet and dark spaces in and around the station.

The map on the right shows the locations of some of the incidents. Most incidents happen in or below the station. But vehicle collisions and accidents also occur at the busy intersection and the bus station.



Social housing
Source: allecijfers.nl

SAFETY AT THE STATION

The bus station leading to the city center is located on the other side of the Zuiderparkweg. Because it is far away from the designated crosswalk, pedestrians tend to cross the road in undesignated spots, leading to dangerous conditions. There is also a large intersection on the west side of the station, which has the same issue with people crossing the road in an unsafe manner.

The images on the right show a range of spaces in, around or under the station. The parking lot is never used at full capacity, even during daytime. Under the station there are some very empty areas, which makes this part of the station not inviting. During the night this also creates a very dark and possibly dangerous environment.

Taking into account the previous statistics on safety and the existing conditions at the station, one can conclude that the area in and around the station reflects a dangerous and uninviting environment. Although the blue corridor and the interior are well lighted, the public spaces outside are dark and unpleasant to walk through. Besides the perception of safety the intersections also pose dangerous conditions, especially for pedestrians.

NEIGHBORHOOD FUNCTIONS

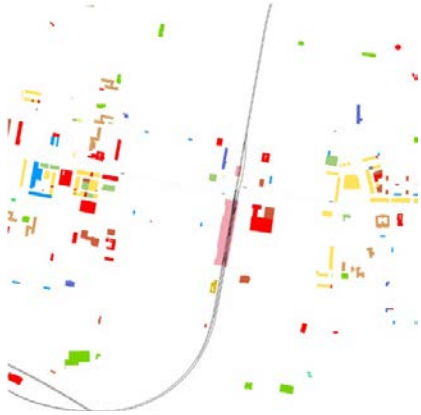
Pendrecht and Zuidwijk neighborhoods were designed after the Second World War as there was a great shortage of housing in the city. In the bombing of Rotterdam on May 14th 1940, 25000 homes were lost and 80000 people were left homeless. It was also expected that the population would grow rapidly. The task was therefore to build new neighborhoods with enough homes to accommodate current and near future residents. Both neighborhoods were built in the 1950s. Pendrech was designed by urban planner Lotte Stam-Beese and Zuidwijk by architect Willem van Tijen, with some buildings designed by Gerrit Rietveld. Both development projects were based on modernist ideas such as Clarence Arthur Perry or Le Corbusier and the "Radiant City". However most of these ideas severely failed and led to degradation and high crime rates in these neighborhoods.

Urban planner Lotte Stam-Beese had an exceptional idea for Pendrecht: small homes (on average no larger than 53 square meters), but open streets with lots of greenscapes. The spaces between the houses were designed to be shared with others. Stores, shops and schools were precisely planned. Even the time it took to walk to school or to church was calculated precisely. This strategy was implemented in one area, named Plein 1953, in the middle of Pendrecht. However, due to this decision other parts of Slinge street became monofunctional, without public spaces and as a result unsafe. Building blocks facing vast green spaces create a row of tall walls along the street.

Zuidwijk was designed with a slightly different approach, according to Clarence Arthur Perry's concept of the neighborhood unit. This idea proposed putting neighborhood institutions inside community centers, such as schools, churches, while all commerce should be placed outside the perimeter, in traffic arteries, like Slinge street.

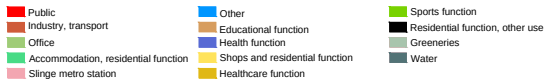
Neighborhoods function as "satellites" of Rotterdam, separated by traffic, the green belt and the blue corridor, which also intervenes it in place where Slinge metro station is located, in this way dividing neighborhoods even more.

Green



Public

Overall



Neighborhoods functions map, from Arcgis

Main entrance crammed with bicycles

Lack of functions in station

Unused green and canal area

Fenced, unused green and canal area

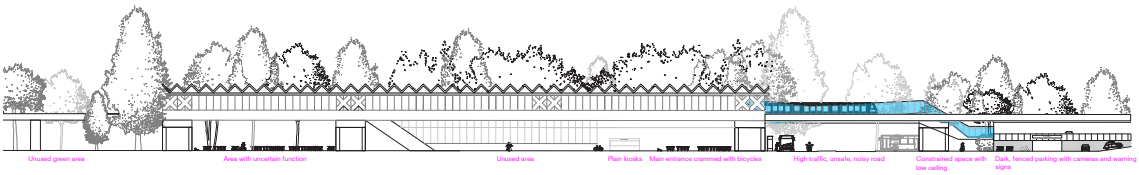
Fences, cameras, and signs which let you know that you are being watched

High traffic

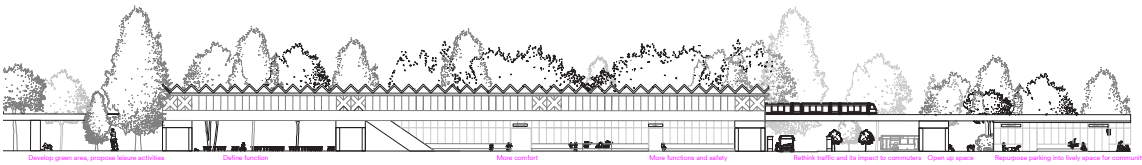
Slinge metro station is located on the edge of both neighborhoods and therefore lacks of public functions. Greenscapes were designed more to work as barriers rather than places for recreation and stay. The green space to the north of the station not only doesn't have any activities but doesn't even have a single bench.

Problems

Possibilities

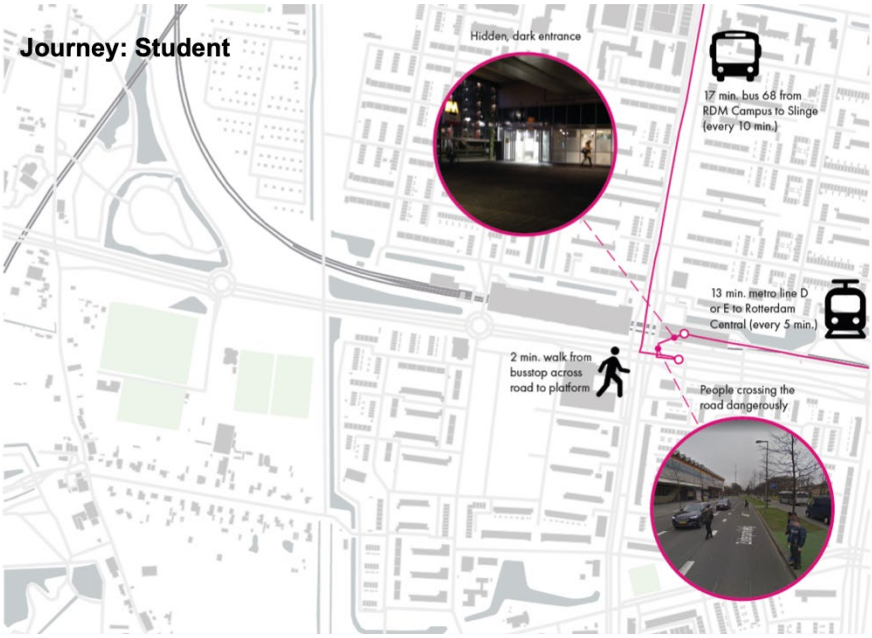


Problems



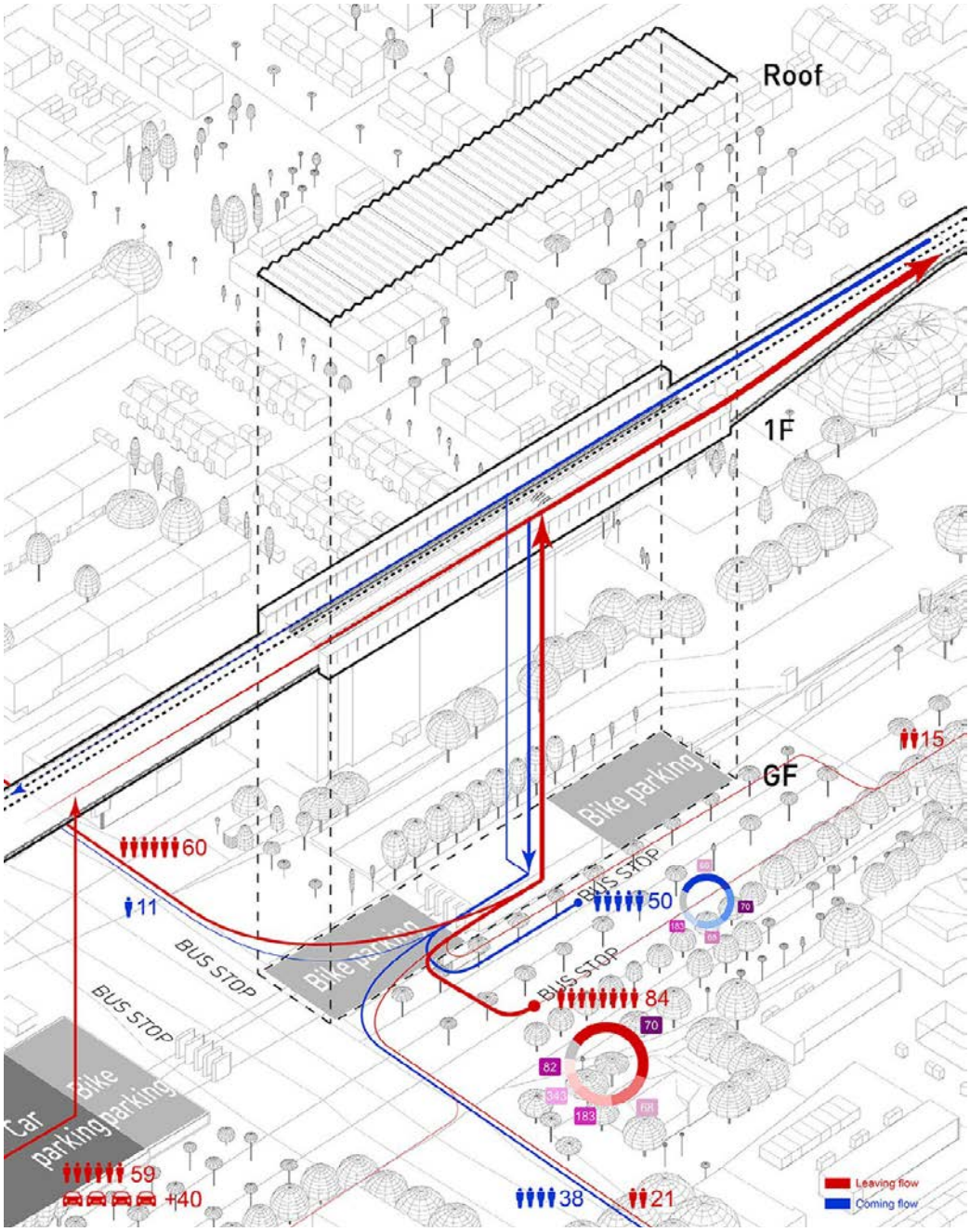
Possibilities

Zuidwijk and Pendrecht are surrounded by a green belt that creates an edge to the neighborhoods. Situation in Slinge street is rapidly changing as old modernist structures with problems like purposeless green areas, windowless facades are being built up. However commercial and public spaces are not developed and the existing ones are far away from the station, not giving commuters any initiative to remain in the area.



Itineraries, Infrastructure and Safety of Slinge's users

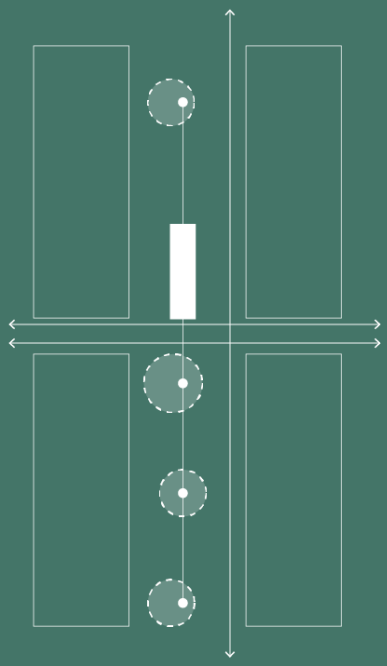
Slinge is used by various commuters and each of them of them encounter different or same inconveniences or even dangers. Most of these problems were caused by Slinge station being interconnection of main roads.



Slinge Commuter Flows

Vision 1

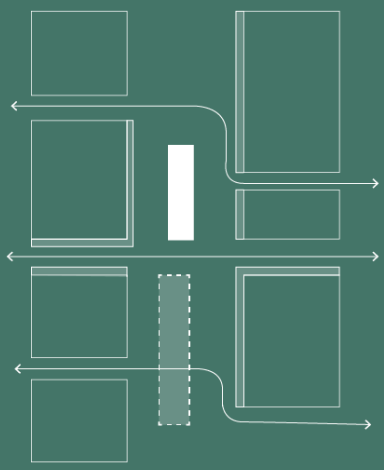
A Densified Green Corridor



‘A Densified Green Corridor’ aims to densify and diversify the area of Slinge beyond the scope of the city of Rotterdam by implementing between 2000-3000 new dwellings. These dwellings will be positioned along a vertical park that connects not only Pendrecht and Zuidwijk but also Zuiderpark and Drechterwijde as a Green Corridor. A Mid- and High-Rise Structure will be implemented together with a mixed use program and park amenities. The station will be slightly altered on ground level only to ensure better connection but keeping intact the monumental identity.

Vision 2

Reclaiming Slinge



‘Reclaiming Slinge’ explores what it would mean for Slinge and the surrounding neighborhoods if we would try to strategically ‘give the station back’ to the community and its residents, ultimately RECLAIMING the station. With this task, we have established it is most important to bring activity in and around the station area by connecting the two neighborhoods of Zuidwijk, Pendrecht and these neighborhoods with newcomers imposed by urbanization of 500 new dwellings and daily commuters.

