

UPCYCLING CENTRE
ZUIDOOST

→ *FROM WASTE TO RESOURCE*

STUDIO ASSIGNMENT

‘How will the growth of inhabitants and tourists, the extra demand for new housing, infrastructure, data and energy networks and climate change management influence the public domain, on a time horizon up to 2025 and to 2050?’

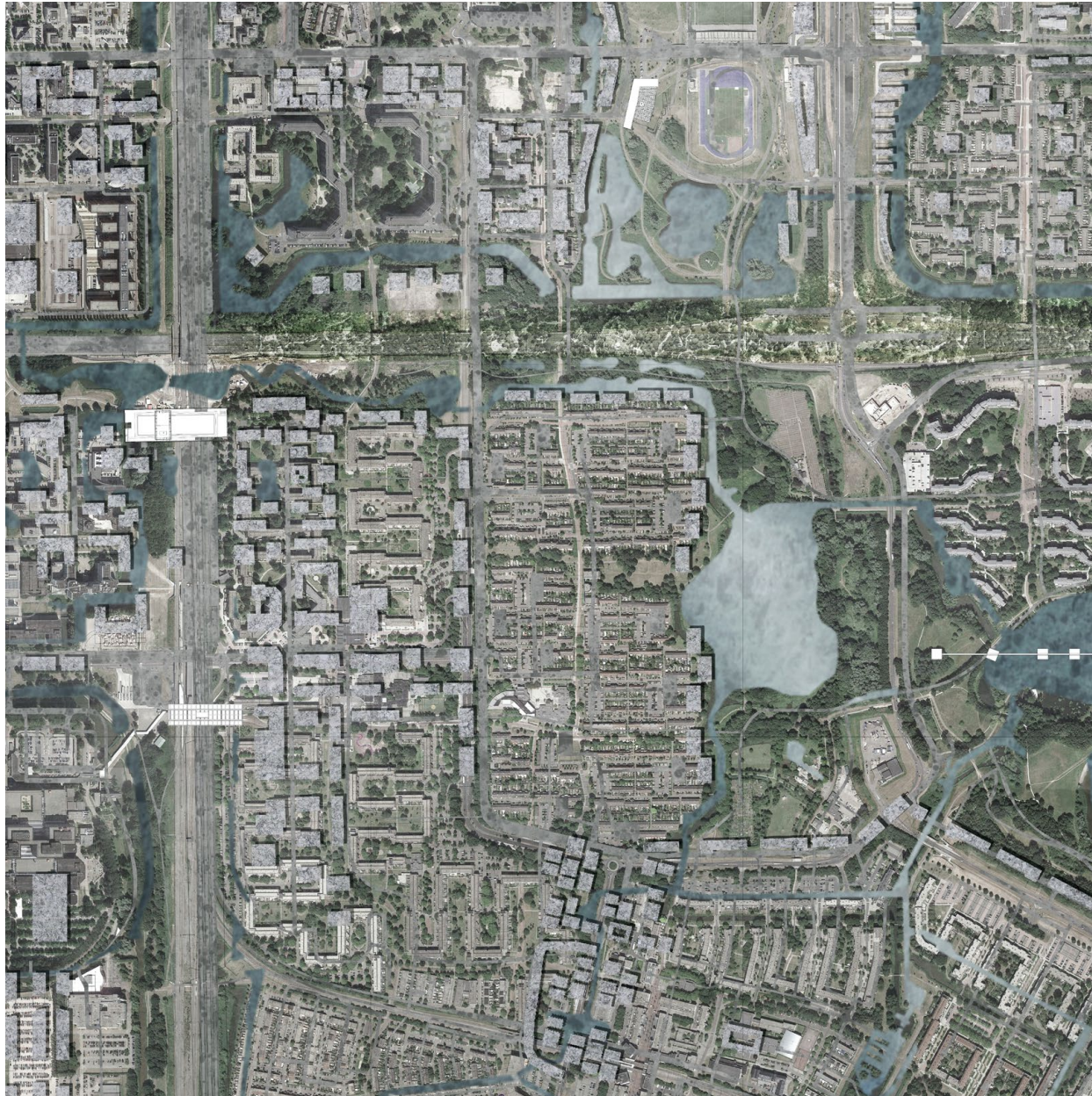


CENTRAAL

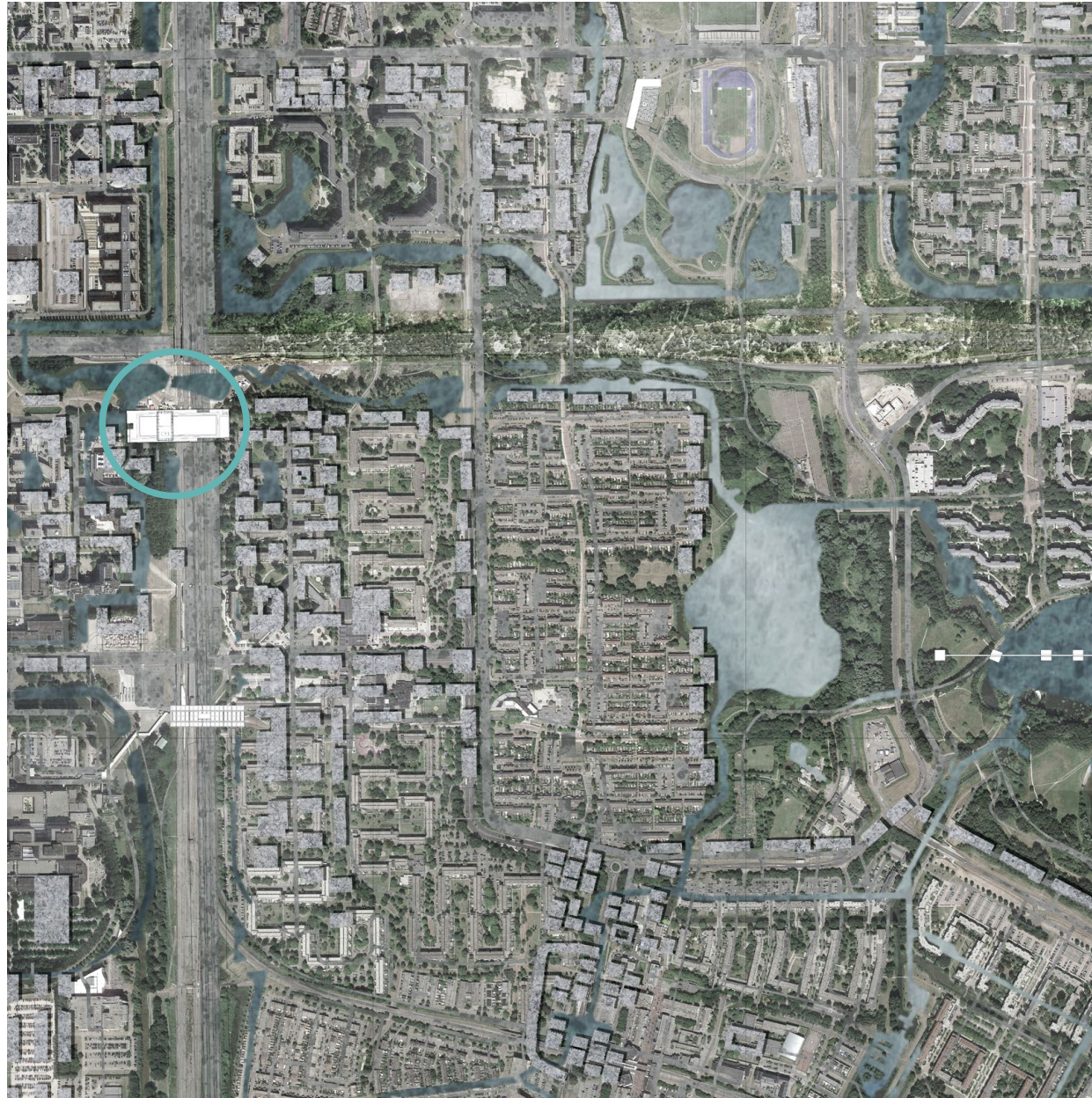
AMSTEL

ZUIDOOST

GROUP VISION 2050



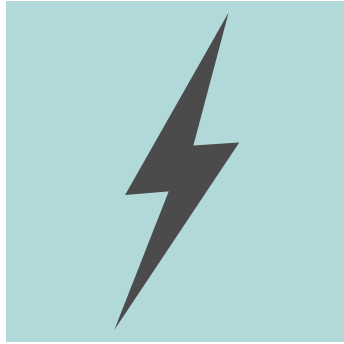
GROUP VISION 2050



STUDIO INTEREST



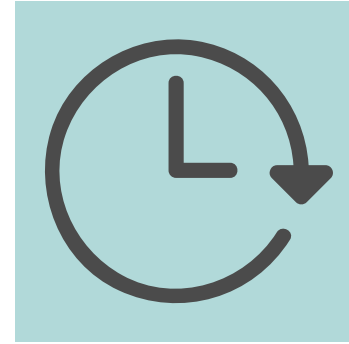
STUDIO INTEREST



Energy



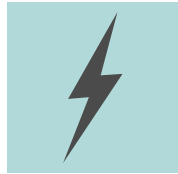
Economy



Future



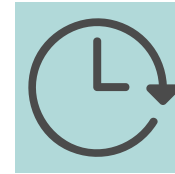
A CIRCULAR ECONOMY IN 2050



+



+



Leader

The Netherlands will be the international leader in the area of the circular economy

50%

Reduction in the use of primary raw materials (minerals, fossil and metals).

100%

The Dutch economy will fully run on reusable raw materials

2020

2030

2040

2050

RESEARCH

Zuidoost

Circular economy

RESEARCH QUESTION

THE PRINCIPLE

Upcycling centre

Future technology

THE PROGRAM

Functions

Users

DESIGN QUESTION

THE LOCATION

Future development

THE CONCEPT

Design

Spaces

DETAILING

Construction

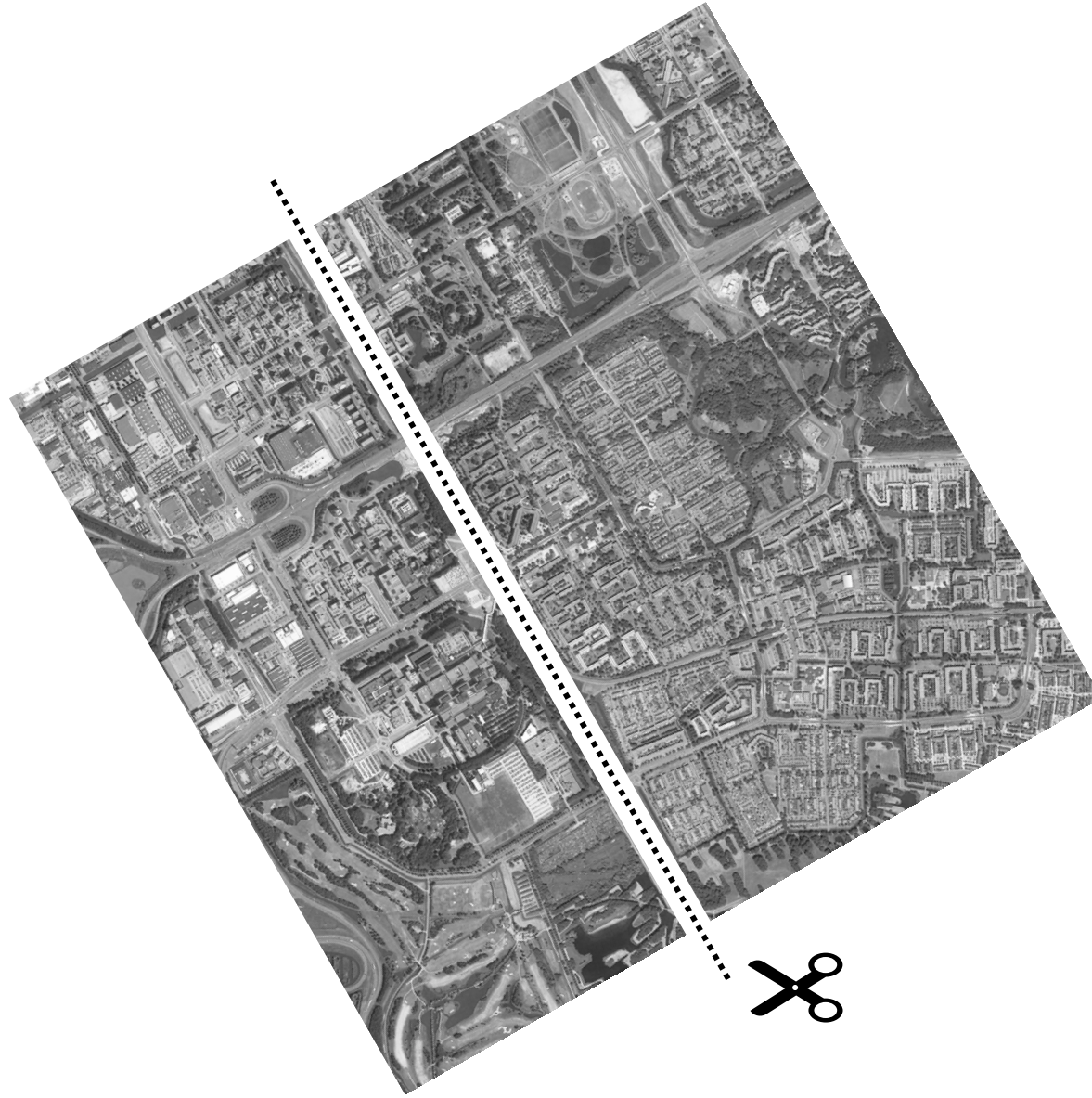
Climate

CONCLUSION

AMSTERDAM ZUIDOOST



DIVISION



BIJLMER / HOLENDRECHT





Source: Zozijnwij.Amsterdam, <http://zozijnwij.amsterdam/over-ons/>

DEMOGRAPHICS



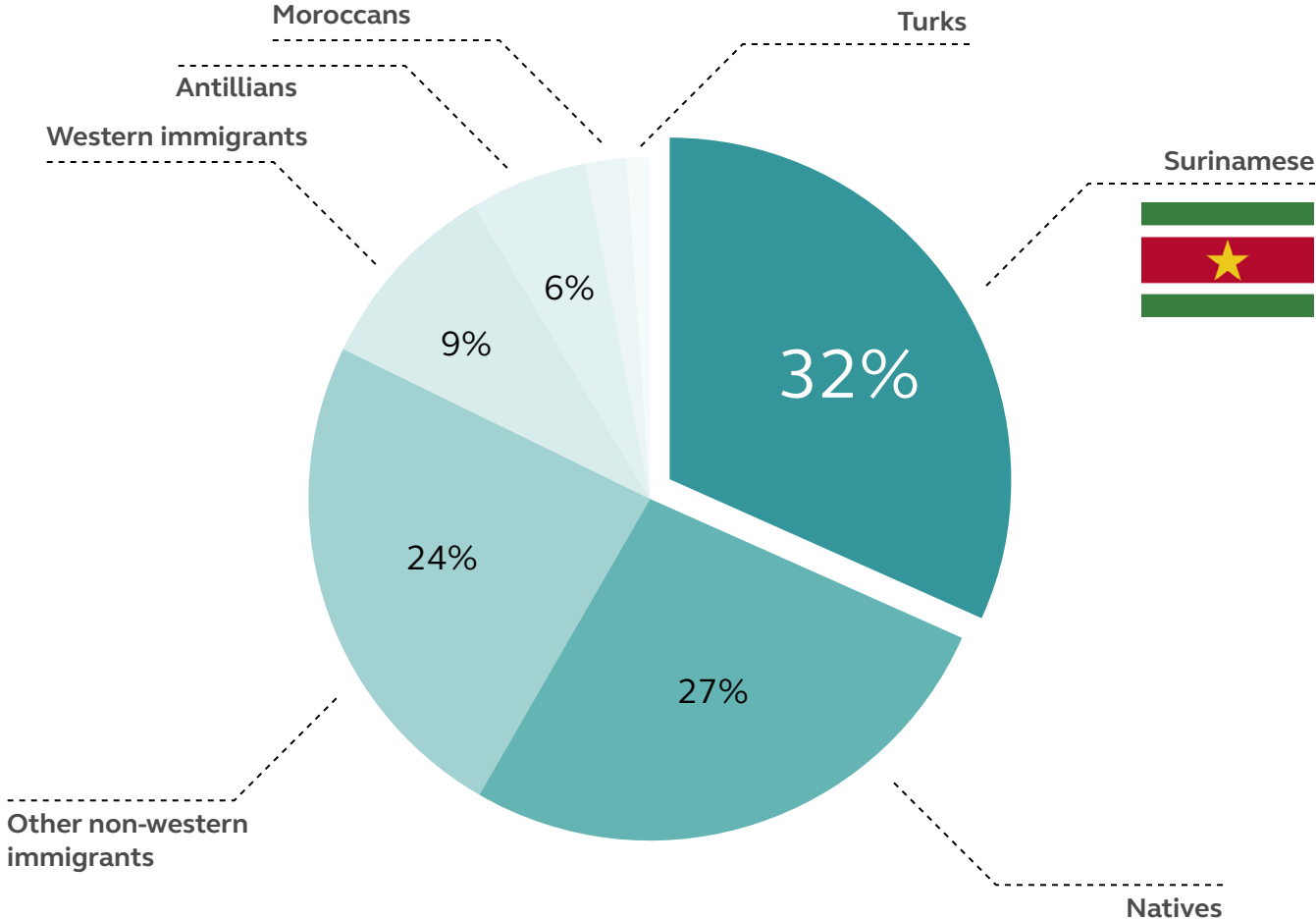
86,000
Inhabitants in
Zuidoost



146
Different nationalities
in Zuidoost



DEMOGRAPHICS



Source: OIS, <http://www.ois.amsterdam.nl/visualisatie/bevolking.html>

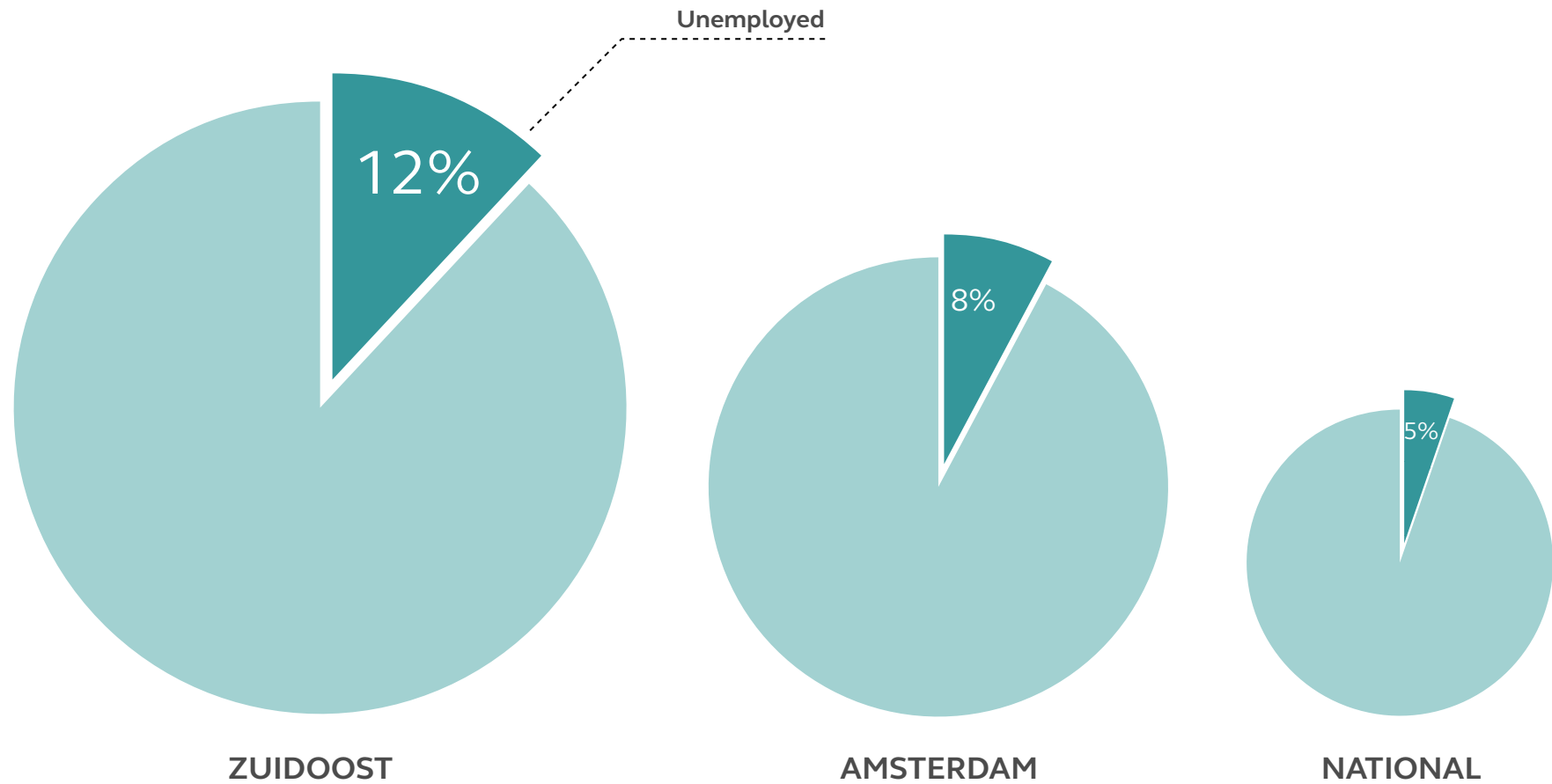
ECONOMICS



12%
unemployment rate
in Zuidoost



22.8%
within the group of
low income



GREENERY

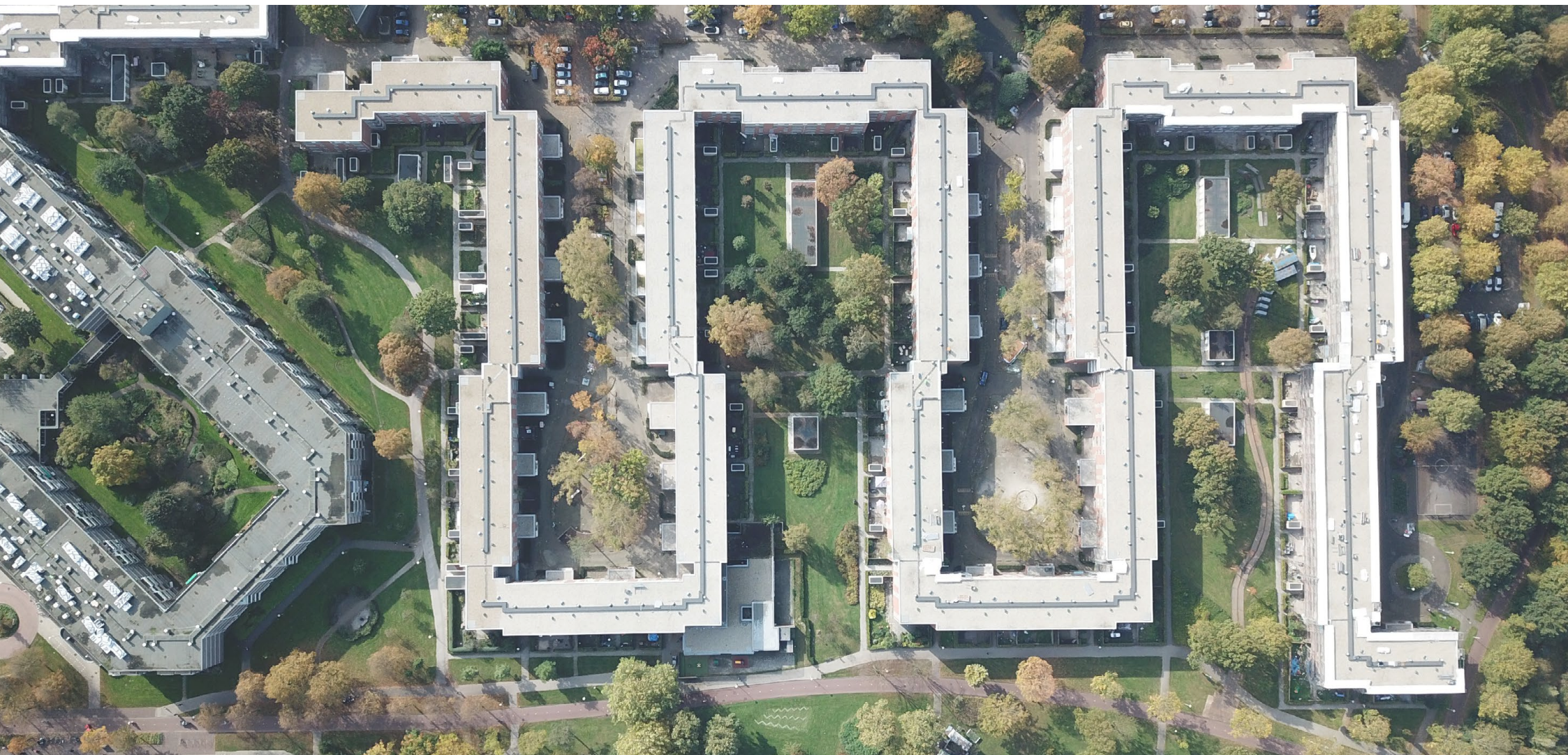


Image by Douwen Chen

AMSTEL III





Source: MVA, <https://www.mva.nl/Pietersbergweg-1>



36%
Office building
vacancy in Amstel III



38,300
Workers in Amstel III
area





NO

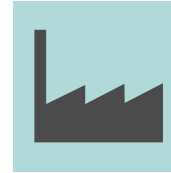
Meeting spaces and a poorly designed public space



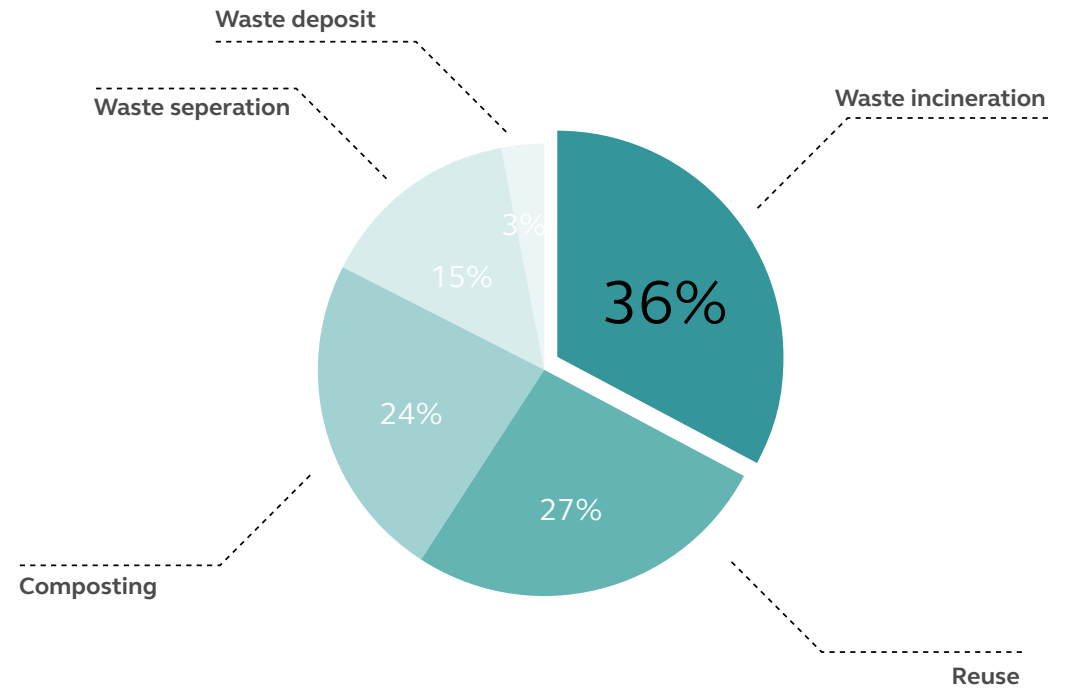
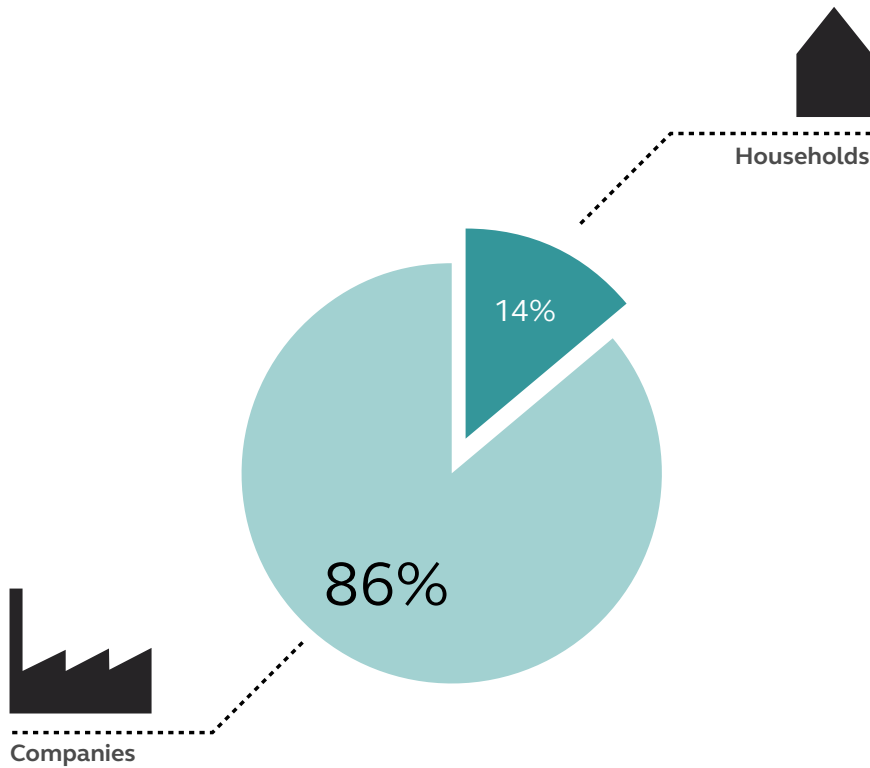
WASTE IN AMSTERDAM



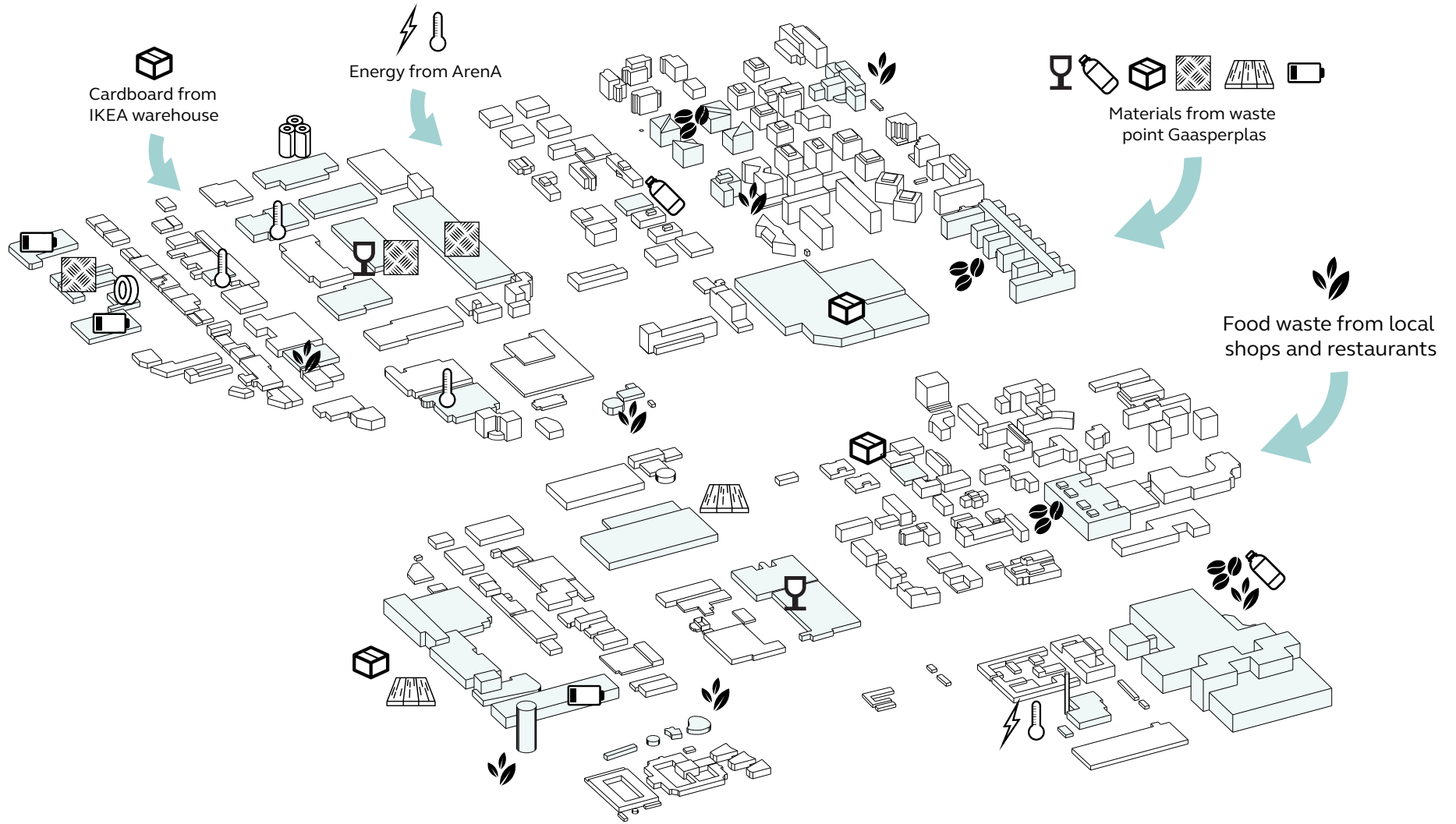
304,000
Metric ton of waste in
Amsterdam each year



261,000
Metric ton of waste from
companies in Amsterdam

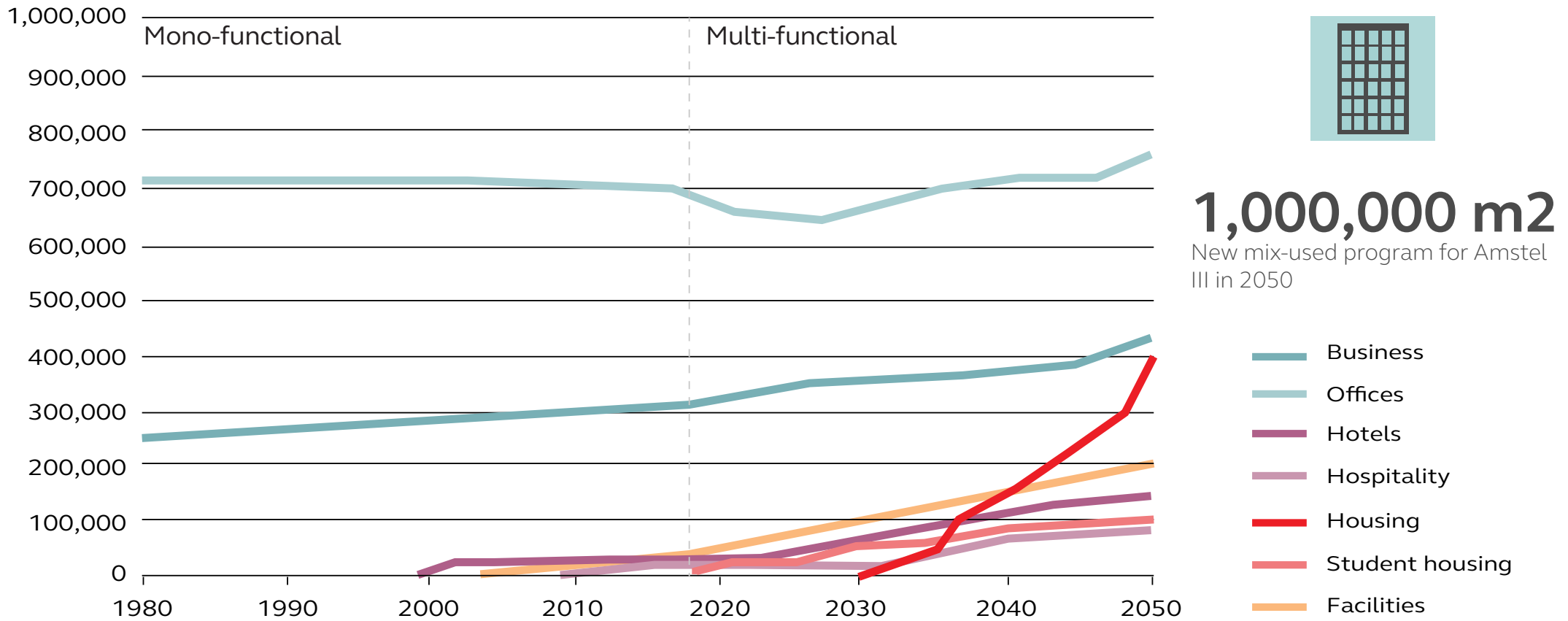


RESOURCES IN AMSTEL III



- | | | | | | |
|--|---|--|---|---|---|
|  Food waste |  Coffee ground |  Glass |  Cardboard |  Textile |  Thermal energy |
|  Wood |  Plastic |  Metal |  Electronics |  Rubber |  Electrical energy |

FUTURE AMSTEL III



AMSTEL III INNOVATION DISTRICT



Mixed-use

development to create an
innovation district

'Innovation districts constitute the ultimate mash up of entrepreneurs and education institutions, start-ups and schools, mixed-use development and medical innovation, bike sharing and bankable investment - all connected by transit, powered by clean energy, wired for digital technology, and fueled by caffeine.'