A Densified Green Corridor

Slinge Station
Slinge 2050

Project Video

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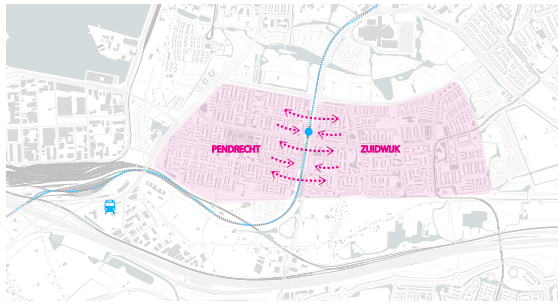
Sophie Soenen
Timo van Dalen

A DENSIFIED GREEN CORRIDOR

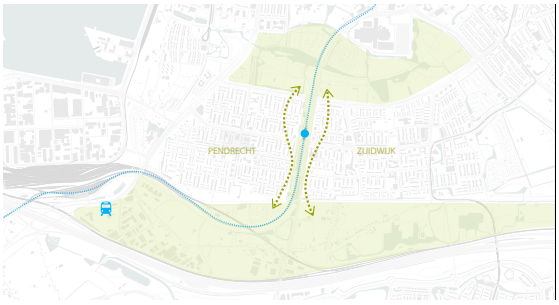
Slinge 2050 proposal aims to generate change on different levels through multiple operations. First, there is the development of 2000 to 3000 new dwellings around the station to densify the area. The creation of new dwellings aims to reduce the housing shortage in Rotterdam and to replace the ageing social housing structures. Next is the creation of a green corridor connecting Zuiderparkweg and Drechterweide. The station is renovated in harmony with the new design of the park amenities. Public functions are incorporated in the park and the plinth around the park. All of the interventions aim to create a liveable environment in Slinge.

The amenities added to the park are located around and under the viaduct created by the metro line. The space under the bridge is currently used for the P&R parking lot. Instead of being a barrier, in the proposed vision the bridge connects the two neighborhoods. The parking lot is removed and pavilions, each with a different function, are added to the area. The materials used for the pavilions are coherent with the three different zones developed in the area: hush, fuzz and buzz. With the use of wood, a warm atmosphere for the calmer area. Concrete for the busier parts of the park. Brick for the more housing zone.

The pavilions are paired with a mobility function to complement the metro station and encourage soft mobility in the city and in the suburbs. The metro and bus lines are a critical part of the larger public transportation network. On a smaller scale shared scooters, shared bikes take on a bigger role. The P&R is moved to Waalhaven, relocating a large number of car in the Slinge area. This gives back the space to pedestrians and bikes for a safer neighborhood. In the next decades, mobility will involve removing cars and promoting green transportation. Therefore the Slinge 2050 proposal aims to take the first steps for a greener and future-friendly environment.



Moving the P&R to Waalhaven
The P&R is currently positioned in front of Slinge station, on the other side of Slinge street. It is currently a physical and visual barrier between Pendrecht and Zuidijk. It also brings a lot of car traffic to the district. The municipality plans to create a new metro station at Waalhaven, a developing area in the south of Rotterdam. The P&R would be moved to Waalhaven to avoid car traffic and further division of the neighborhood. The new station at Waalhaven is well connected with the A15 and has space to host the parking lot. The D line currently stops at Slinge but the creation of Waalhaven would allow the D line to start there instead. With the relocation of the P&R, the crossing in front of the station will no longer be a dangerous and unpleasant space.

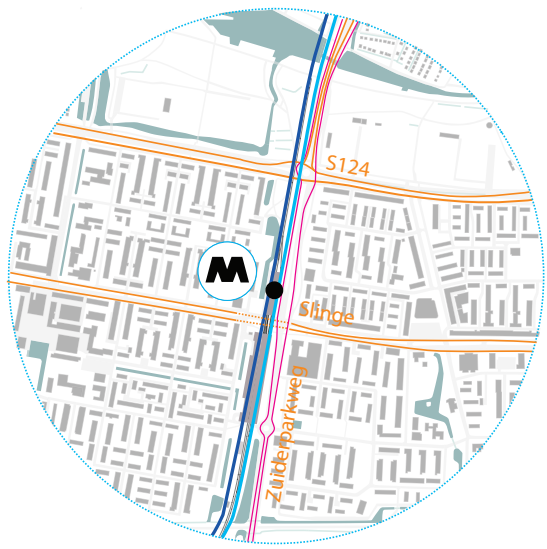


Creating the green corridor
Slinge station is positioned between two parks: Zuiderpark in the north and Drechterweide in the south. We propose a green corridor to link the greenscapes on all sides. This also provides easier access to nature from surrounding neighborhoods. The proposed park creates a meeting point for Pendrecht and Zuidijk instead of being a division. Public functions, leisure spaces and meeting areas are integrated in the park to provide amenities to the inhabitants and travelers. In contrast to the programs in Zuidplein, smaller 24/7 functions are introduced in Slinge to activate the neighborhoods and help with the safety issues.

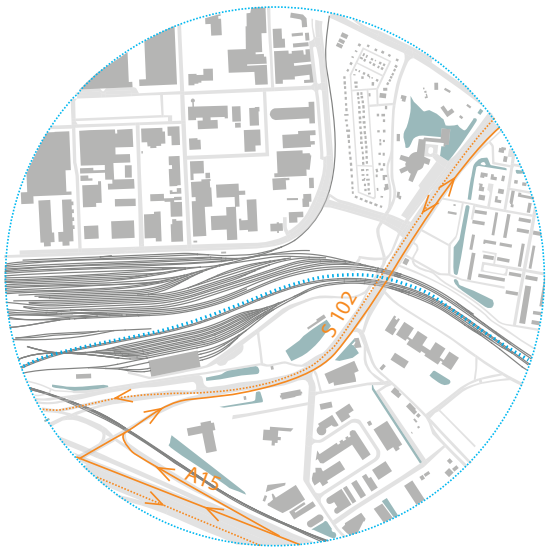
Densifying and diversifying the neighborhood
The Netherlands is experiencing an extensive housing shortage and Rotterdam isn't exempt from the crisis. There is a project to densify the south of Rotterdam, which we took as a starting point for Slinge 2050. As the municipality aims to create 500-1000 new dwellings for the area of Slinge, our proposal takes this further and aims for 2000-3000 new dwellings in the neighborhood. Pendrecht and Zuidijk have been constructed mainly in the 1960s and are mostly social housing. After 60 years, these dwellings are in a bad state. We decided to carefully select and remove some of the social housing around Slinge and create dense housing units.

The open form of the modernist structures offers great possibilities for new interventions. By keeping this open structure in our new urban plan the different typologies can merge into an interconnected whole. The connection of public space allows for the coming together of different communities and therefore the neighborhood will diversify rather than gentrify.

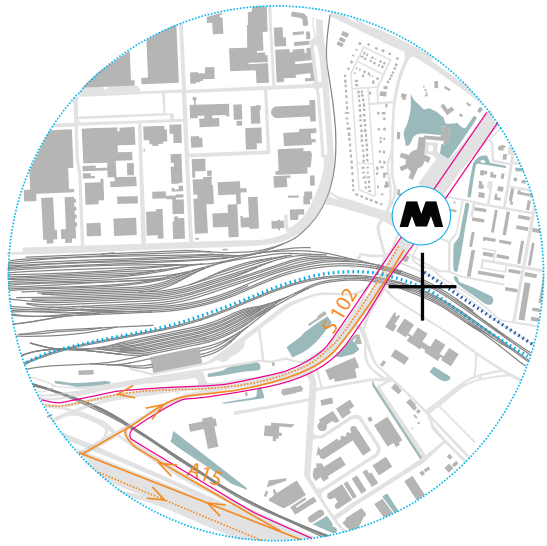
Slinge current condition



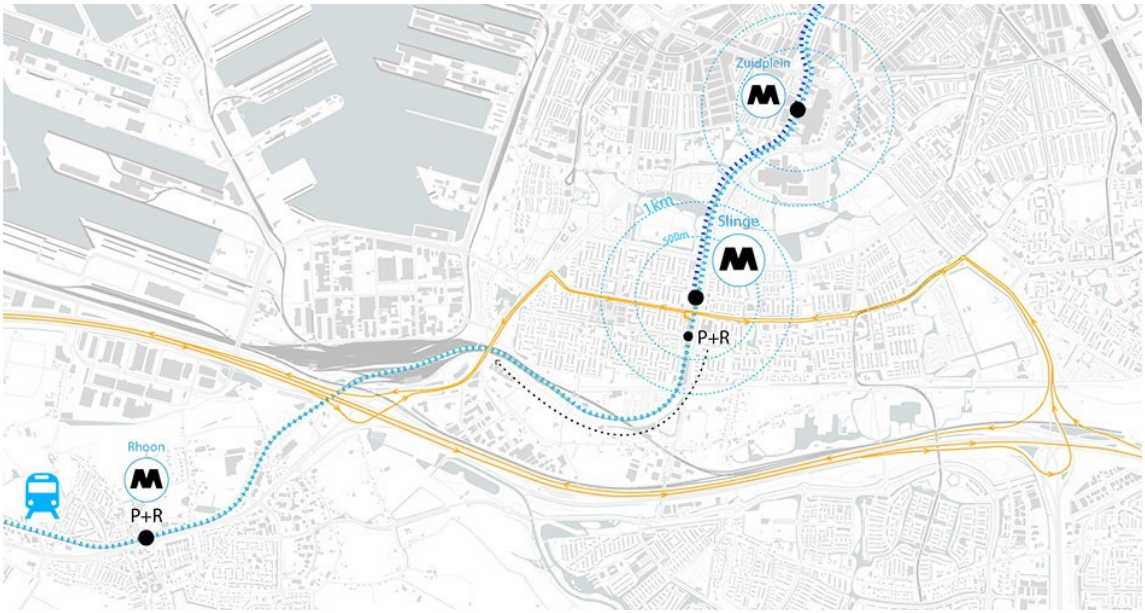
Slinge proposed condition



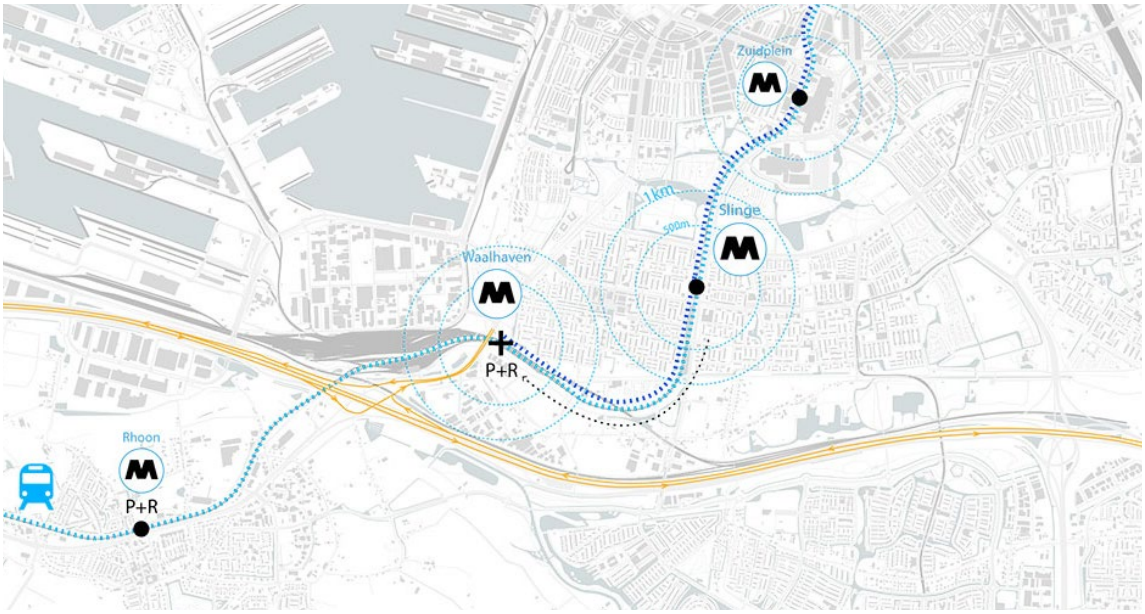
Waalhaven current condition



Waalhaven proposed condition



Current accessibility to Slinge station



Projected accessibility to Slinge and Waalhaven station

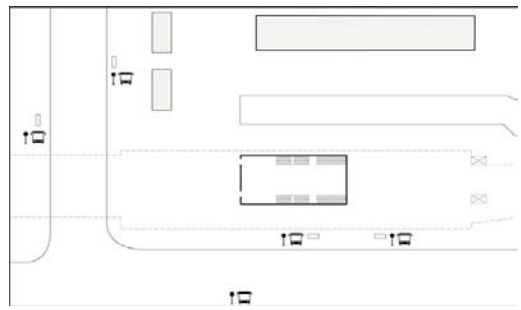
STATION INTERVENTIONS

The ground floor of the station is closed off and public functions are added within the new plinth to address the unsafe environment in and around the station. The plinth is opened towards the station hall as well as the street to make it accessible for travelers and visitors of the park. Entrances to the station are added on all sides to make it accessible from all directions. The added functions are a bakery, a fast food store and a convenience store using ingredients and products from the urban farm, market and restaurant located in the park, creating a connection with the other amenities.

The north side of the station is reserved for indoor bicycle parking, giving room for almost one thousand bikes, containing a bike mechanic and the possibility to rent electric scooters and bikes, making the route from point A to point B more convenient for travelers.
The water at the west of the station is extended into the station creating a connection with the park. Steps are added alongside the water for people to sit down and relax. The greenscape is extended into the station, with a green wall in the southwest corner and an elevated green circle with a bench around it in the middle.

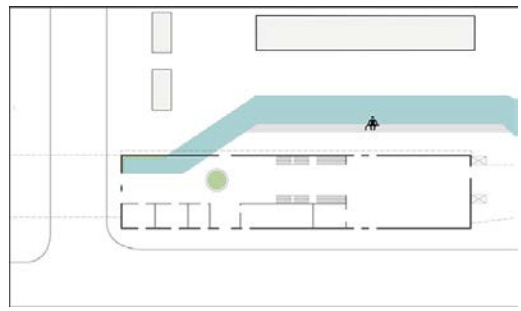
The Zuiderparkweg has been made car free and is now exclusively accessible by buses. The bus stops have been regrouped alongside a loop to the east of the station to improve wayfinding and to deter people from crossing the road. The Slinge road has been put underground with the exception of one bus lane in each direction and destination traffic for the kiss and ride. It is also possible to rent shared electric cars at this location.