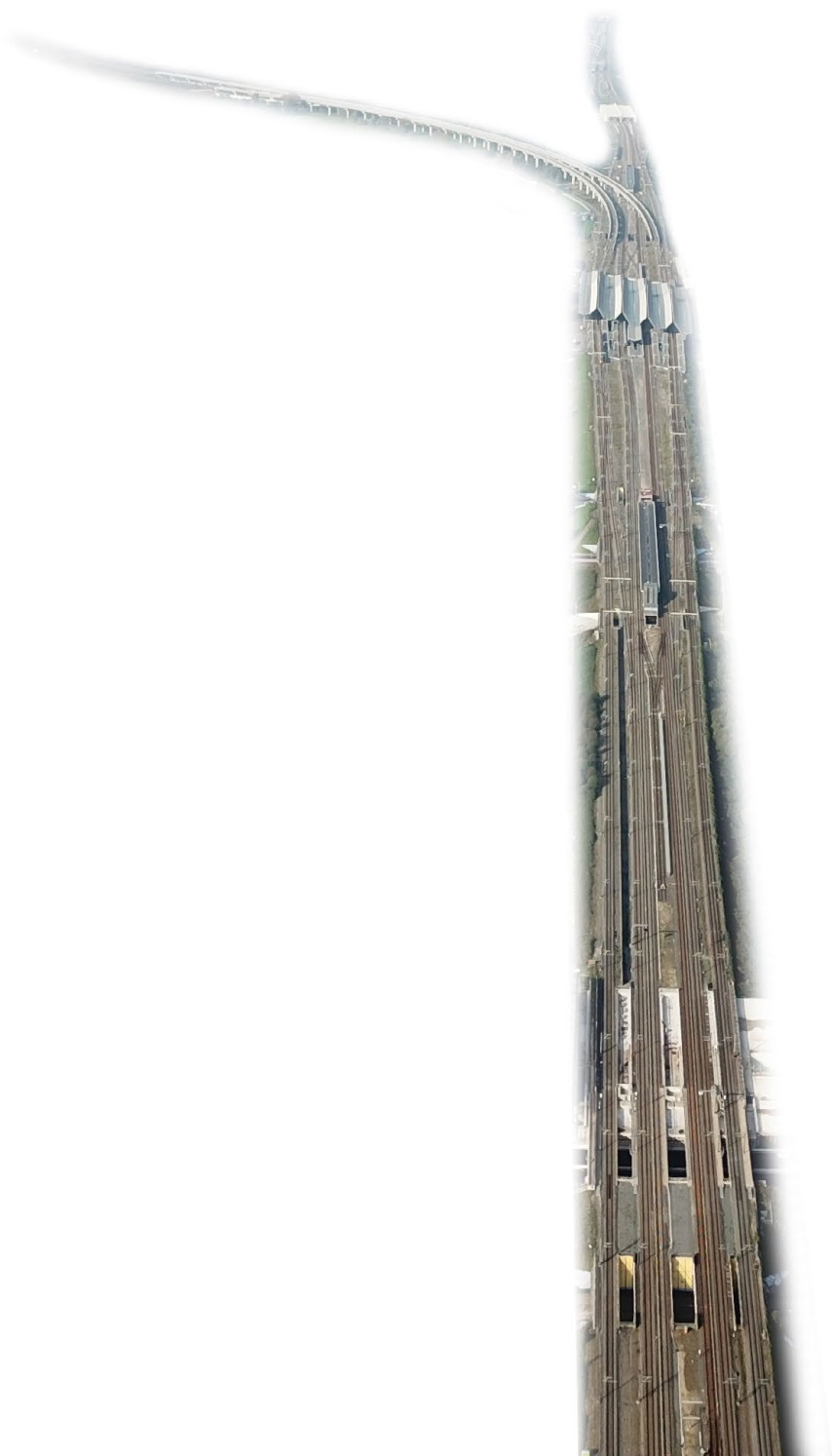
-Katz & Wagner (2014)

THE BORDER





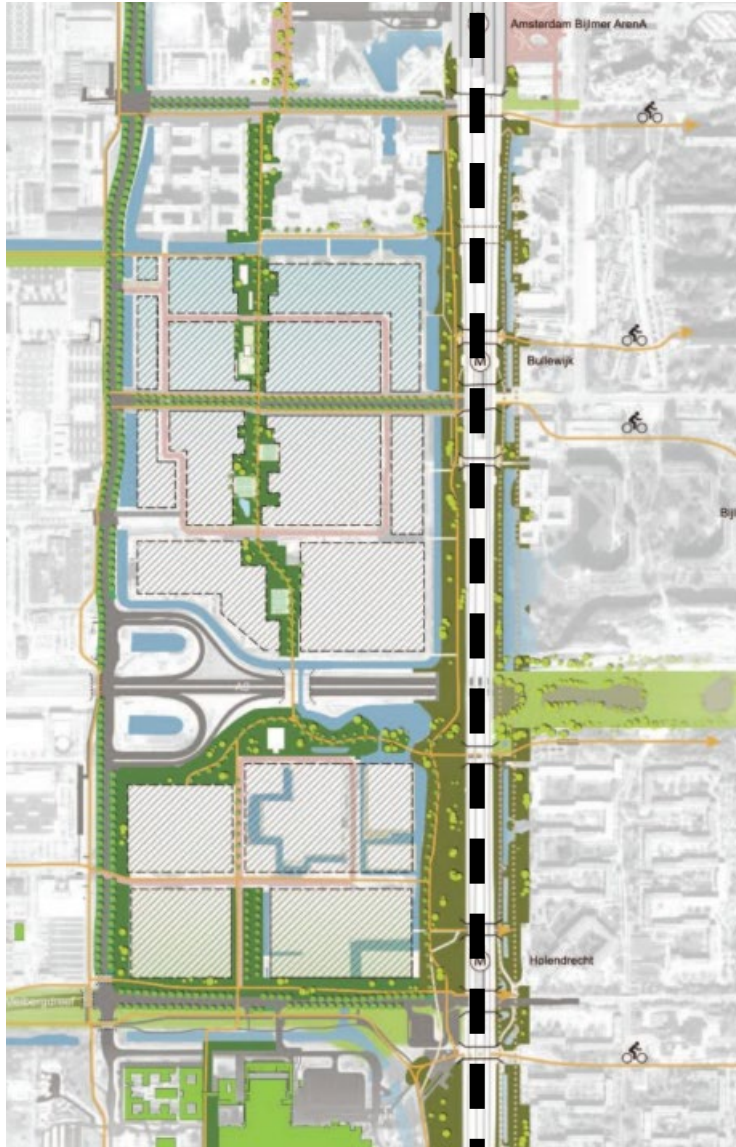
Image by Douwen Chen



Border

creates strong disconnection
between mono-functional areas

FUTURE PLANS



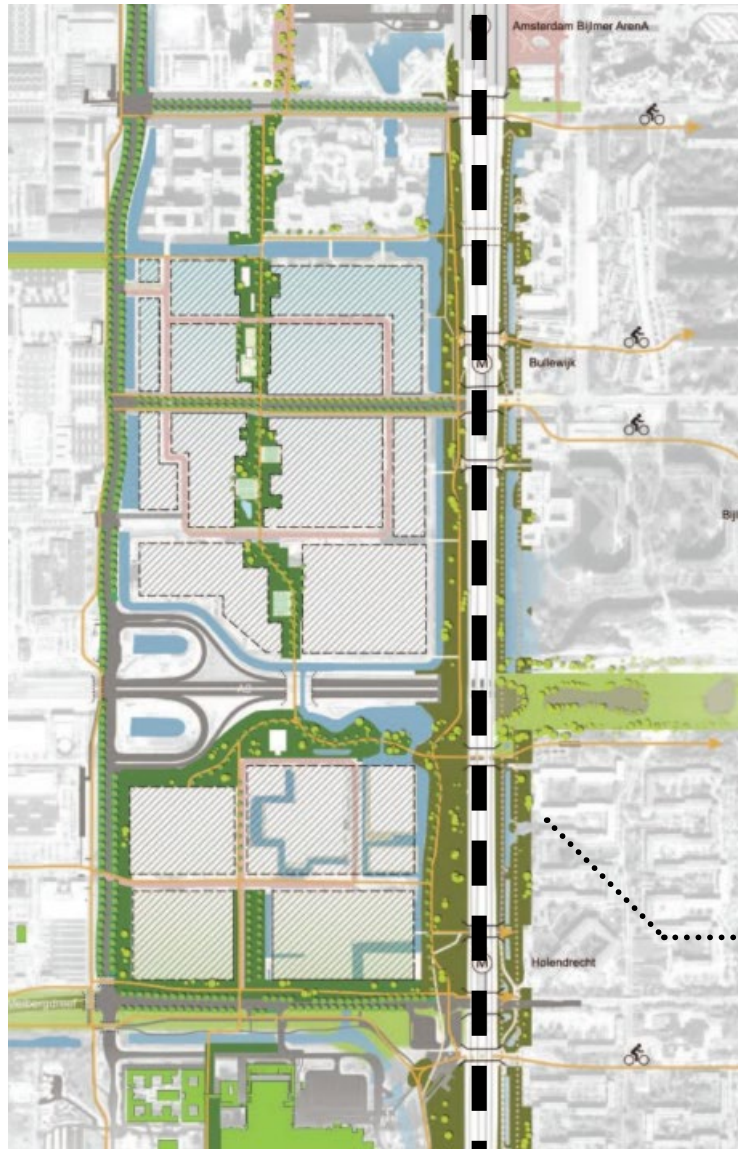
Connect

the future mixed-use areas of
Amstel III and Holendrecht

‘The Zuidoost district welcomes the development of Amstel III to a lively, connected city district. There will be more homes, facilities and recreational opportunities, and more opportunities to strengthen the local economy. Amstel III is therefore for several reasons important for the residents of Zuidoost ‘on the other side of the traintrack.’

- Muriël Dalgliesh, district manager (2017) (translated)

FUTURE PLANS



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the future mixed-use areas of
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SAME BORDER ?

ZUIDOOST CHALLENGES



Unemployment

High unemployment rate and a big low income group



Disconnection

strong disconnection between Holendrecht in Amstel III, train track forms a border



Waste

Lots of waste available from the companies of the Amstel III area

THE CIRCULAR ECONOMY



+



+



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2020

2030

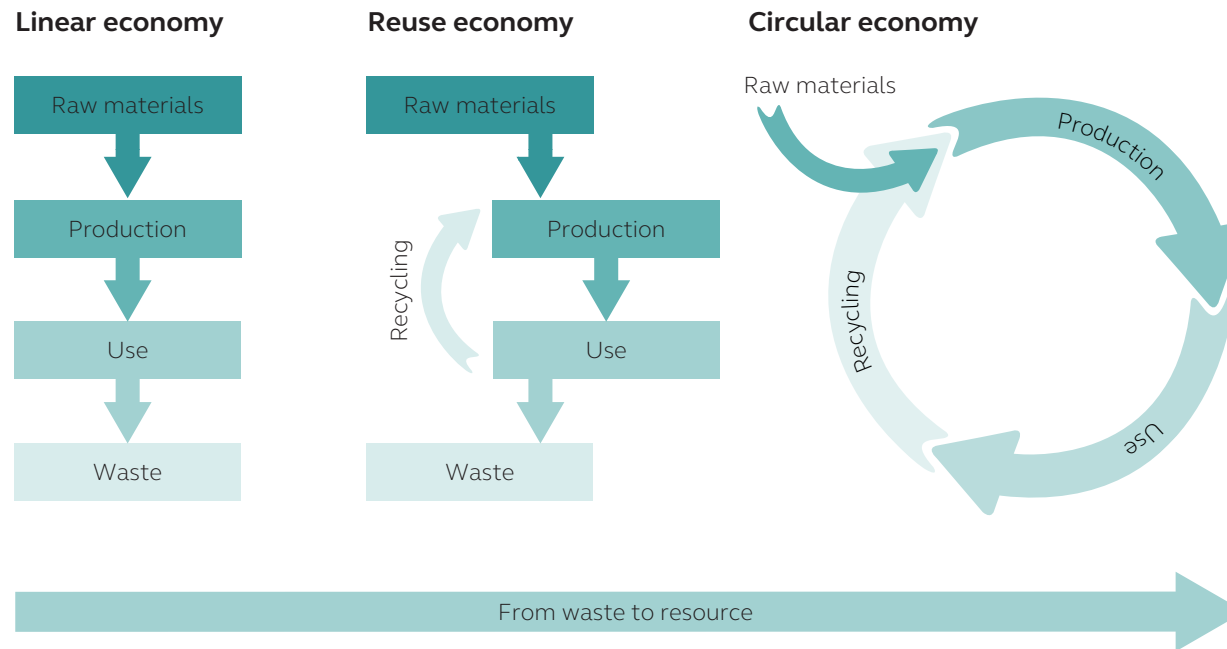
2040

2050

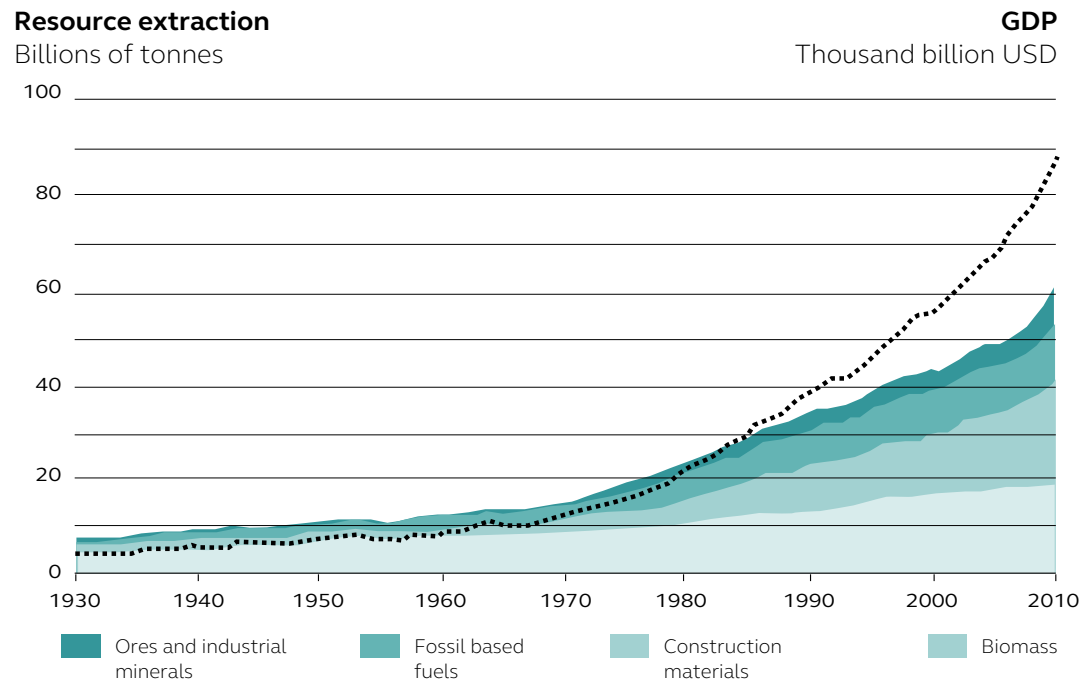
WHAT IS A CIRCULAR ECONOMY?

'A product is just a temporary use of a material or component.'

- Ruben van Doorn, CEO of Turn Too

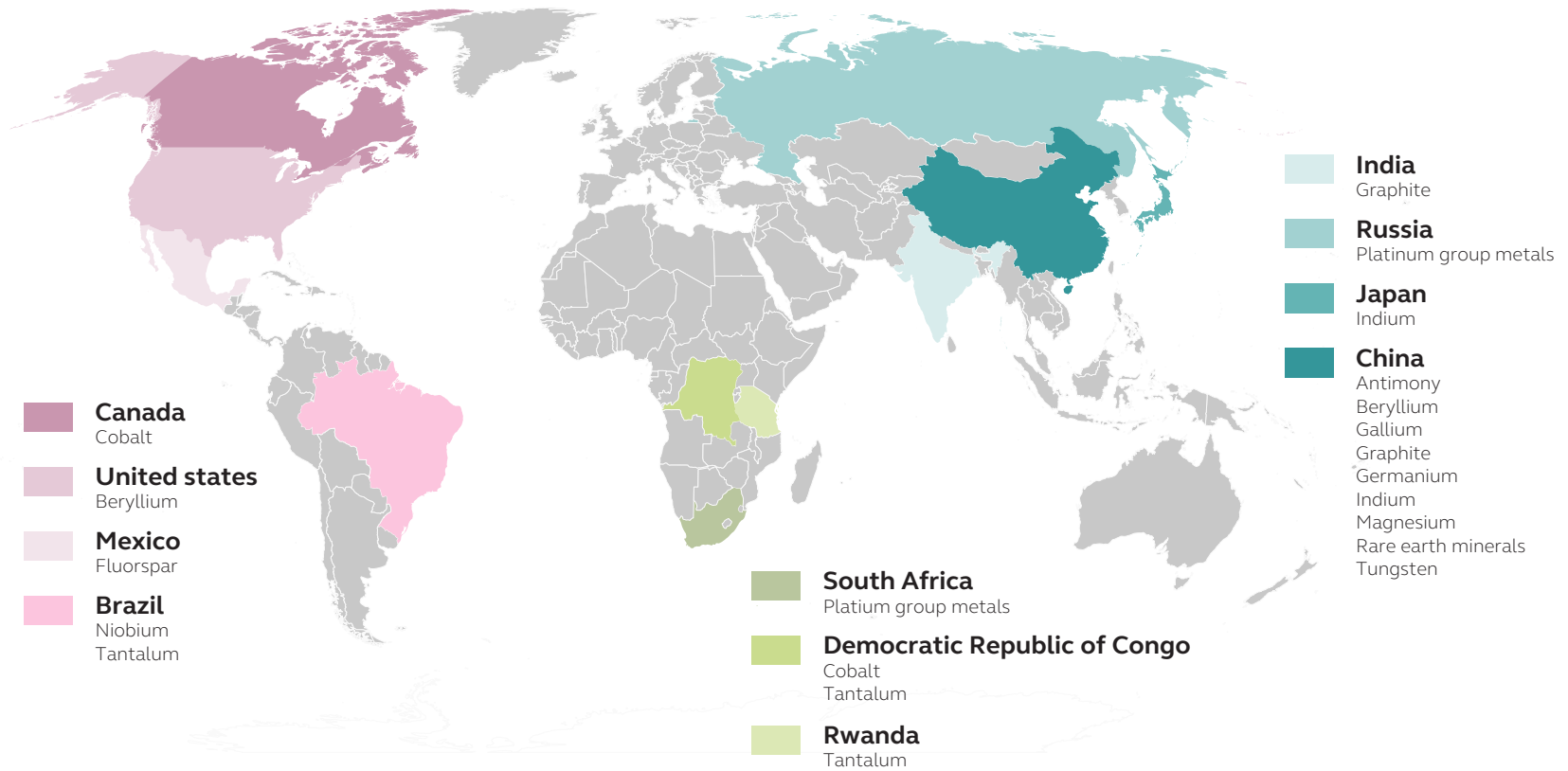


WORLDWIDE RESOURCE EXTRACTION



Source: Krausmann et al., 2009.

CONCENTRATION OF CRITICAL MATERIALS



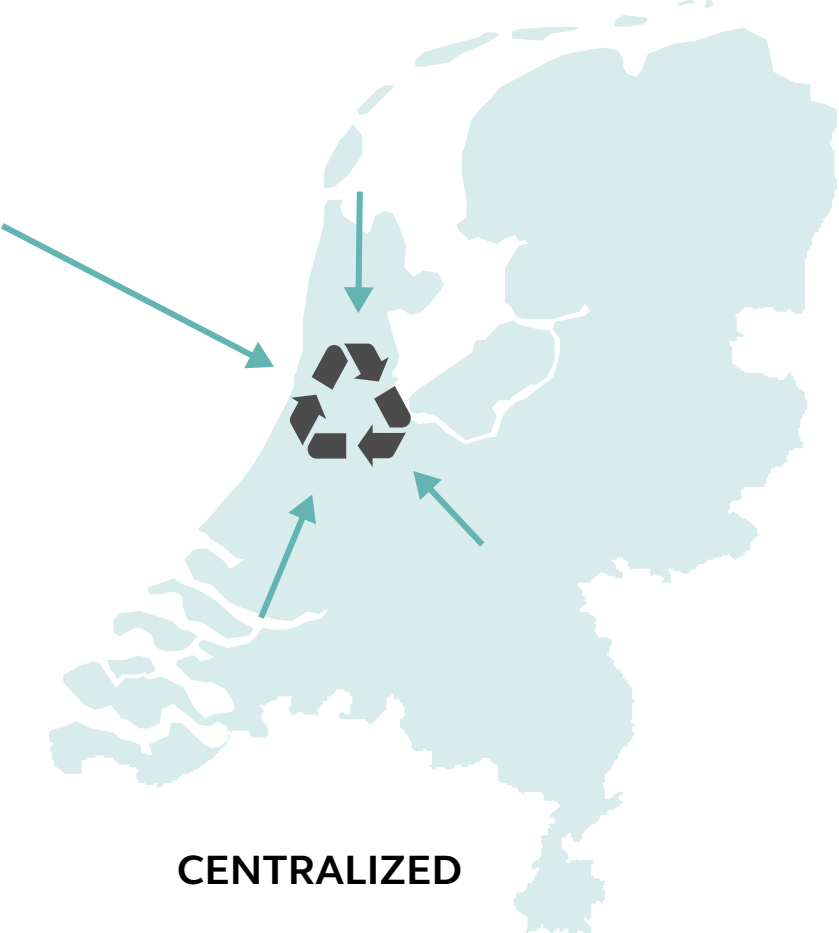
Source: European commission, 2010

ENVIRONMENTAL IMPACT



Source: Plasticchange. <http://plasticchange.org/>

CENTRALIZED RECYCLING PROCESS



CENTRALIZED



DECENTRALIZATION IN AMSTERDAM

Stimulation of decentralized waste and water management systems. This makes it possible to recover heat, energy and raw materials locally.

Amsterdam circulair



Source: Amsterdam circulair: Een visie en routekaar voor de stad en regio (2015), p. 65

FINANCING THE CIRCULAR ECONOMY



Investing

Banks and pension funds search for sustainable projects to invest in

‘In 2020, ABP, the biggest pension fund in the Netherlands, invests 23 billion Euros more in sustainable projects compared to 2015.’

- De Nederlandsche Bank N.V.

‘We need to build a new system – one that delivers sustainable investment flows, based on both resilient market-based, and robust bank-based, finance. We need finance for the long term.’

- Mark Carney, CEO Bank of England!

OPPORTUNITIES IN THE NETHERLANDS



7 billion

Euro can be generated
in a circular economy



54,000

new jobs will be created
in the Netherlands



9%

CO2 reduction with a
circular economy

RESEARCH CONCLUSIONS



High unemployment
and low income



Disconnection
mono-functional
zones



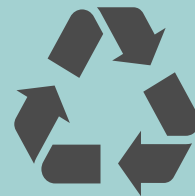
Lots of waste
available at
the Amstel III
companies



ZUIDOOST CIRCULAR ECONOMY



Long term investments
in large sustainable
projects

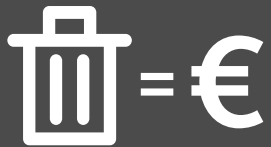


Decentralized recycling to reduce
use of raw materials

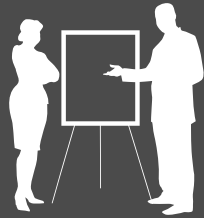


Value potential
in large amount
of waste

PROJECT AMBITIONS



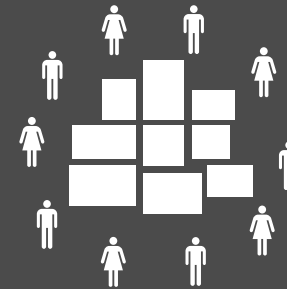
Waste as a resource in the circular economy to create local economic value



Opportunities in work and investment by inserting a circular economic model



Connecting the areas Amstel III and Holendrecht physically, socially and economically



Social inclusion and interaction by a mix-used program for all people



Climate goals contribution by creating a new sustainable typology

RESEARCH QUESTION

How can a circular sustainable economic model be implemented to connect Amstel III and Holendrecht socially, economically and physically in the future?

RESEARCH

Zuidoost

Circular economy

RESEARCH QUESTION

THE PRINCIPLE

Typology

Upcycling centre

THE PROGRAM

Functions

Users

DESIGN QUESTION

THE LOCATION

Future development

THE CONCEPT

Design

Spaces

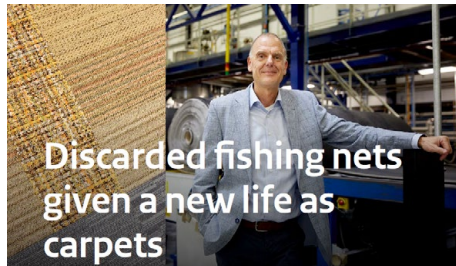
DETAILING

Construction

Climate

CONCLUSION

RECYCLING START-UPS EXAMPLES



Wasteboards

Making skateboards from plastic

Rotterzwam

Making mushrooms from coffee ground

Refil

Making 3D print ink from used plastics

Instock

Restaurant that uses waste of supermarkets

Black bear

Reuse of carbon black into ink, tires or other products.

Interface

Recycling fishnets into new carpets

Fruitleather

Transforming leftovers of fruit into leather like material

Spireaux

Making of spirulina, a proteins and vitamins rich food.

Community plastics

Transforming plastic from the community into new products

Reblend

New clothing from used textile parts.

BLUE CITY ROTTERDAM



ROTTERZWAM

“Companies can earn six times more money on coffee grounds than on the coffee itself, making the ‘waste’ more valuable than the product.”

- Gunter Pauli



Source: Rotterzwam. <https://www.rotterzwam.nl/page/rotterzwam-growkit>

SEOUL RECYCLING PLAZA

'The facility allows visitors to experience the entire process of recycling in a functional and exciting atmosphere that encourages participation.'



RETUNA | ESKILTUNA, SWEDEN



REGEN VILLAGES

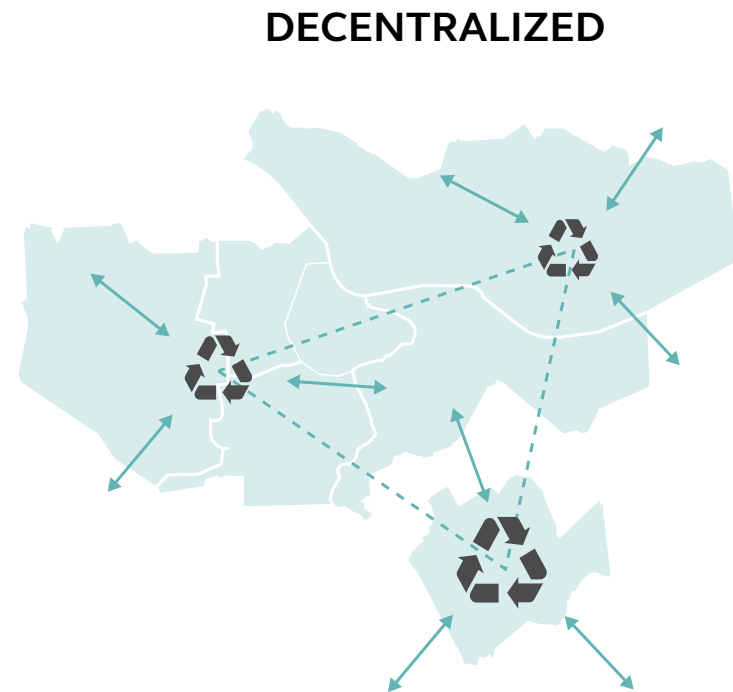
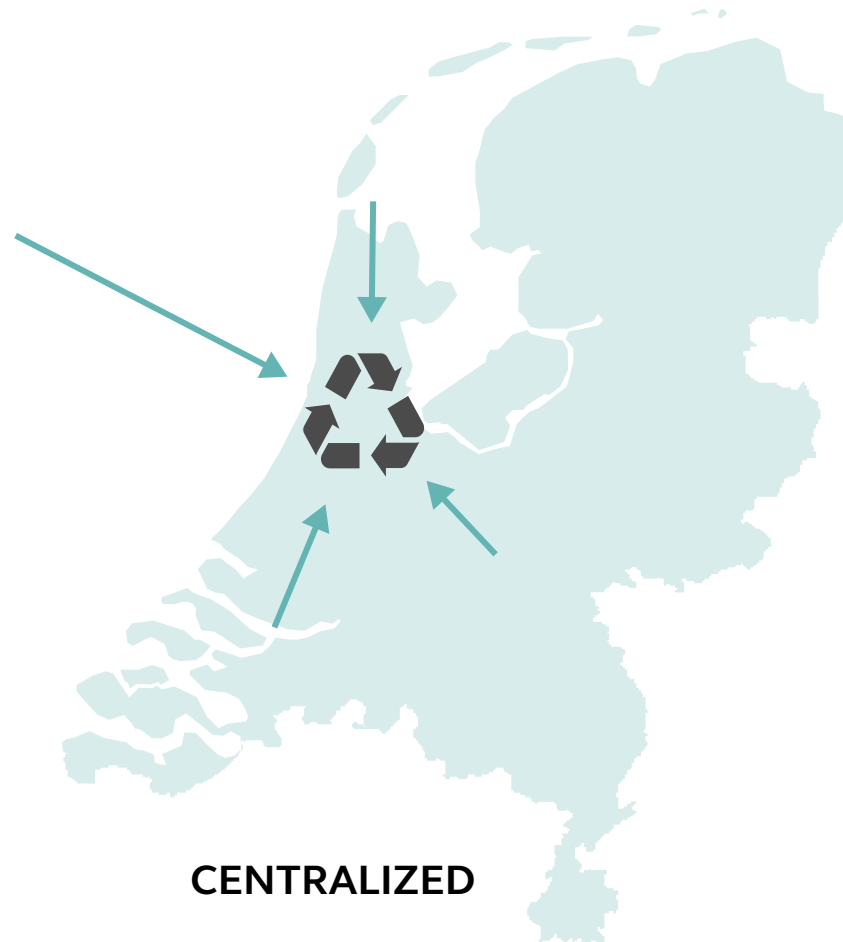


Source: <http://www.oeffekt.dk/work#/regenvillages>

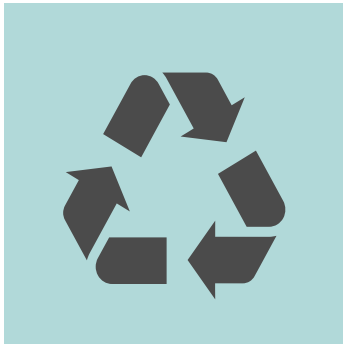
DECENTRALIZING RECYCLING

'To avoid depletion of material resources, violation of ecological values and loss of cultural diversity the trend towards globalization must be broken and replaced by new economic approaches (e.g. circular economy) tailored to local conditions.'

Wilderer, P. A., & Grambow, M. (2016).



WHY DECENTRALIZING?



Awareness

creation about recycling and waste, making it visible for the people



Transport

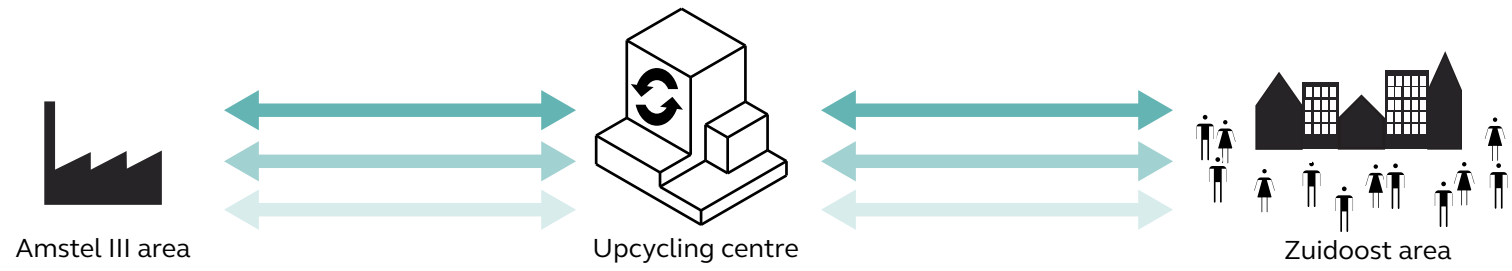
can be reduced, creating less CO2 emission



Local

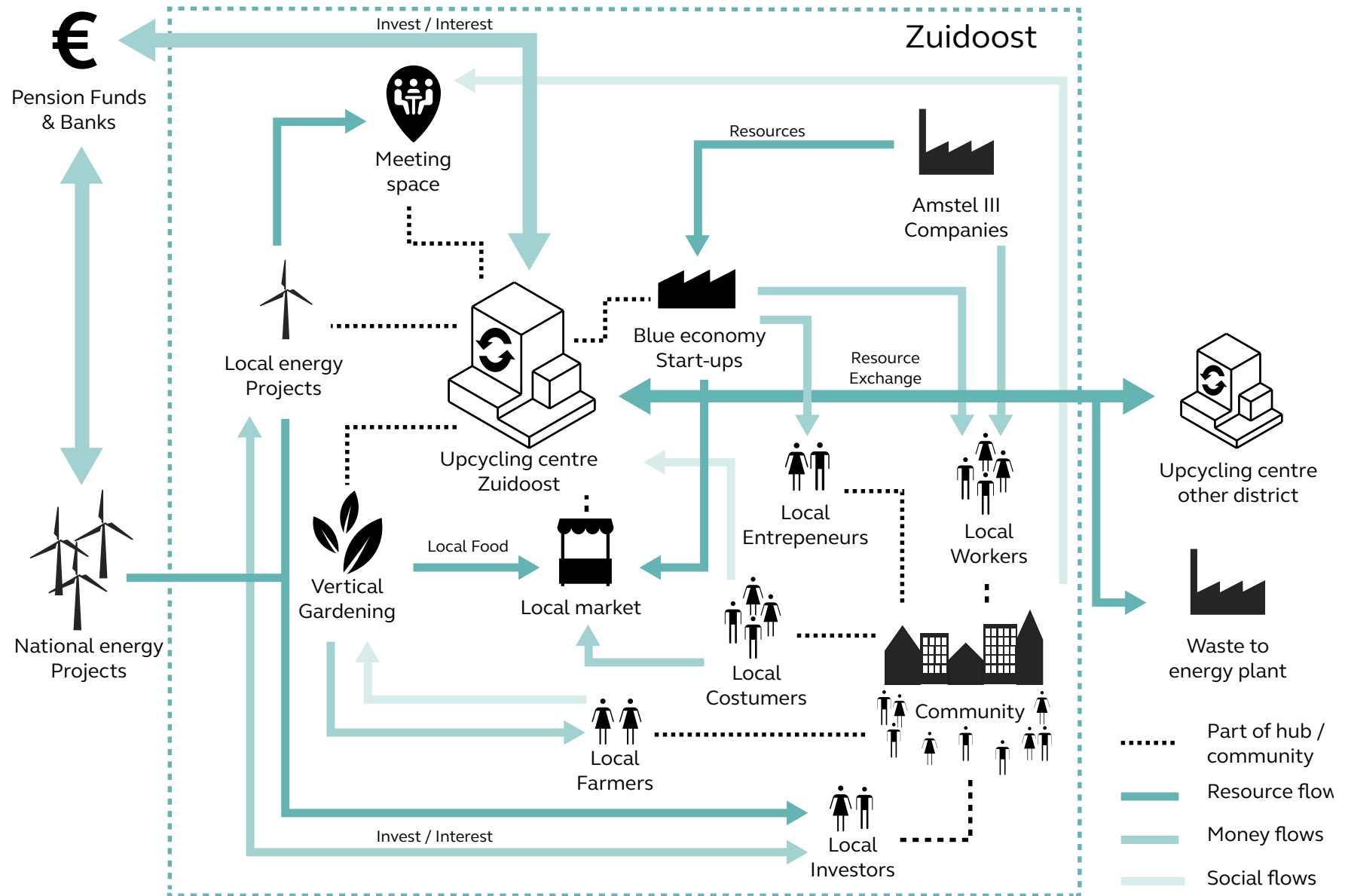
circular economy is stimulated by creating local jobs and local products

CONNECTING



- Physical connection
- Social connection
- Economical connection

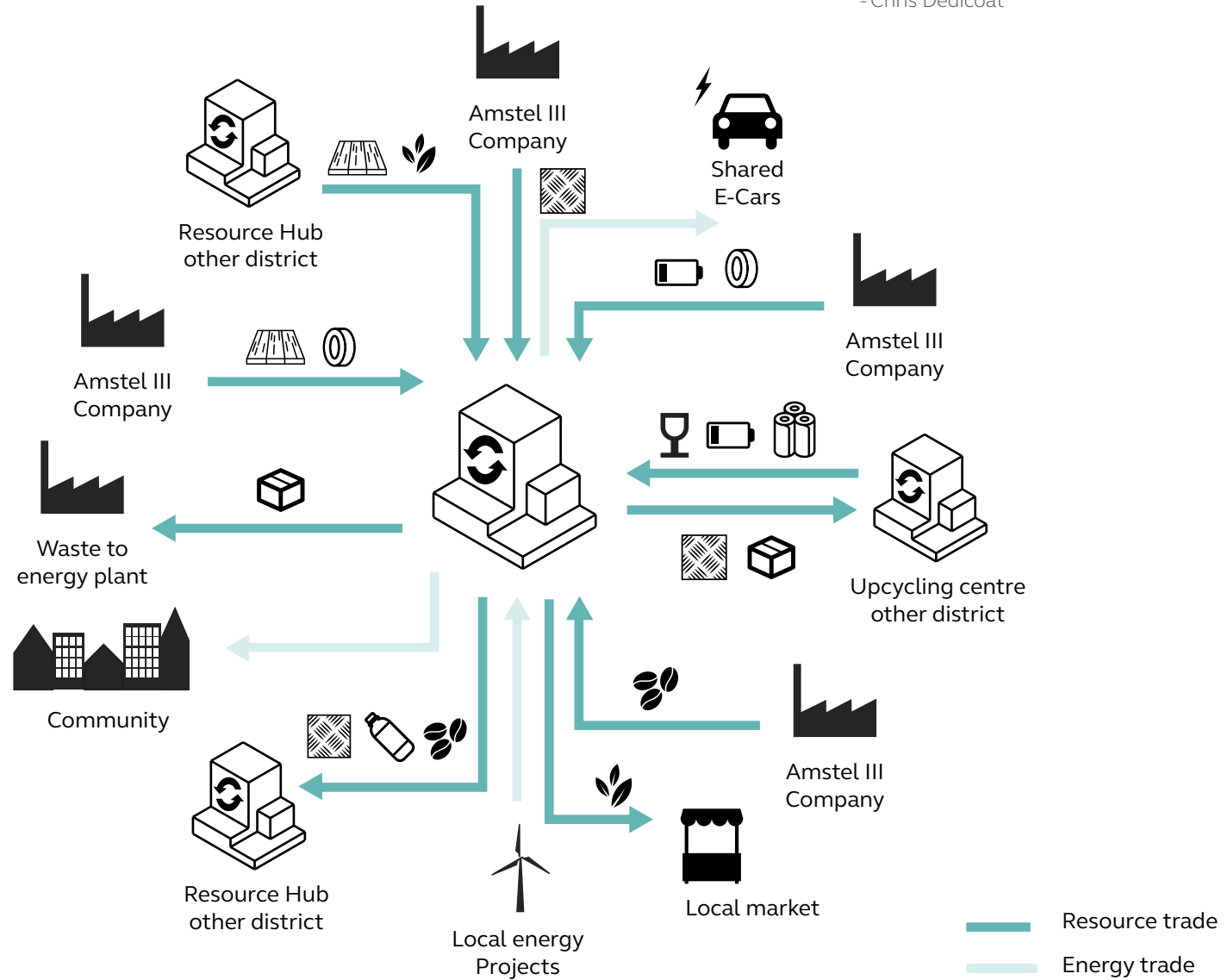
THE PRINCIPLES



RESOURCE EXCHANGE

'With the spread of the Internet of Things (IoT), there is incredible opportunity to enable circular innovation.'