Changing the bike lanes and the addition of a bicycle garage also make it more accessible for cyclists, which improves the transition from one form of transport to another, making it a more convenient and future proof transport hub. The new floor plan improves the accessibility of the station from all directions and creates routes through the station. This together with the integration of green and blue structures within the station makes it merge seamlessly into the park. These interventions make the station now also function as a social hub for residents of the neighborhood as well as travelers and visitors, apart from only its transport function.

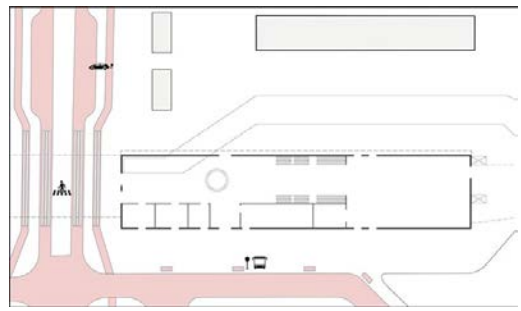


Slinge station existing situation: schematic diagram

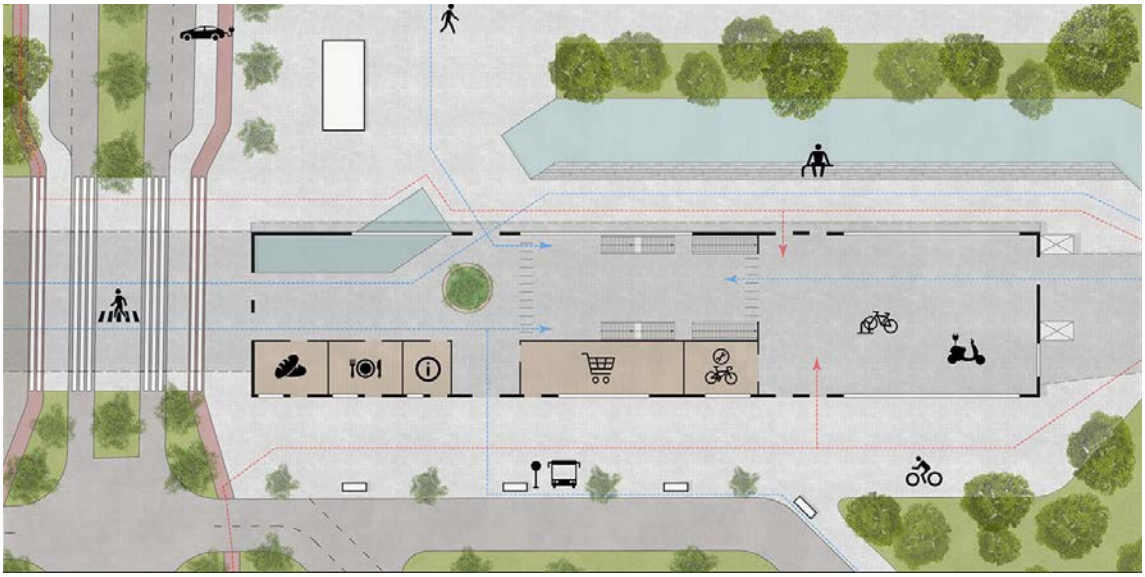
New facade and additional public functions



Integration of green and blue



Traffic solution



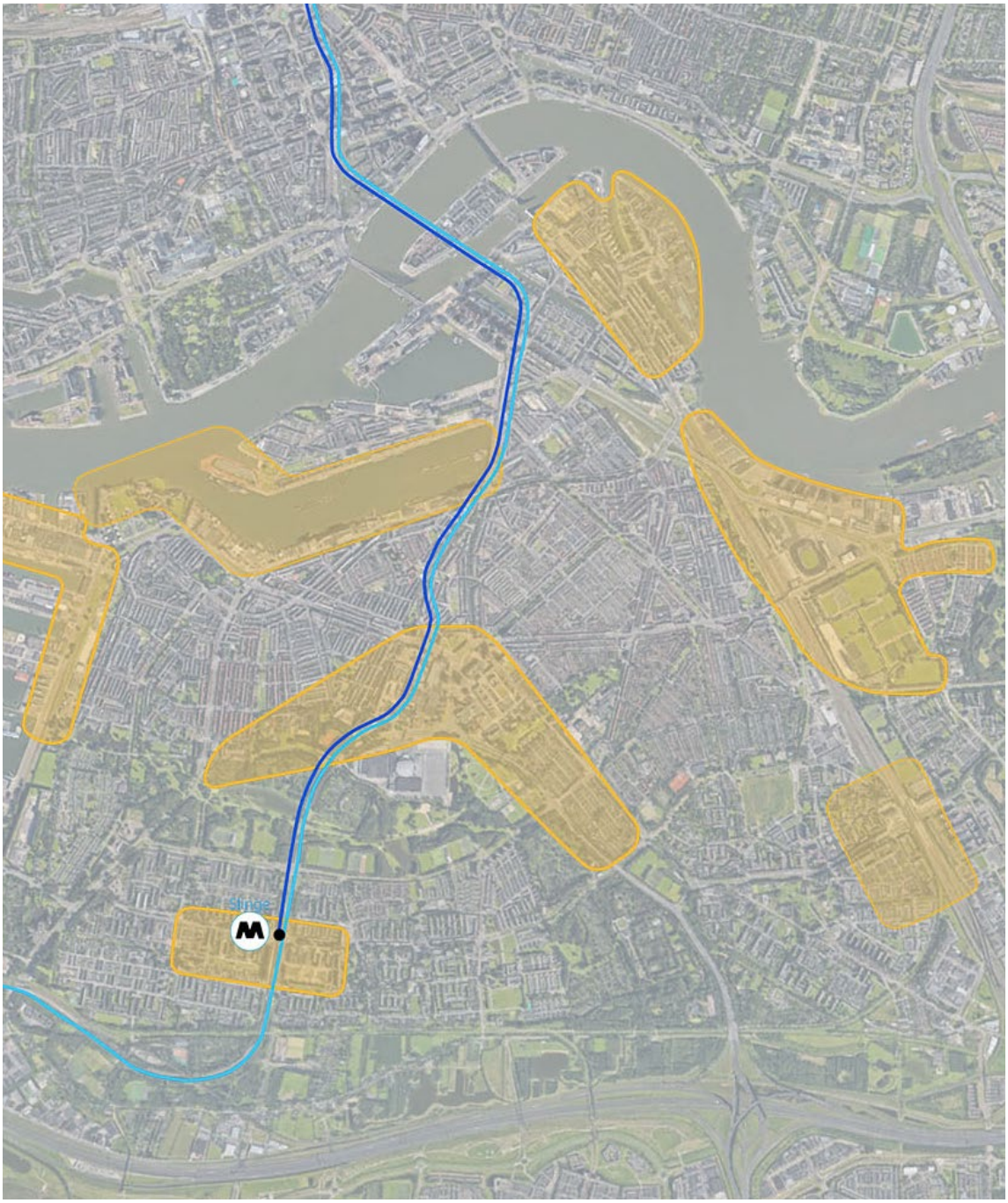
Redesign of Slinge station and its surrounding

Redesign of the Slinge station hall

A DENSIFIED GREEN CORRIDOR
Increased housing

With the increasing housing shortage in the Netherlands, all municipalities started developing a future growth map showing the hot spots for increased housing demands in the coming years. In Rotterdam's growth map, Slinge area is identified for growth around 500-1000 new dwellings. Our proposal takes this further by proposing more units with mid- and high-rise typologies especially along the axis of the metro line. The area itself however, is known for its modernist identity, and therefore can not be irresponsibly and carelessly deconstructed. Hence we analyzed the current building stock carefully to identify social housing blocks that are depleted.

By relocating the P+R in Slinge to Waalhaven, the building will no longer pose a physical and visual barrier between Pendrecht and Zuidwijk. Consequently the removal of barriers at Zuiderparkweg creates a great open axis that could be perfect for a public park. The axis with a high-rise housing typology could provide great views to the park and the surroundings. Therefore we propose to go beyond the 500-1000 units the municipality suggests and develop between 2000-3000 housing units to further tackle the issue of a great housing shortage.



Densification Map, Stadsvisie, City of Rotterdam

NEW HOUSING SCHEME

Intentionally removing buildings
Many of the modernist buildings in Pendrecht and Slinge were built in the 1960s and are already showing deterioration. Nonetheless the architecture has great value due to its modernist roots. However with continued structural deterioration some of the buildings will become uninhabitable in the near future. Therefore we propose removing some of the building stock and replacing them with high-density housing units.

The map on the right identifies the buildings to be removed. The most obvious one, in the middle of the map, is the current P+R. This colossal building is a great physical and visual barrier and its relocation makes way for new pedestrian connections between Pendrecht and Zuidwijk.

The other buildings are all social housing blocks, which makes them bureaucratically easier to replace. Furthermore many of these buildings are in state of decay. Especially the majority on the left side of the map are in a depleted structural state. Due to its great location along the Zuiderparkeweg, this area will be replaced with high-quality building blocks.

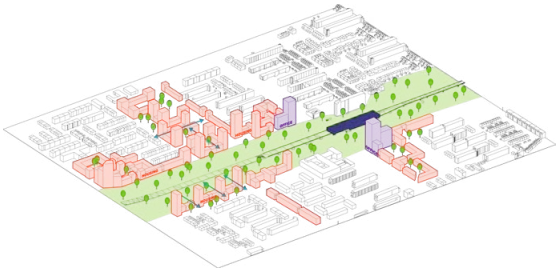
New typology
The buildings are replaced with new and denser mid- and high-rise blocks. The morphological implementation can be seen on the image below. Towers, ranging from 40-70m, will be combined with housing units, 12-30m high.

Most of the high-rise typology is positioned along the park providing a views into nature. Wider views are made possible by keeping some distance between each tower. The placement of the towers has been intentionally decided. By placing the towers at street corners, these 60-70m high buildings function as an entrance to the park and become visual anchors.

New building typology, Base image from Google Maps

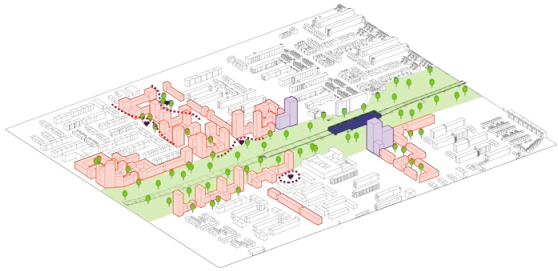
URBAN INTEGRATION

The new high quality buildings are developed in connection with the surrounding urbanscape. The new park, the pedestrian oriented streets and integration into the existing urban tissue allows for a design that can function greatly for many years. By introducing diverse typological forms, the new buildings create a contrast with the existing station that will consequently stand out. By using sustainable materials, the ecological footprint of the urban integration is minimized and made future proof.

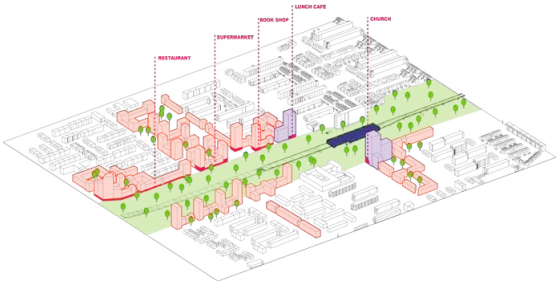


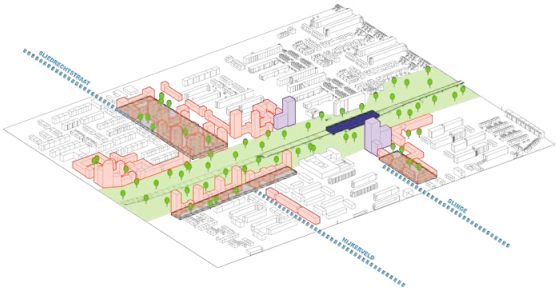
Open Form
The new building blocks are developed with an open form with varying heights of high- and mid-rise blocks. This ensures that the visual connection between neighborhoods isn't lost. Also the blocks are U-shaped and not closed off on ground level, which allows for public connections and a better integration with the rest of the neighborhood.

More ground level connections are created by openings in the buildings themselves. These openings, with a height of two floors, enable direct connections with the surroundings and also allow for more views into the courtyards and towards the park.



Open character
The open form of the blocks are extended with an open character. The character specifically talks about its connection with the existing urban tissue. New squares are created by creating setbacks from the street across the existing buildings. This further functions as a catalyst for urban diversification. In the image above the hearts show the spaces that function as meeting points.





Mixed-use program
Apart from amenities placed throughout the park, there are also office buildings around the station and a public plinth along the park. As shown above, the plinth contains various public functions that are needed for a well functioning park. Also some of the current functions such as the church next to the station are reintegrated in the plinth.

Other functions within the plinth are a cafe, bookstore, restaurant and a supermarket. The biggest added program is the office buildings around the station. Two of these buildings are existing companies, the other two will be housed in the new towers, which can host multiple small or some bigger companies. Behind the offices are courtyards, which are shared between the employees working in the offices as well as the housing that surrounds it.

Underground parking
Even though the P+R is relocated to Waalhaven we still expect parking spaces to be necessary for the new housing blocks. However, we do believe each building has to be integrated with parking spaces but people could generally walk a few hundred of meters to get to their cars. The image above shows these spots and how they are connected and can be entered by car.

THE PARK AS AN INCUBATOR

The park in between the two neighborhoods introduces nature as the incubator for various urban functions, which creates distributed 24/7 mix-used spaces to connect the two neighborhoods, activate the area and help with the safety issue, as proposed in the group vision. It serves as a green corridor connecting two parks outside Slinge, providing abundant high quality green area for the growing population. The Slinge station becomes a critical part of the park design, because it is the most intensive place where people go, stay and gather. We take inclusivity and accessibility of the station into account within the whole park and change the urban morphology around it.

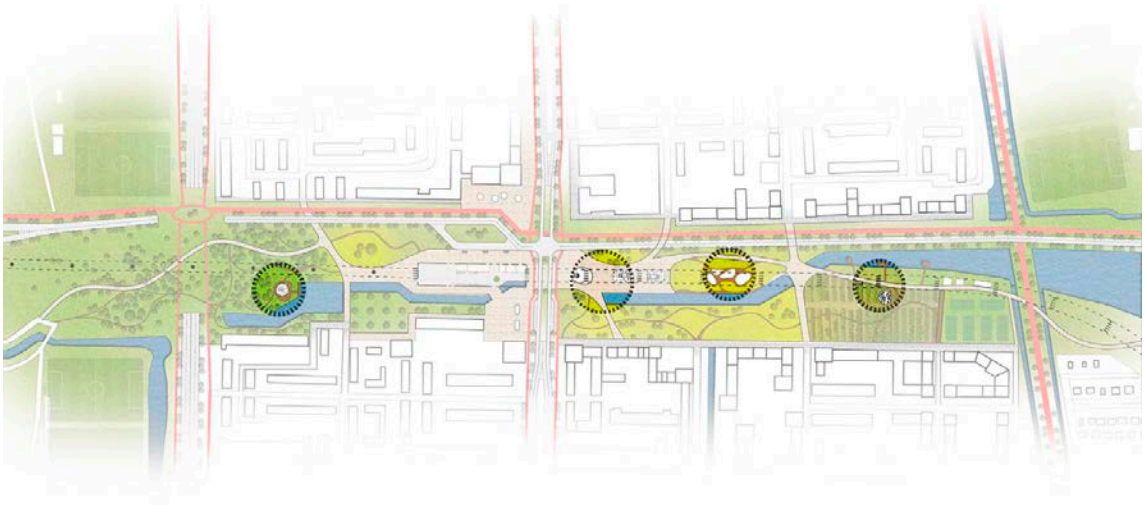
Firstly we investigate the local water network, finding a separate and isolated pieces of canals. Looking into the history of the area we notice that the canal was continuous and coherent as a whole when it was originally built in the middle of last century. Because of the emergence of the station and P+R, the canal was cut and gradually became fragmented. Our proposal aims to reconnect the existing canals along the park after relocating the P+R, to provide more opportunities for nature oriented activities and leisure spots.

The two main intersections are set underground for car traffic, leaving the ground floor a continuous pedestrian space that connects the station with the rest of the park. One of them is Slinge street close to the station, where the car lane goes underground as the bus lane and kiss and ride places are placed on ground level. Greenscapes are waterscapes extend continuously across the street, in order to reduce traffic speed.

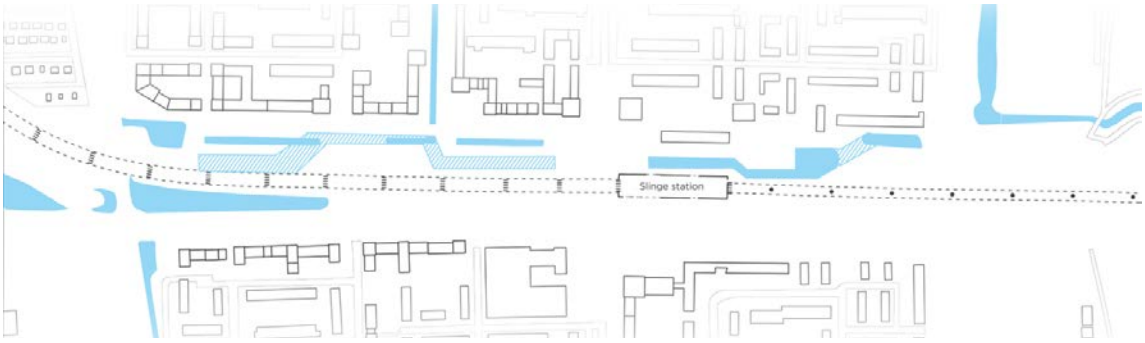
The other underground intersection is in the north of Zuiderparkweg, resulting in a consecutive green surface connecting the urban and the rural.

The proposal creates urban squares around the station where intensive public functions can develop including retail stores, bus stops, restaurants, open-air gardens, waterside steps, etc. Then we extend various walking routes from the station to the new surroundings, including some long lines that we create based on the existing road network. The new path responds to the canal to create places with different atmospheres, some are tranquil and some are more open. In the end, various activity spaces emerge along the park, especially under the viaduct, activating the semi-open space and leaving more field-like area for natural landscape and urban farming.

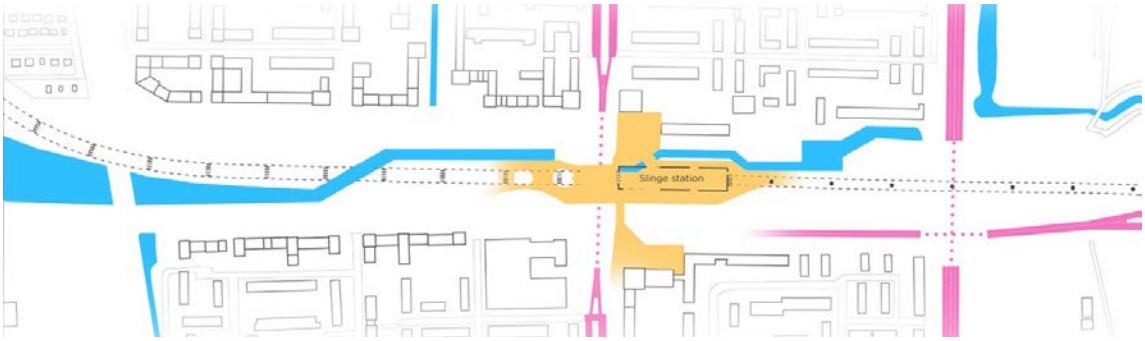
Hush, Fuzz and Buzz are taken into account when designing the specific zones in terms of program and materiality. The areas more close to the housing blocks are Hush, where big lawns, playgrounds, urban farming, community meeting place are set for liveability. The areas close to the station are Fuzz, where mix-used buildings with the plinth emerge. Office and commercial places are more intensive. Buzz is within the station and the traffic spots nearby, where logistics are mainly developed to enhance the traffic safety, efficiency and convenience.



Master plan 1:5000



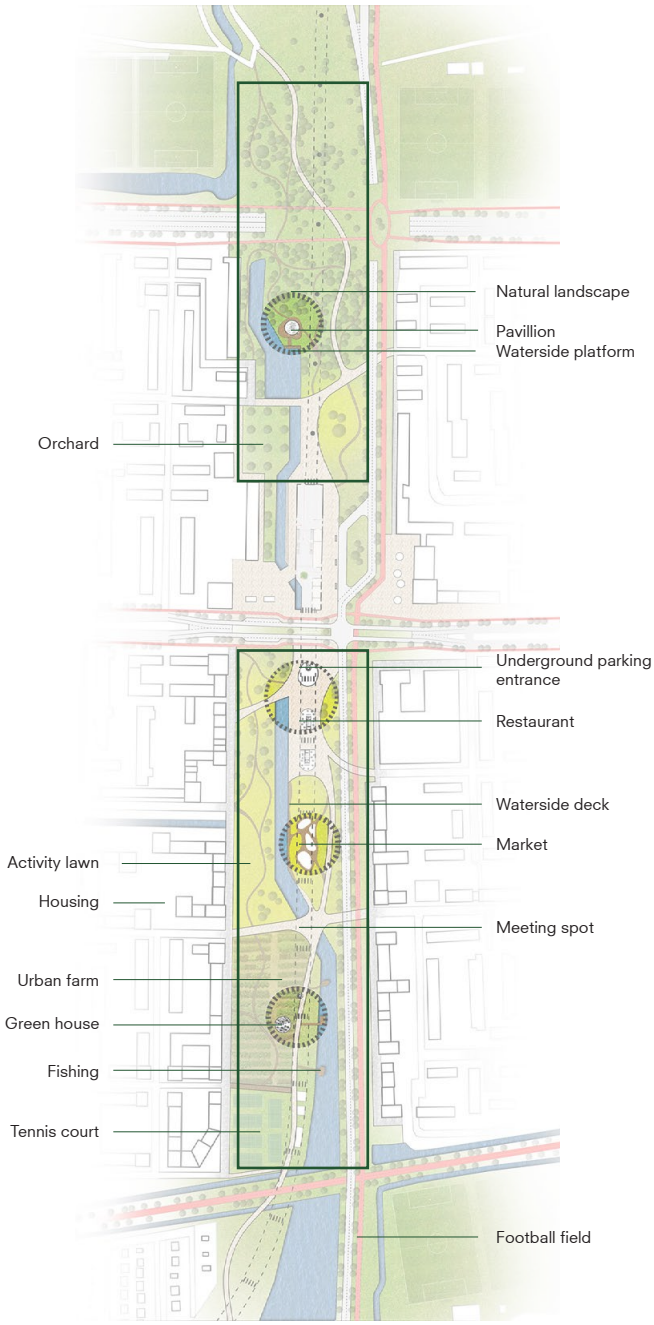
Generating diagram: Reconnecting historical and current canals



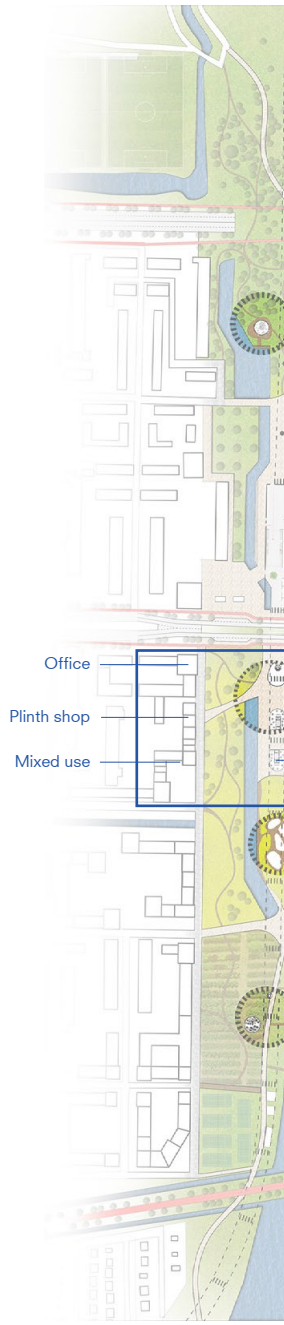
Generating diagram: Underground intersections and public space around the station