- Chris Dediccoat




MARKETPLACE FOR RESOURCES

The screenshot displays the Oogstkaart website interface. At the top left, the logo 'OOGSTKAART' is shown in a stylized font, followed by the tagline 'marktplaats voor professionele upcyclers'. To the right, there are language options (EN, NL, DE), a 'Superuse' logo, and 'the UPSTYLE WOOD GUIDE.org' logo. Below the header, there are navigation tabs for 'Materialen' and 'Gebruikers', and a search bar with the text 'Bekijk:'. The main content area features a map of the Netherlands with numerous green location pins, each containing a white icon representing a resource type. A sidebar on the left contains a search bar and a 'Materiaal soort' section with icons for Hout, Kunststof, Textiel, Metaal, Glas, Elektronisch, Steenachtig, Chemisch, Organisch, and Papier & Karton. Below this are filters for 'Locatie' and 'Radius (km)', and a 'Categorie' section with fields for 'Publicatiedatum', 'Beschikbaarheidsdatum', and 'Beschikbaarheid'. On the right side, a detailed view of a resource is shown, including a photo of a white door and the text: 'Uithoorn', '6500 deuren en steigerhout', '19-03-2014', 'Aantal: 1000 (stuk)', and 'Winkel in gebruikte bouwmaterialen heeft continu 6500 gebruikte houten deuren op voorraad en biedt o'. The name 'Oogst' is visible at the bottom of this view.

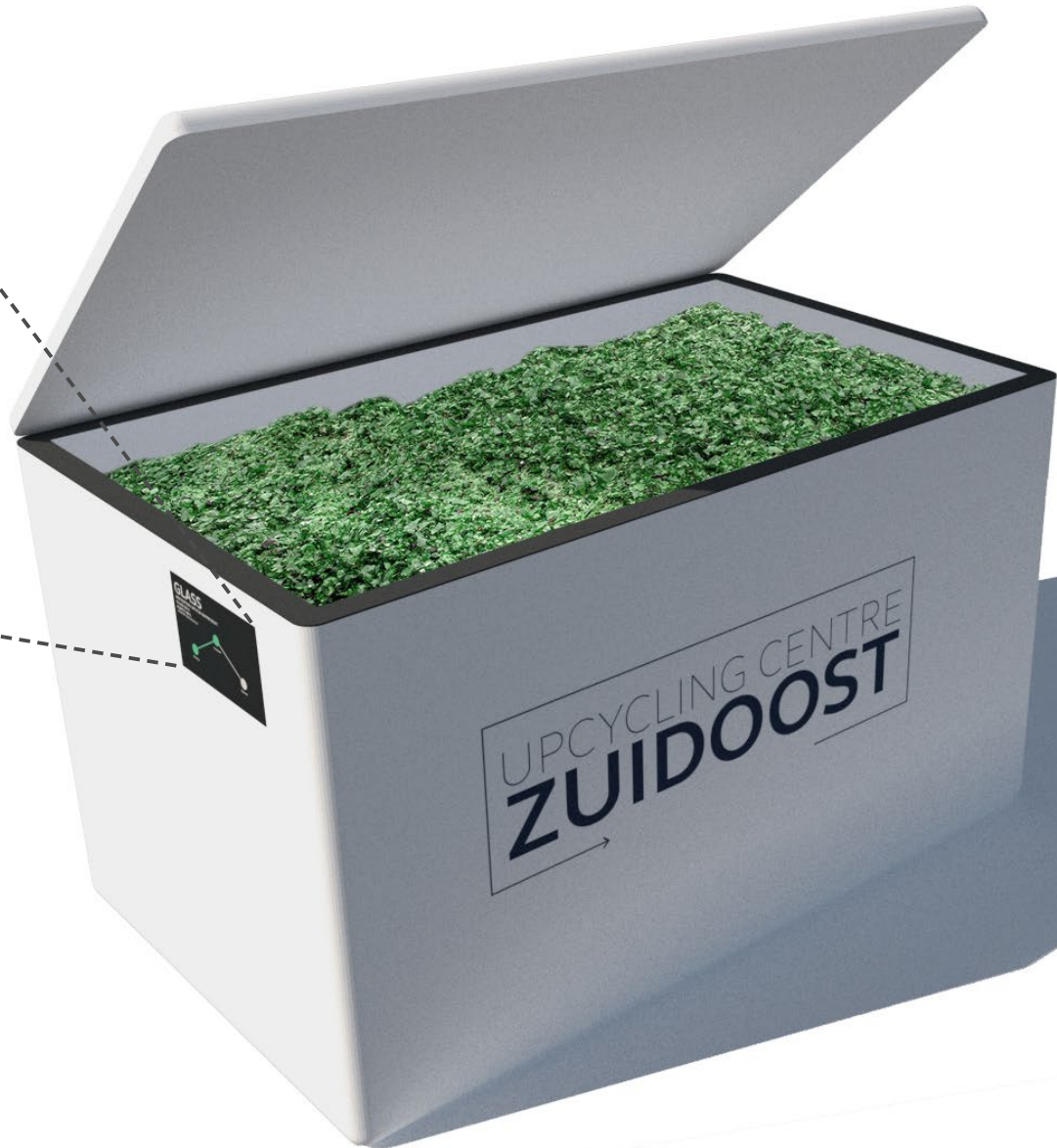
STANDARDIZED MATERIAL TRANSPORT UNIT

GLASS
DESTINATION: UPCYCLE CENTRE UTRECHT
FILLED: 85 %
PURITY: 99 %
TRANSPORT: TRAIN 2EF3G 03:23

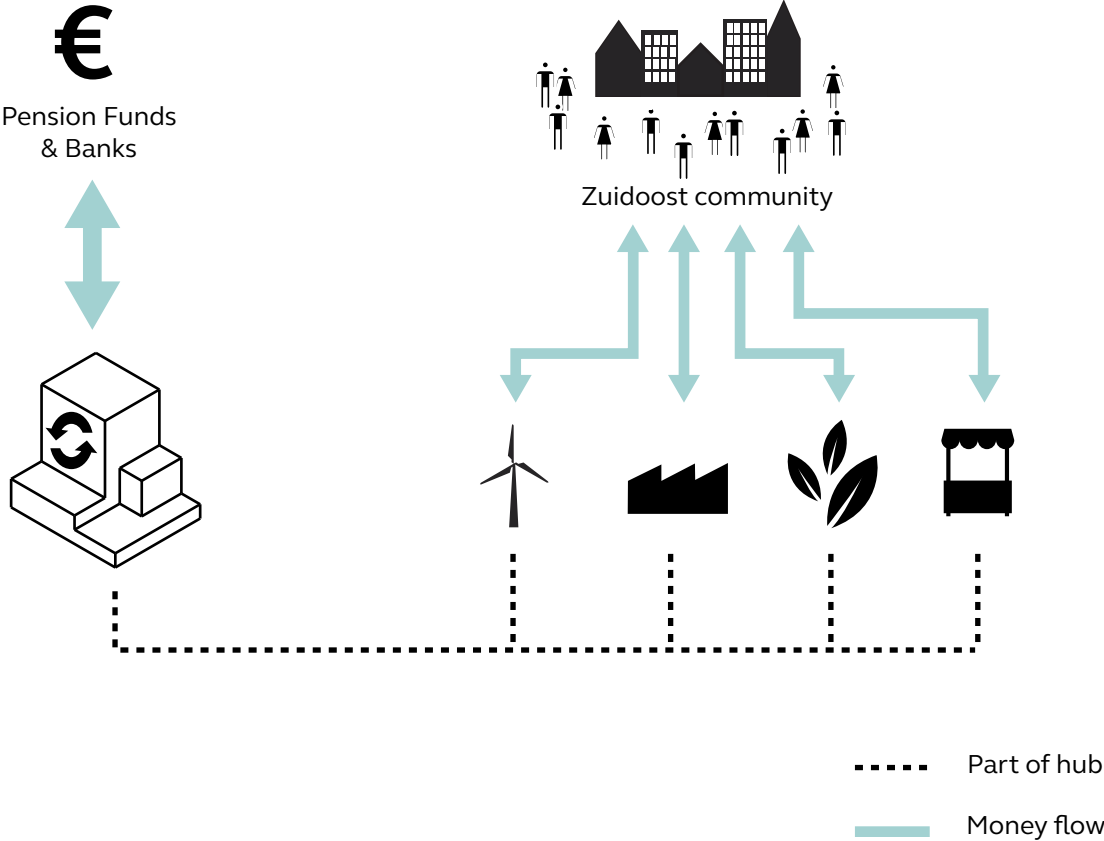


```
graph TD; A((Picked up)) --> B((Processed)); B --> C((Delivered));
```

Picked up Processed Delivered



INVESTING



UPCYCLING CENTRE
PROGRAM

PROGRAM REQUIREMENTS



Recycling

Program necessary for recycling and transport of waste and product making



Inclusion

Mixed program for inclusion of social entrepreneurs, learners and low educated workers



Interaction

Approachable meeting space for users and visitors to get to know the building and each other

PROGRAM REFERENCES

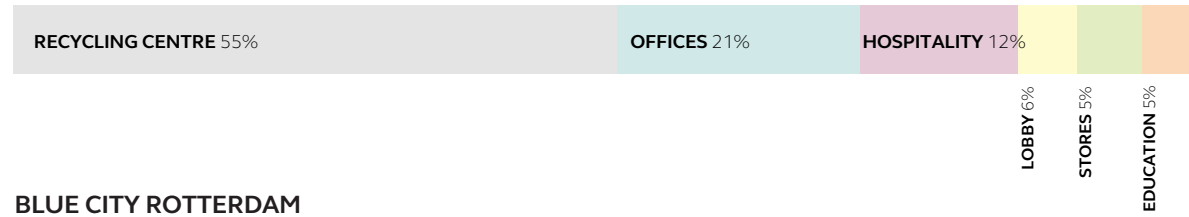
ETOBICOKE CIVIC CENTRE

HENNING LARSEN ARCHITECTS 60,000 m²



SEOUL RECYCLE PLAZA

SAMOO ARCHITECTS & ENGINEERS 16,500 m²



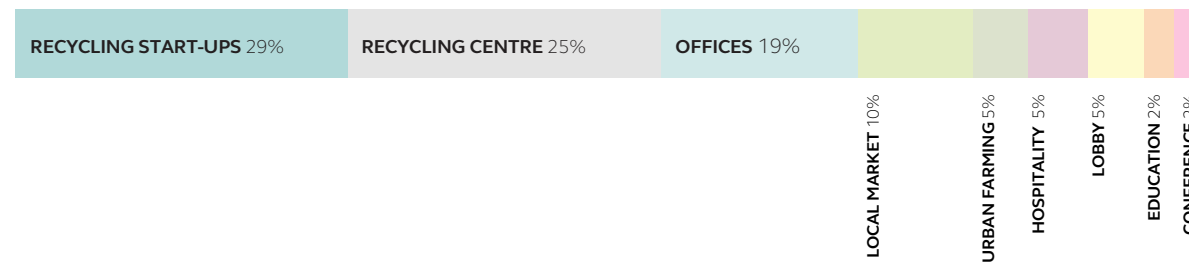
BLUE CITY ROTTERDAM

SUPERUSE STUDIO 11,800 m²

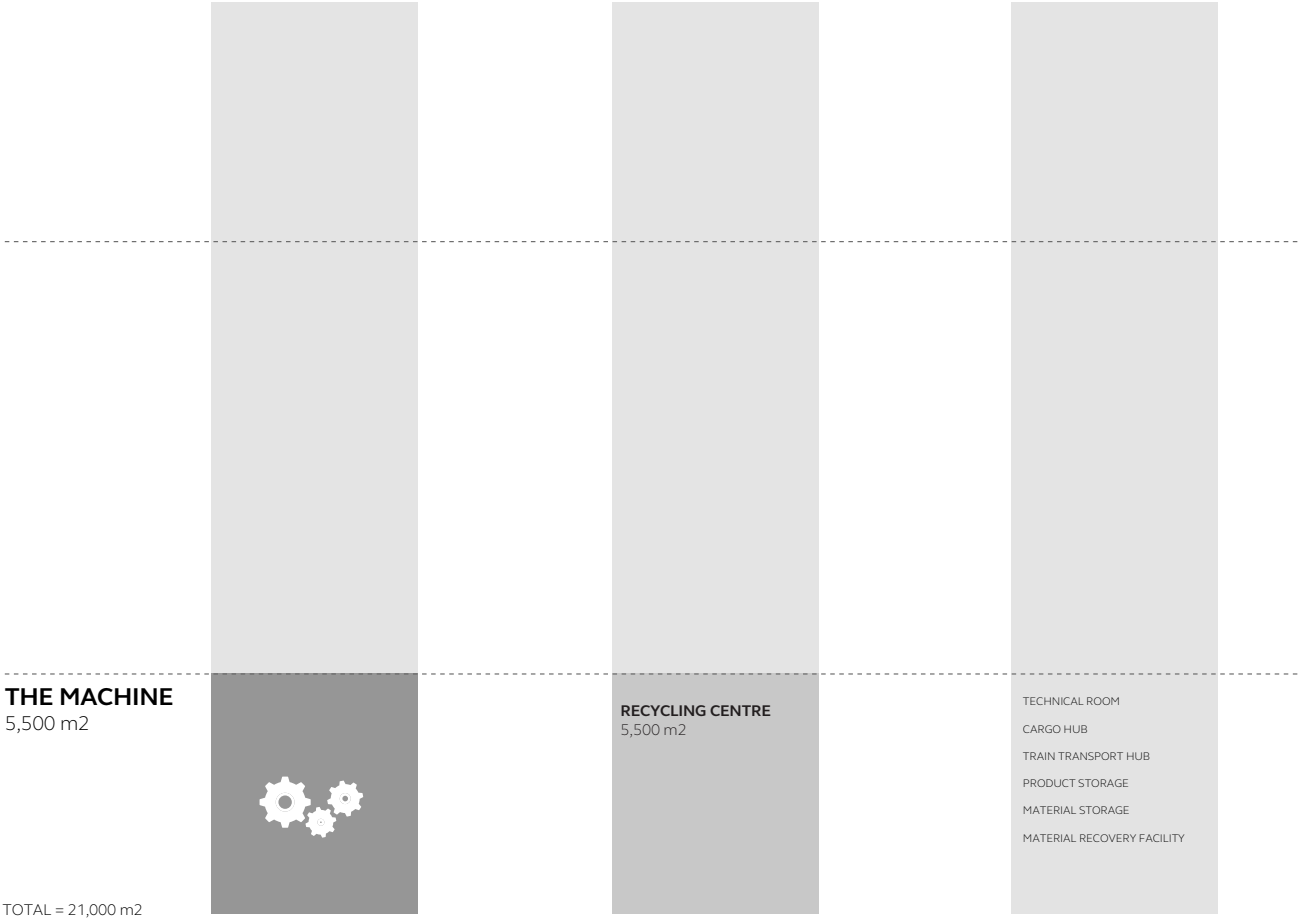


UPCYCLING CENTRE ZUIDOOST

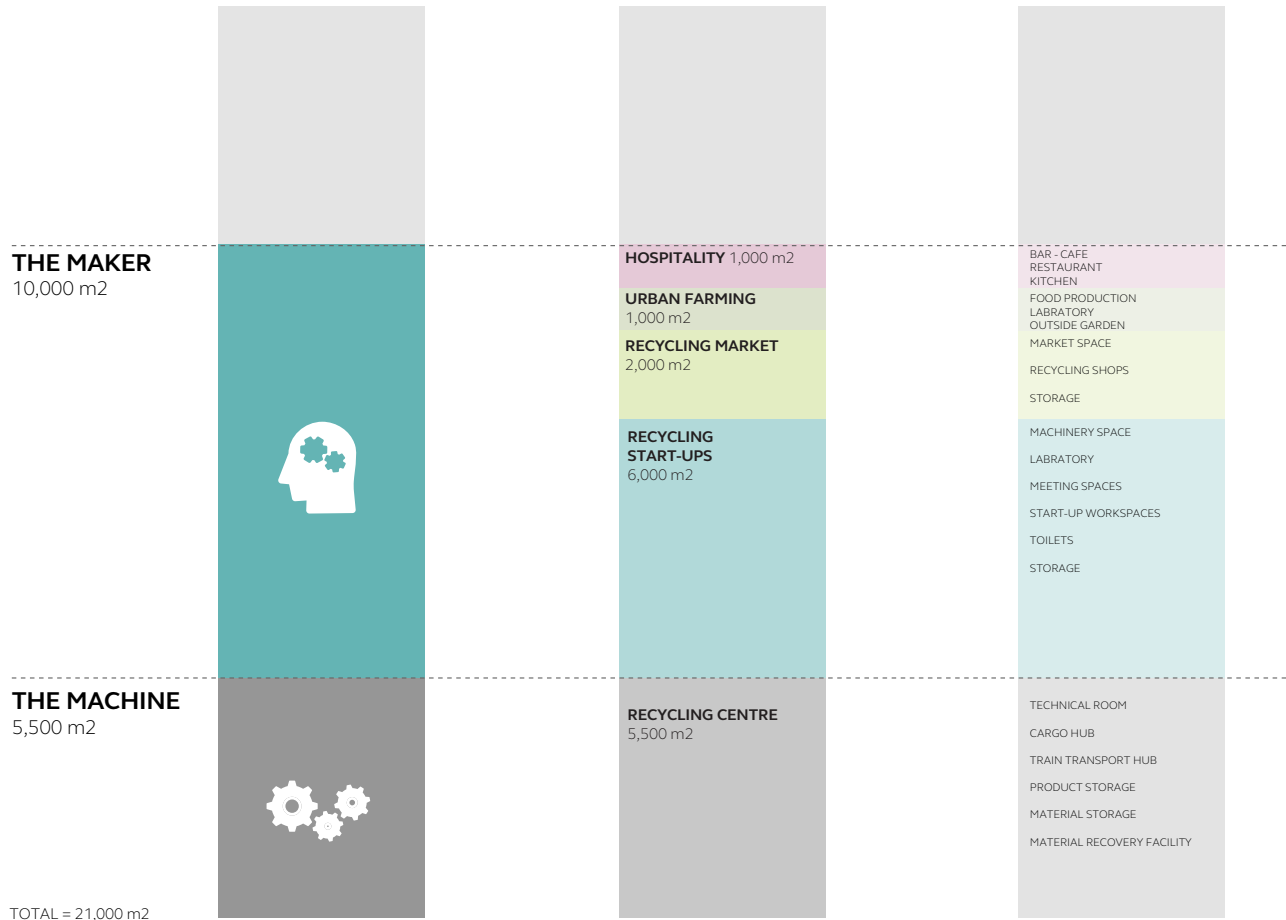
21,000 m²



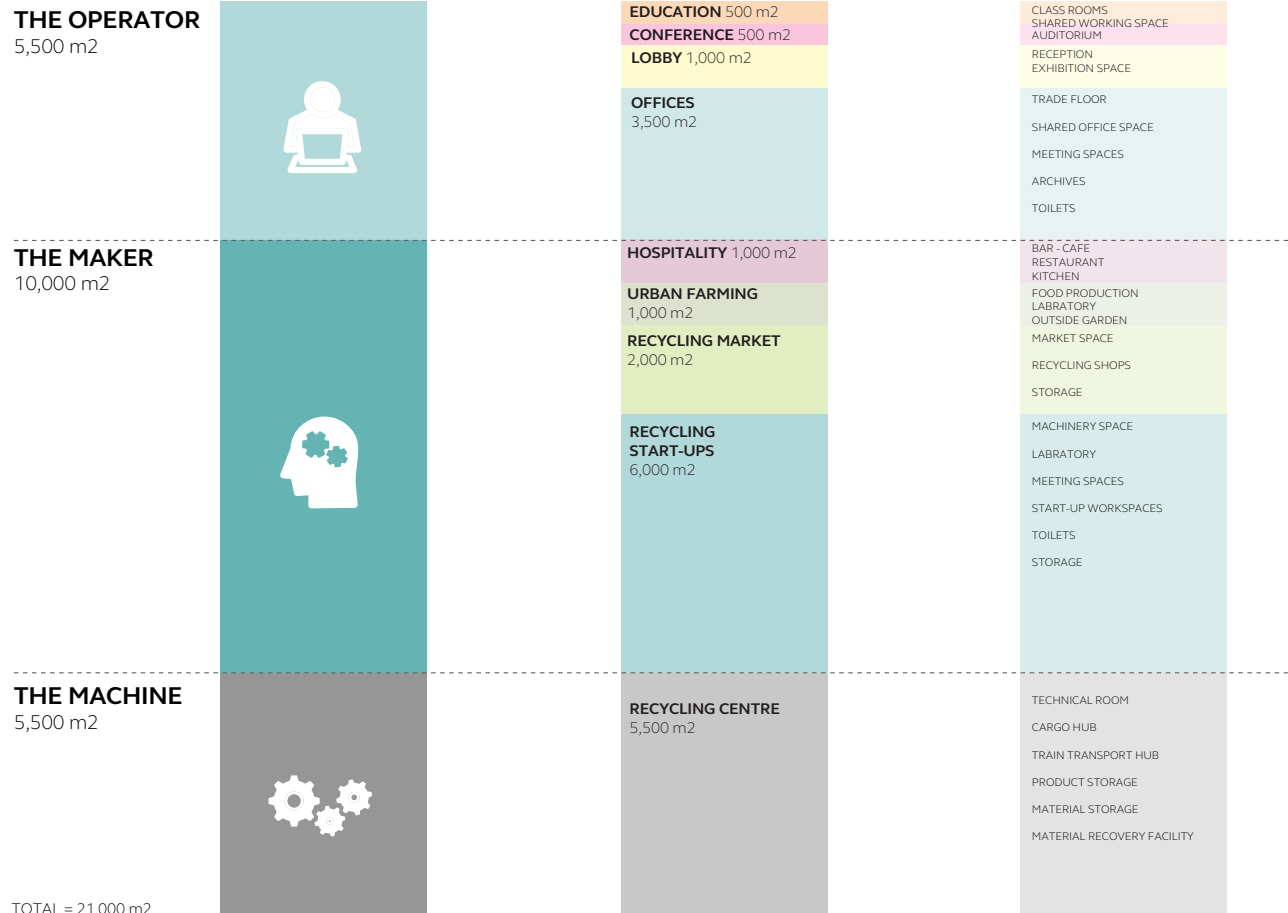
PROGRAM MACHINE



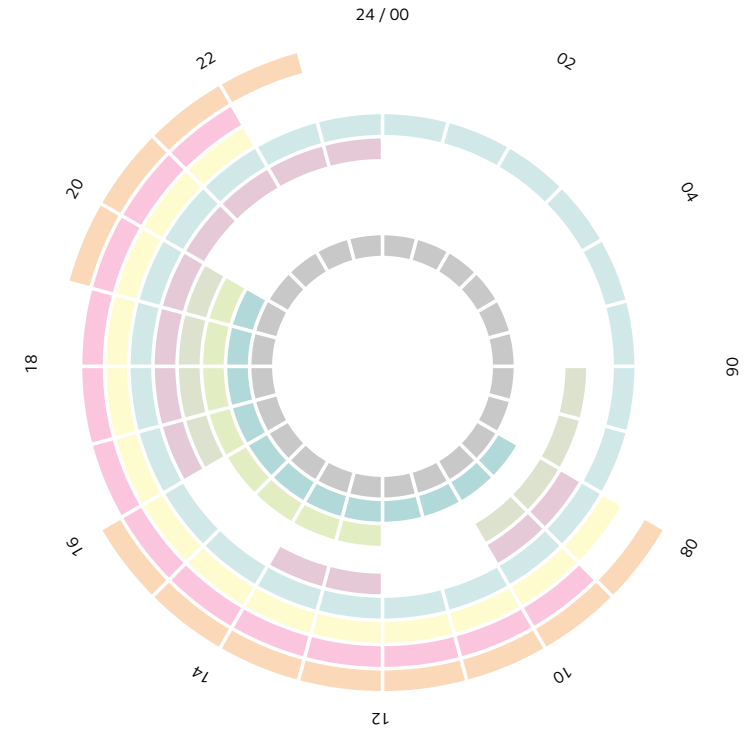
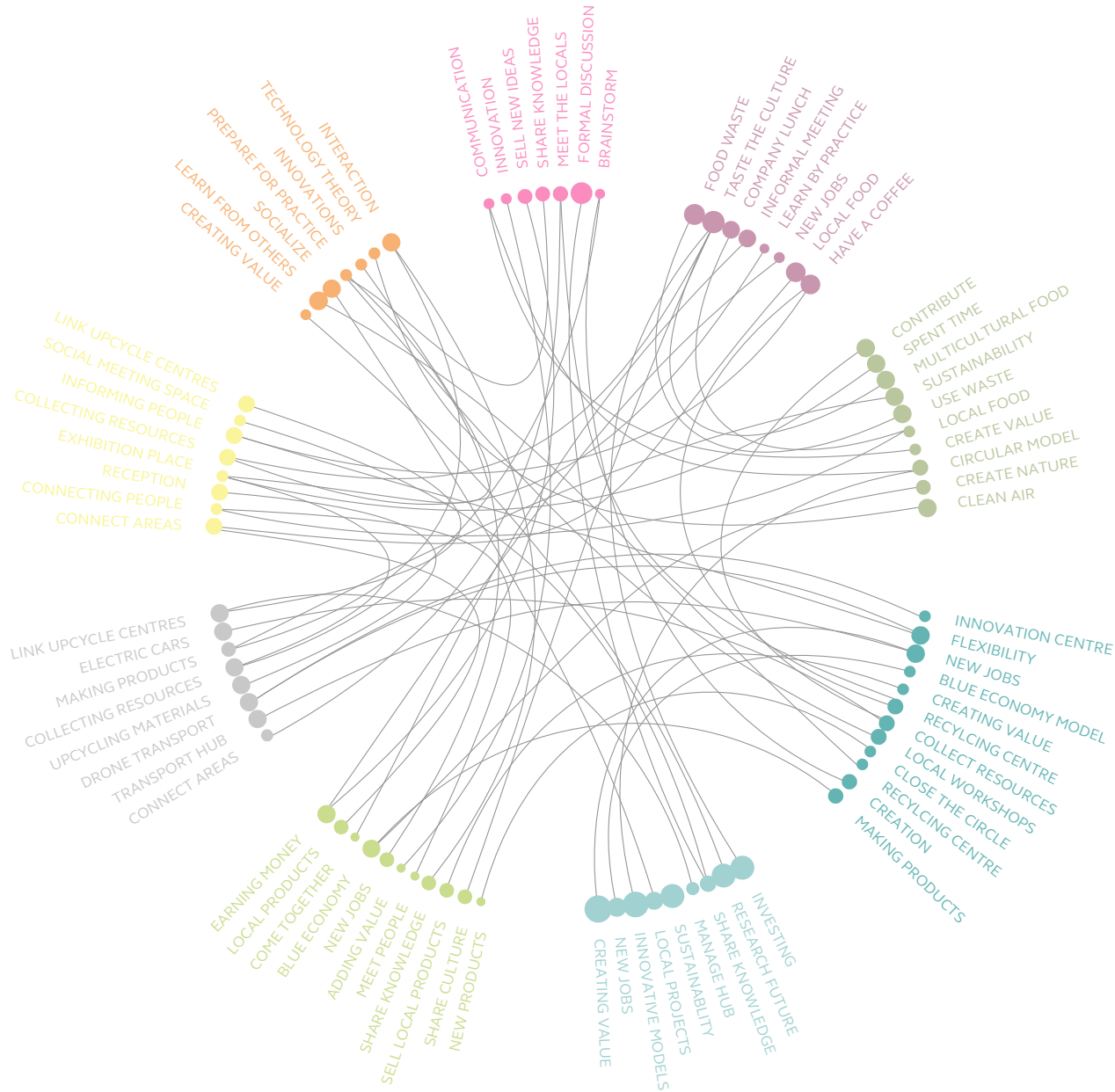
PROGRAM MAKER



PROGRAM OPERATOR



SYNERGY & ACTIVITY



Conference	Local market
Hospitality	Machine
Urban farming	Lobby
Businesses	Education
Offices	