Generating diagram: Routes to the station

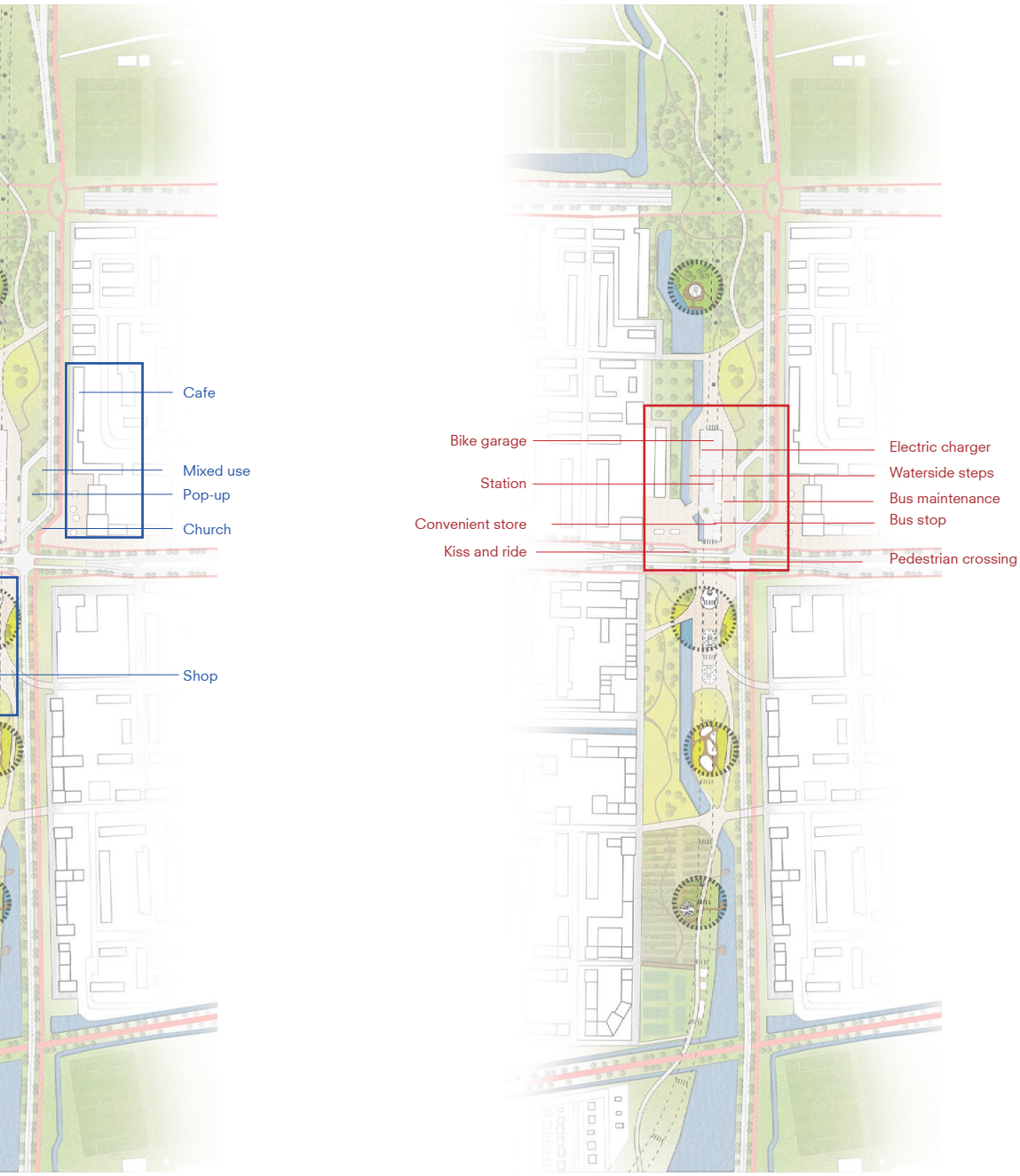
Generating diagram: Activity space



HUSH analysis



FUZZ analysis



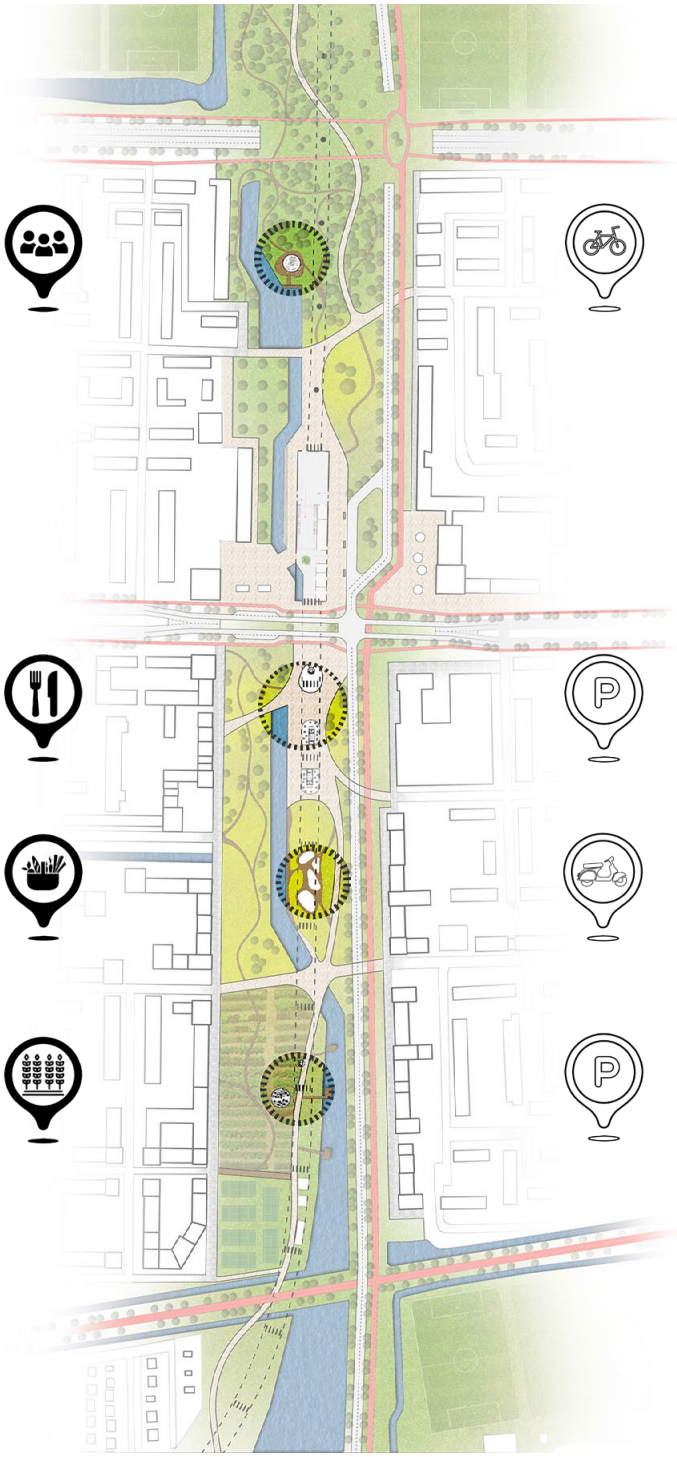
BUZZ analysis

A DENSIFIED GREEN CORRIDOR
Providing amenities in the park

Slinge 2050 project comprises multiple operations on different levels and sector. First, there is the creation of 2000 to 3000 new dwellings around the Slinge area and station to density the south of Rotterdam. The creation of new dwellings aims to reduce the housing shortage in Rotterdam and in the Netherlands and to replace the ageing social housing. Next is the creation of the green corridor connecting Zuiderparkweg on the north and Drechterweide on the south. The station will be renovated in harmony with the new design of the park amenities as well as public functions will be incorporated in the park and the plinth around the park. All of the interventions will create a coherent project for the future of Slinge.

The amenities inserted in the park are located around and under the viaduct created by the metro line. The space under the bridge is currently used for the P&R parking lot or is simply empty. Instead of being a barrier, the bridge will connect the two neighborhoods once the parking lot removed and a few pavilions, each with a different function, are placed. The pavilions are integrated within the design of the park and the material used are coherent with the three different areas we created in the park and the buildings around: hush, fuzz and buzz. A wooden and warm atmosphere for the calmer area of the park. Concrete for the busier parts of the park. Brick for the more domestic sector.

The pavilions are paired with a mobility function. To complement the metro station and encourage soft mobility in the city and in the suburbs. The metro and buses are a large part of public transportation on a wide scale. On a smaller scale and individual mobility, electric and shared scooter or shared bikes but also post to recharge electric cars in the underground parking lots. The P&R is removed to Waalhaven, removing a large amount of car in the Slinge area and gives back the space for pedestrians and bikes for a safer neighborhood. In the next decades, mobility will evolve by removing cars and promoting green transportation, Slinge 2050 project will be en route for a greener and more future-friendly environment.



Amenities in the park : general plan and functions
https://thenounproject.com/

COMMUNITY SPACE
A place to meet

A neighborhood is a community. Both districts of Pendrecht and Zuiwijk have a vibrant community mainly coming from immigration during the 1960s. The addition of 2000 to 3000 dwellings will bring a large amount of new inhabitant to the neighborhood. To keep harmony and cohesion within the community and meeting spaces are created all around and within the park. The community pavilion is placed in the greener area of the park, in the more quiet and residential sector in the north. It is important to integrate the new population in the community already present. The diverse and heterogeneous population will expand the community.

The community space allows people from the Slinge area but also both neighborhoods and the newcomers to meet in this natural area. They can connect, exchange and relax in this green environment. The building is located in the "hush" area, which is the calmer and greener section of the park. To go along with the peaceful environment, the materials chosen are natural and warm. Wood and glass are omnipresent to connect with the nature surrounding the pavilion. The terrace around the building is protected from the sun. It offers a great place to relax outdoor close to the canal where people can enjoy the water.

Shared bikes are offered in front of the pavilion underneath the bridge. Either to enjoy a stroll in the park or to have easy access to the pavilion, bikes are a practical way of transportation. Used a lot in the Netherlands already, shared bikes are convenient for people who don't need a bike constantly or for the people visiting the area. Additional spaces for other bikes will be provided for accessibility to the pavilion.

RESTAURANT AREA
A place to eat

A restaurant is always a nice and enjoyable space. Food brings people together and makes everyone happy. Gathering around a drink near the water as well. The restaurant is placed in front of the station, on the other side of the road, reserved to kiss and ride and buses. This pavilion is situated in the "buzz" area, the busiest section of the park and next to the station. The visitor of the station just have to cross the street and the large zebra crossing to get to the restaurant area. Commerces and offices are located around the station and the buzzing area brings diversity.

The restaurant area provides space for the community to gather and have foods and drinks. Conveniently placed next to the canals, steps lead to the dock to easily access and enjoy the water. A lot of seating spaces are dispersed around the restaurant to provide resting spaces. The restaurant is placed directly under the bridge. The material chosen for the "buzz" area is concrete to tolerate a more heavy use of the space. Different types of concrete and surfaces are used to create diversity and verdured spaces are present around this area and the canal as well.

A few parking lots are placed underneath the residential blocks around the park to provide parking options for the population. A parking entrance is located in front of the station, on the other side of the road and near the restaurant. The access to the station is easy and convenient for the population of the neighborhood and the visiting people. The goal is to remove as many cars as possible in 2050 but we realize we still need parking option for the inhabitants and the visitors.

FARMER'S MARKET
A place to shop locally

The farmer's market is in the south of the park, near the urban farming and the gardening section of the park. The farmer's market is an opportunity for the community to have access to fresh and local products grown by the neighborhood. This area is located in a calmer district but busier than the northern part of the park. A market is a great platform for the community to meet and exchange regularly around good products. Located right next to the urban farming, this space works in close connection with it.

The market area is a permanent installation located just underneath the bridge to be protected from the weather. Worktops are placed in an organic shape to incorporate the organic design of the park. The canal runs next in parallel to the bridge and accompanies the market The materials chosen are linked with domesticity and are warm and natural. The brick pattern on the ground related to the homely environment but can support heavy use. The worktops for the market are placed on wooden platforms. Lots of greenery are planted around the bridge to provide greenery around the market

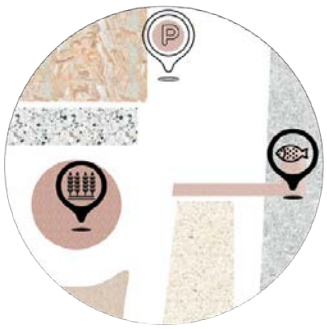
Shared electric scooters are placed next to the farmer's market. Like bikes, scooters are a great way of transportation. Scooters and quick and easy. The market seems to be a convenient place to place them. That way, people have easy access to the market and can easily transport goods and quickly run errands. Allowing people to have easy access to the park is a key factor to eliminate the excessive amount of cars.

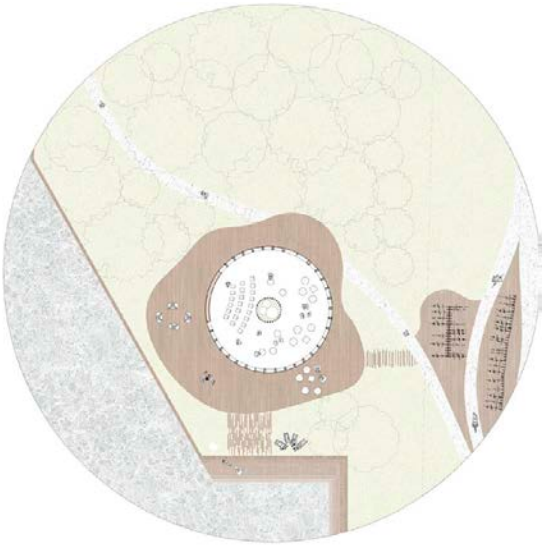
URBAN FARMING
A place to garden

Farming is starting to be introduced or reintroduced in the urban space. Food is an essential part of life. Locally produced food is rare in cities and they rely on the farming around. Having a place to produce healthy and fresh produces in the Slinge neighborhoods is a great opportunity for the community to meet and work the ground together. The relationship between urban farming, the farmer's market and restaurant is very important to provide local food. The canal in front of the urban farming area is also filled with fish.

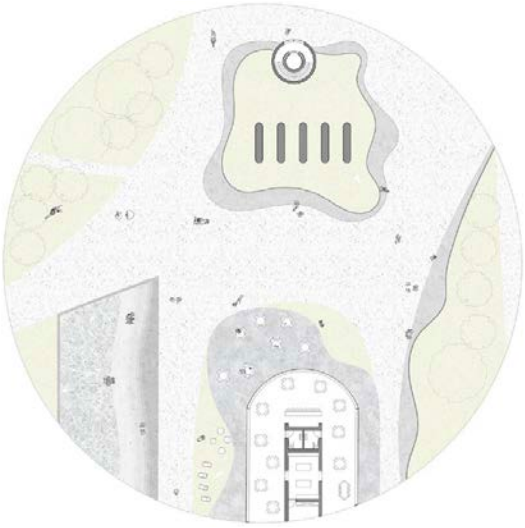
The urban farming area is comprised of spaces of rich soil for farming, greenhouse space and a fishing pond. The community can come here and grow vegetables and fruits, enjoying the company of others. The weather in the Netherlands doesn't allow for farming all year round and a greenhouse is a great way to grow certain foods. The fishing pond is placed on the continuity of the canals and allows locals to fish. The northern side of the greenhouse is a closed side with a stacked brick pattern. The materials are the same as in the farmer's market to link both of them together.

A parking entrance is placed next to the greenhouse in the farming area. Convenient access to a parking lot is important to bring heavy tools and utensils to the garden. The local population as well as people living further away can use the space and can conveniently access it. It is also why the farmer's market is placed closed to the farming area to avoid unnecessary trips.

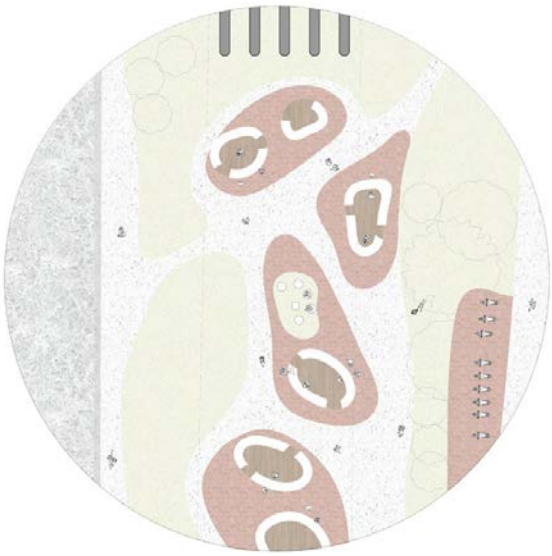




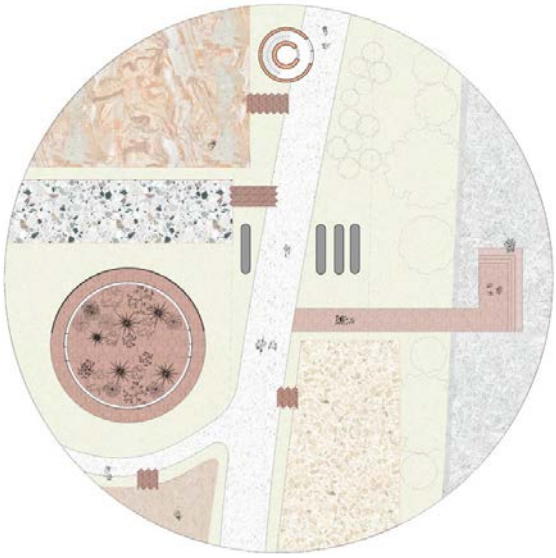
Community space: Plan and functions diagram
Community space : floor plan
Community space: atmosphere



Restaurant area : Plan and function diagram
Restaurant area : floor plan
Restaurant area : atmosphere



Farmer's market : plan and function diagram
Farmer's market : floor plan
Farmer's market : atmosphere



Urban farming : plan and function diagram
Urban farming : floor plan
Urban farming : atmosphere


Diner
Atelier
Car Service
METRO

Reclaiming Slinge

Slinge Station
Slinge 2030

Benas Vencevicius
Casper Van Duuren
Daniel McNally
Jin-ah Duijghuisen

URBAN VISION
Slinge 2030

The city of Rotterdam is proposing a circle metro line, in the given scheme Zuidplein station, which is next after Slinge heading to the Rotterdam side, becomes a node connecting E, D and new circular line. This new hub is projected to serve Rotterdam Ahoy convention center, which only arena's capacity is of 16,426 visitors. While Zuidplein will become a major hub, supposedly with park and ride function, Slinge might lose its importance and become a more local one. Slinge's metro station, railway viaduct and existing park and ride garage interrupts further densification, divides neighborhoods, creates lots of unusable, unlivable space, this directly leads to safety problems. In summary, it can be said that Slinge's not becoming into a hub might bring many advantages to Pendrecht and Zuidwijk, however careful actions must be taken.

In addition to previously described change of Slinge station, another tool for solving problems and coping with the negative image of both neighborhoods and station is foreseen densification around the Slinge metro station for at least 500 housing units. Densification would enclose streets with a perimeter of residential buildings, full with everything seeing eyes of newcomers, it would bring more diversity into these "satellite" neighborhoods, which are mostly built up with social housing, and more opportunities. On the other hand, densification brings drawbacks of over-crowdedness, but re-purposing underused parking, developing green belt and implementing new and needed functions in it might work as a compensation for this new residential development.

Overall, whole approach of this concept can be called adaptive, for instance, parking is not fully used, moreover Zuidplein might become way more convenient for commuters, but full demolition of it is not taken into account, because it is the first and the oldest park and ride in the Netherlands and lot of different, not explored habits of commuters might have formed already, some might have their favorite shop here, others children might be going to school here as well. Application of non demolition but rather adaptation can be also justified in heritage, time and sustainability means.

EXISTING CONDITION
Demographics Fact Sheet

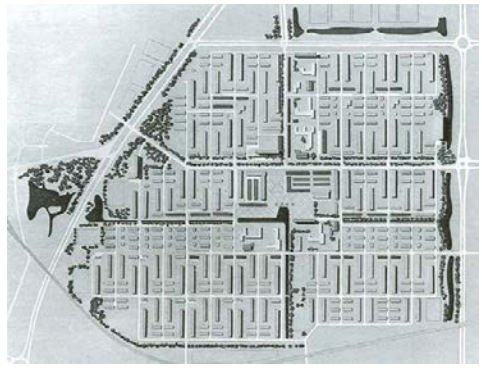
Post-war constructed Pendrecht and Zuidwijk are known for being low-income neighborhoods, marked by one of the highest crime rates and disproportionate car usage.

Pendrecht was initially designed by the urban planner, Bauhaus student, Lotte Stam-Beese, who had a vision for Pendrecht: open streets with lots of greenery where different population groups could live side by side. The open ground between the houses was shared with others, but due to housing shortage living units were no larger than 53 square meters and this was the main factor that caused the neighborhoods' failure.

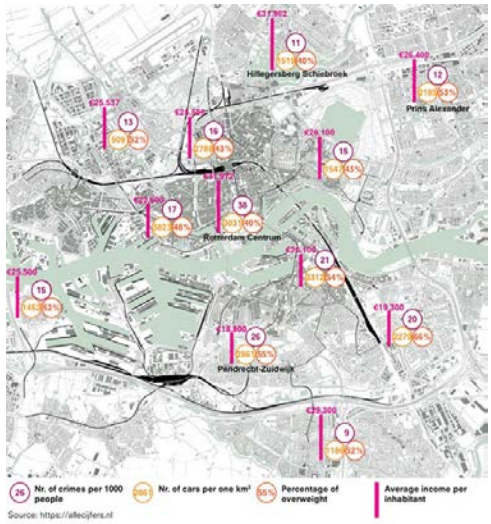
Fifty years after its construction, the neighborhood changed its appearance. Children, who grew up in Pendrecht, moved away and went to live in the suburbs. The houses were too small and young people wanted bigger, better houses. The houses became obsolete and were inhabited by immigrants as it was their only choice. Being a "satellite" neighborhood, far from opportunities, caused an increase in crimes (especially around Slinge station), unemployment and a negative image.

Cosmetic urban changes around the station tried to improve the condition but noticeably failed. A major restructuring has been going on for years to make the neighborhood more attractive again. Many homes have been demolished or carefully renovated in both neighborhoods. In the southern part of Pendrecht, around 1,000 homes made way for around 500 new-build homes. However, after the restructure Slinge station remained an unappealing transportation artery, new safety measures such as fences, cameras only strengthened the image of unsafety.

One of the reasons for the neighborhood's impoverishment was Pendrecht's poor image. That is why a two-year image campaign was launched in June 2009: Pendrecht is on the right track! Currently, residents of the south of Rotterdam are experiencing a new threat which is gentrification and is marked by protests.



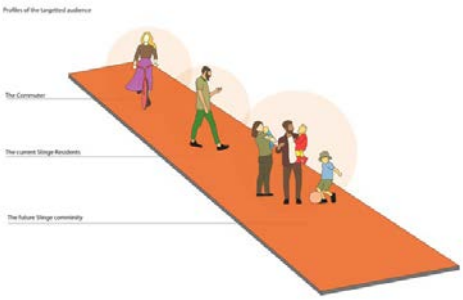
Pendrecht, a canonic example of post-war urban planning

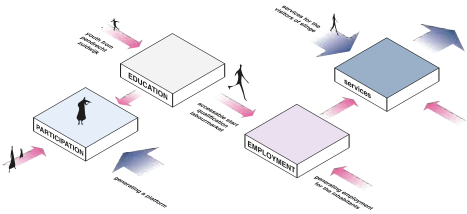


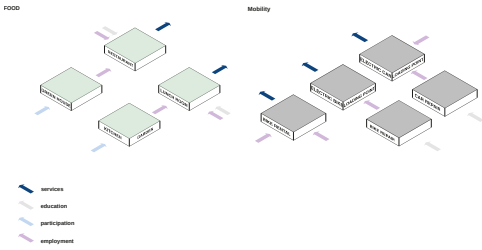
Lowest income neighborhood in Rotterdam marked with one of the biggest criminal rate and disproportionate car usage with apparent number in overweight.

INCLUSIVE HUB

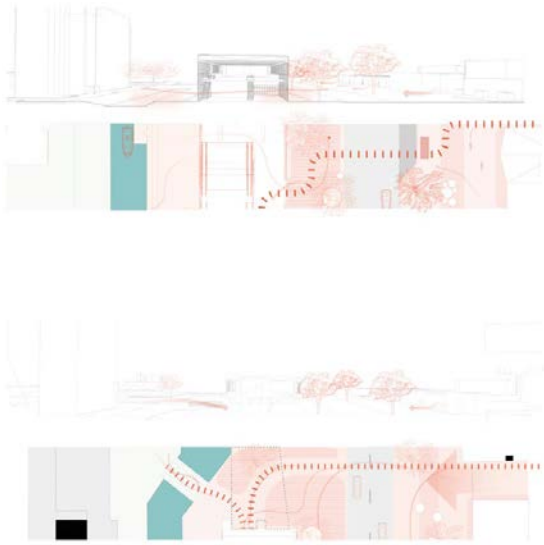
Reconstruction of Slinge station contains temporary and permanent measures, with an ambition to convert this station into an inclusive hub for commuters, the community and newcomers. Various functions are proposed to provide education, work experience and at same time services for station itself. We have taken a sensitive approach of reclaiming Slinge from its disjointed image. Reclaiming Slinge station into a place of connectivity, embracing all users , which empowers the current residents. In summary, our work will focus on how community and infrastructure can coexist together.



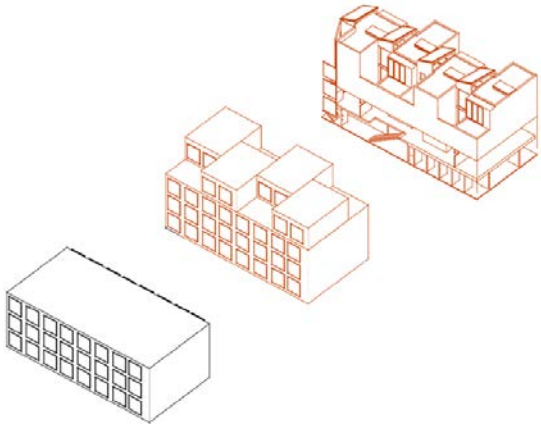




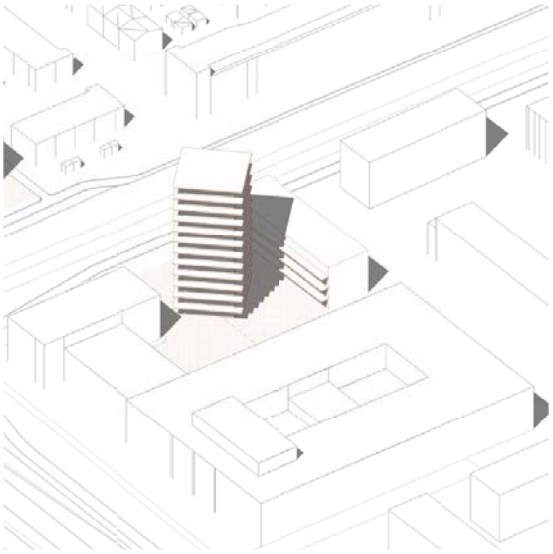
URBAN VISION TOOLS



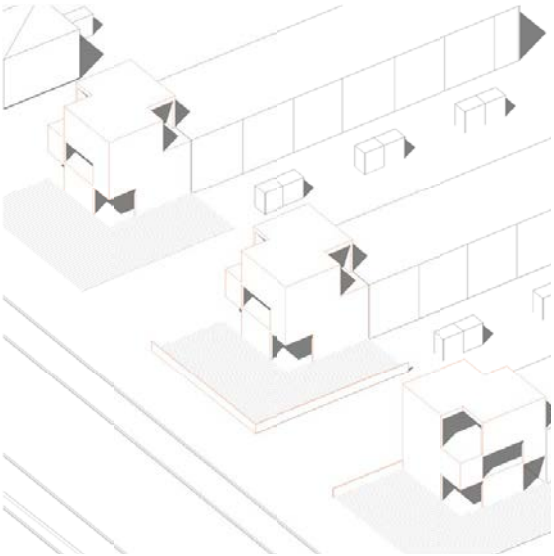
Creating new routes to make station more accessible and approachable



Refurbishing existing residential buildings and giving it new qualities

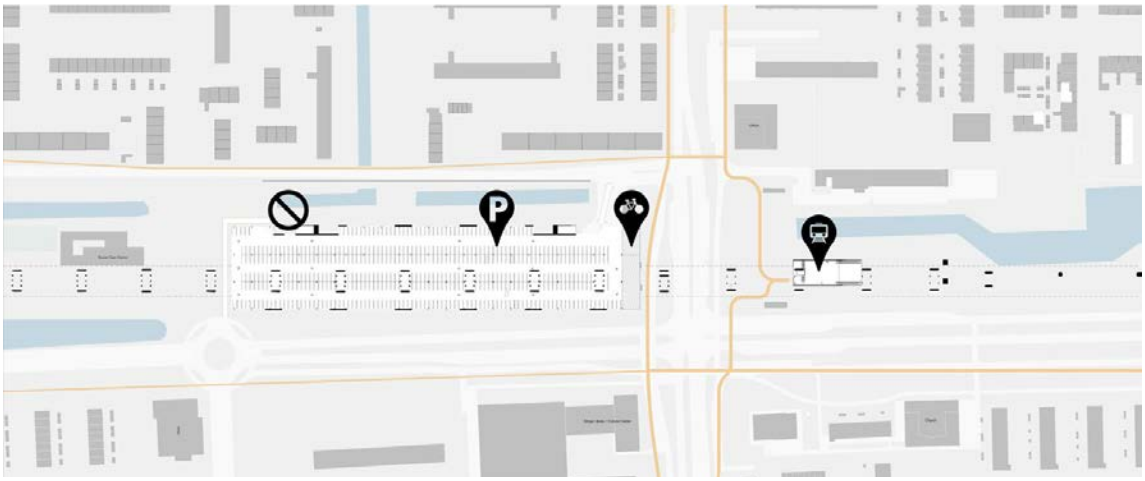


Using gaps or re-purposing areas which might become obsolete in near future. For instance, gas station area could accommodate 50 housing units



Developing Zuiderparkweg and covering the firewalls while not eliminating existing pedestrian flows could create safer and lively street. One addition could offer 2-4 housing units