UPCYCLING PEOPLE



**THE MARKET
MAN**



**THE SOCIAL
ENTREPRENEUR**



**THE CREATIVE
STUDENT**



**THE PRODUCT
CREATOR**

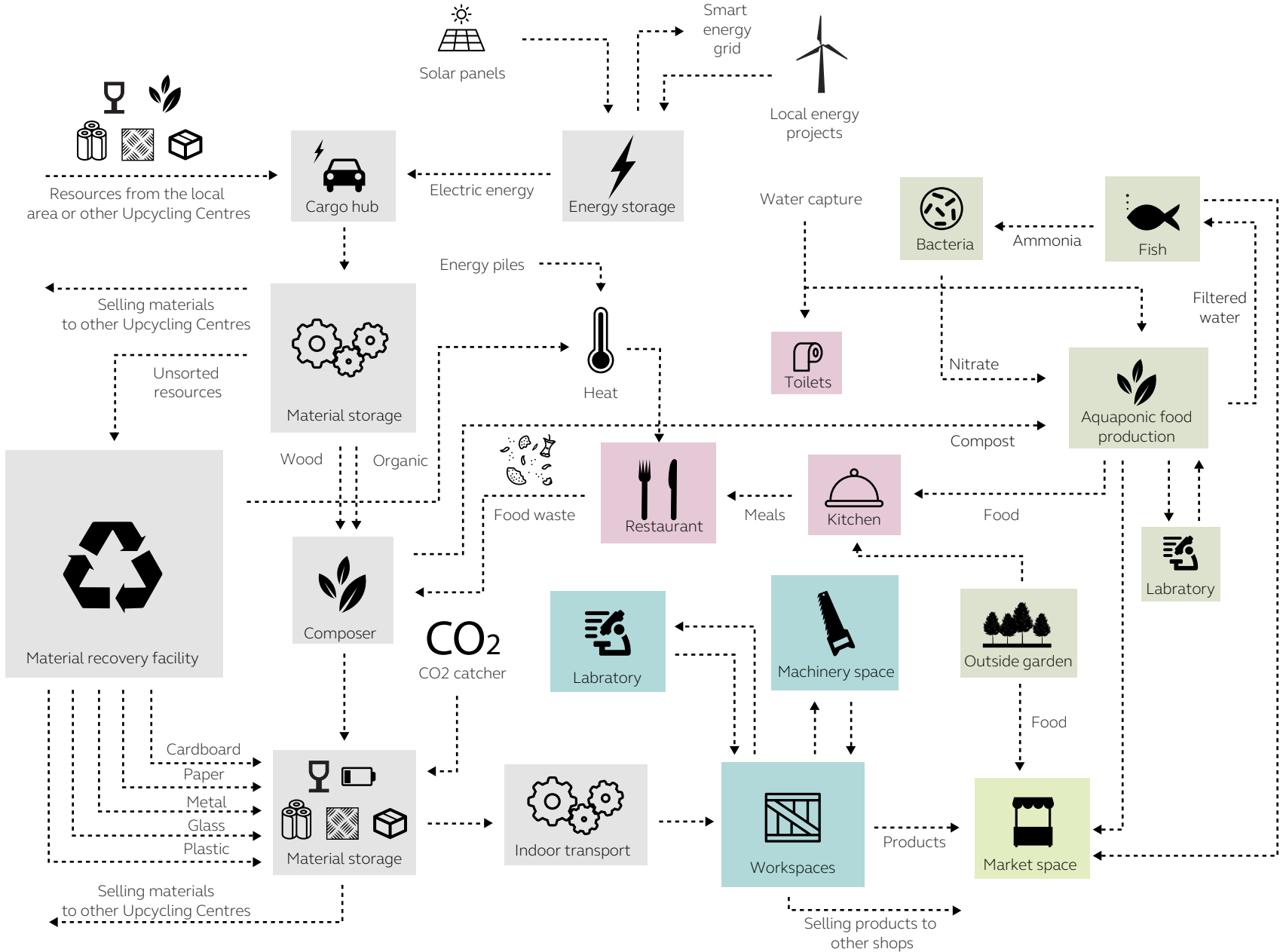


THE INVESTOR

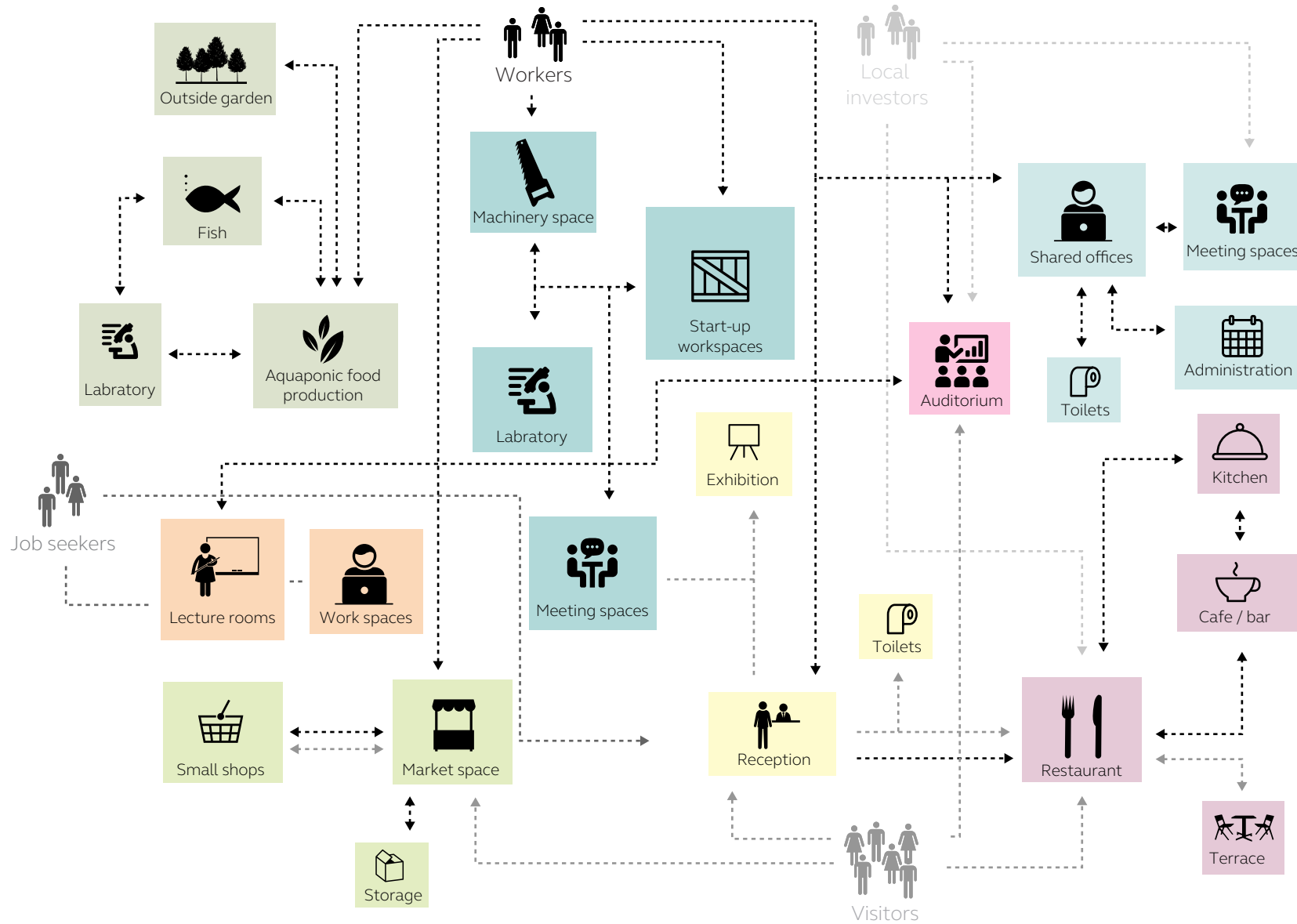


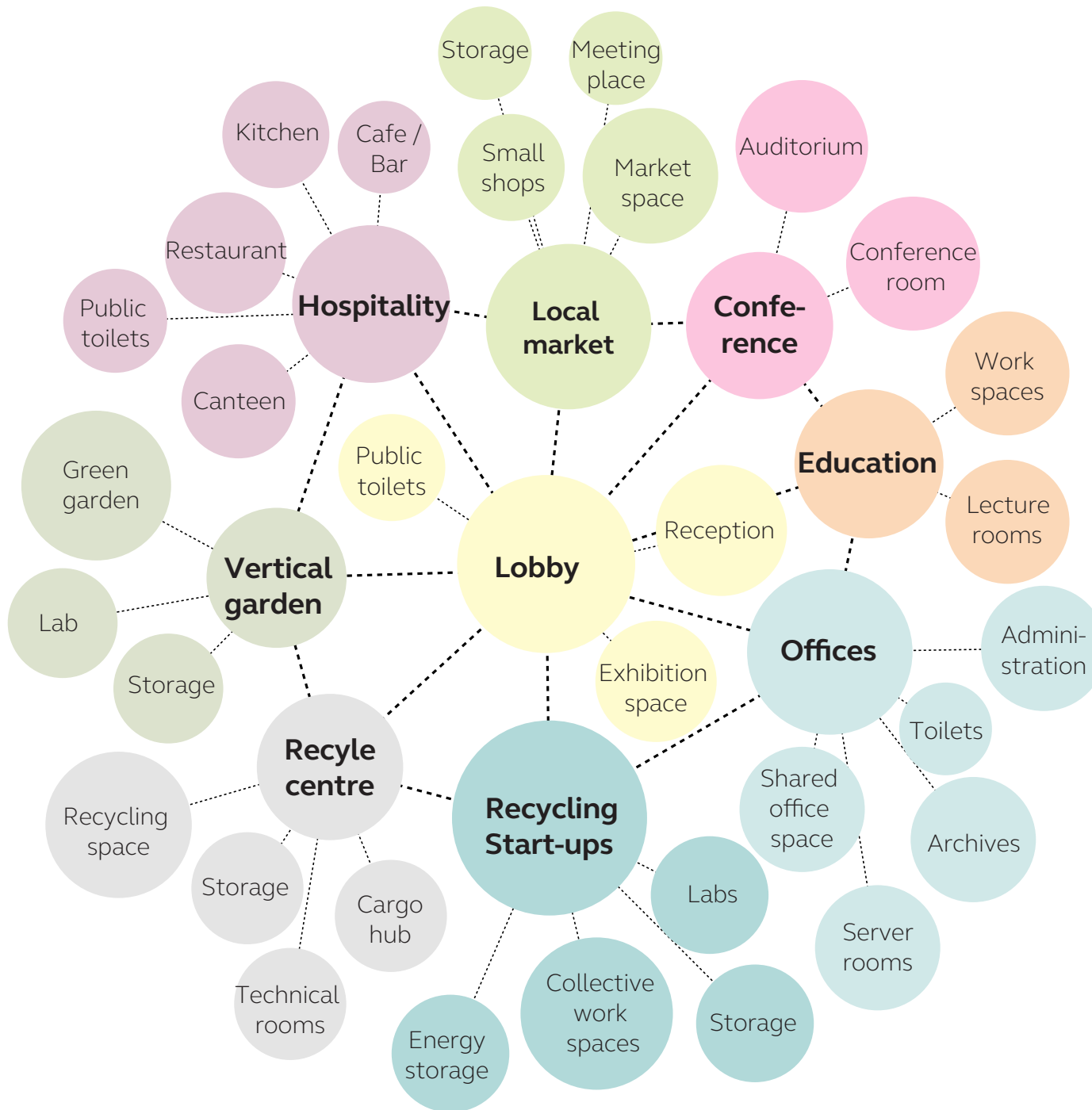
THE VISITOR

RESOURCE FLOWS



PEOPLE FLOWS





RESEARCH

Zuidoost

Circular economy

RESEARCH QUESTION

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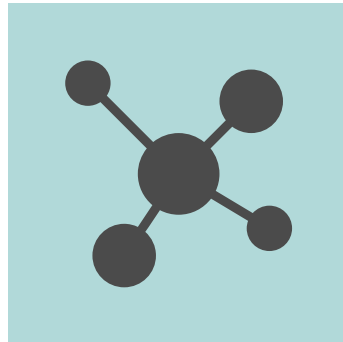
DETAILING

Construction

Climate

CONCLUSION

SITE REQUIREMENTS



Network

Embedded in local and regional infrastructure to transport resources



Connect

The areas of Amstel III with Holendrecht in a physical way

POTENTIAL LOCATION

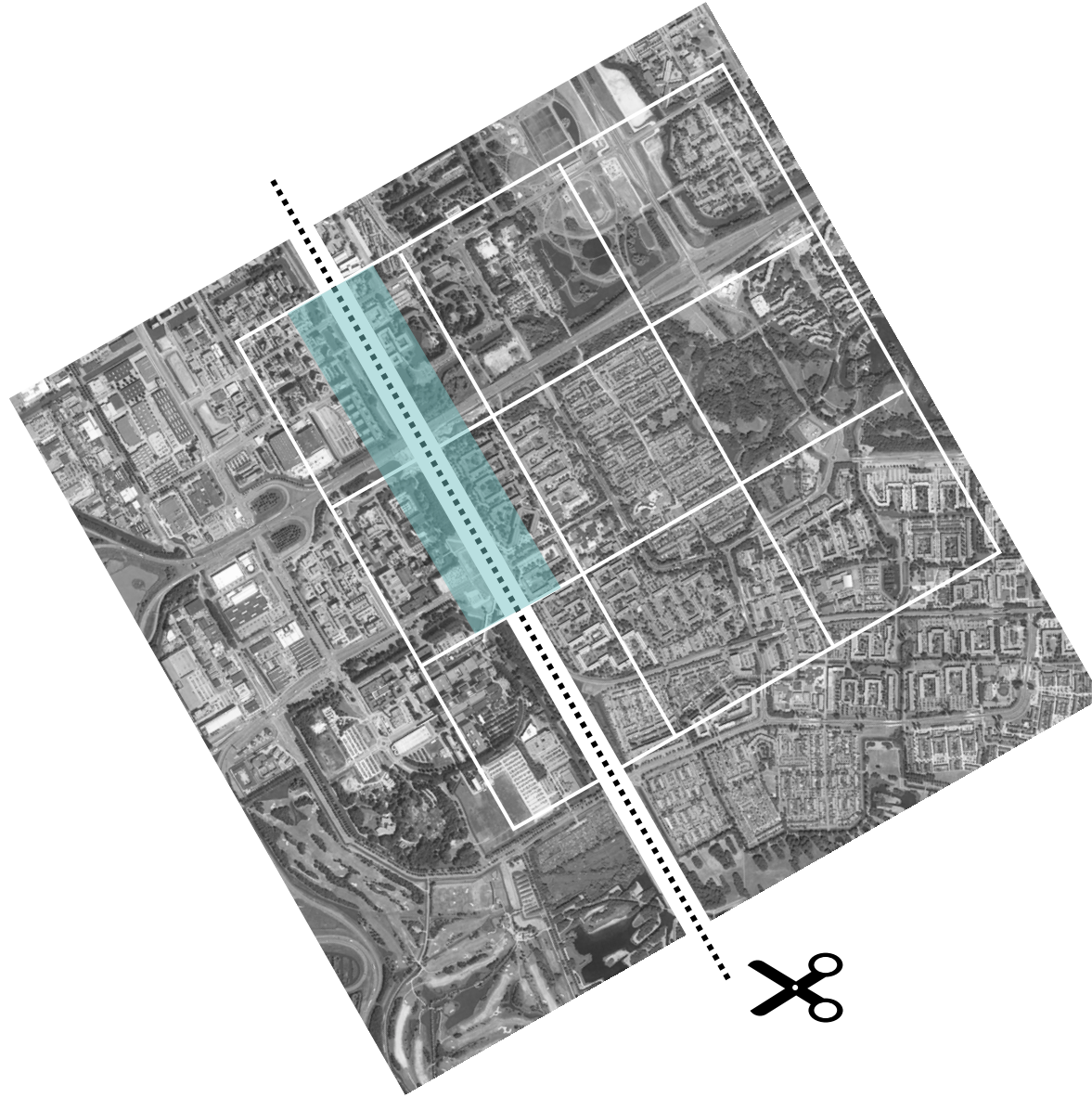
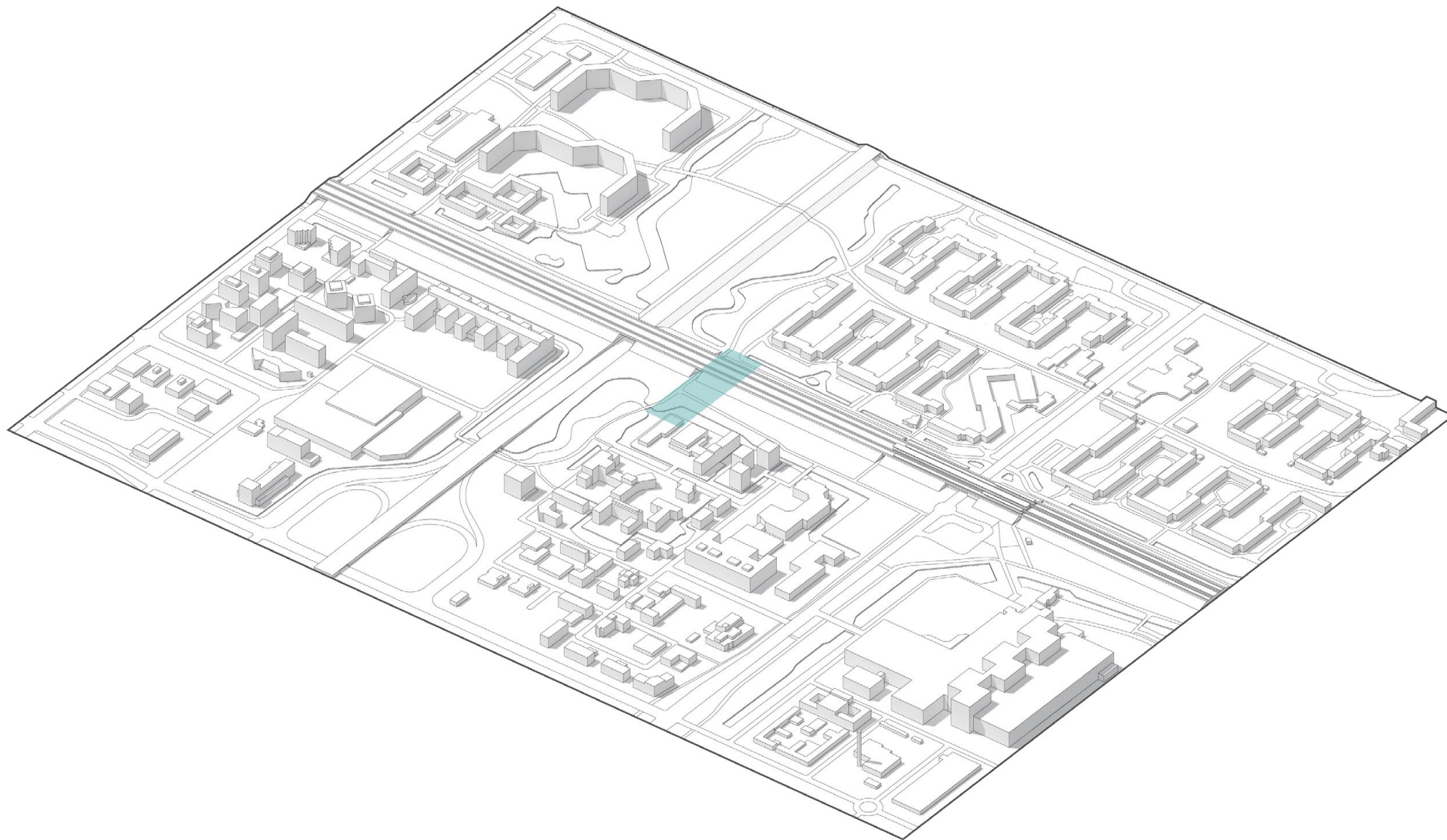


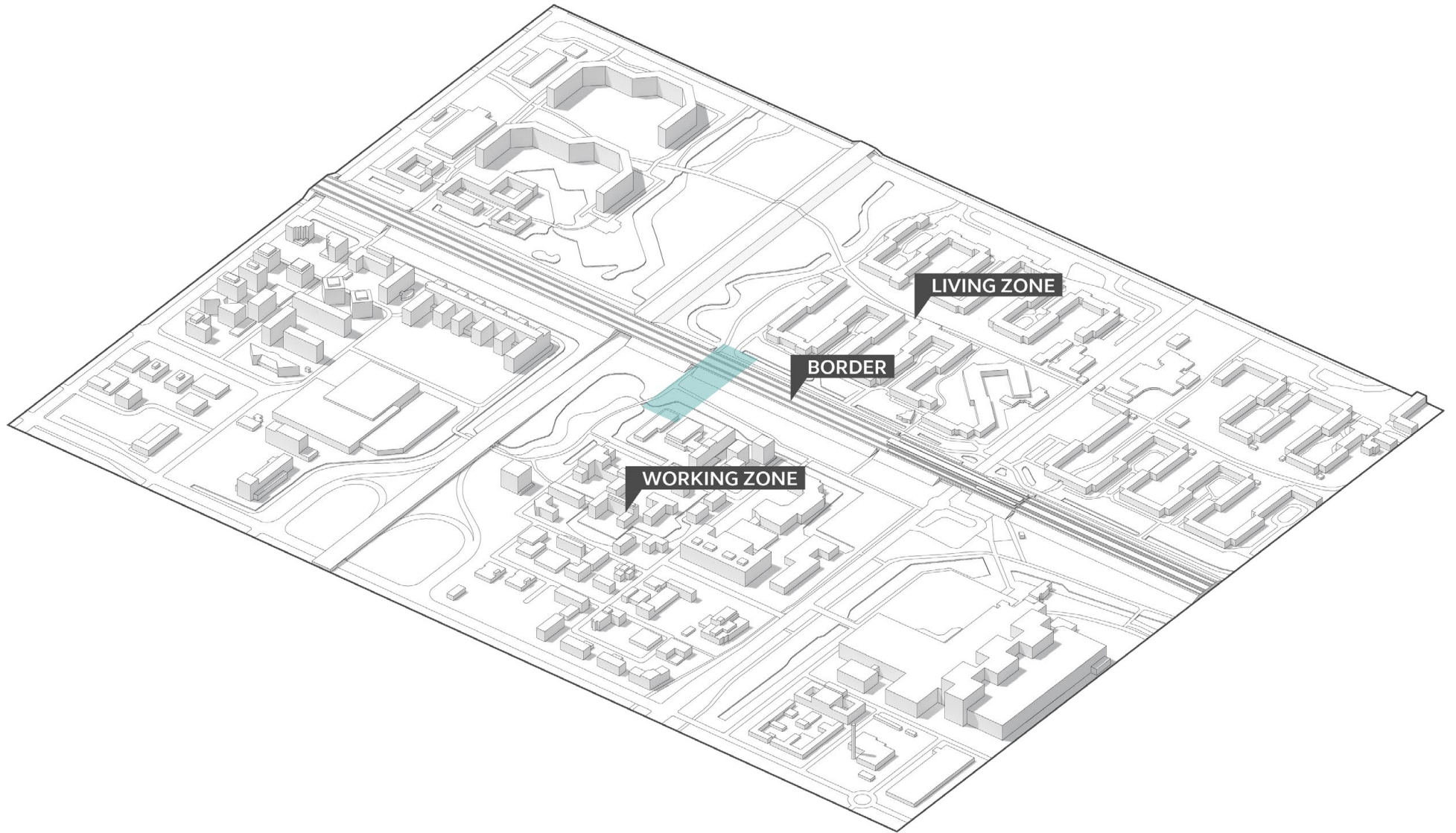


Image by Douwen Chen

CURRENT SITUATION



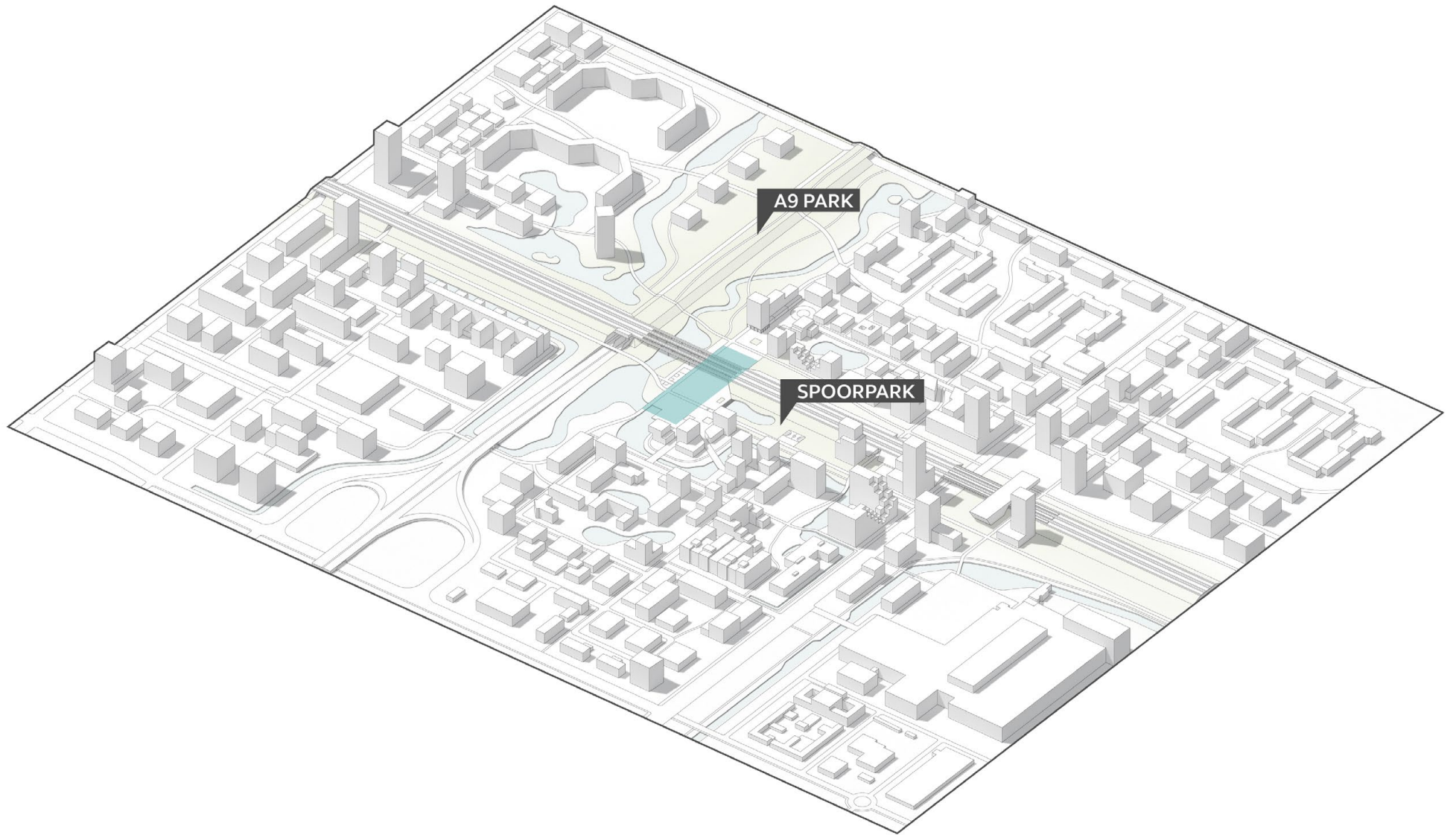
PROBLEMS



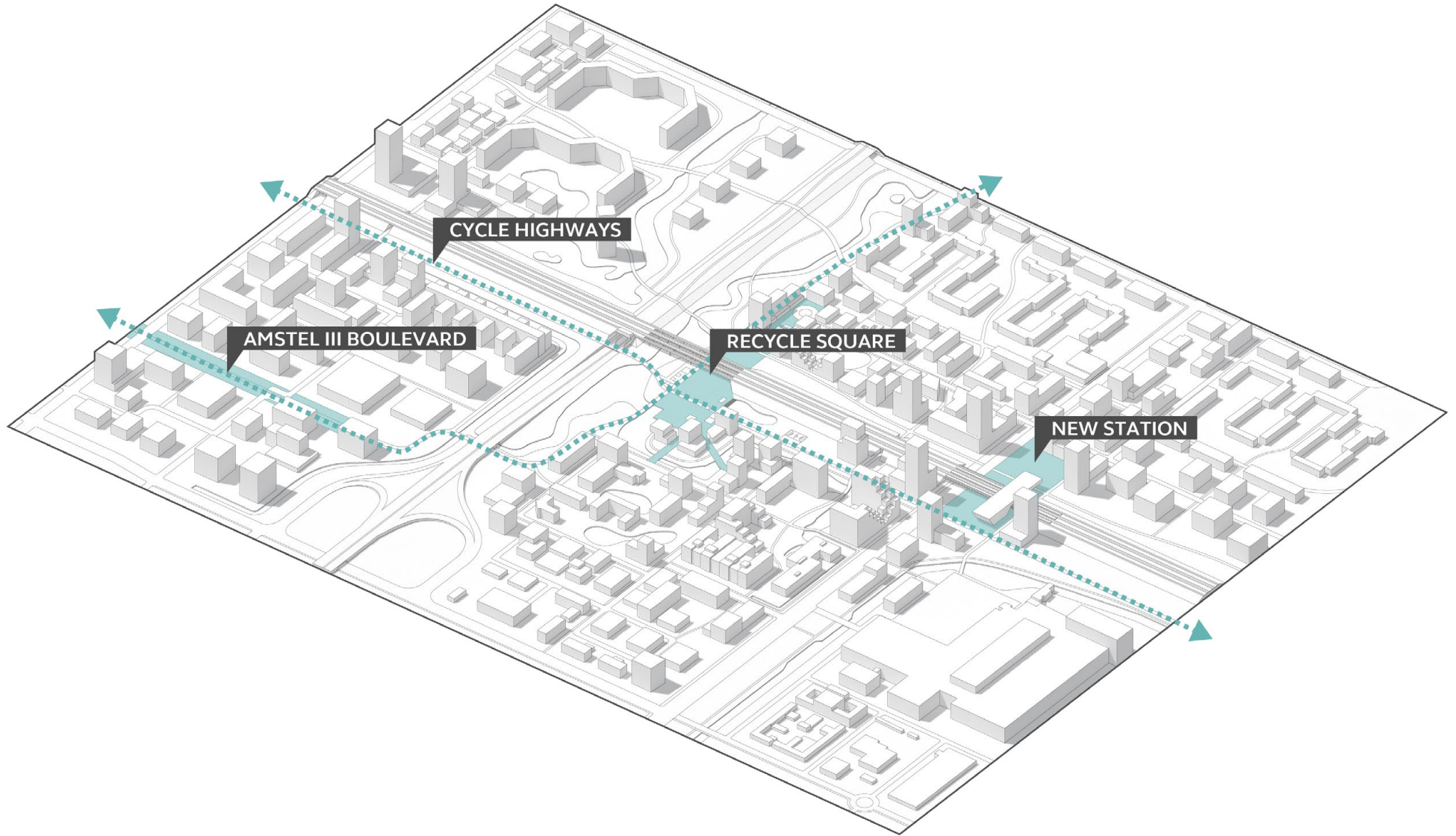
2050 DEVELOPMENT

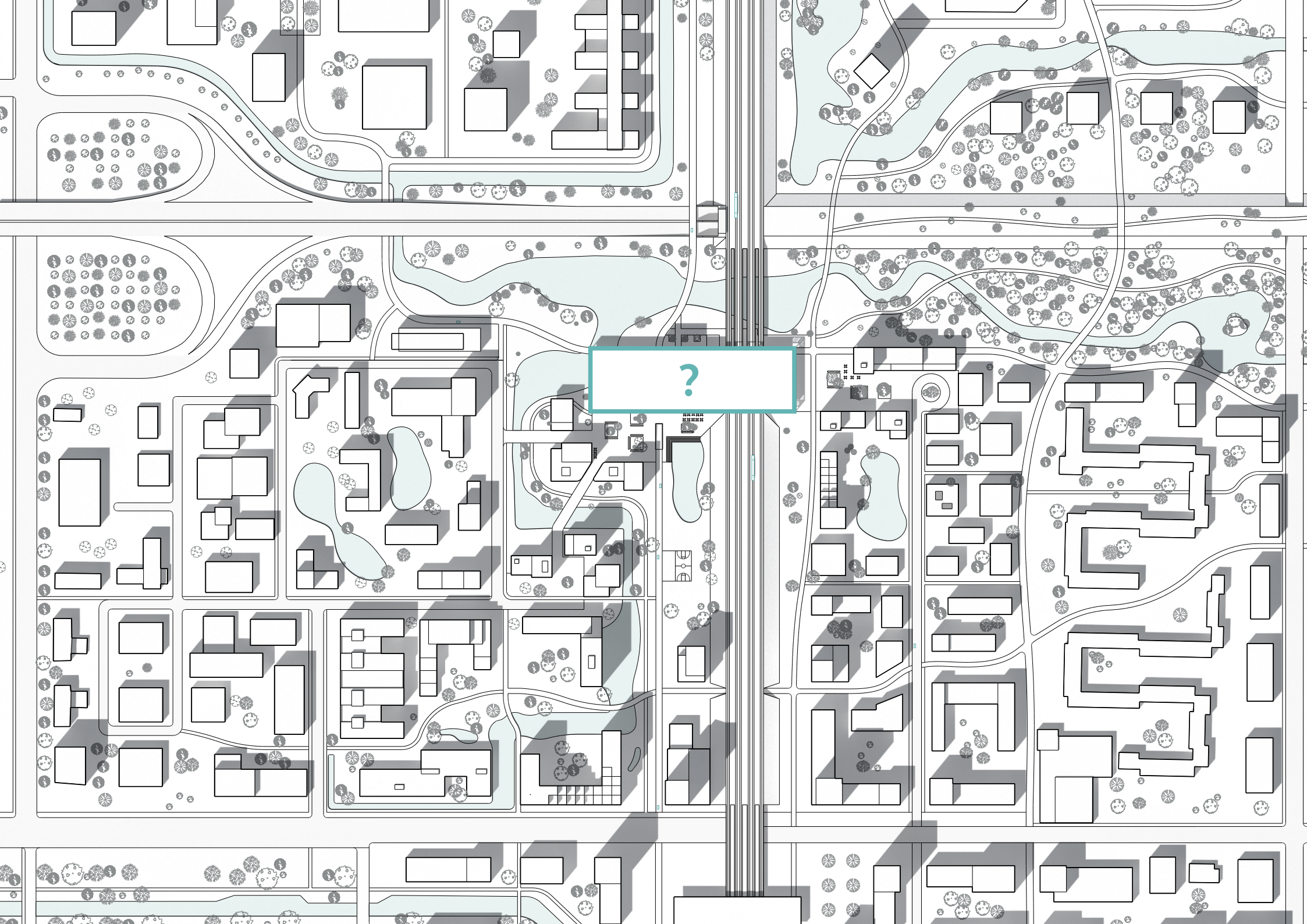


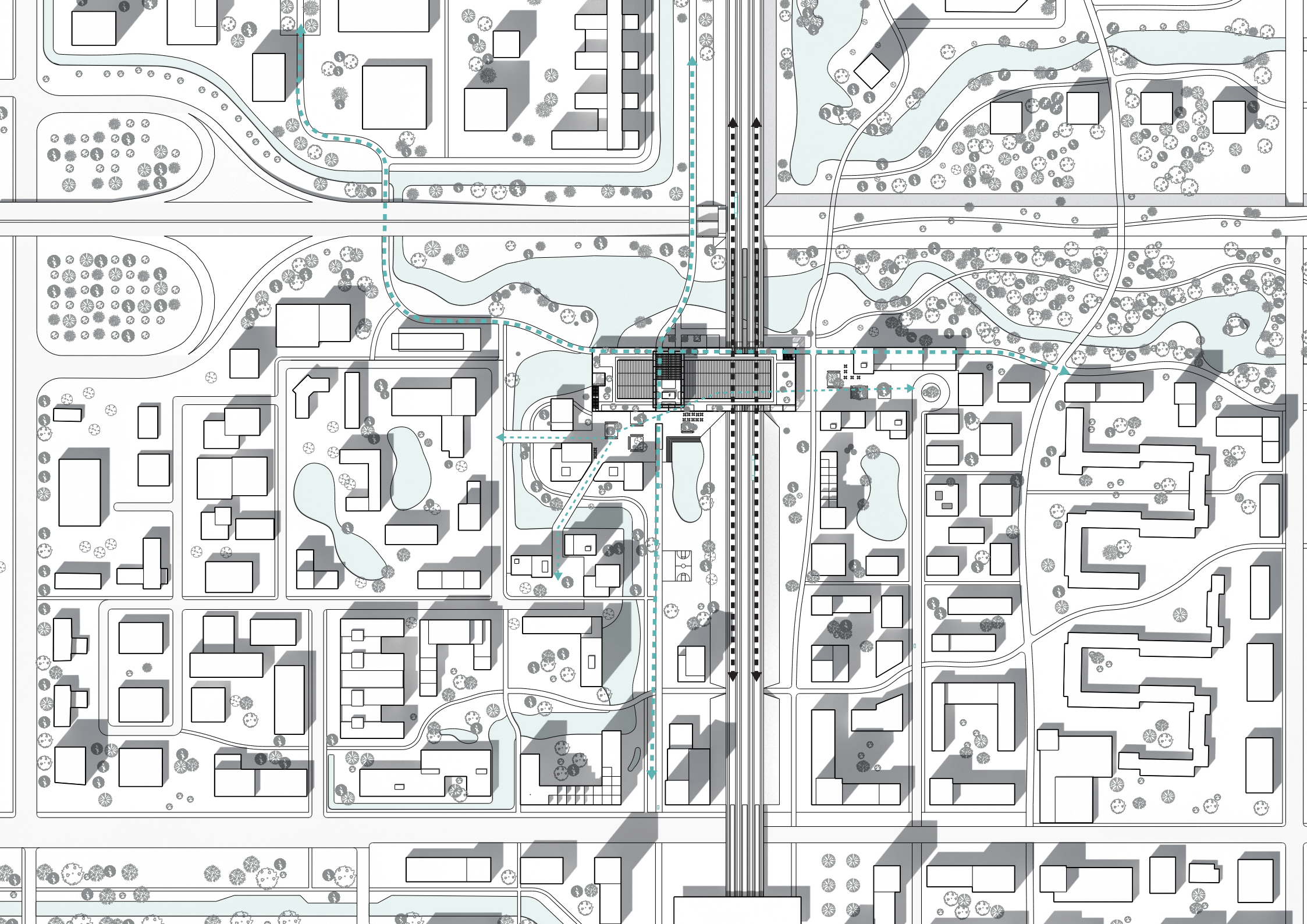
CONNECTING GREEN



CONNECTING INFRASTRUCTURE







UPCYCLING CENTRE
CONCEPT

DESIGN REQUIREMENTS



Users

Create vibrant spaces that welcome all users for social inclusion



Flexible

Create solid grid structure that can easily be reused



Transparent

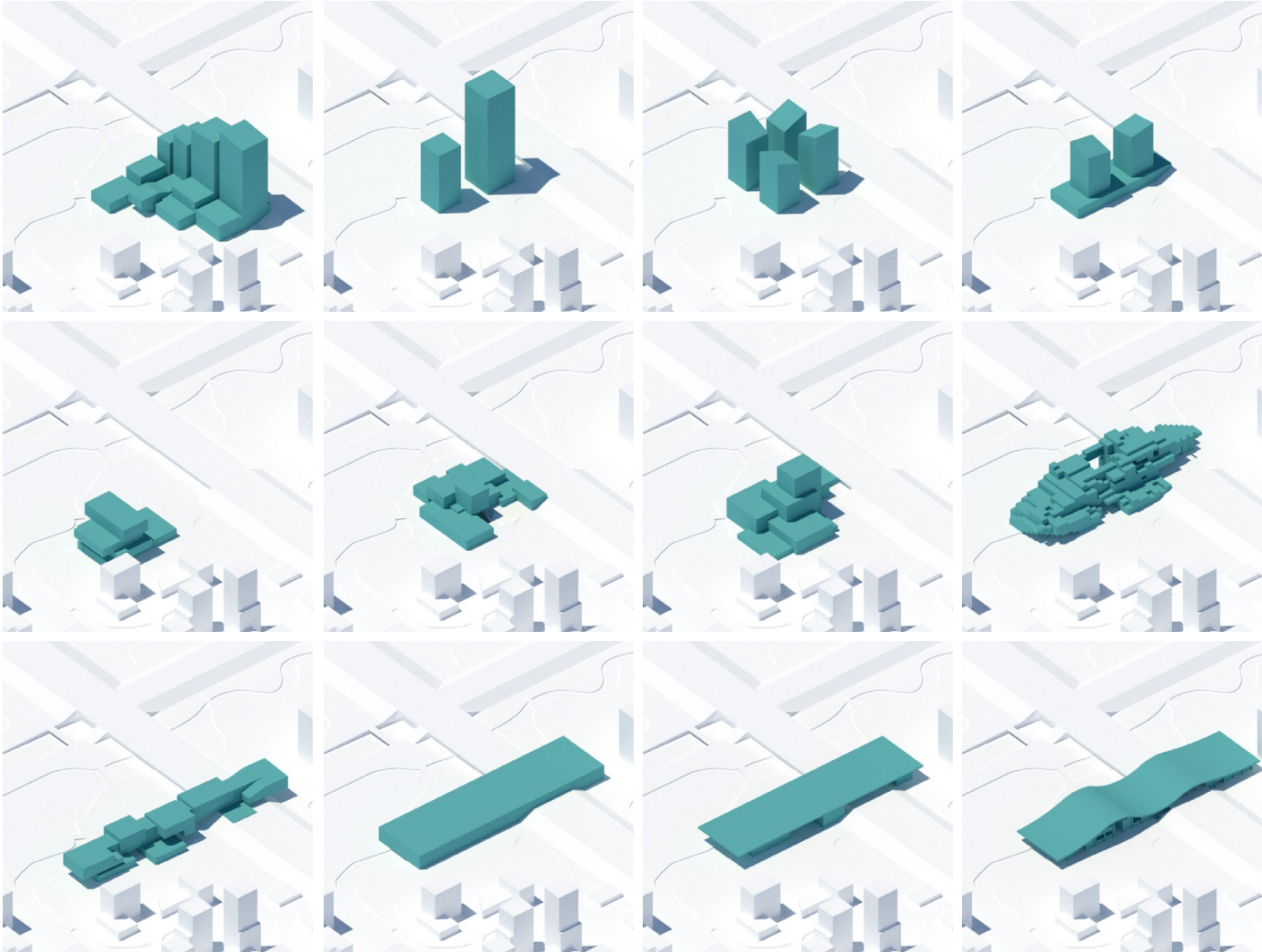
Create an easy approachable and welcoming building that shows all activity