EXISTING

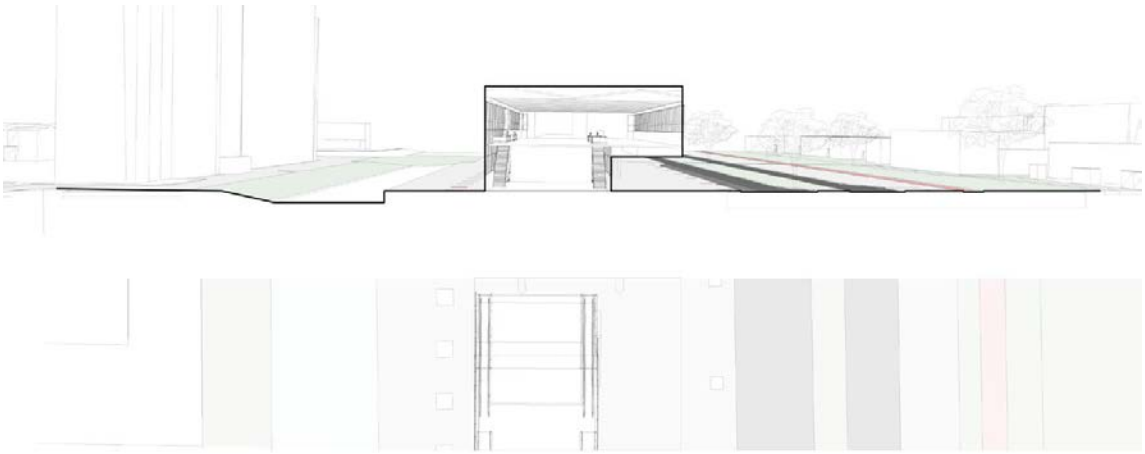


PROPOSAL

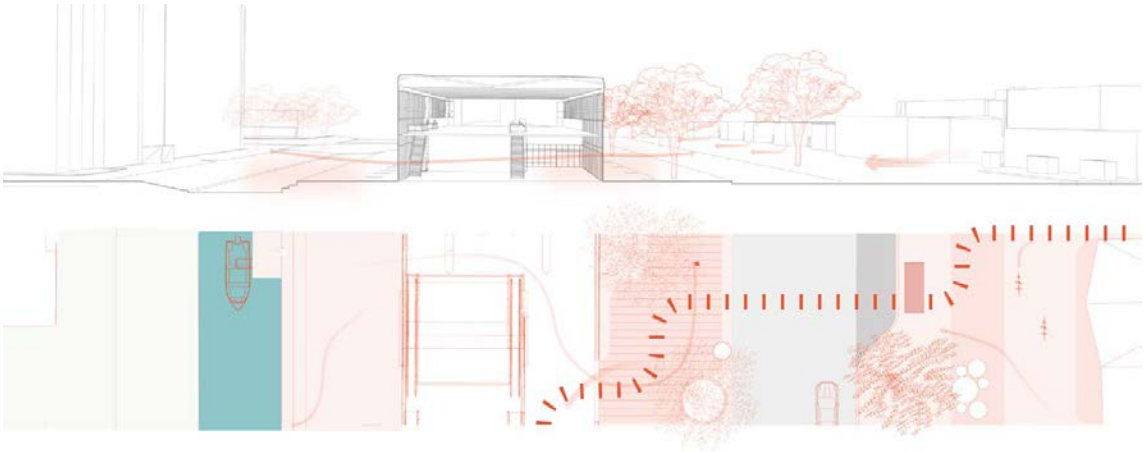
IMPROVING STATION CONNECTIVITY

The first section drawing below shows the current situation at the station. The L-shape of the station causes a narrow underpass between the columns and the facade of the station. The flow inside and around the station is interrupted. Two bus lanes and car lanes are also not helping with connecting the station to its neighborhoods. These become barriers for the community and often create dangerous situations.

The new section shows several improvements to the station as well as to its environment. First of all the station interior is expanded, so the narrow underpass is gone. Furthermore this extra space improves the flow within the station, because people can now enter the station from the north. The roads are narrowed down to two lanes and a short bus lane to get a better connection to the other side of the Zuiderparkweg.



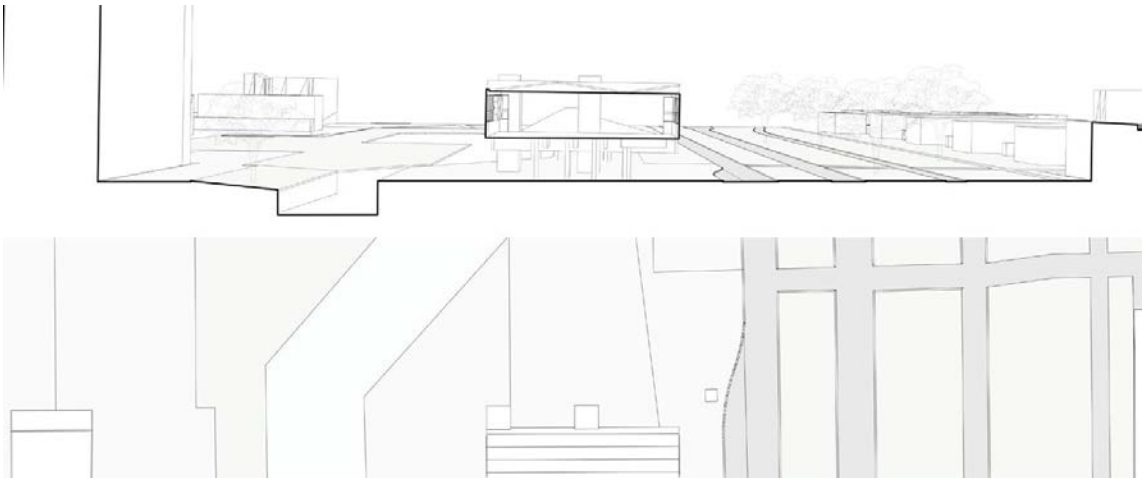
Existing condition



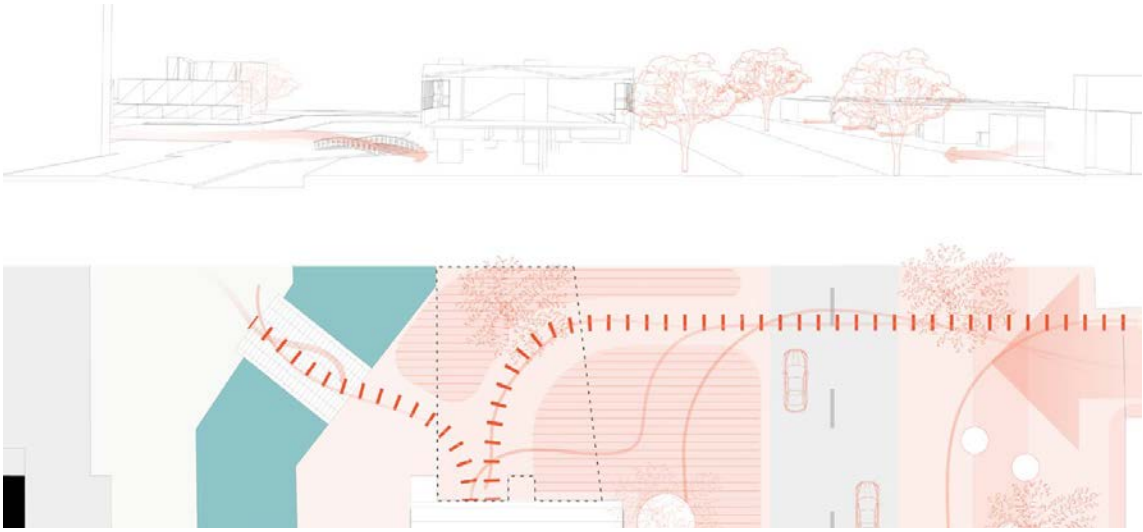
Proposed condition

This second section is taken further down north, where the station (in the current situation) flows over to the underpass where nothing really happens. Disconnected from everything, this space is uninviting and dark at night. The crossing by the road is not highlighted, nor is the water on the west side of the station. This area is completely neglected.

The changes that are made focus on improving the connectivity to the north side of the station. By adding a new bridge over the water, people from Pendrecht don't have to walk around this area, but can rather cross it directly. By narrowing down the road on the east of the station, the crossing becomes inviting again. People can walk to the new entrance, created on the north side of the station. This way the north side becomes alive again.



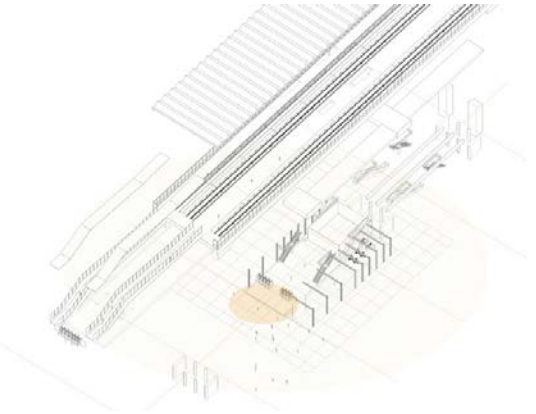
Existing condition

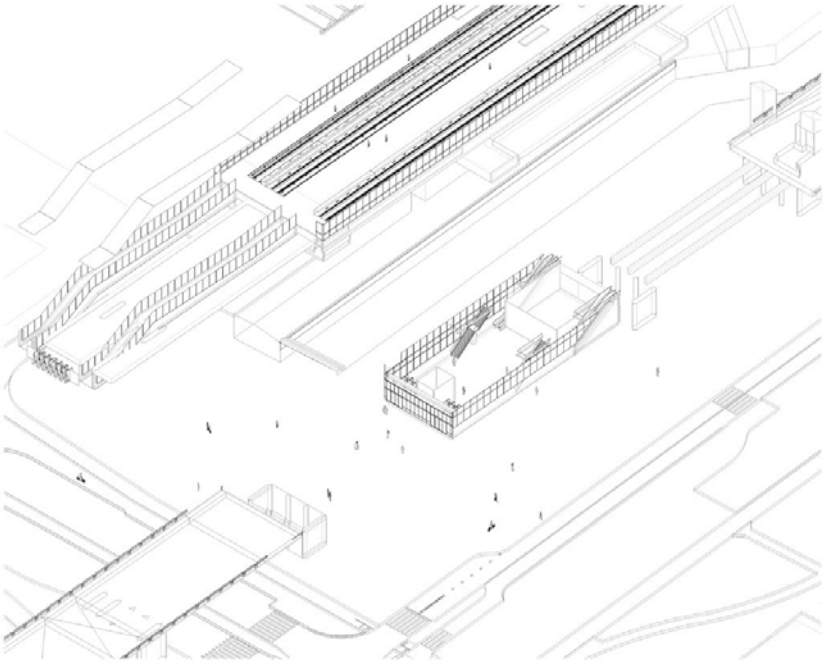


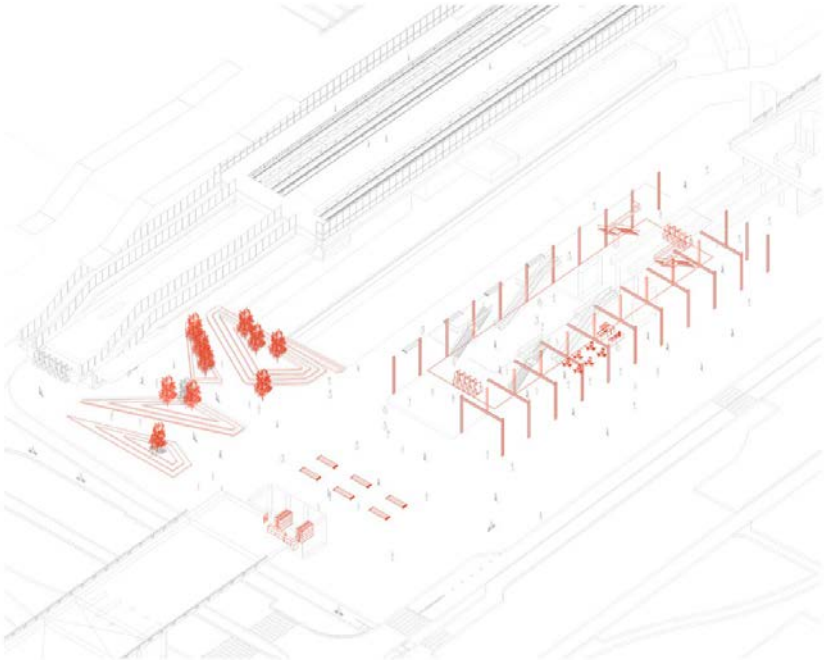
Proposed condition

IMPROVING STATION FLOWS

The 1970s concrete barricade is removed in favor of ground-level transparency and connectivity. Inside, trains operate above the commuters along the elevated track. The design changes introduce an entrance to the north of the station, appropriate to the character of the neighborhoods of Pendrecht and Zuidwicht, improving commuter flow. Additionally, we introduce some facilities, like the cafe extending from the east of the station and the shop located beneath the viaduct. The spaces have been designed so that they remain interchangeable and facilitated to new programming adaptations. The square in front of the station, Slingeplein, is a public space free of traffic, where one can find seating and green spaces for the use of residents and commuters. Station surroundings are also urbanized in an adaptive manner, it does no harm to the neighborhood's urban fabric, keeps walkability, but at the same time creates a safer environment with the main facades and yards facing the station.

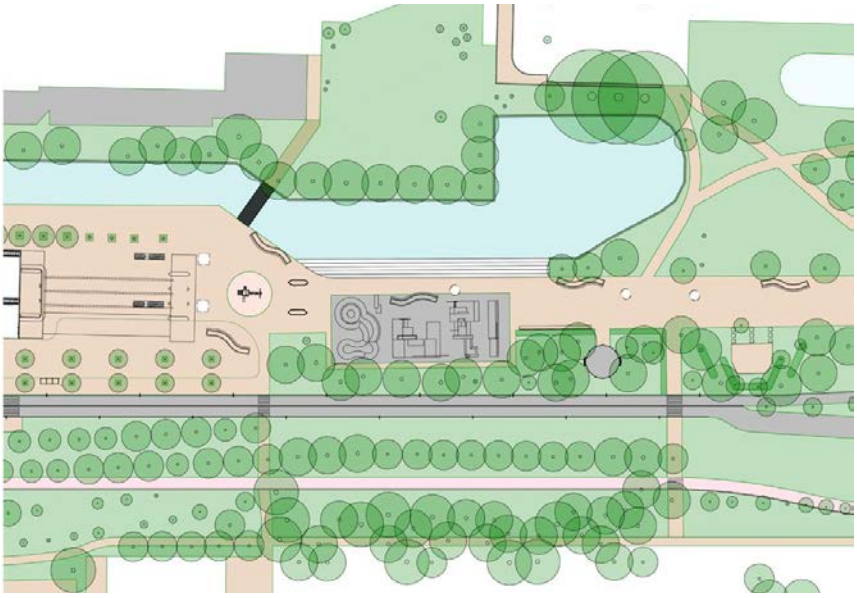


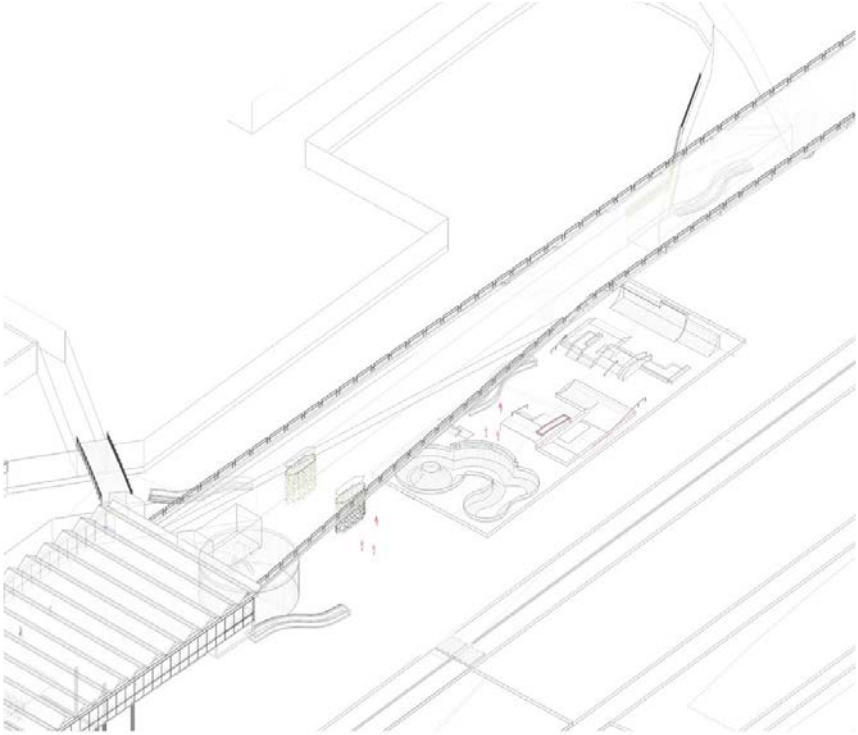




PROPOSAL
Urban Sport Park

With the increase of residents, we expect many young families. The proposed masterplan caters to the young as well as the old. Sports and leisure activities are facilitated in the north of the station. Because of the size and the lack of program, the space currently feels empty and uninviting. Creating a bridge that goes over the water strongly improves the connectivity to the station. Also because a new northern entrance is being placed, people have reason to go to the north of the station. Several benches with greenery are placed for joggers and walkers. Meanwhile the kids can play in the playground but also go for the more challenging climbing wall, put up against the current concrete pillars. A large skate park is integrated for older children. Further down north, a more soothing place is created, where people can do yoga, have a seat or do other organized calm activities. This area is shielded from the road to prevent noise pollution.