Green

Design meeting spaces with lots of green to blend in with Zuidoost

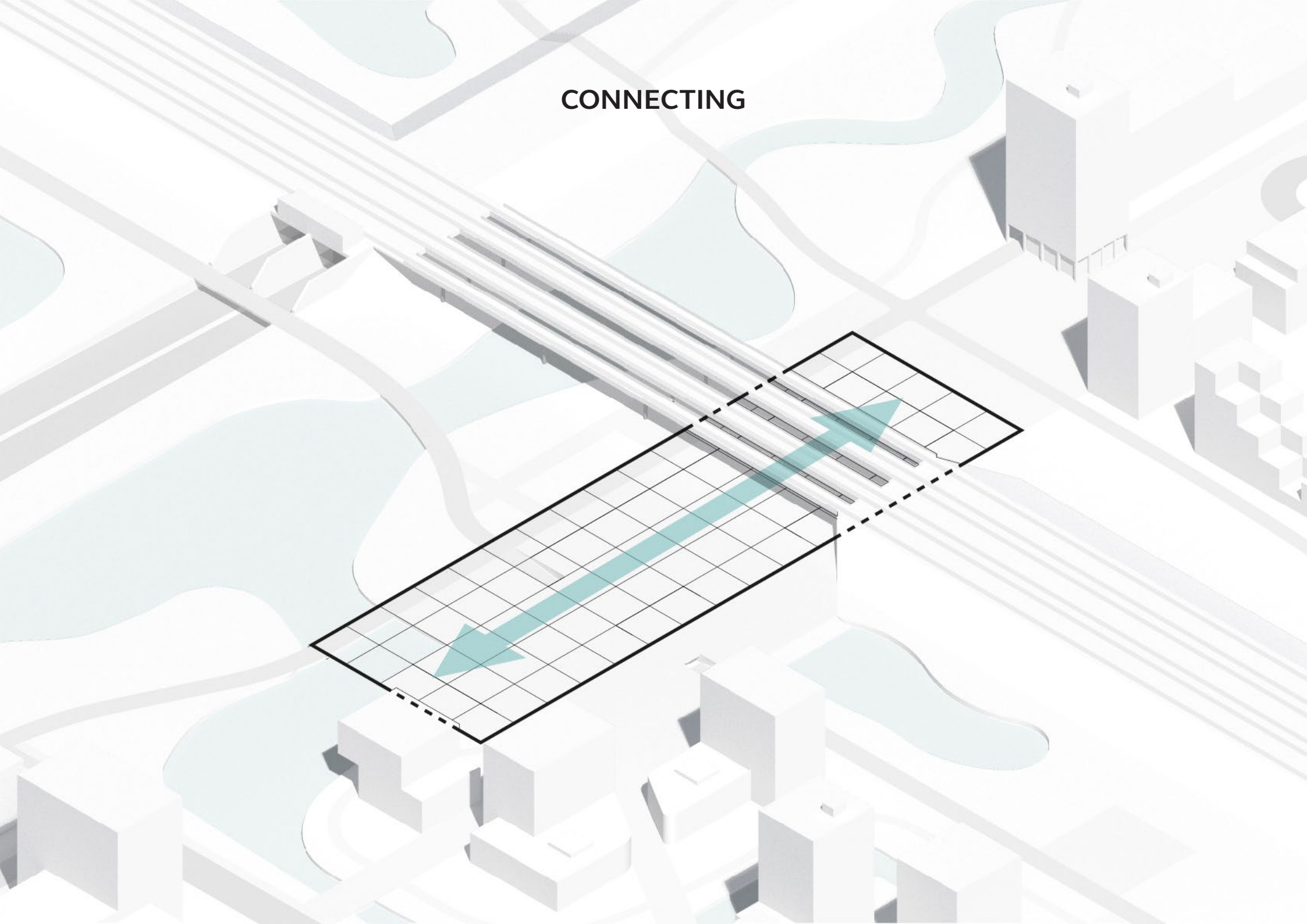
DESIGN OPTIONS



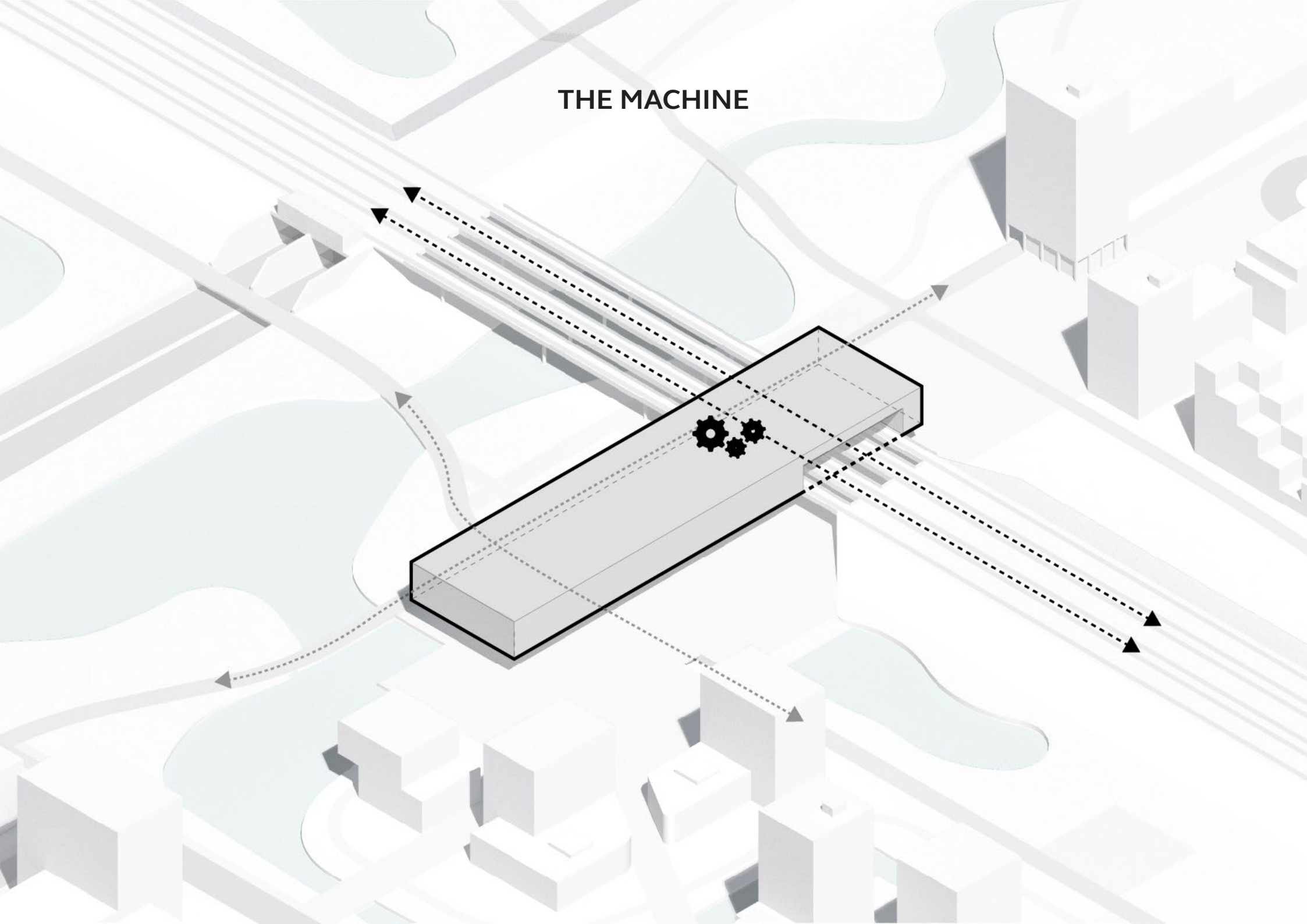
SITUATION



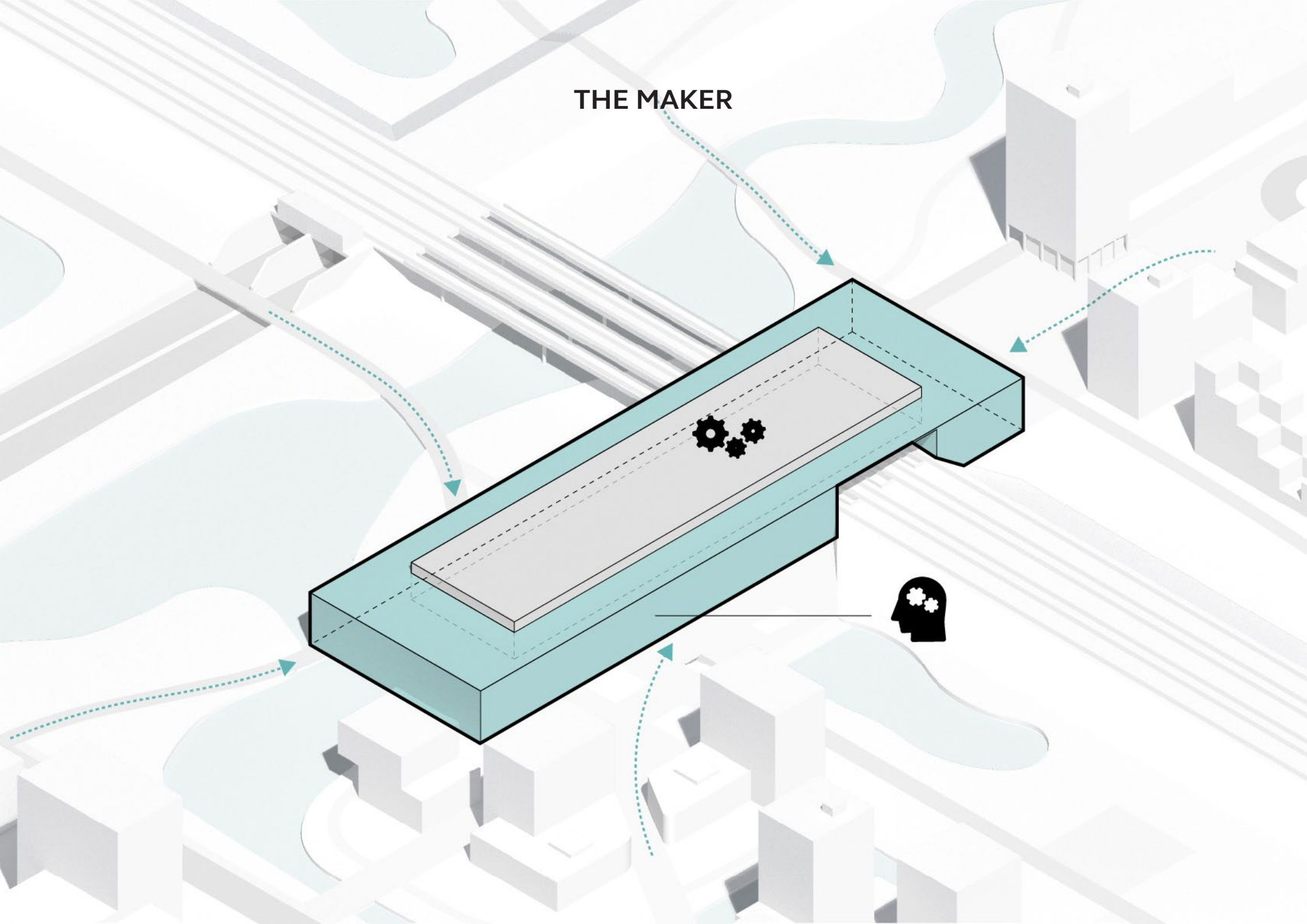
CONNECTING



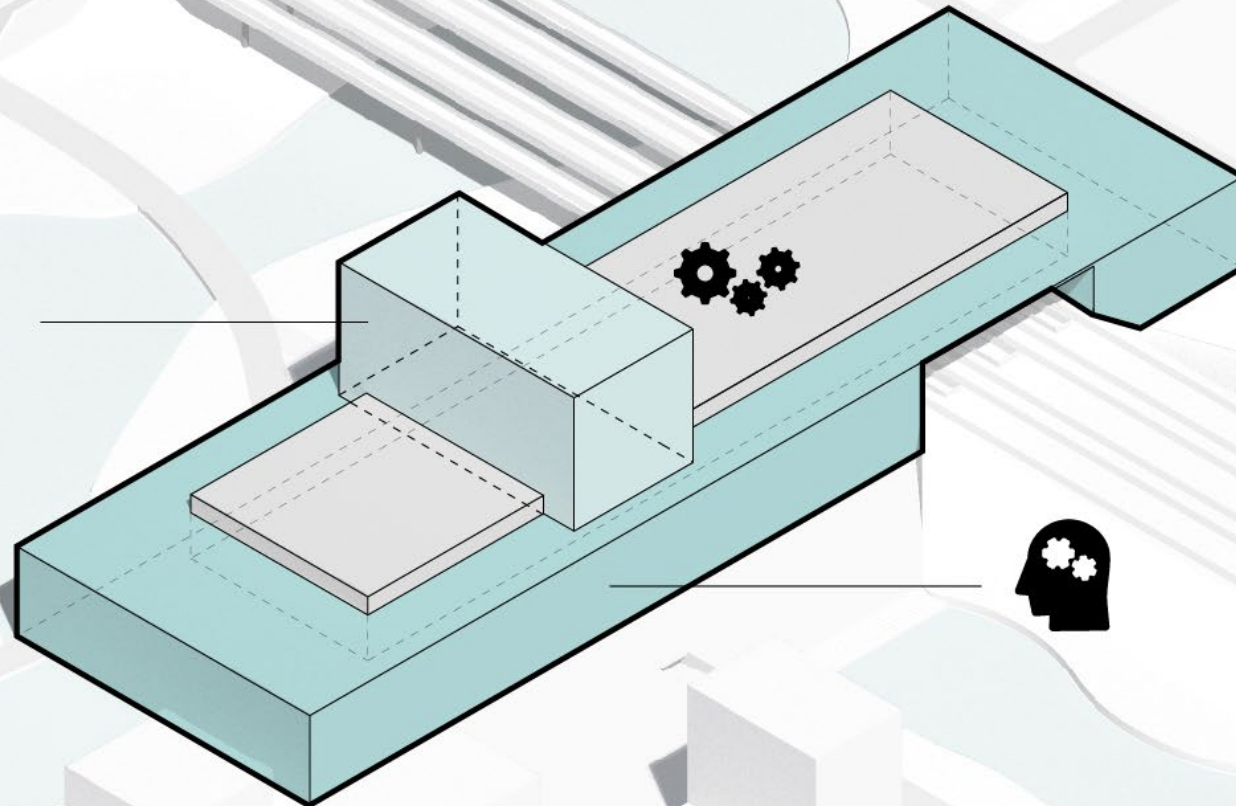
THE MACHINE



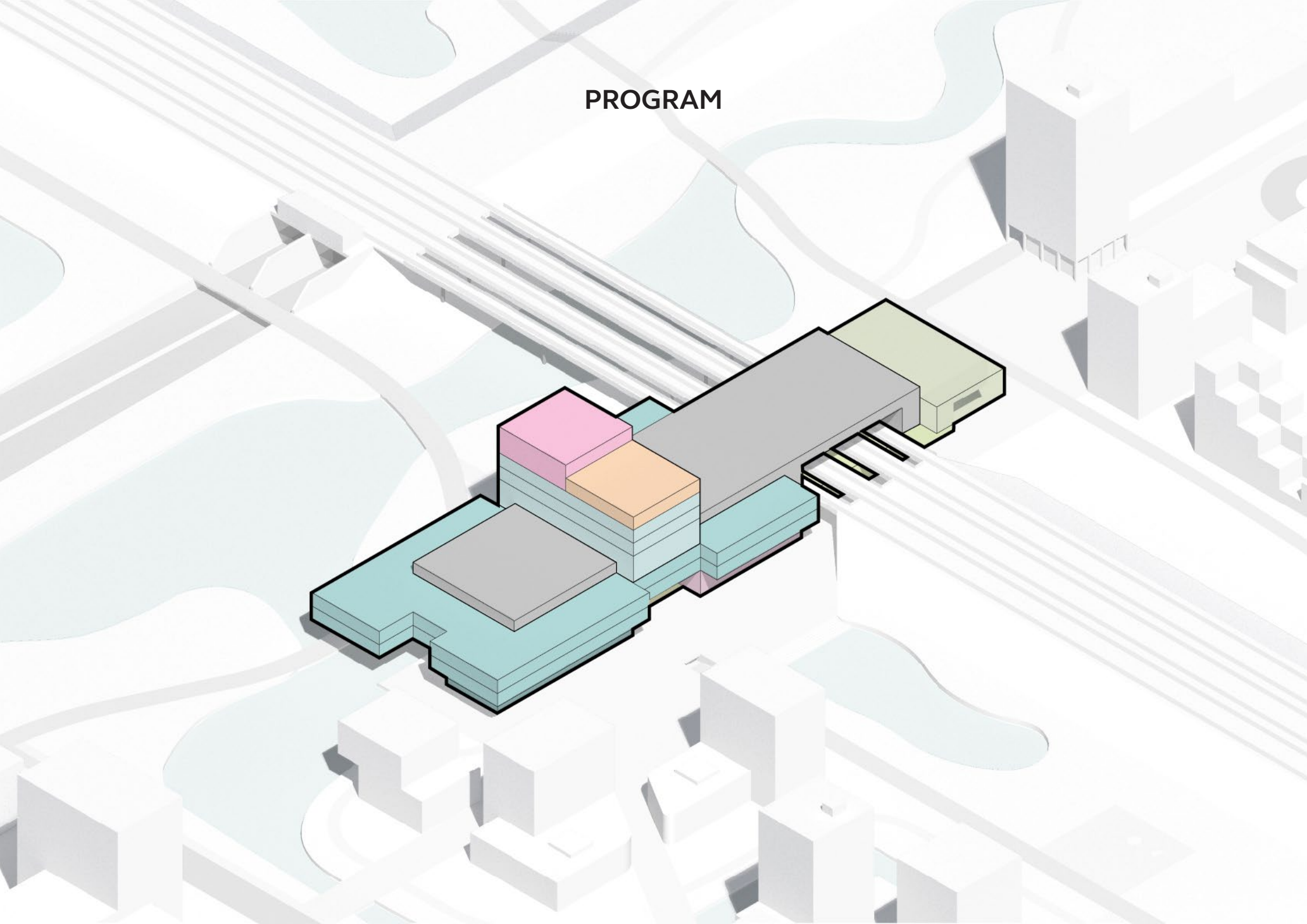
THE MAKER

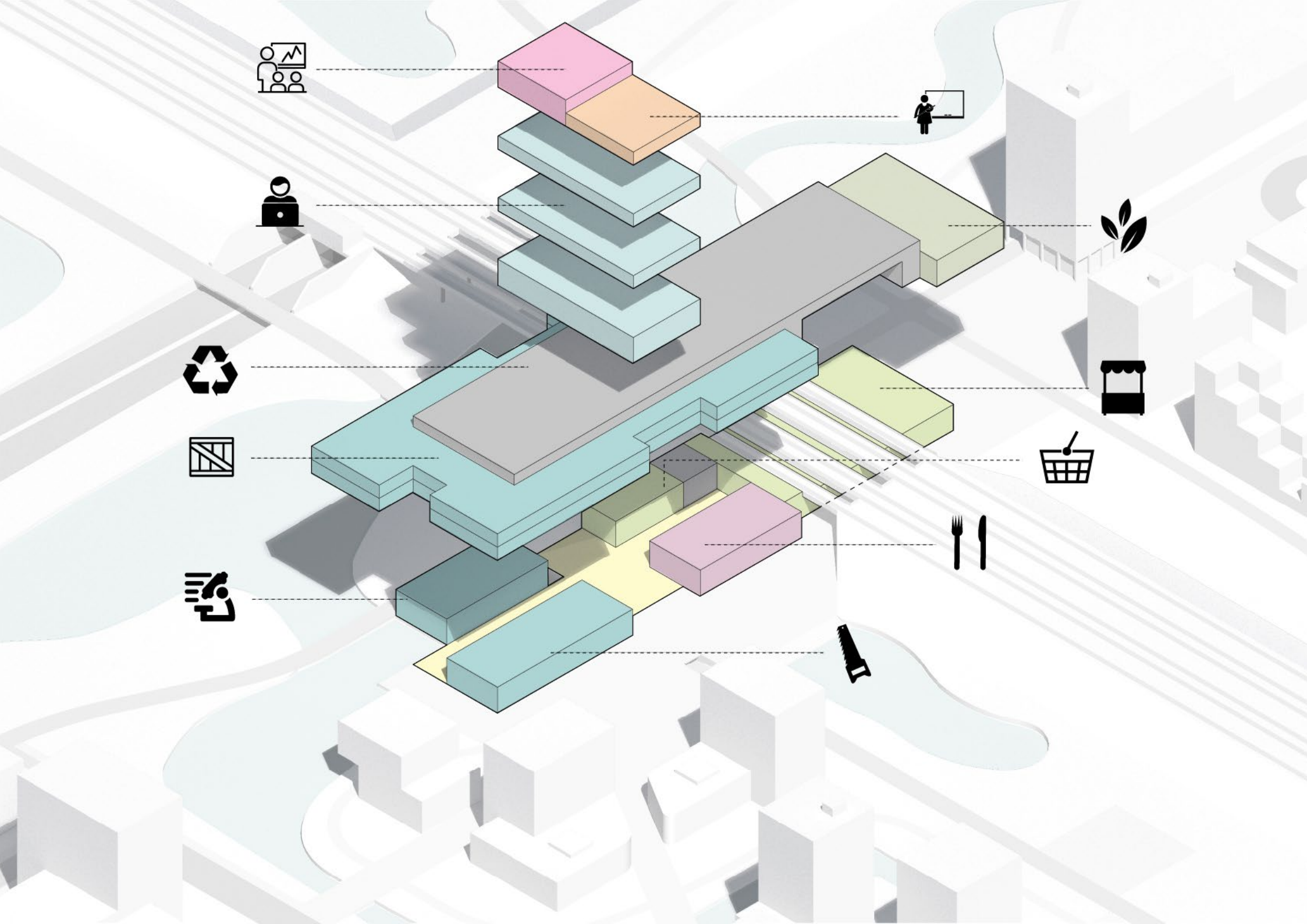


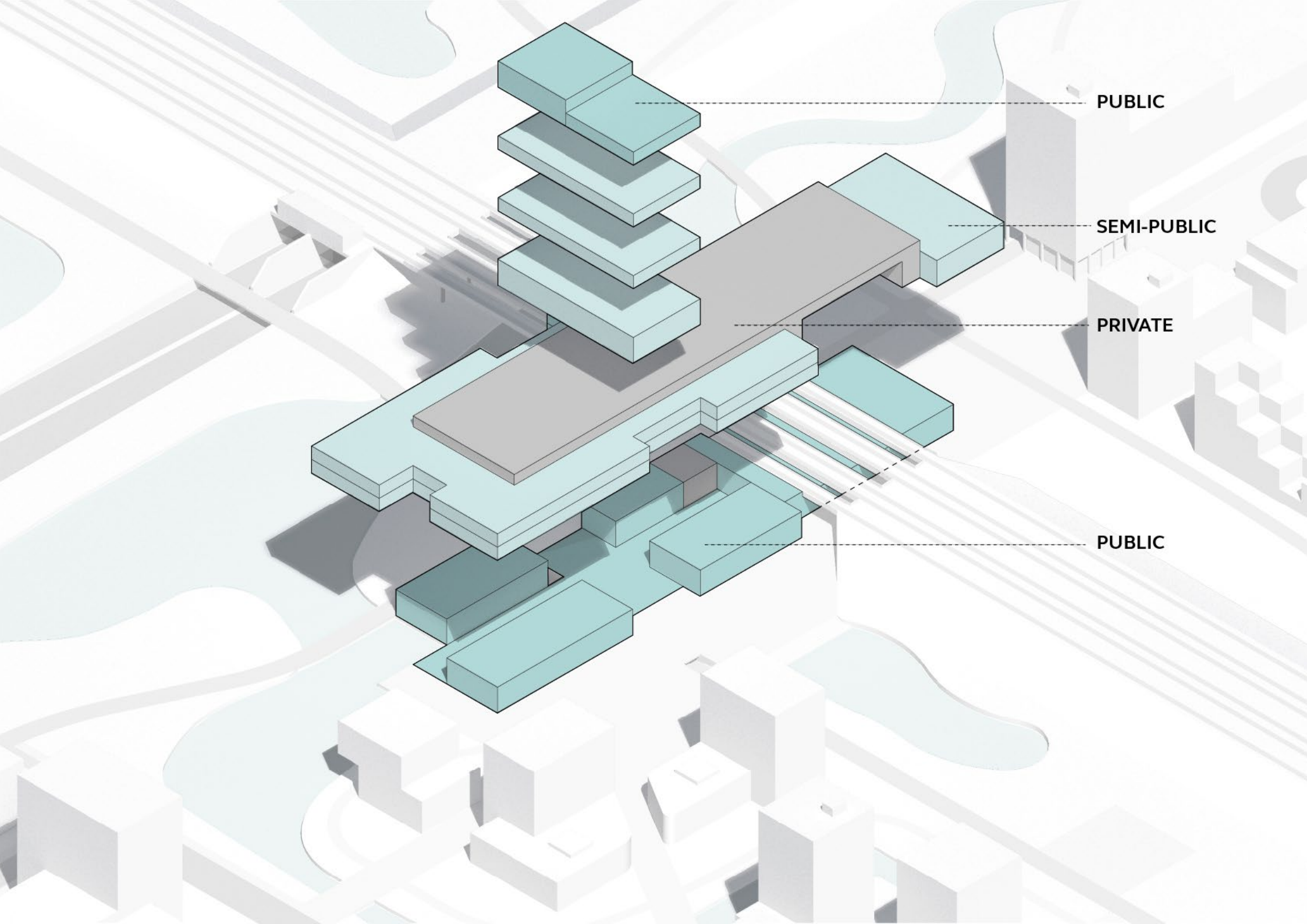
THE OPERATOR



PROGRAM







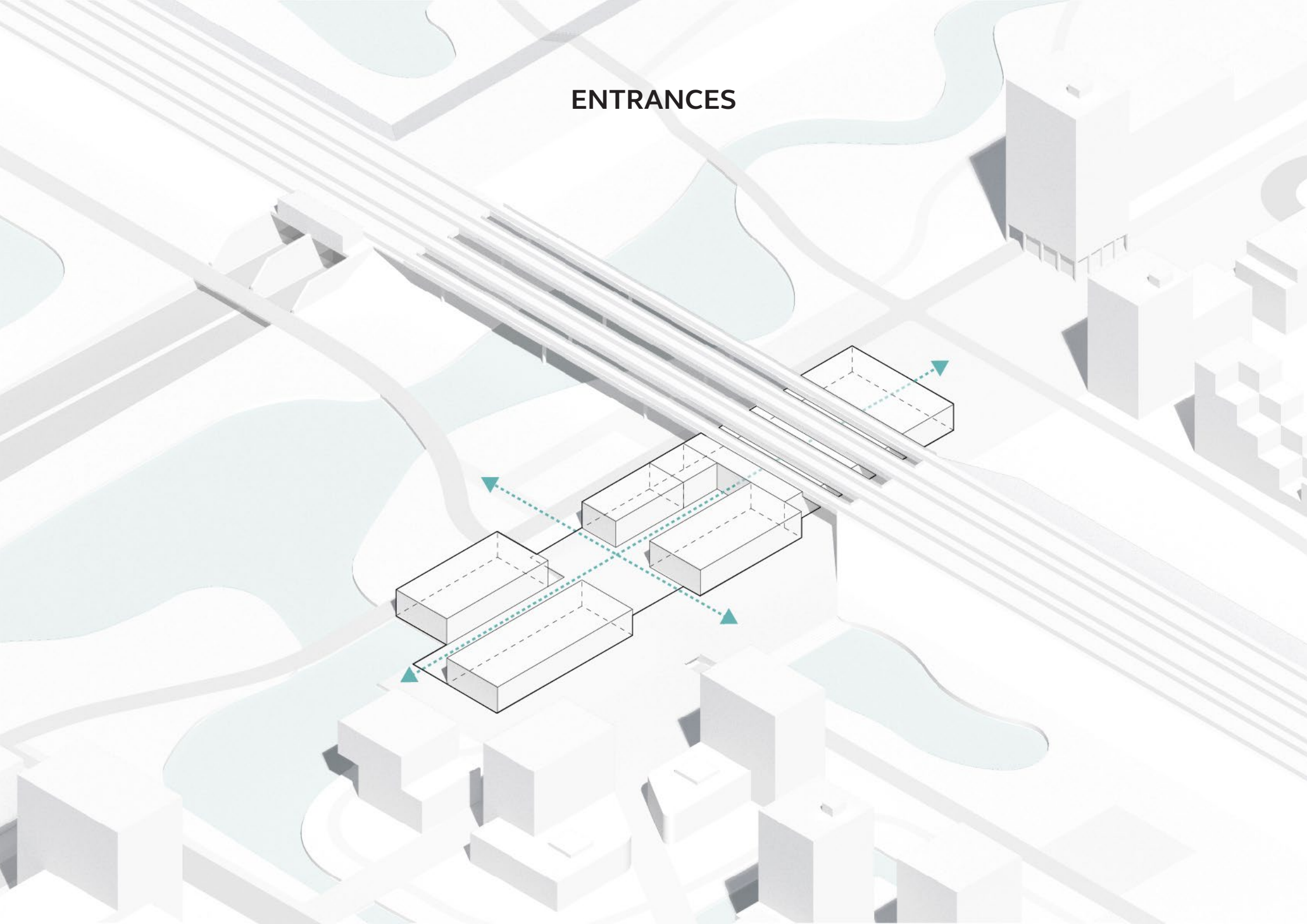
PUBLIC

SEMI-PUBLIC

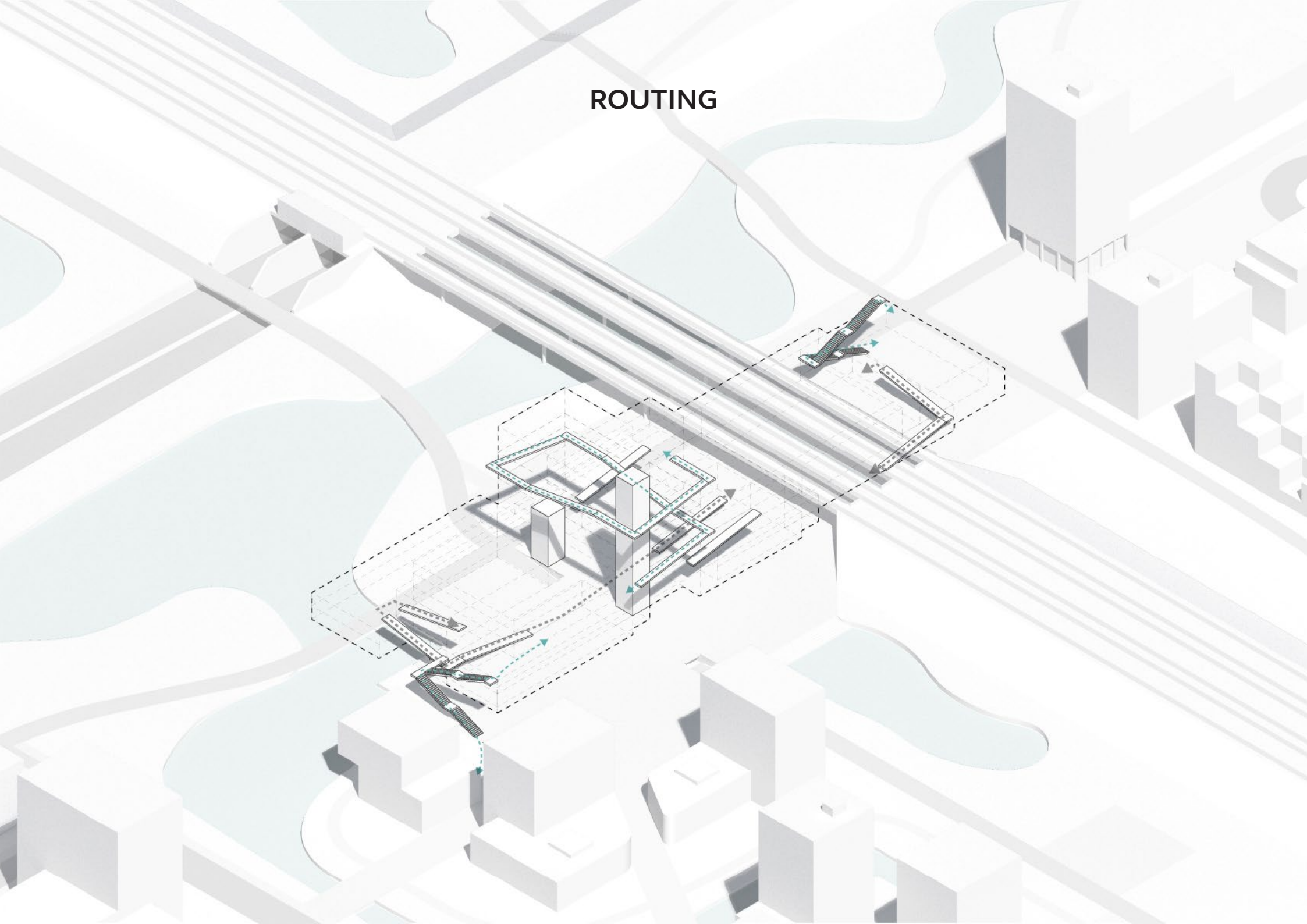
PRIVATE

PUBLIC

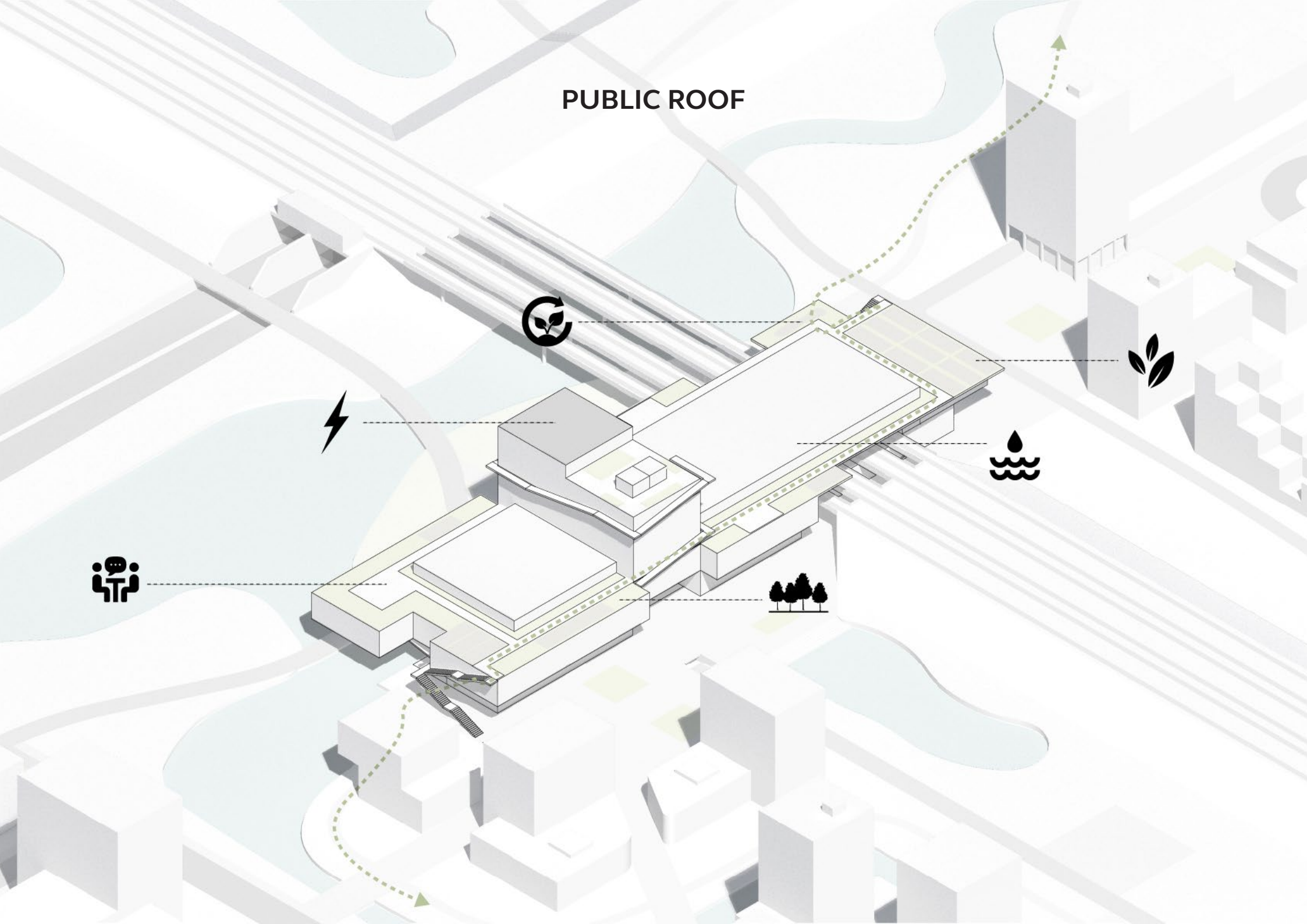
ENTRANCES



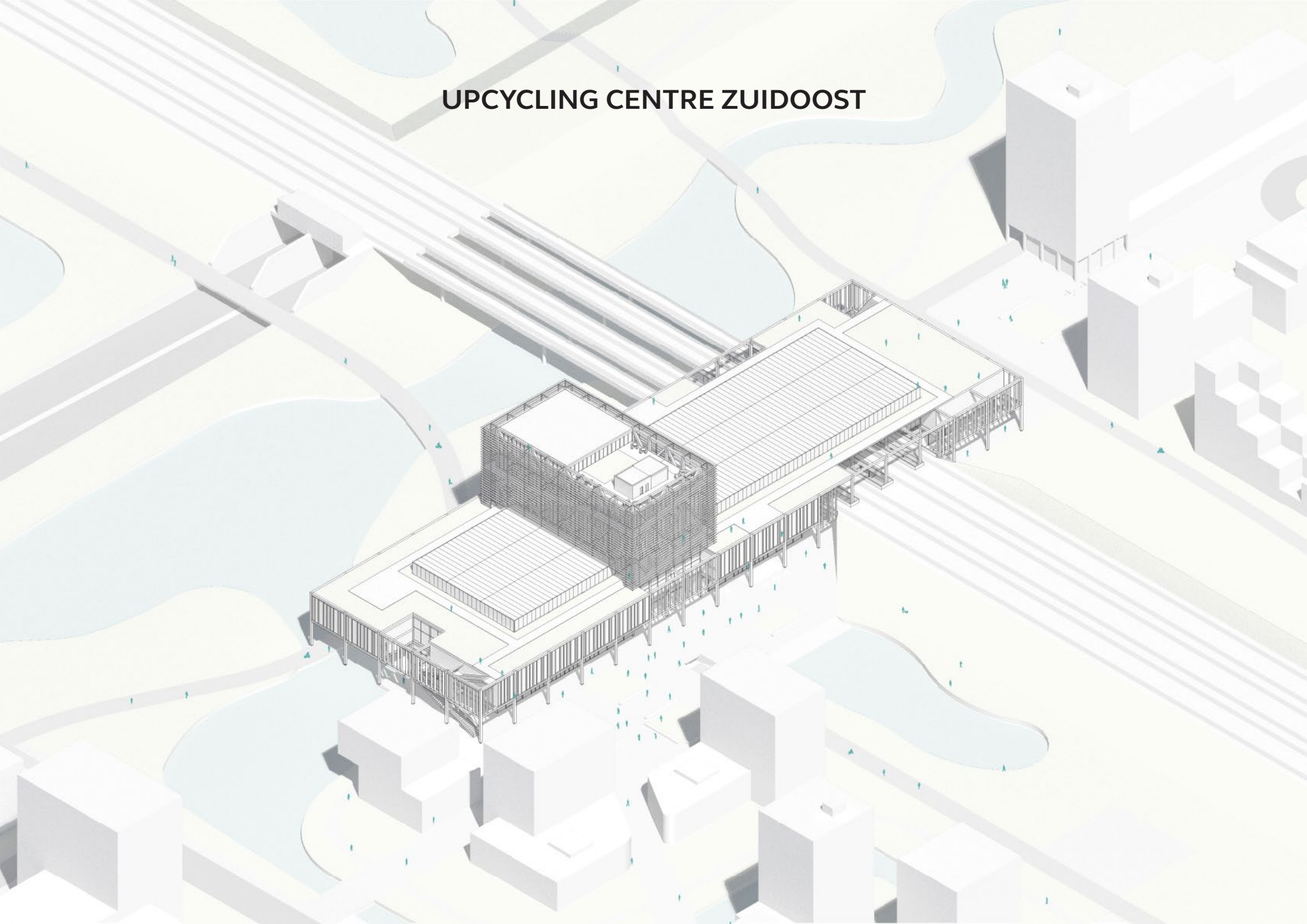
ROUTING



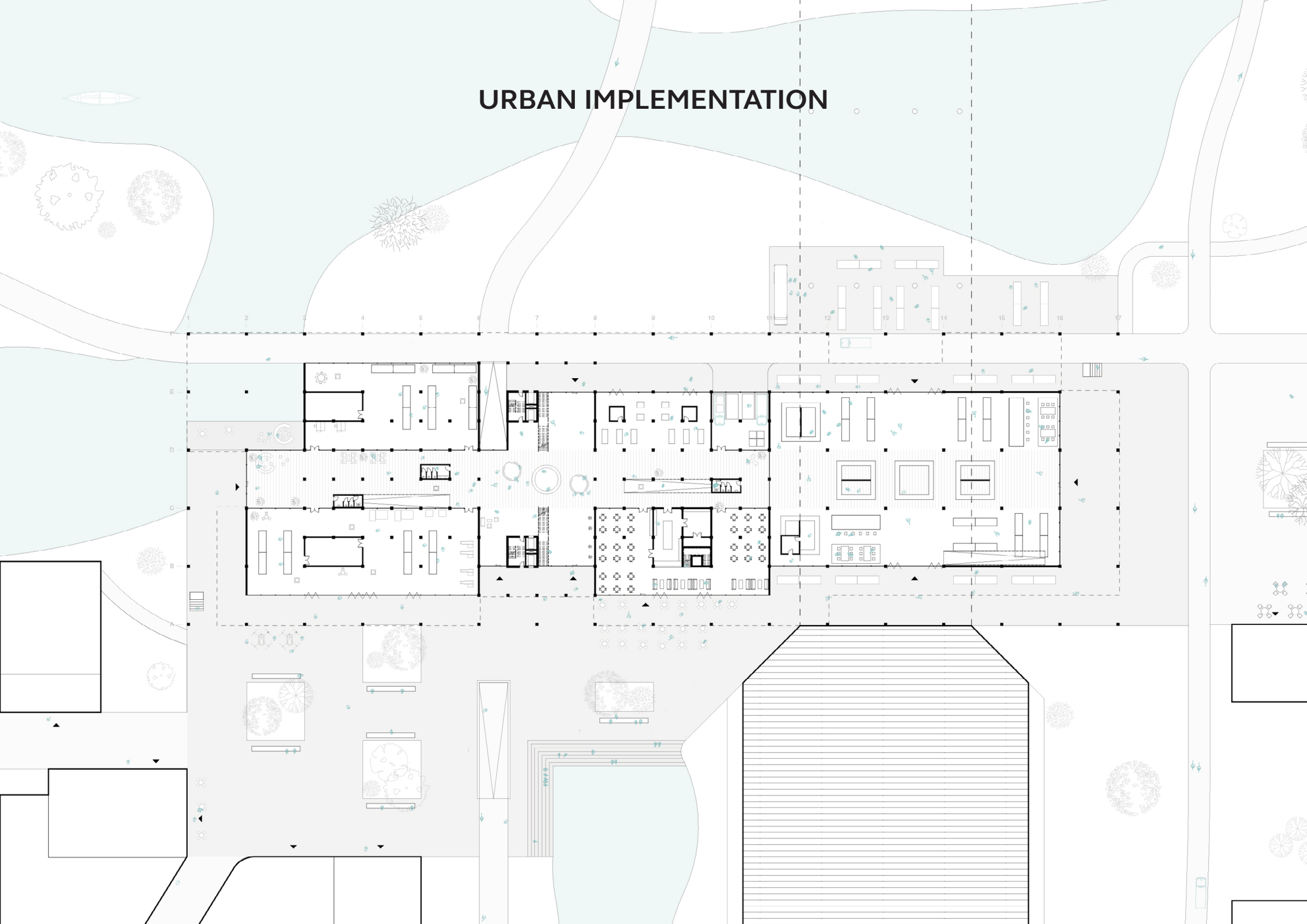
PUBLIC ROOF



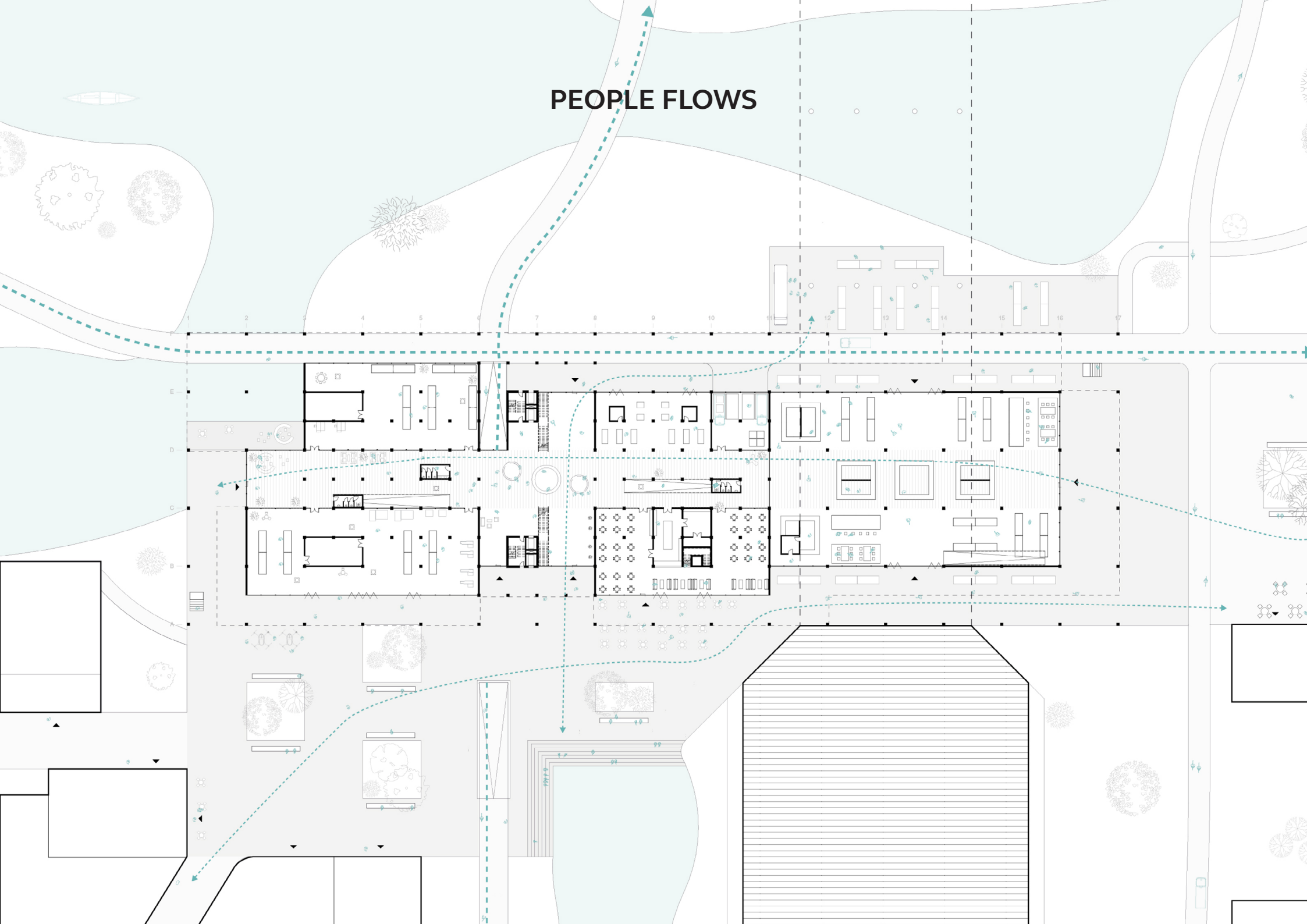
UPCYCLING CENTRE ZUIDOOST



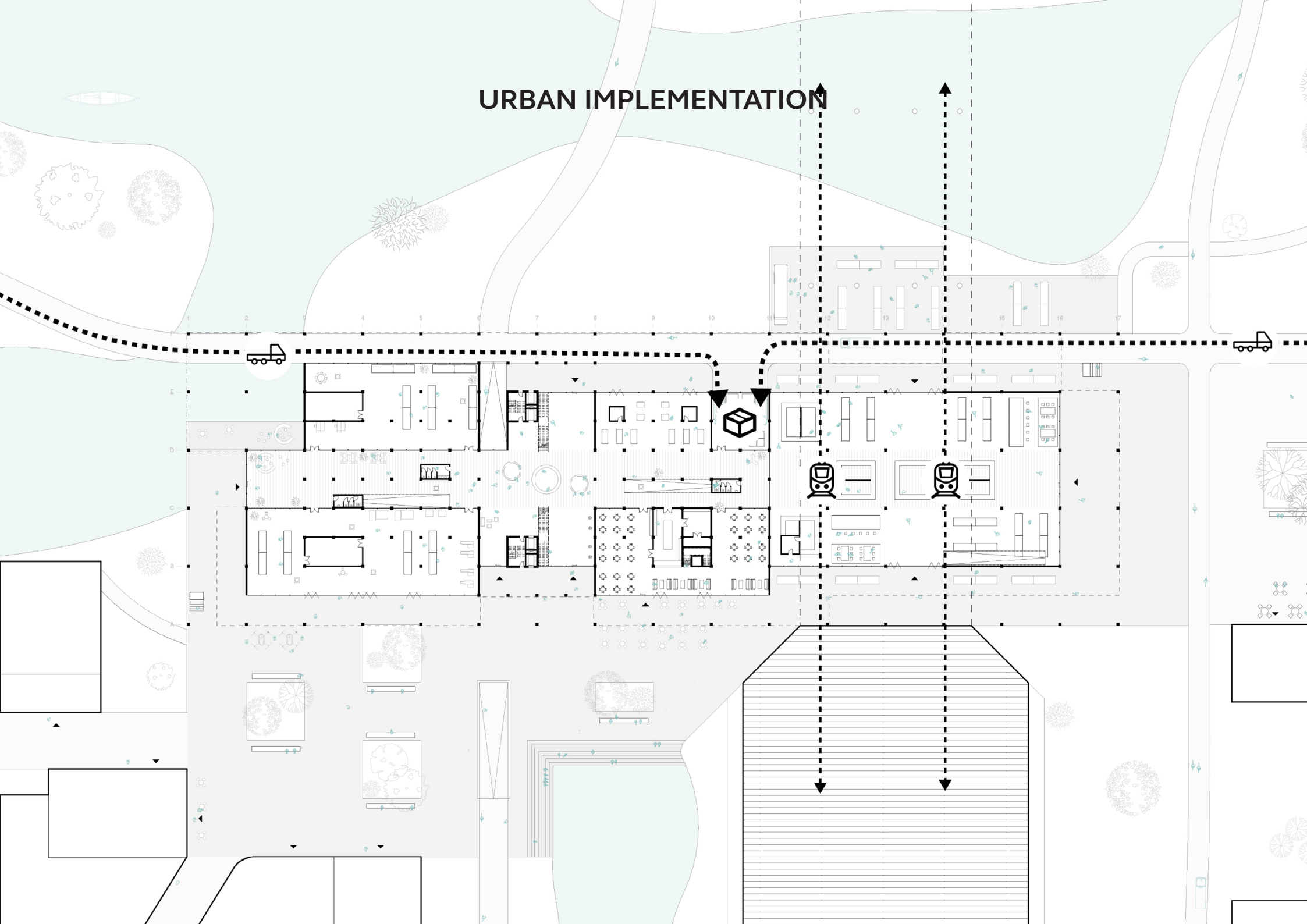
URBAN IMPLEMENTATION



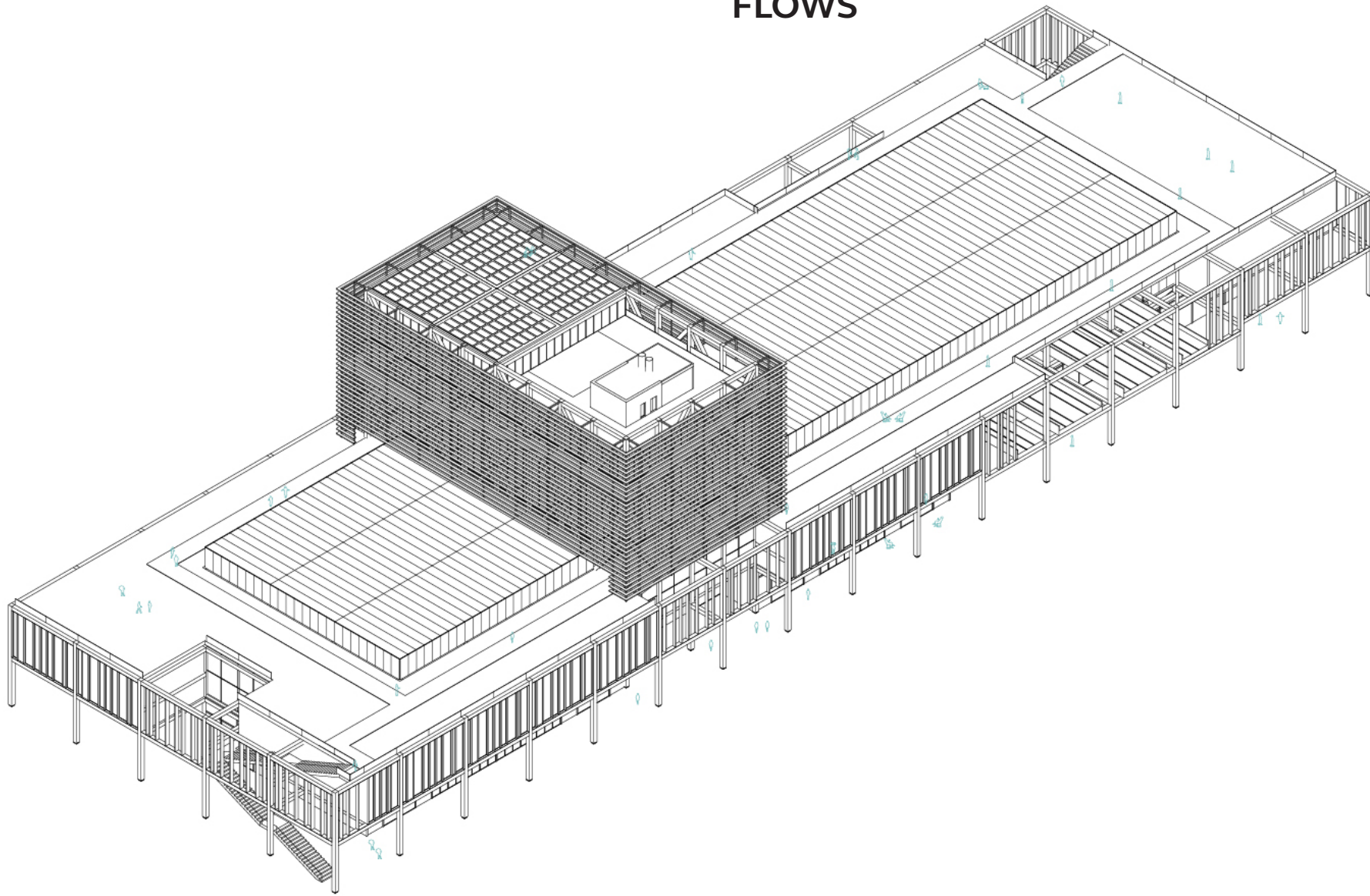
PEOPLE FLOWS



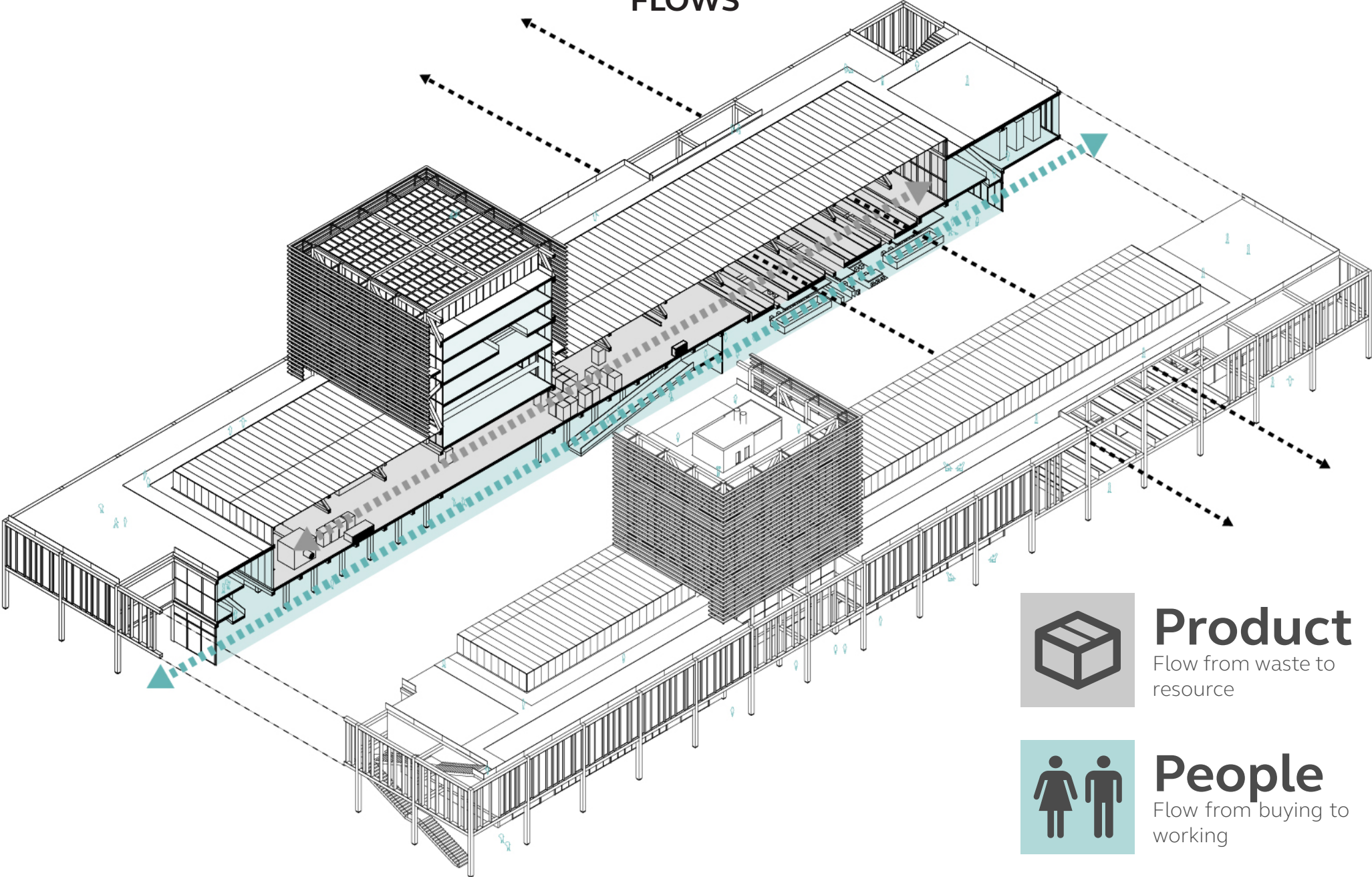
URBAN IMPLEMENTATION



FLOWS



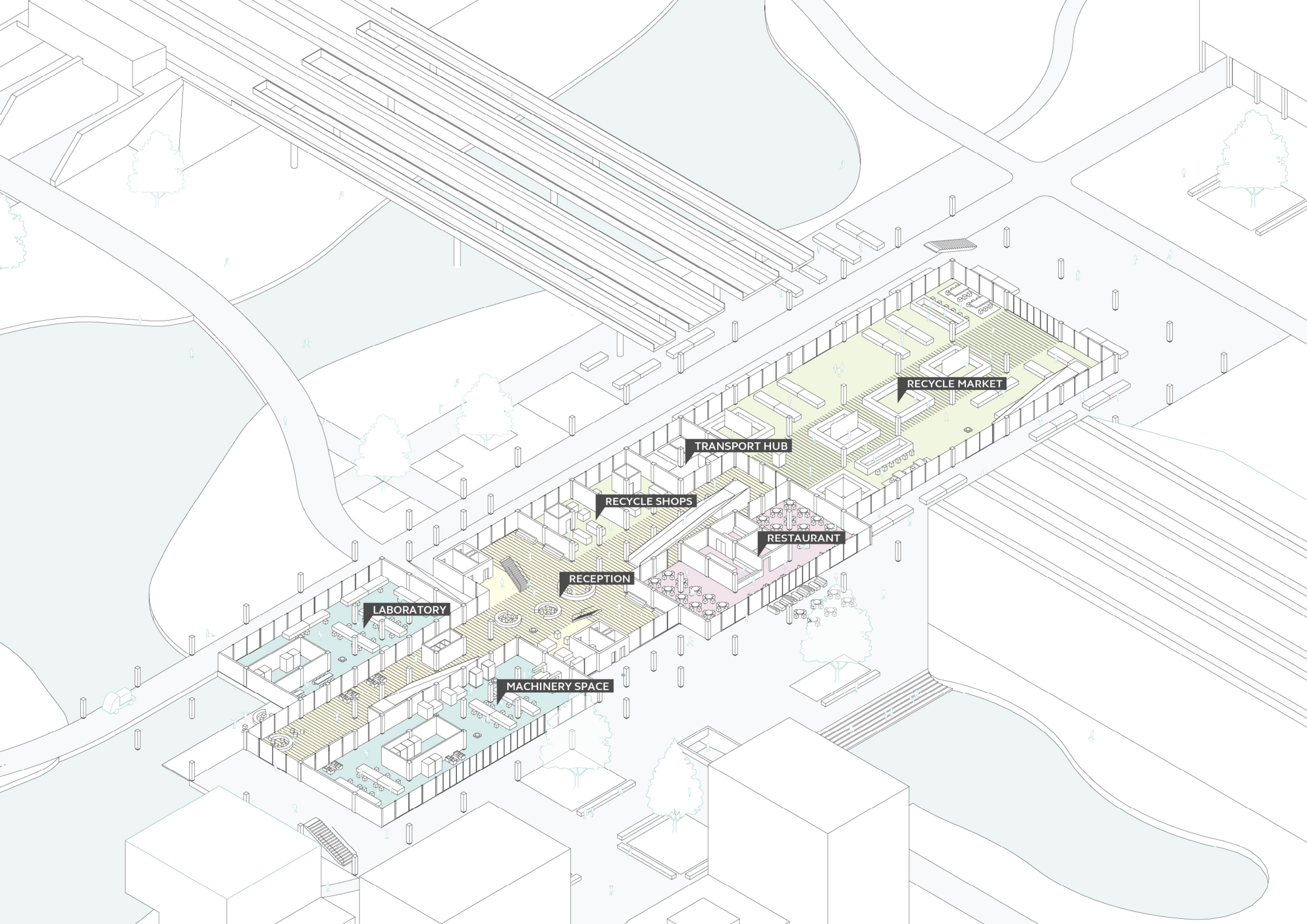
FLOWS