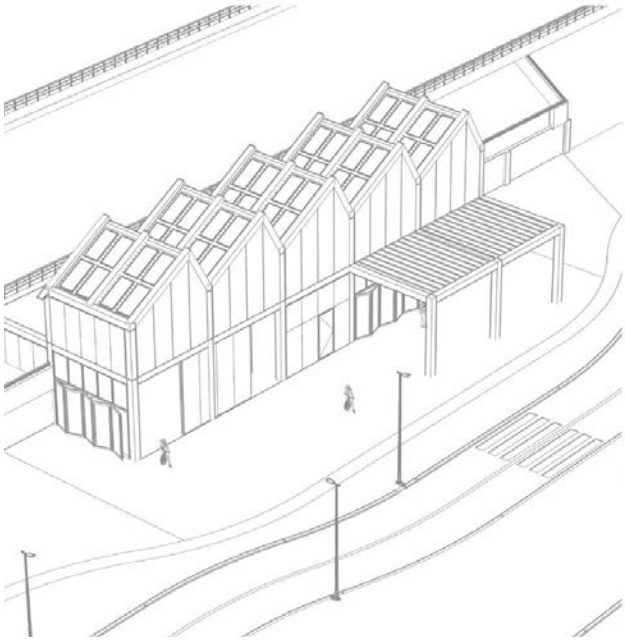


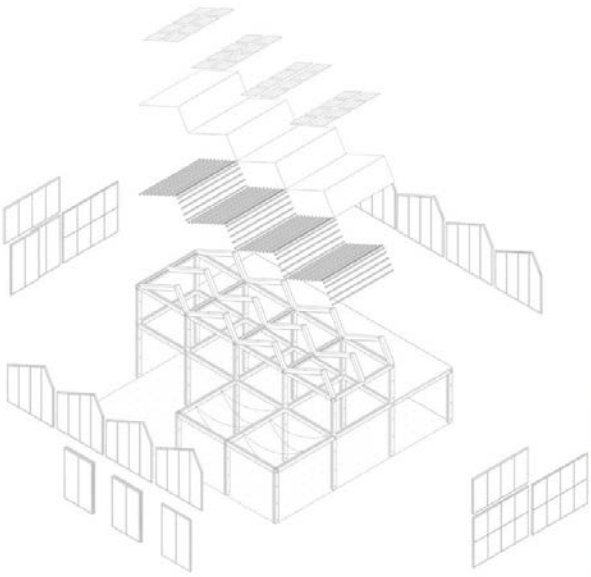


PROPOSAL
Transport Hotspot

A local manufacturing hotspot is a place where cars can recharge and repair. Same applies to all other more sustainable means of transport such as bicycles or electric scooters. Besides these activities, the multi-functional spaces houses an area for education and creates jobs for locals. This multi-functional facility provides not only for the commuters but also for the locals. The open plinth creates a connection between the new slow traffic street and its users and the new employers of the manufacturing hotspot.

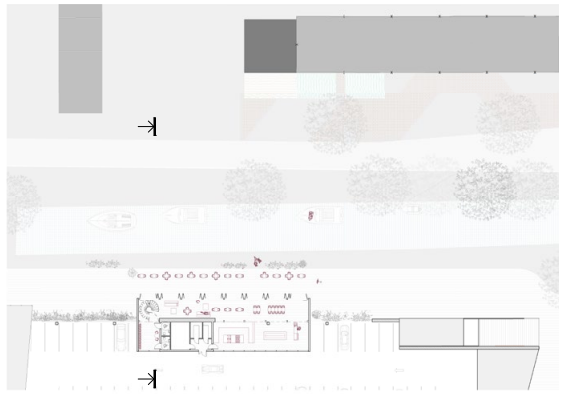
The manufacturing hotspot is built up out of a modular structure and could expand if the demand for workspaces increases and the demand for parking spots decreases.

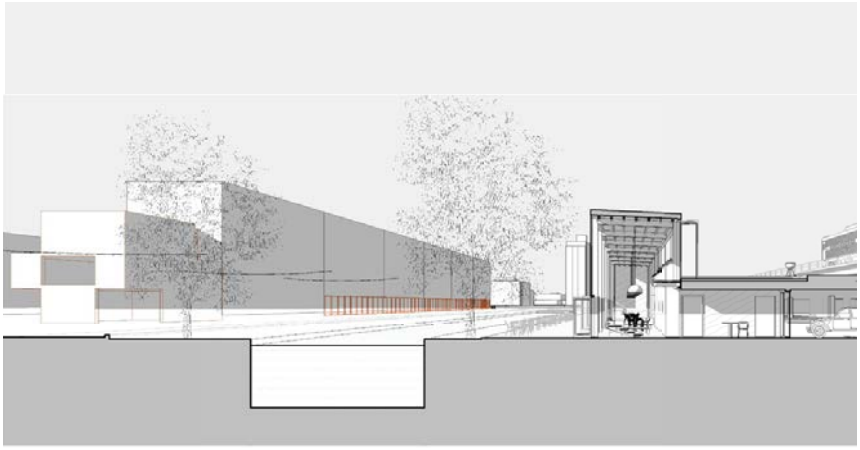


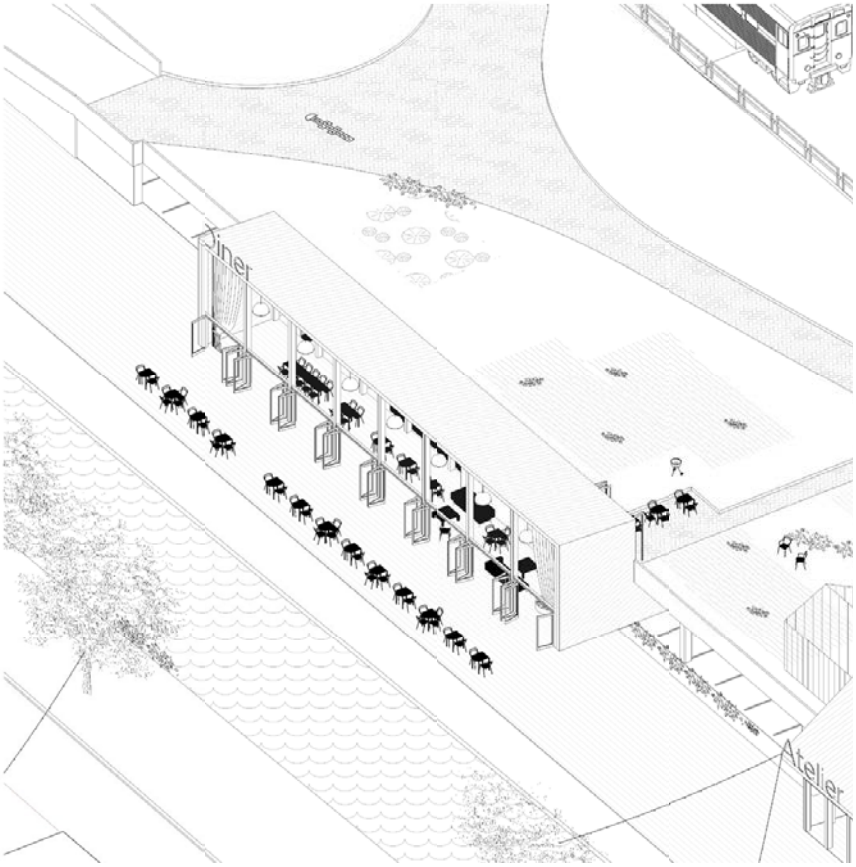


PROPOSALS
Diner and Community Garden

As stated before our partially reclaimed P+R becomes a more interchangeable and inclusive space for all three indicated actors. A new café-diner space is added with the boardwalk along the canal. Entrances to the parking are moved to the Zuiderparkweg side. Previously fenced and overgrown canal area becomes an attractive, almost uninterrupted walking area connecting south and north green areas with newly implemented service, education facilities. The possibility of developing water transportation ways is not ruled out too. Due to the P+R restructuring, one redundant ramp was given away for pedestrians to reach the upper level where the public garden is proposed. This garden would not only extend existing green infrastructure in the south but could also, with nearby Arboretum Pendrecht, serve for the proposed diner. The structure is built up out of a modular structure and could expand if there is a need. Its see-throughness would illuminate the parking, volume and stairs reach the garden in the upper level, this way creating a hub for community events.






Diner
Atelier

BIOGRAPHIES

B

Kees Kaan: TU Delft; AMS Institute
Kees Kaan is founding partner of KAAN Architecten. He is Professor of Architectural Design, head of Complex Projects Chair and Chairman of the Architecture Department at the Faculty of Architecture at TU Delft. He has built up a global portfolio of architecture and urban planning projects. He is an international lecturer and sits on several juries, both in the Netherlands and abroad. Various books and exhibitions have been dedicated to his body of work.

Manuela Triggianese: TU Delft; AMS Institute
Manuela Triggianese is Assistant Professor at TU Delft at the Department of Architecture, section of History & Complexity. She achieved her PhD in 2014 at IUAV and she worked as visiting researcher at the Beijing Technical University. She is member of 'Architecture and the City' (Department of Architecture), 'Smart Urban Mobility' (AMS Institute) and 'Future(proof) Urban Infrastructure' (Deltas Infrastructure Mobility Initiative) research groups.

Yagiz Soylev: TU Delft
Yagiz Söylev is an architect and researcher. He received his Masters in Architecture from TU Delft. He takes part in the teaching and research activities at TU Delft. He was the associate curator of the Pavilion of Turkey, in the 2018 Venice Biennale. His work has been displayed in international exhibitions like Istanbul Design Biennial and Shenzhen UABB.

Yang Zhang: TU Delft
Yang Zhang is a Rotterdam based architect. She graduated as post-master on Architecture and Urban Design from the Berlage in 2015. She works as a project leader in KAAN Architecten, projects scale from interior to urban planning. She is also involved in curation and design for exhibitions and magazines, like FLOWCITY in Shenzhen Biennale.

Nacima Baron: University Gustave Eiffel Paris
Nacima Baron is human geographer, working at the nexus of social science and territorial policies. She is Full Professor at the Ecole d'Urbanisme de Paris and member of the LVMT laboratory. She is responsible for the Railway Stations Chair at the Ecole des Ponts and for Axis 3 in the ISIte Futurs Urbains MUTANDIS research program.

Wouter Kamphuis: Gemeente Rotterdam
Wouter Kamphuis operates as a designer and strategic advisor for the municipality of Rotterdam. He obtained his master's degree in architecture at TU Delft. His studies contribute to regional policy and planning for the new river crossing and metro lines by positioning infrastructure and its impact in Rotterdam's spatial context.

Marc Verheijen: Gemeente Rotterdam
As architect of the City of Rotterdam, Marc Verheijen combines traffic engineering with architecture. His projects vary in scale and abstraction, from masterplan to building. Recently he wrote the book 'Infratecture, infrastructure by design' as an invitation for debate on the quality of public space. As architect the within the engineering office of the municipality of Rotterdam he realized a wide range of infrastructure related buildings: parking's, hubs, stations.

Sigrid van Veen: Gemeente Rotterdam
Sigrid van Veen is mobility advisor for the municipality of Rotterdam. Her focus lies on public transport, working for instance on topics such as public transport hubs, and the development of new, high quality lines.

Alankrita Sarkar: Delta Metropool Association
Alankrite is an urbanist, working as a researcher and designer. She completed her Masters in Urbanism from TU Delft. Her interest lies in understanding the (smart and futuristic) city planning. She believes in strengthening the knowledge and practices by learning from international networks and urban studies around the world.

Arjan Smits: Delta Metropool Association
Arjan was trained as an urban planner at TU Delft. In recent years, he has been closely involved with the development of the National Environmental Vision. In addition, Arjan is working on various projects in the field of node development (Southern Randstad, U10), the energy transition (KEER, GO! RES), landscape (Spot On), design explorations.

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Kjai is an urban designer at DeZwarteHond and teaches at the TU Delft Architecture. The office is specialized in tackling complex urban projects and combines the disciplines of architecture, urbanism and strategy. Kjai works in all scales; translating ambitions from regional/urban plans/visions into meaningful and realized places (station areas in particular).

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ISBN 9789463664868