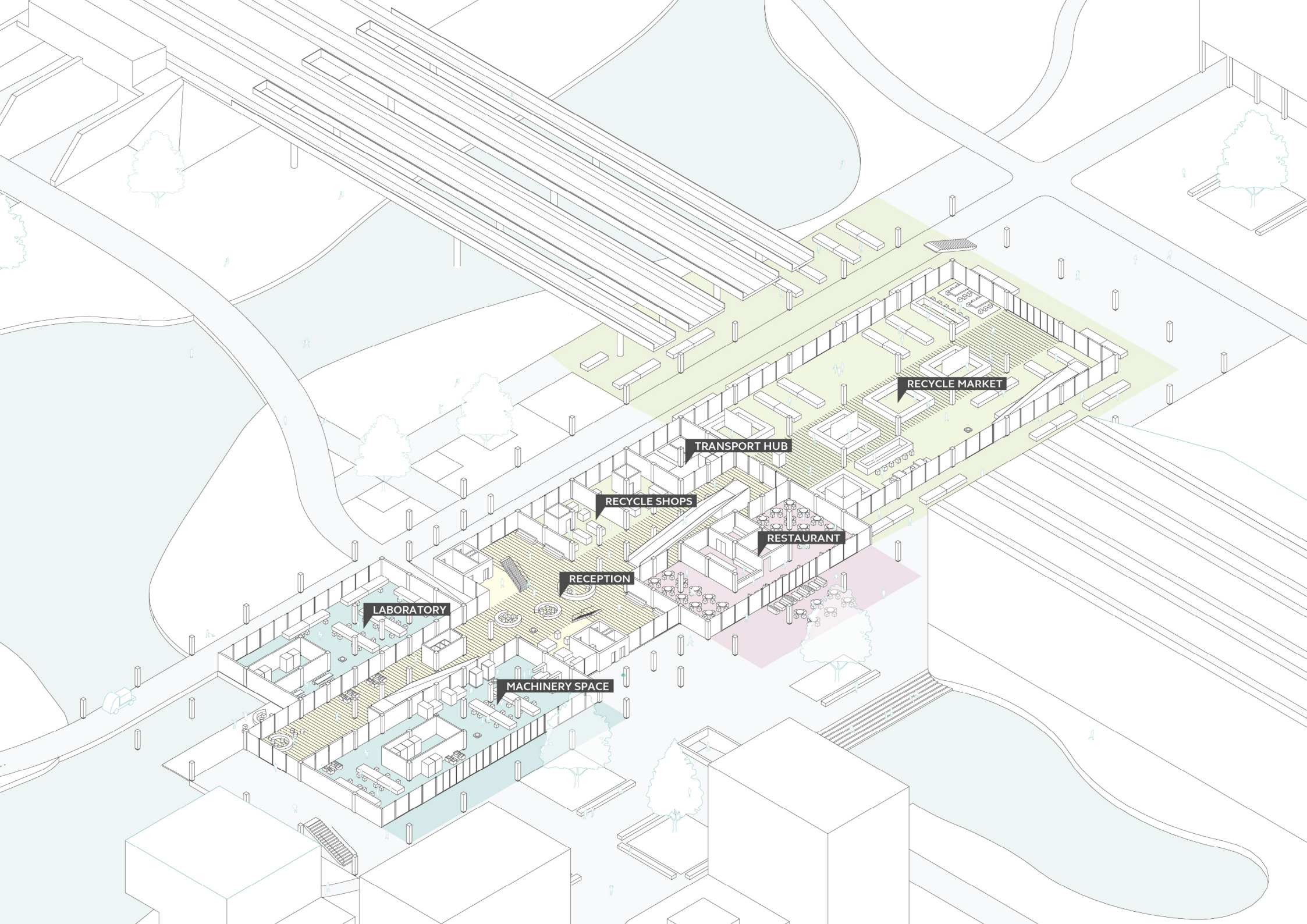


Product
Flow from waste to resource



People
Flow from buying to working





RECYCLE MARKET

TRANSPORT HUB

RECYCLE SHOPS

RESTAURANT

RECEPTION

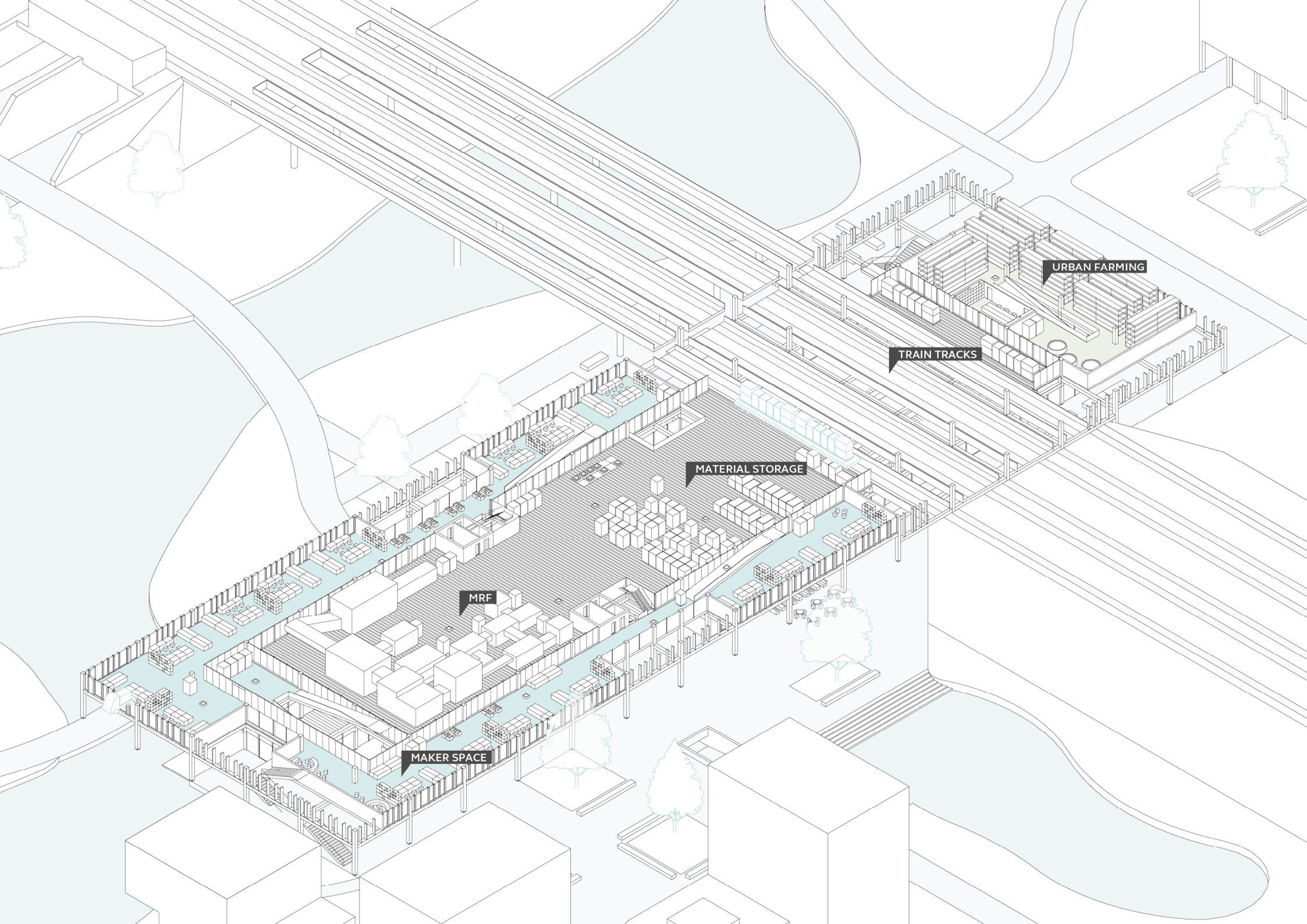
LABORATORY

MACHINERY SPACE

KSHOP
OOST

HOH
T20





URBAN FARMING

TRAIN TRACKS

MATERIAL STORAGE

MRF

MAKER SPACE

THE MACHINE



Source: CPGRP, <http://www.cpgrp.com/>

ALIBABA WAREHOUSE





UPCYCLING CENTRE
ZUIDOOST

UPCYCLING CENTRE
ZUIDOOST

UPCYCLING CENTRE
ZUIDOOST

UPCYCLING CENTRE
ZUIDOOST

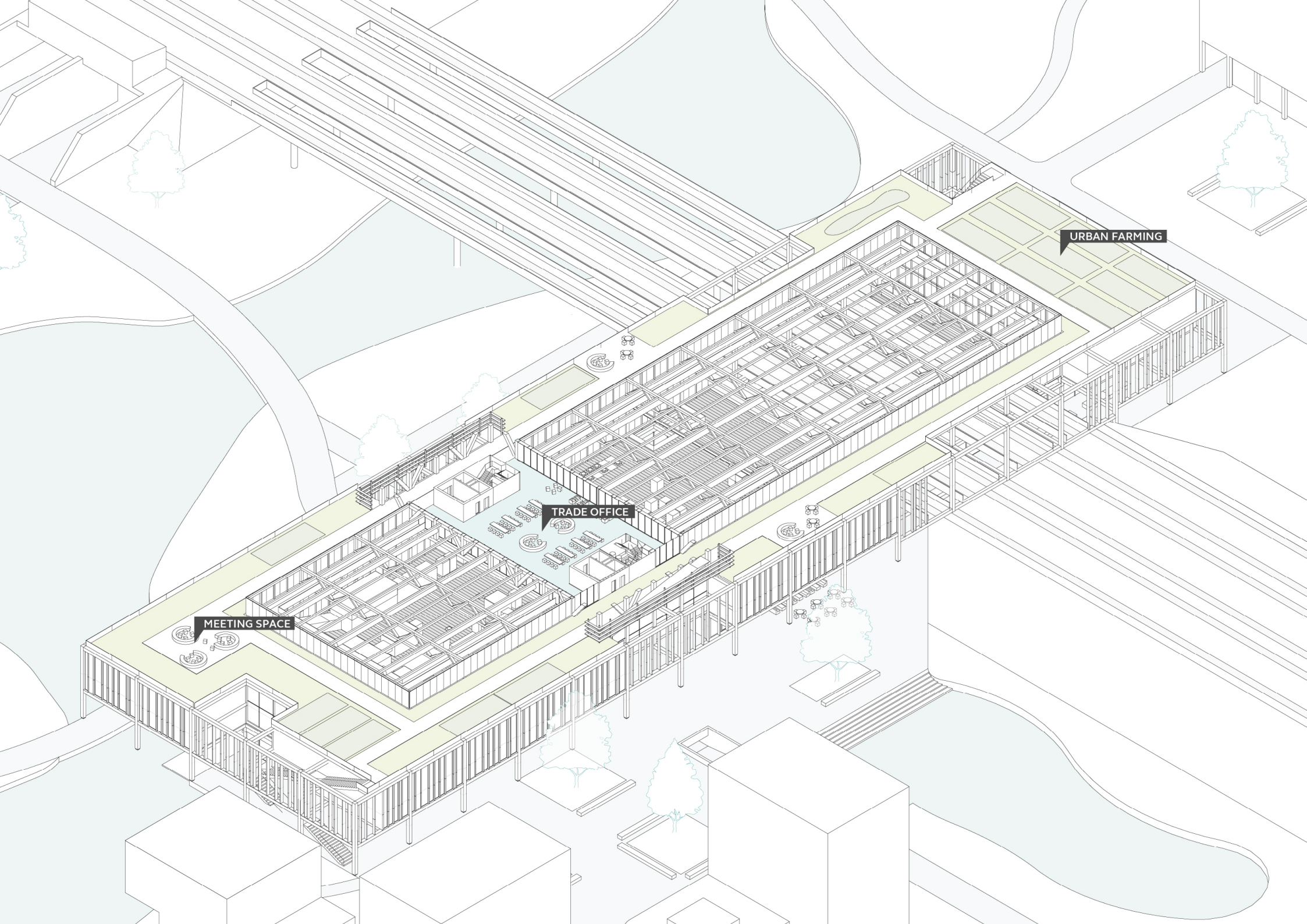
UPCYCLING CENTRE
ZUIDOOST



UPCYCLING TOYS TO FURNITURE



Source: Ecobirdy. <https://www.ecobirdy.com/>

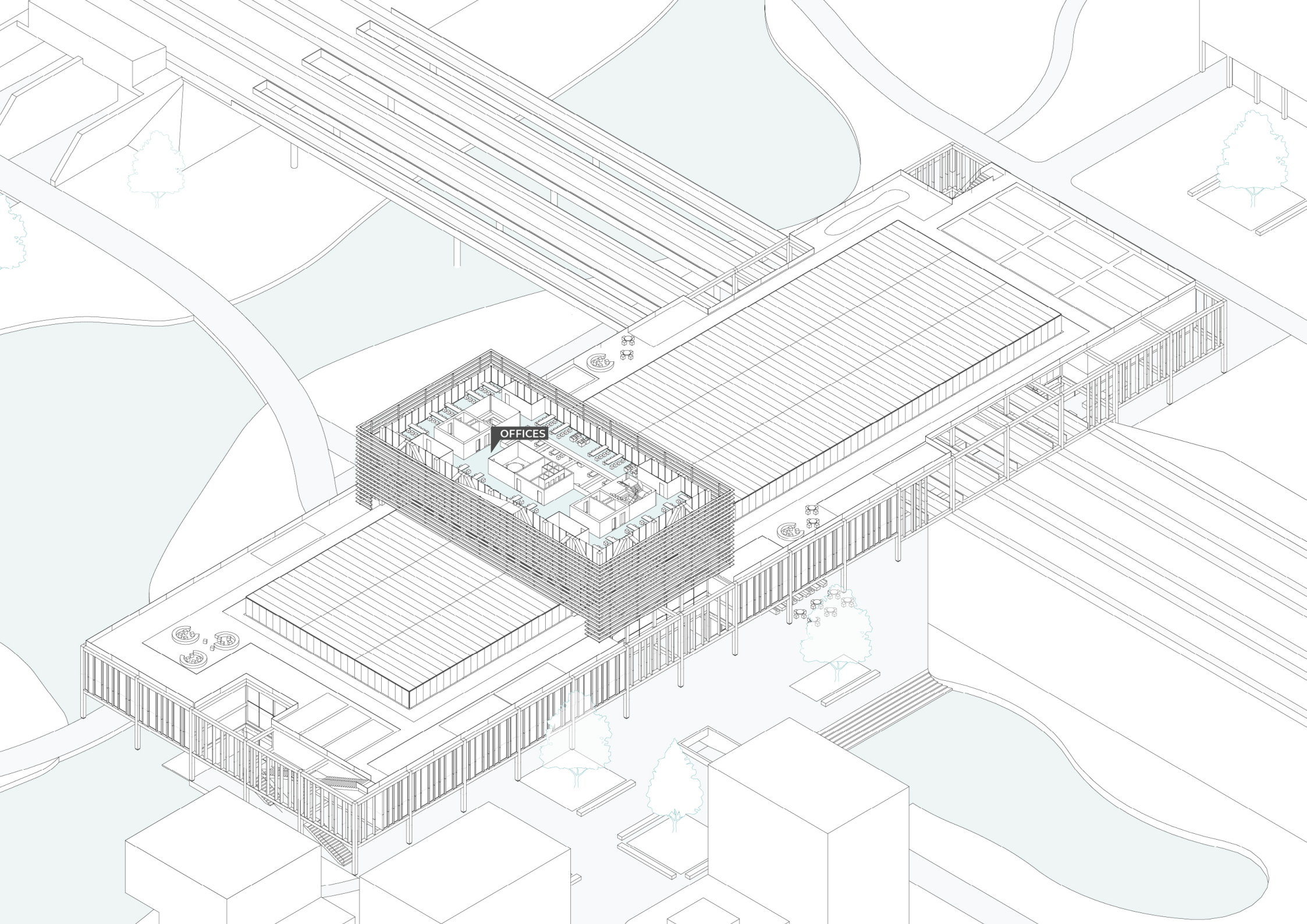


MEETING SPACE

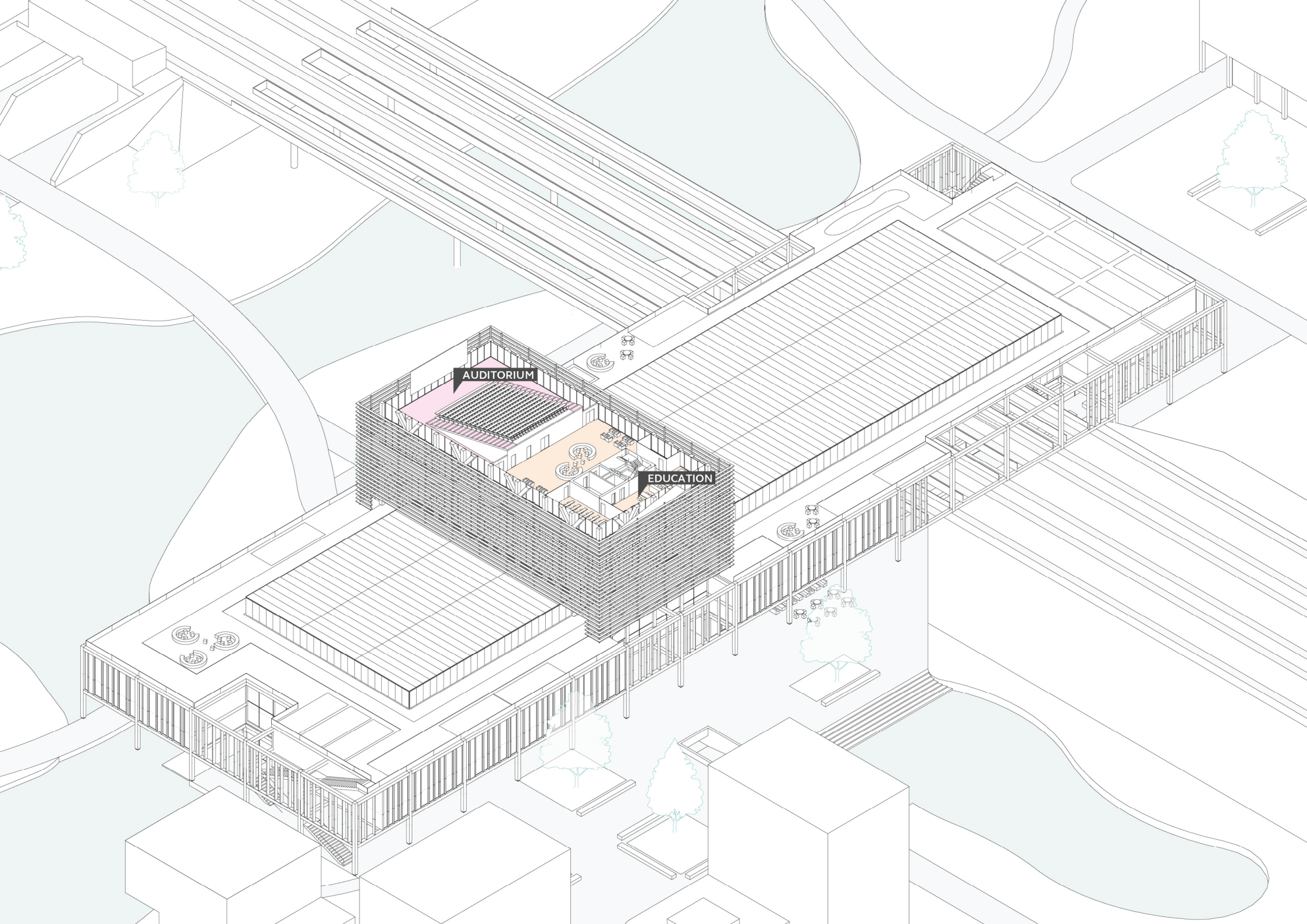
TRADE OFFICE

URBAN FARMING



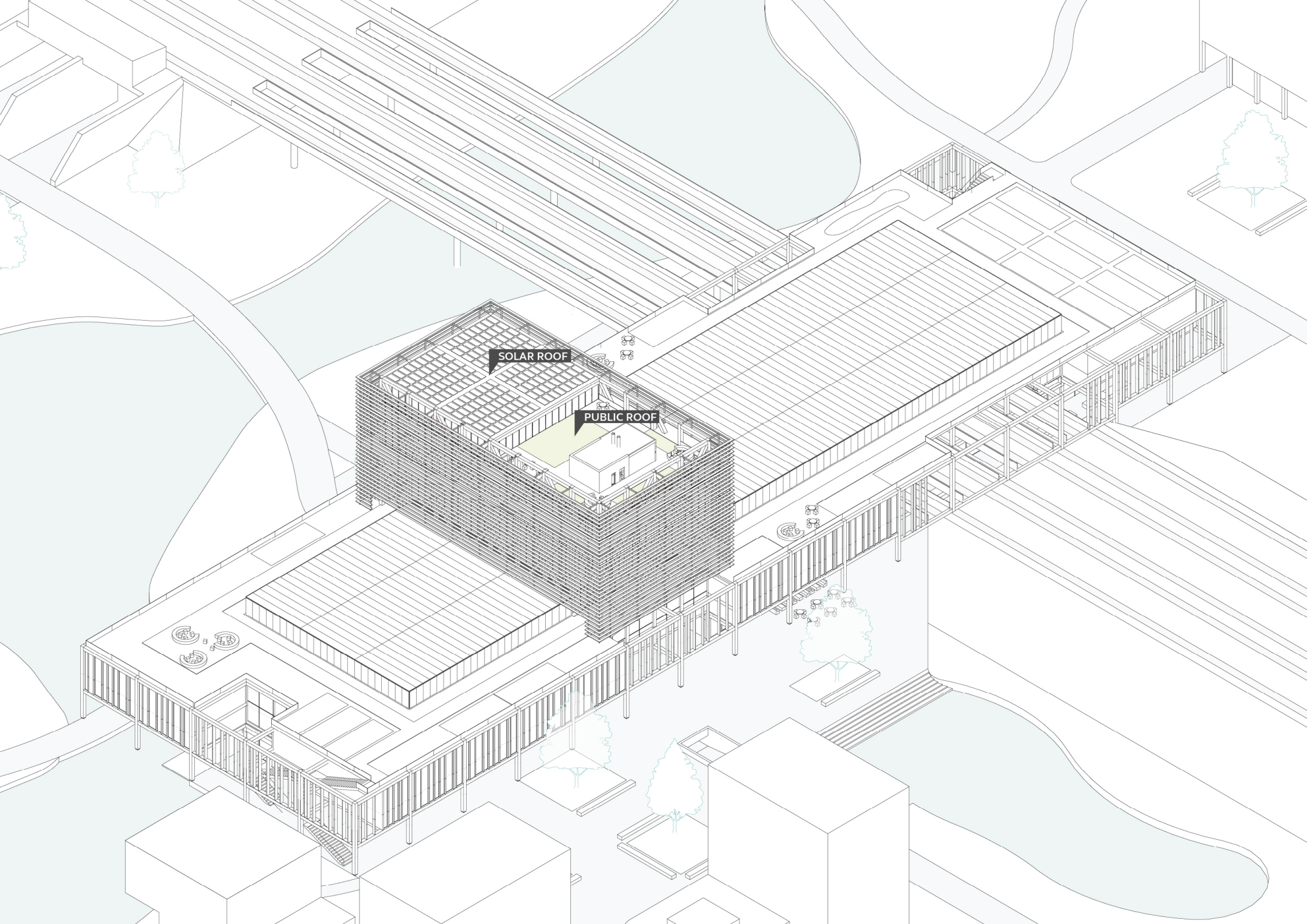


OFFICES



AUDITORIUM

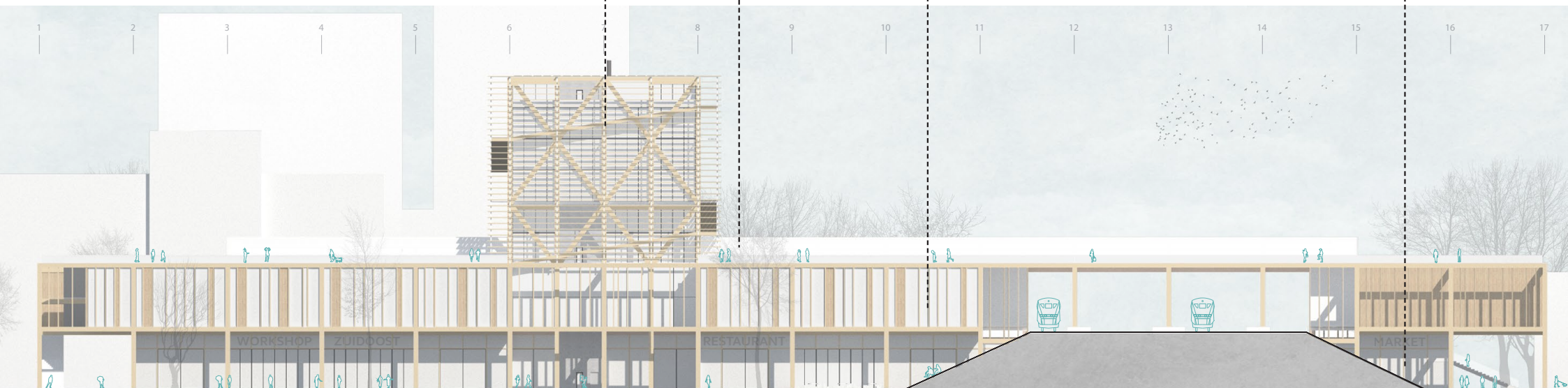
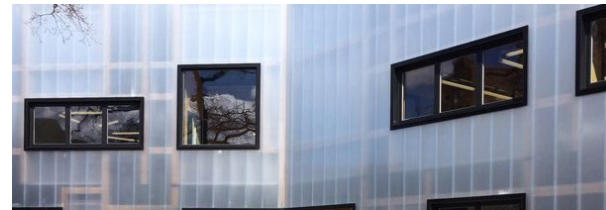
EDUCATION



SOLAR ROOF

PUBLIC ROOF

FACADE PRINCIPLE





AMSTEL III

RECYCLING RESTAURANT



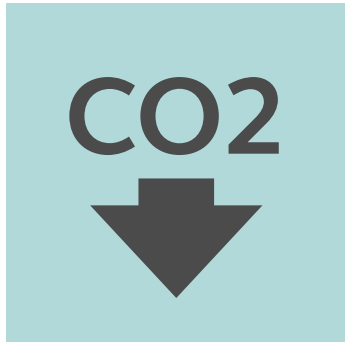


ZUIDOOST MARKET



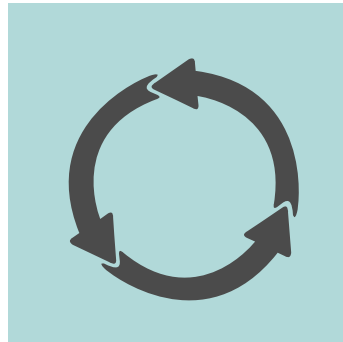
UPCYCLING CENTRE
DETAILING

WOODEN CONSTRUCTION



Storage

instead of emitting CO2 by production, like concrete and steel



Renewable

Wood can regrow, creating new carbon storage, oxygen generation and forest habitat



Reuse

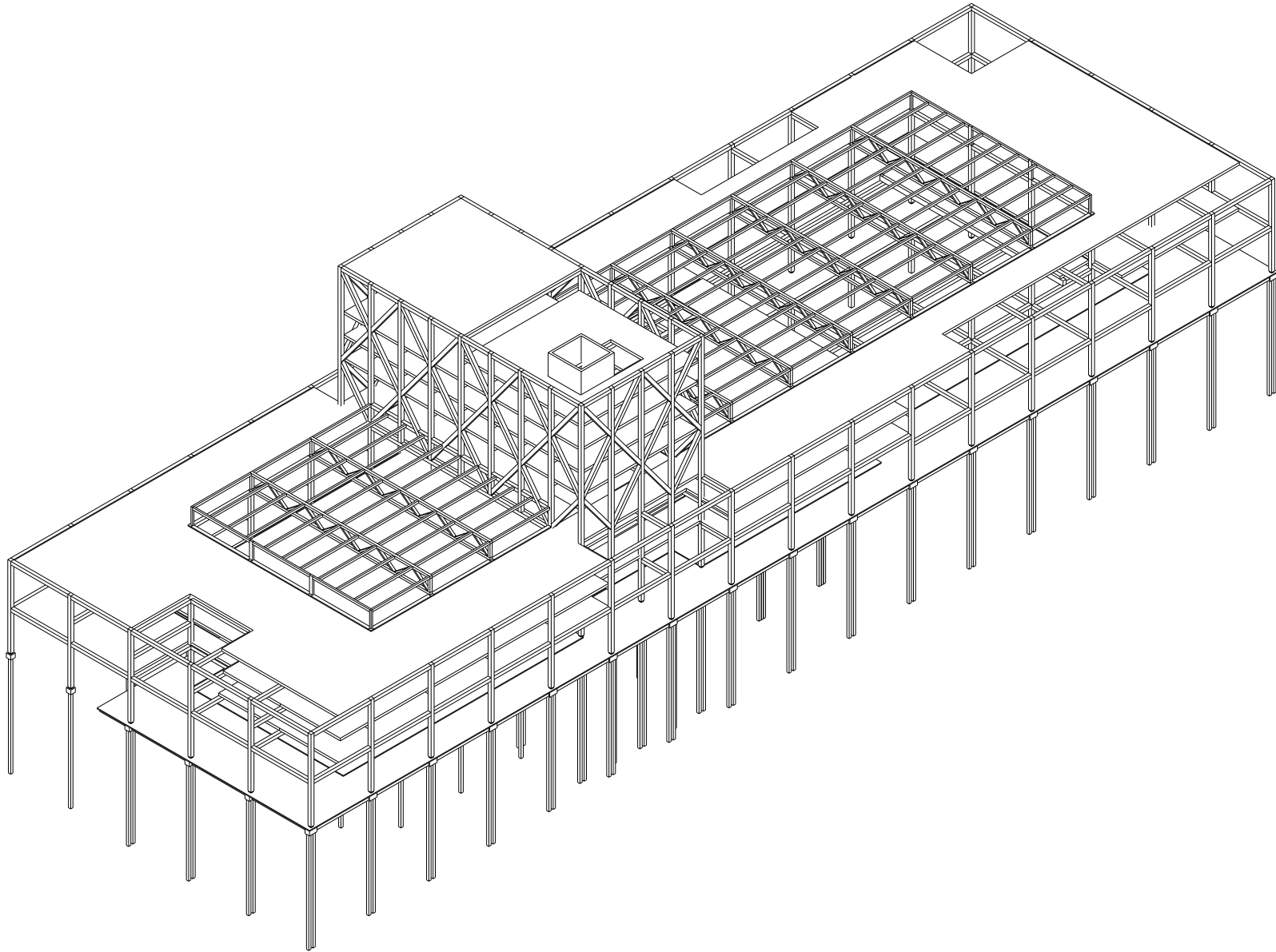
possibilities when constructed in the right way



Well being

lowering blood pressure and heart rates, reducing stress and increasing positive social interactions

THE CONSTRUCTION

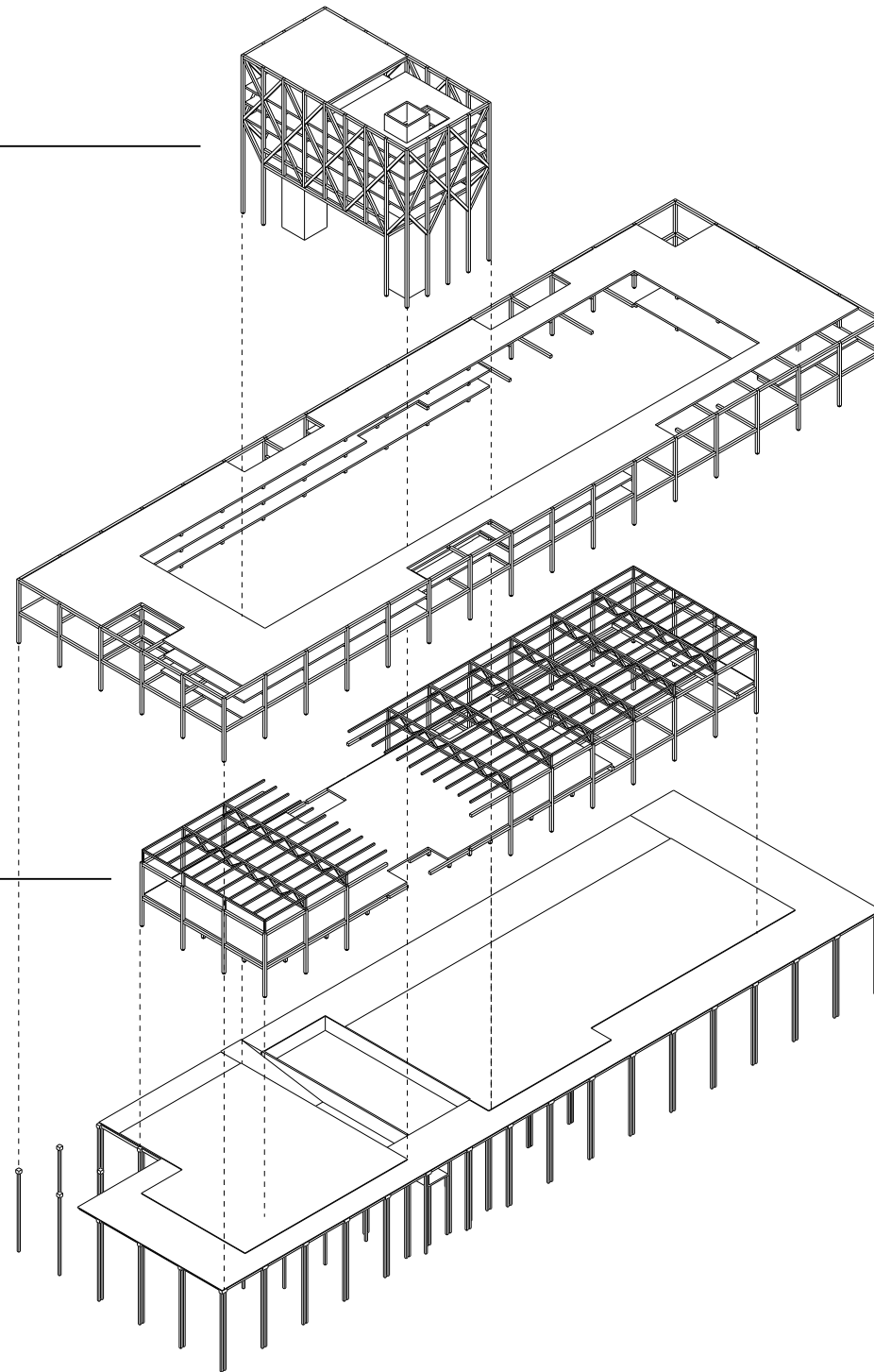


OPERATOR:
GLULAM COLUMNS
CROSS-BRACED
CLT CORE

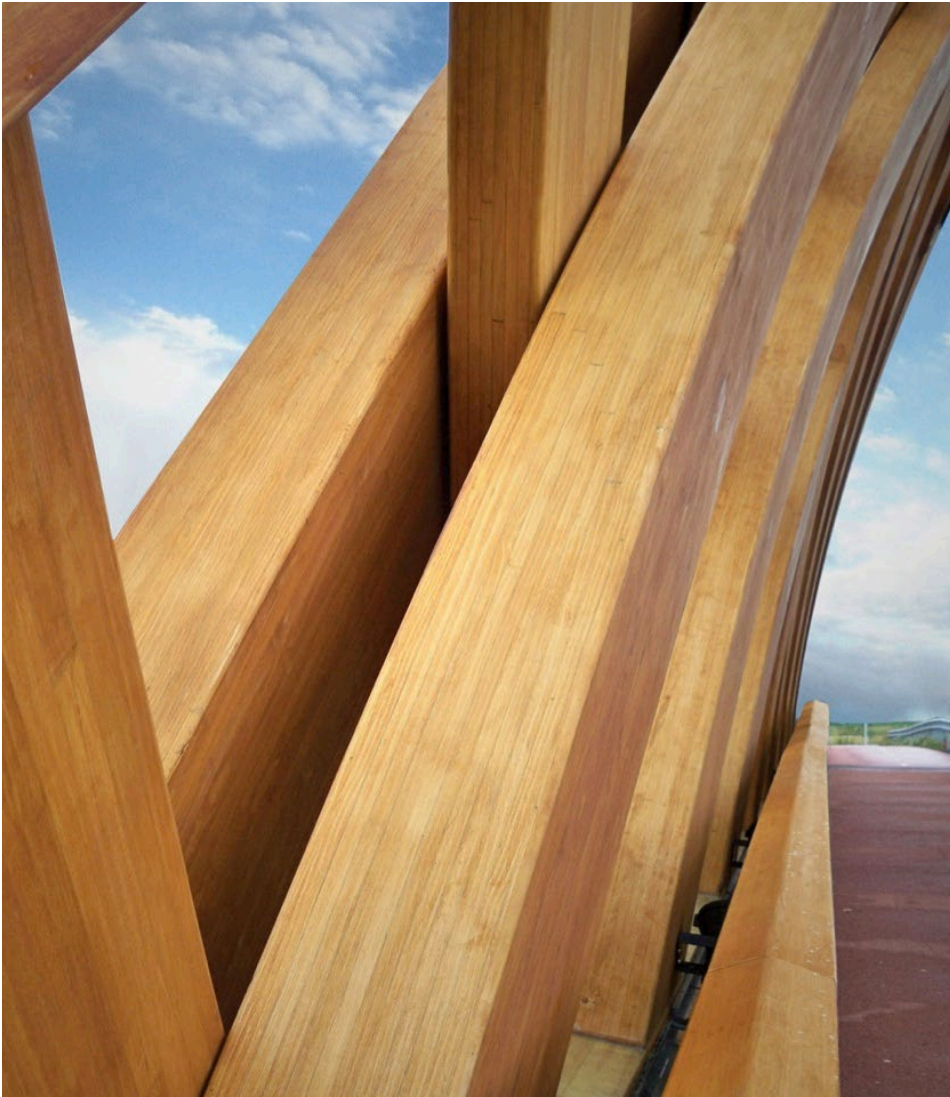
MAKER:
CLT FLOORS
GLULAM COLUMNS

MACHINE:
LVL BEECH TRUSSES
GLULAM COLUMNS

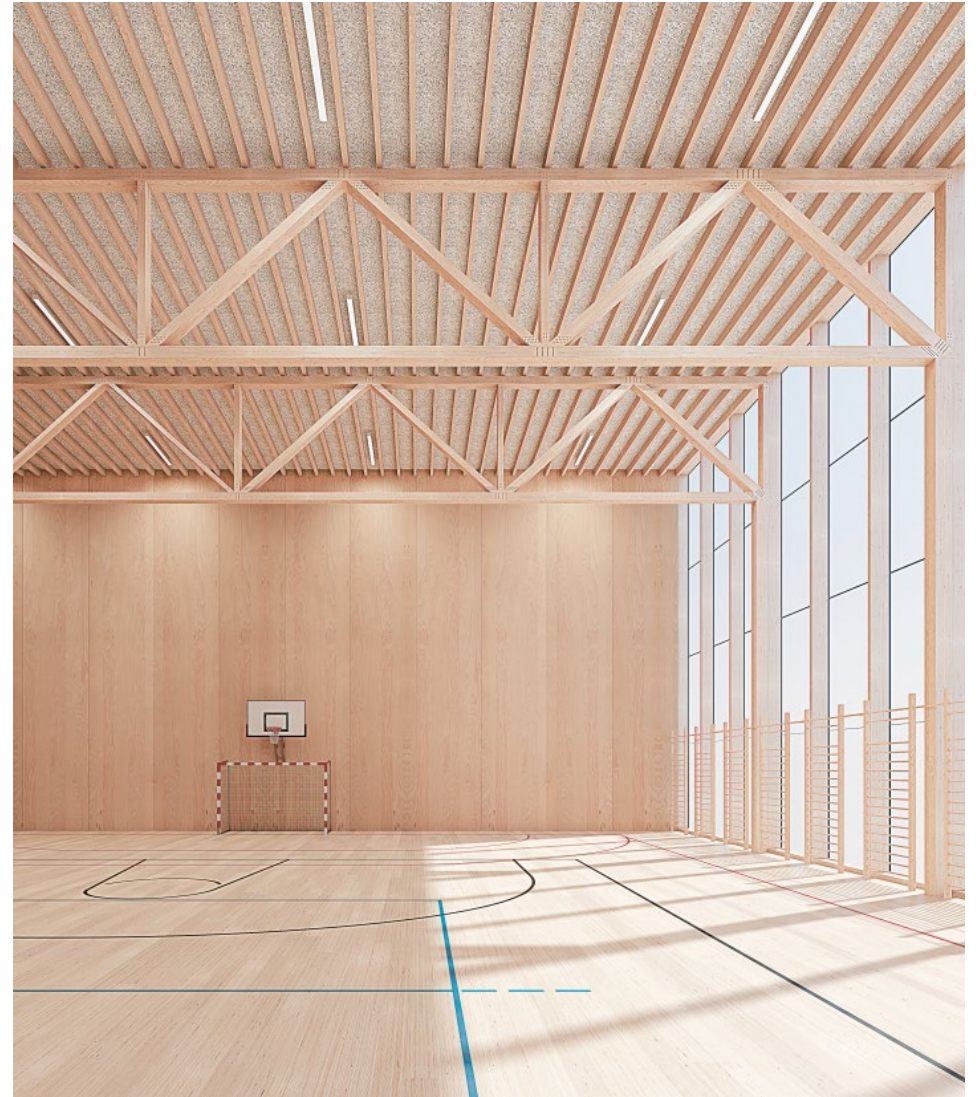
FOUNDATION:
CONCRETE FLOOR
ENERGY PILES



WOOD TYPES

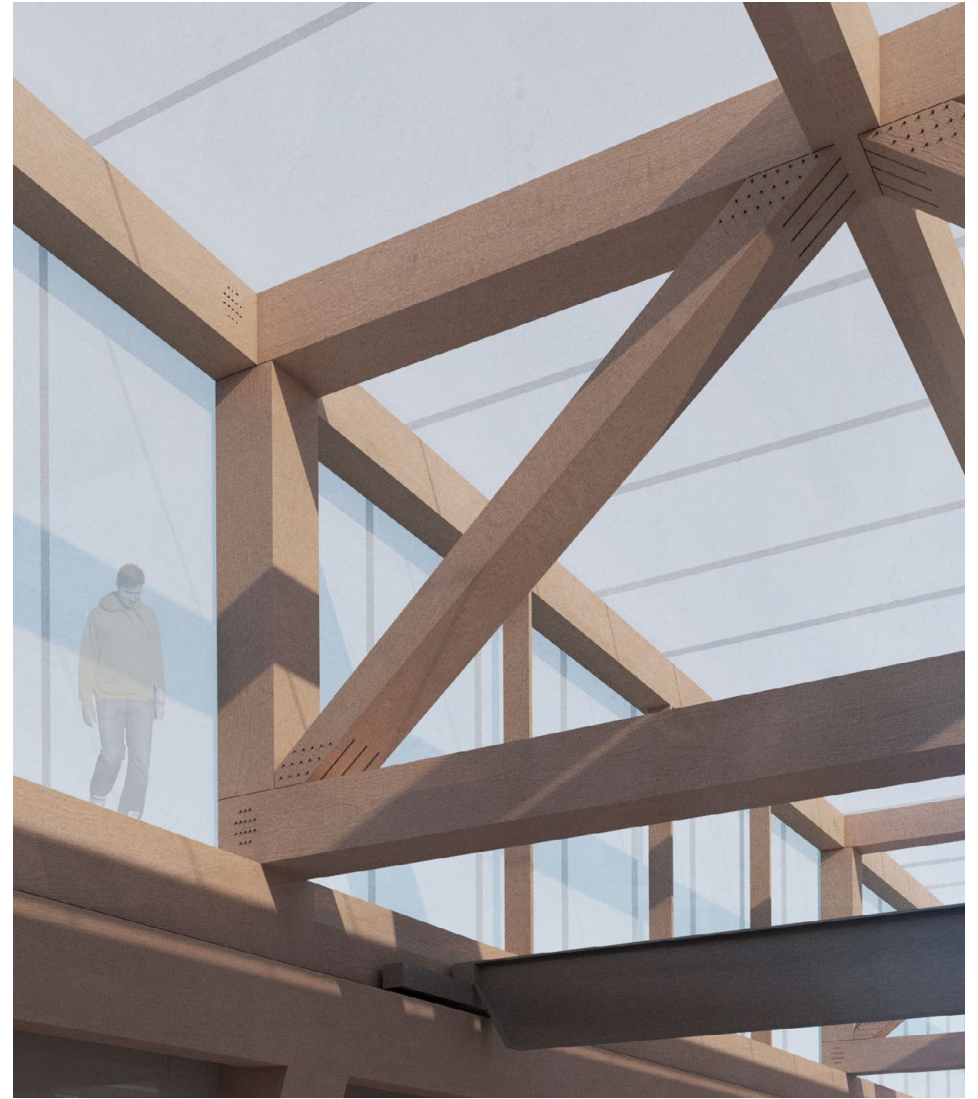


Source: Courtesy of Achterbosch Architectuur and Onix



Source: Pollmeier <https://www.pollmeier.com/nl/onze-producten/baubuche/baubuche-plaat.html>

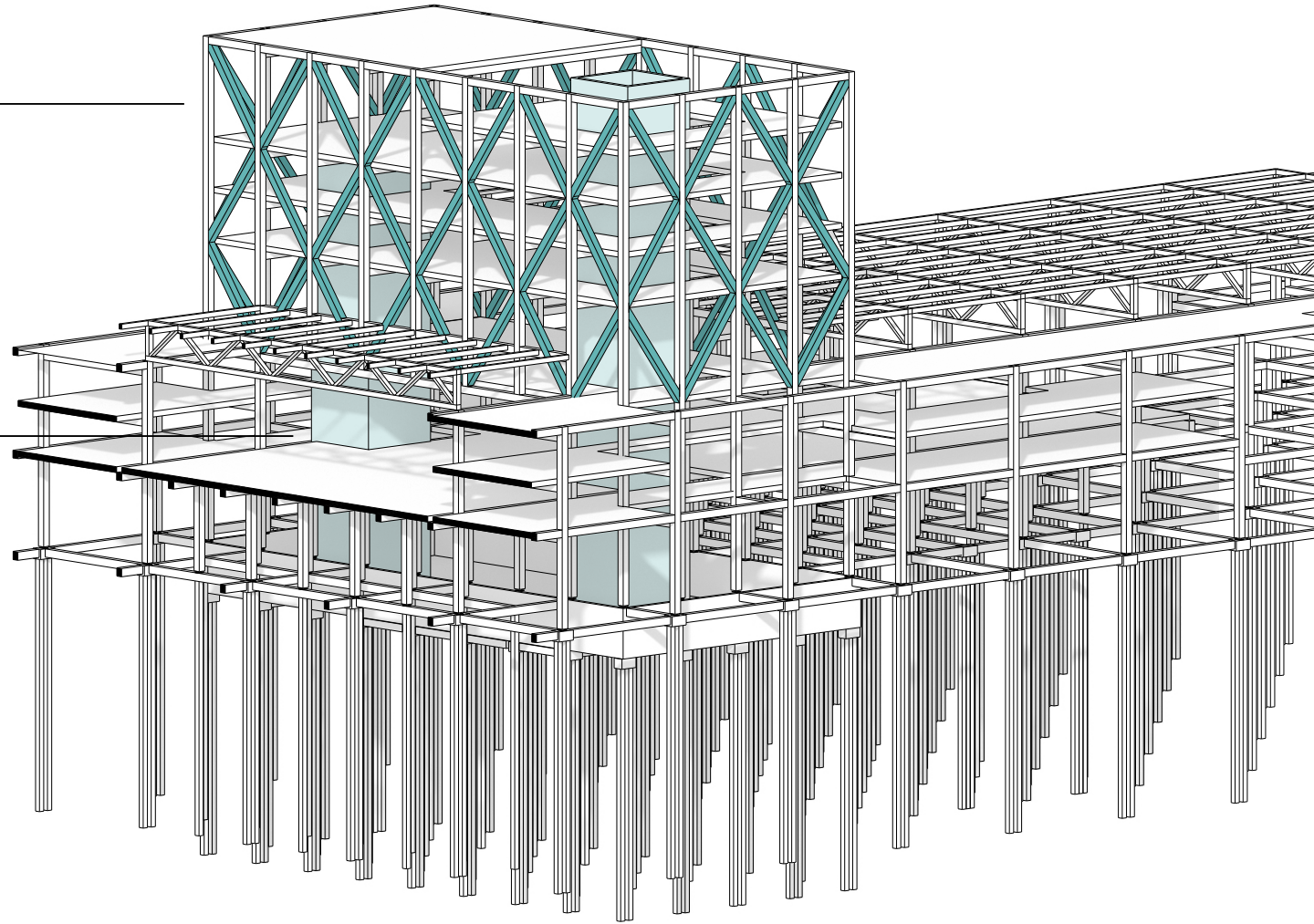
WOOD TYPES

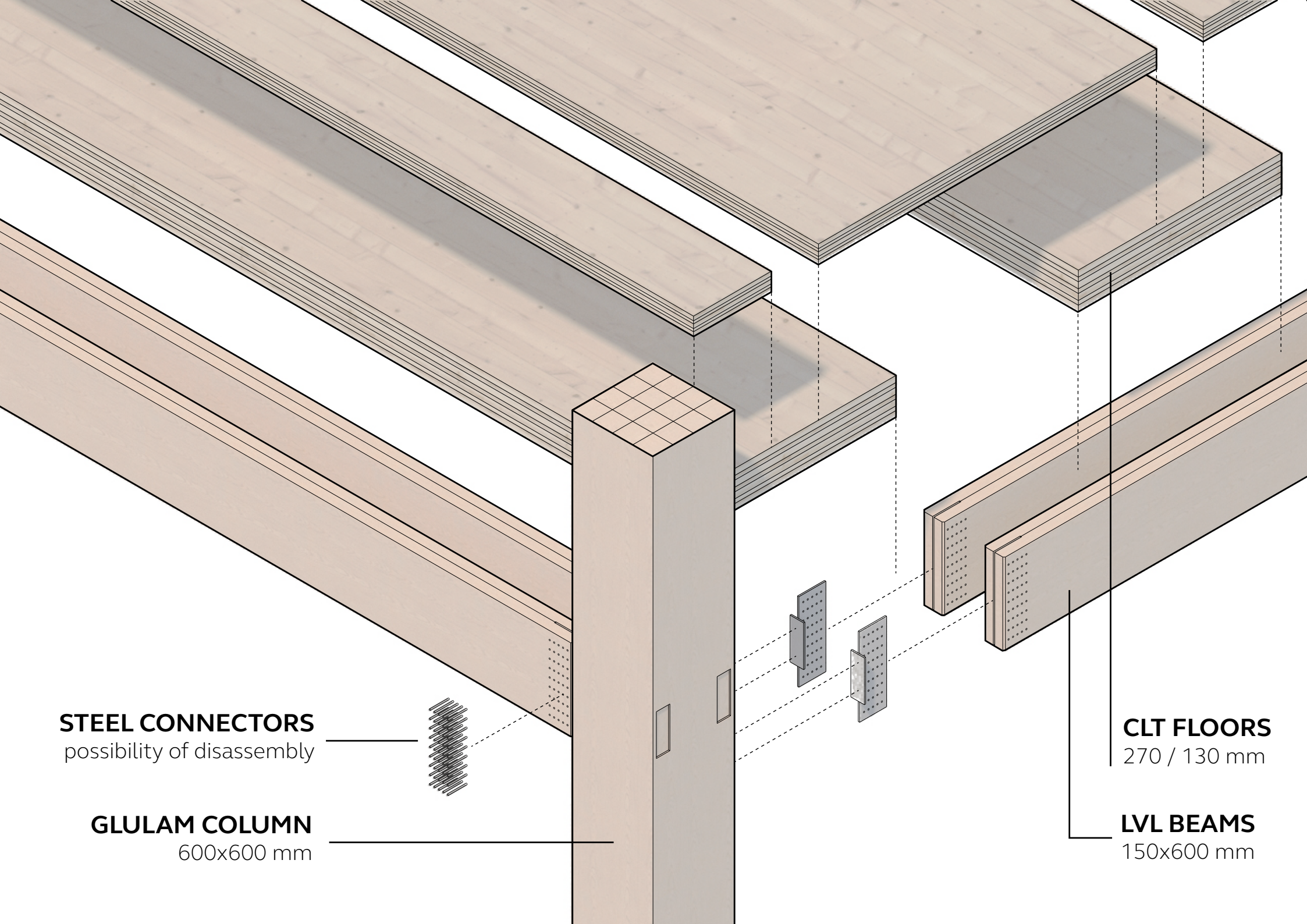


STABILITY

CROSS-BRACED CONSTRUCTION
TO WITHSTAND LATERAL FORCES

BUILDING CORES
TO WITHSTAND
LATERAL FORCES





STEEL CONNECTORS
possibility of disassembly

GLULAM COLUMN
600x600 mm

CLT FLOORS
270 / 130 mm

LVL BEAMS
150x600 mm

REUSE OF WOOD



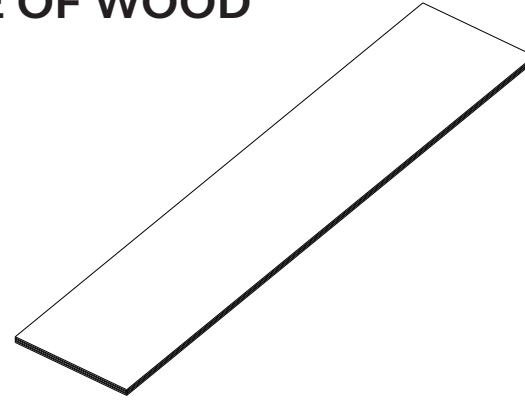
2,300 m

Glulam Column
Pinus Radiata
600x600 mm



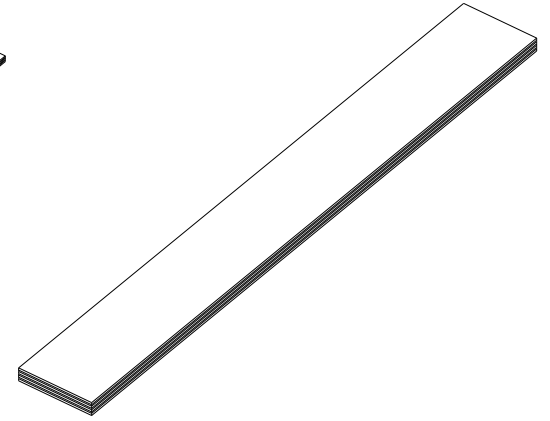
2,000 m

Glulam Column
Beech
600x600 mm



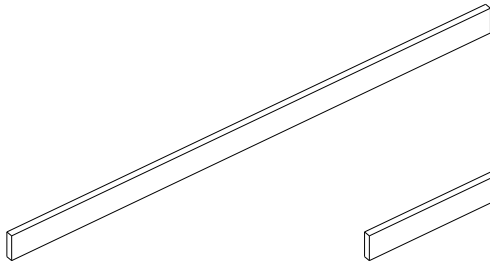
19,000 m²

CLT Floor
130 mm



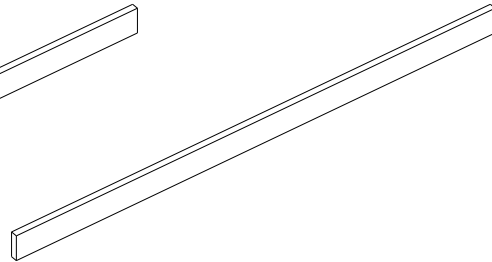
8,500 m²

CLT Floor
270 mm



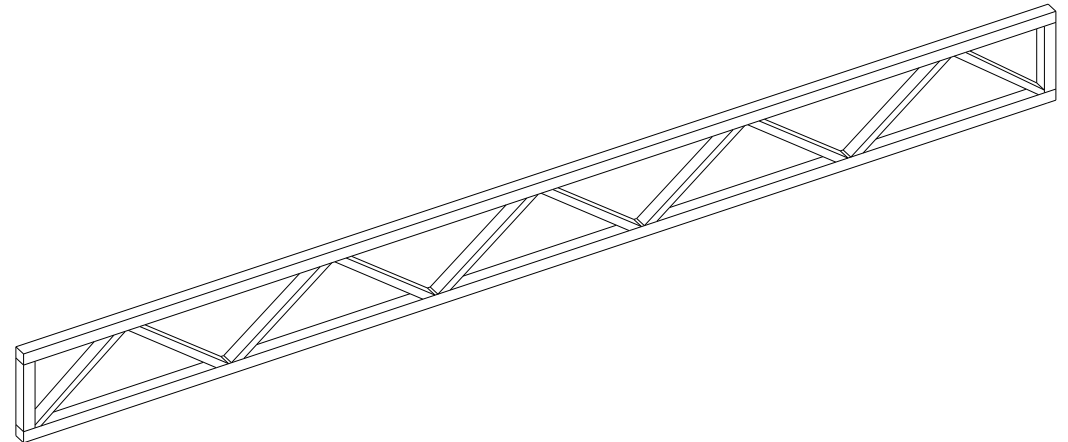
2,000 m

LVL Beam
Pinus Radiata
150x600 mm



1,400 m

LVL Beam
Beech
150x600 mm



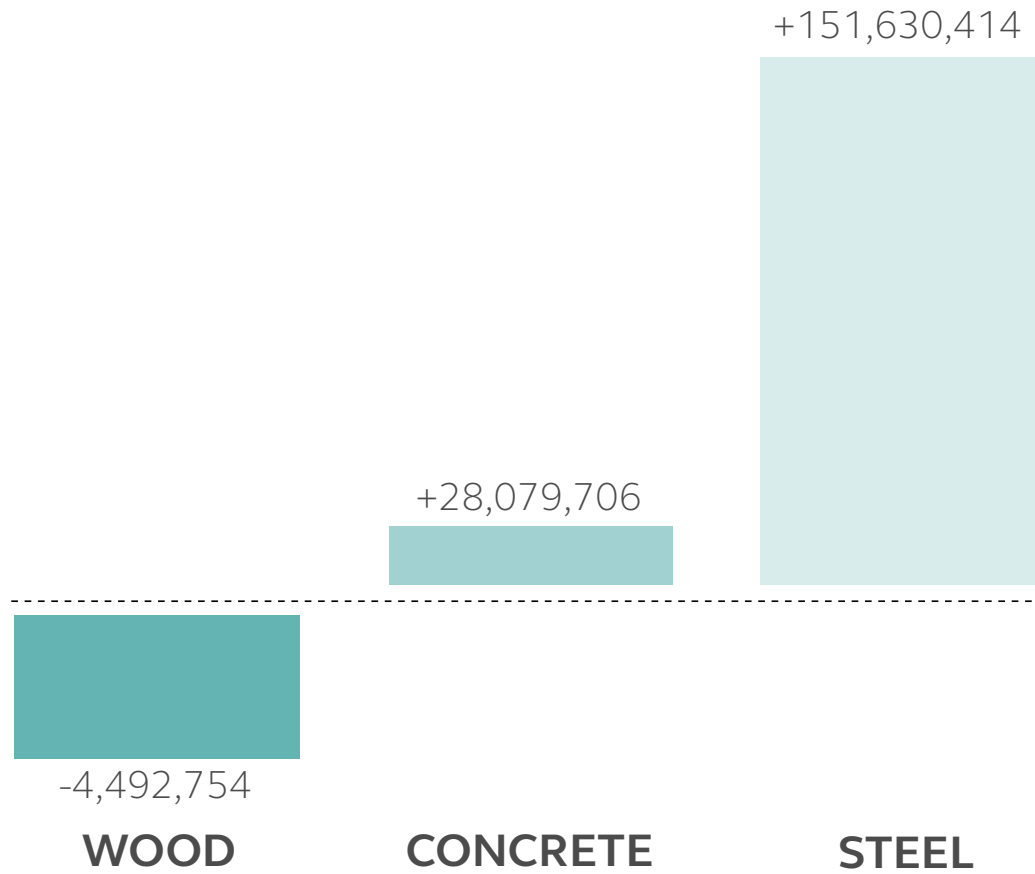
9 pcs

LVL Beam
36 m

BUILDING = RAW MATERIALS DEPOT

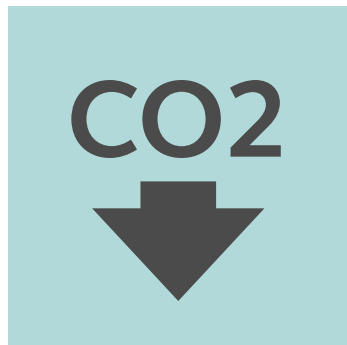


CO2 REDUCTION



Comparison of net emissions of CO2 for various materials (KG)

CO2 REDUCTION



4,500

KG tons of stored CO2
in the wood of the
Upcycling centre



5.5 min

Time it takes for the
European forests to
produce this amount of
wood



5,000

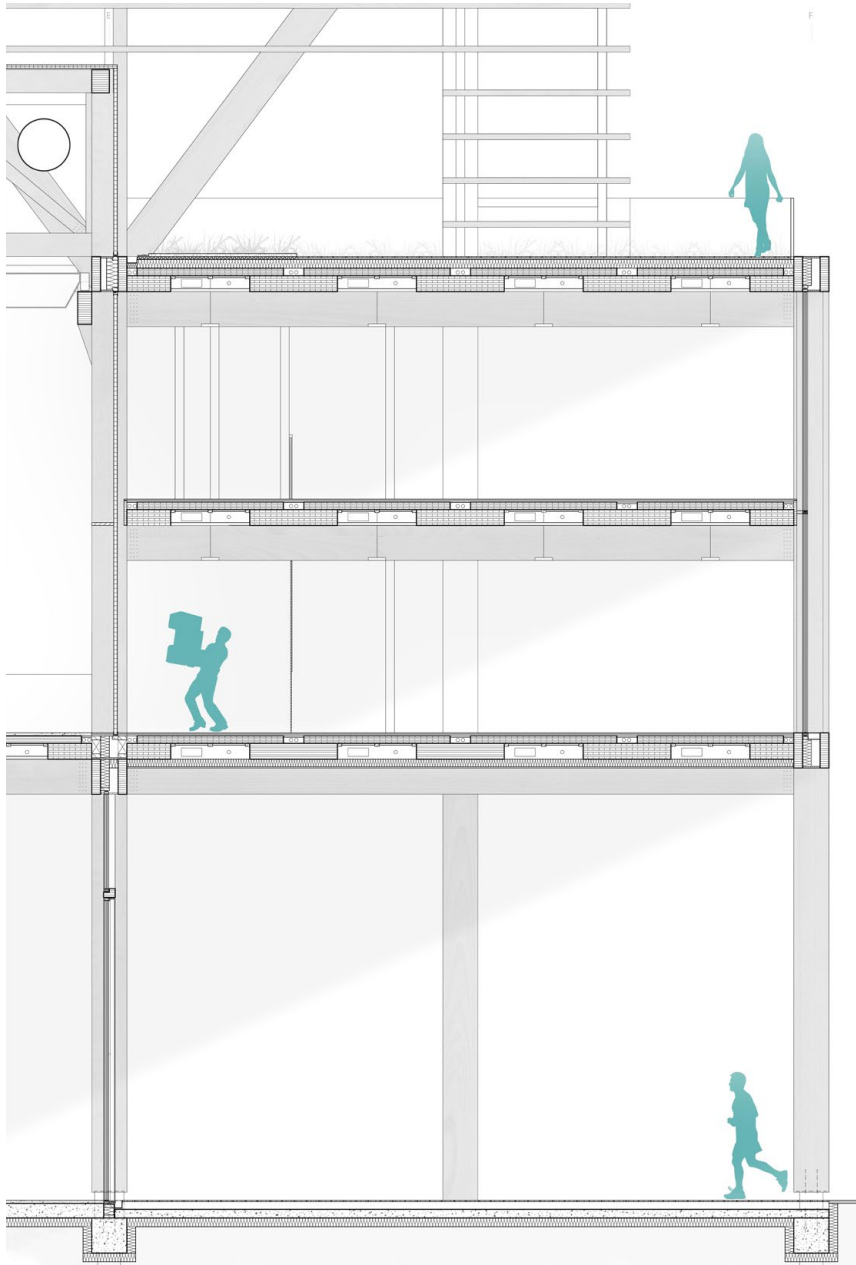
households produce
the same amount
of CO2 with energy
consumption each year



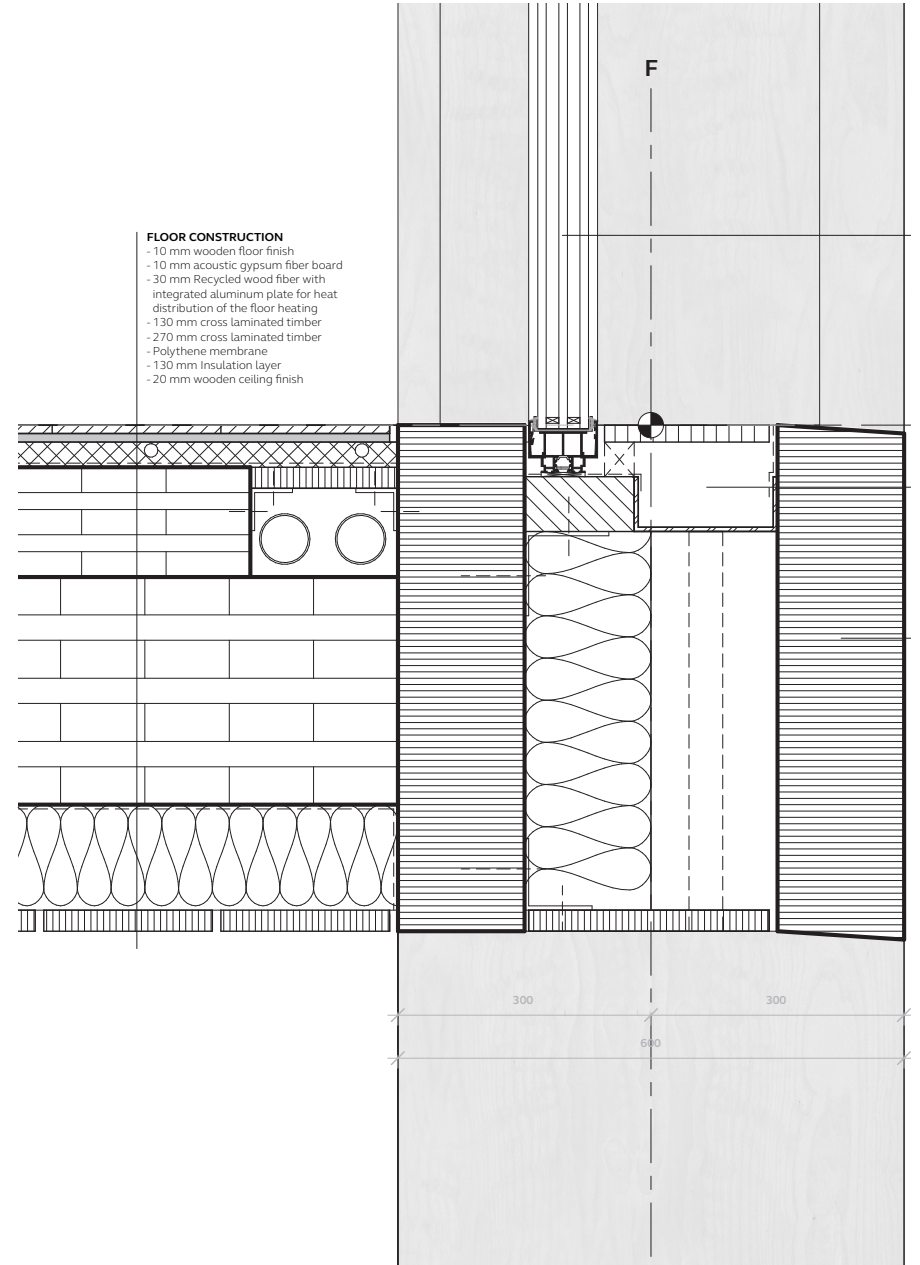
2,900

cars produce the
same amount of CO2
emission each year in
the Netherlands

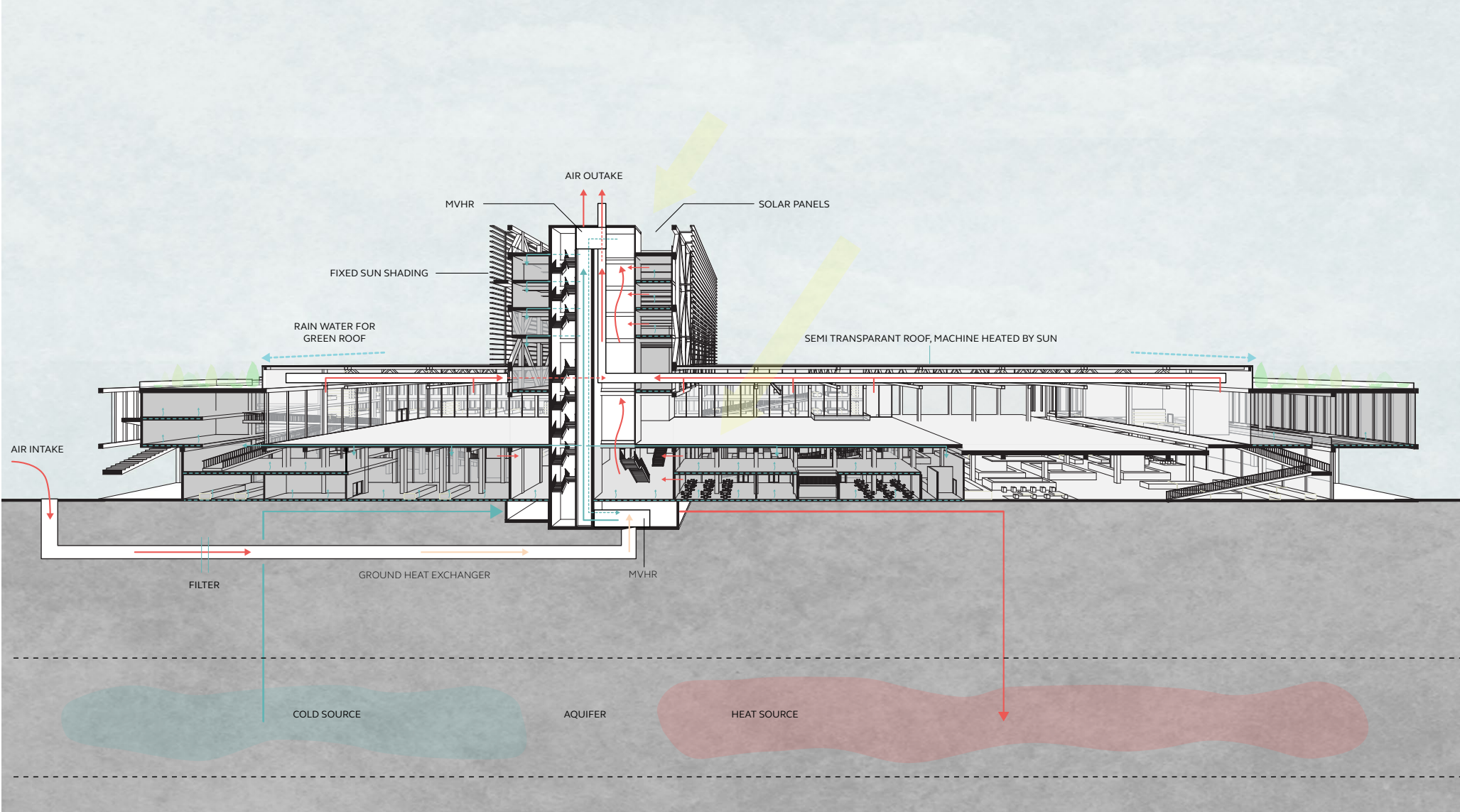
DAYLIGHT



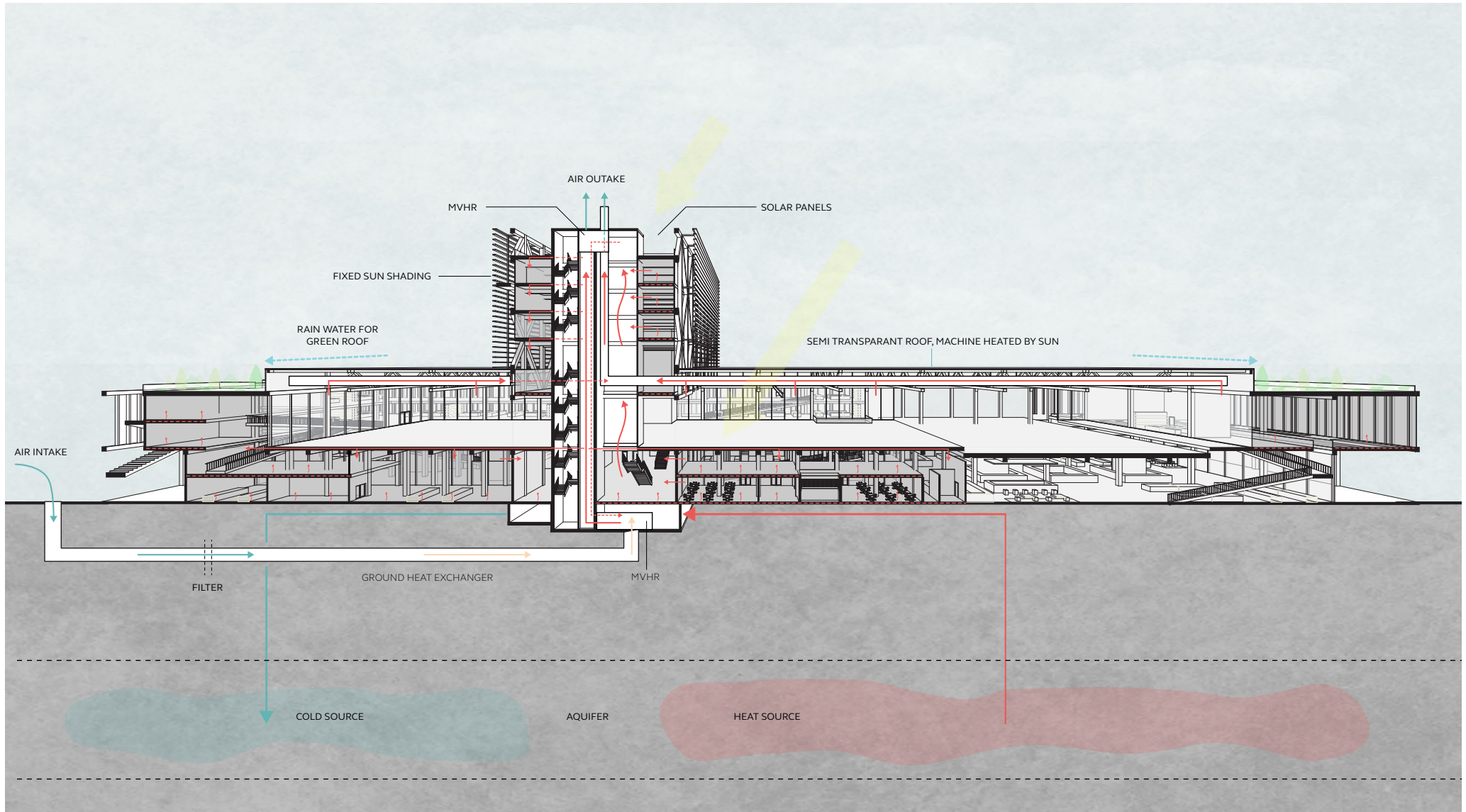
- FLOOR CONSTRUCTION**
- 10 mm wooden floor finish
 - 10 mm acoustic gypsum fiber board
 - 30 mm Recycled wood fiber with integrated aluminum plate for heat distribution of the floor heating
 - 130 mm cross laminated timber
 - 270 mm cross laminated timber
 - Polythene membrane
 - 130 mm insulation layer
 - 20 mm wooden ceiling finish



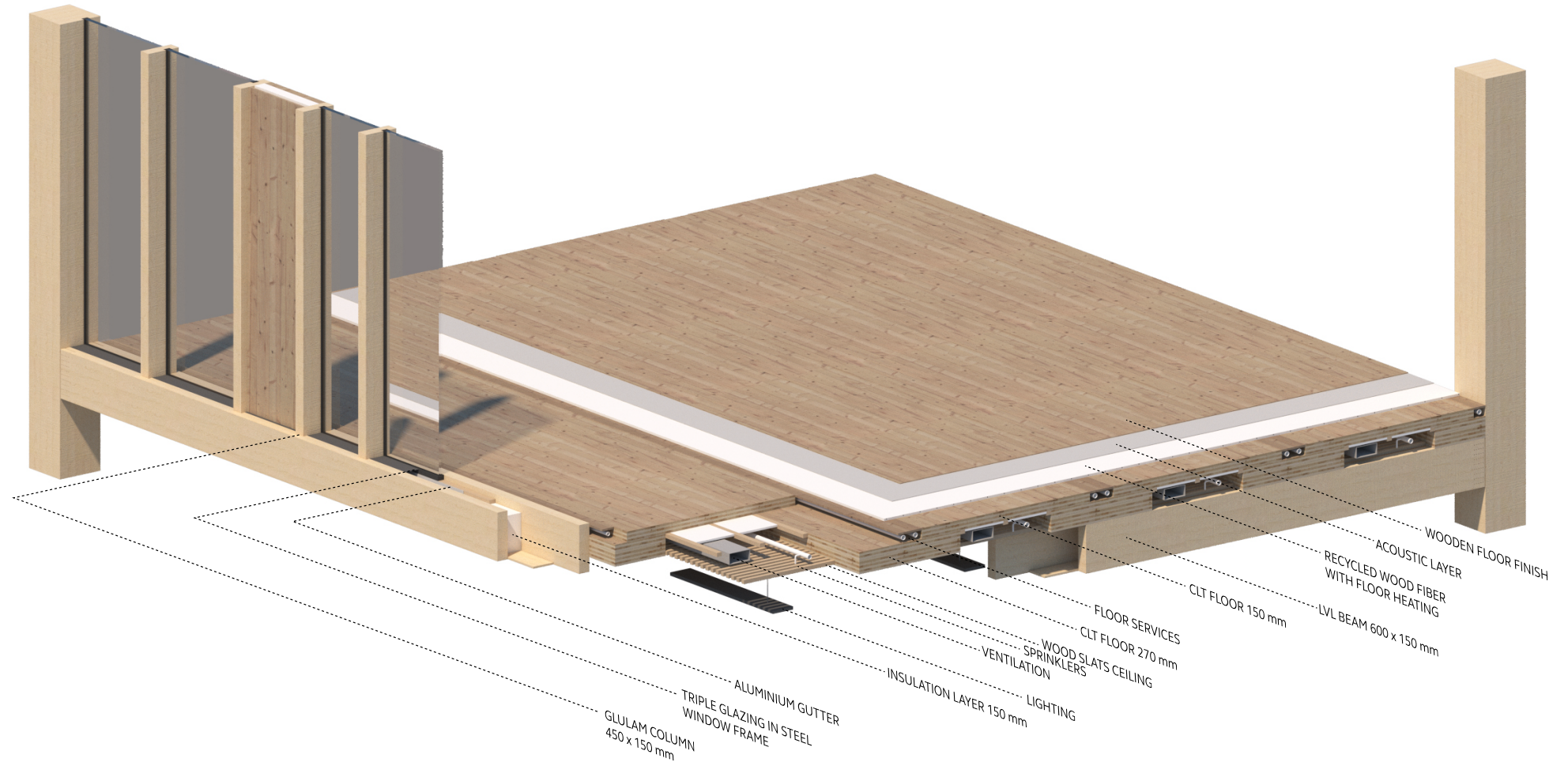
CLIMATE SUMMER



CLIMATE WINTER



INSTALLATIONS

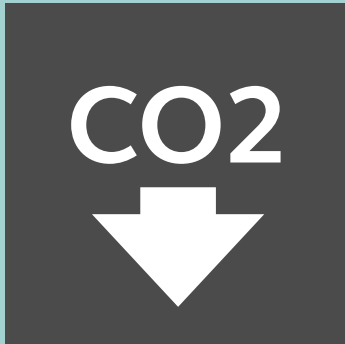


UPCYCLING CENTRE

ZUIDOOST

→ *FROM WASTE TO RESOURCE*

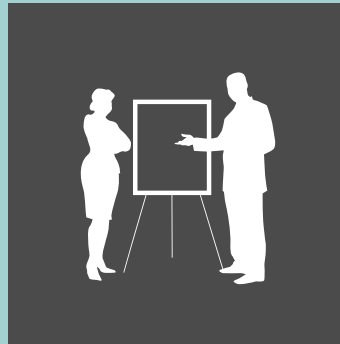
CONCLUSION



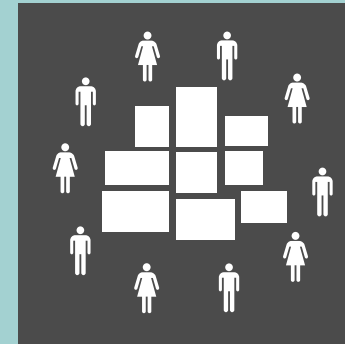
Climate goals



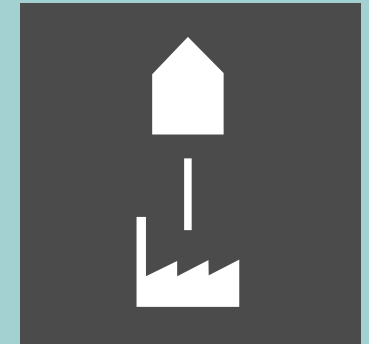
Waste as a resource



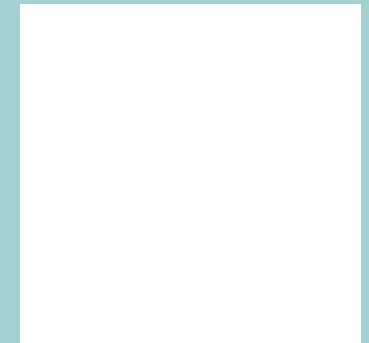
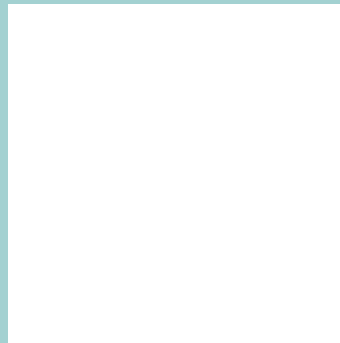
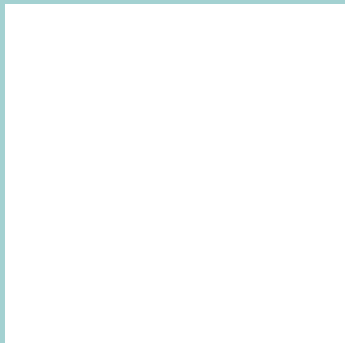
Opportunities in work and investment



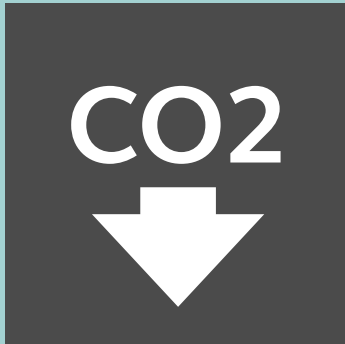
Social inclusion and interaction



Connecting the areas



CONCLUSION



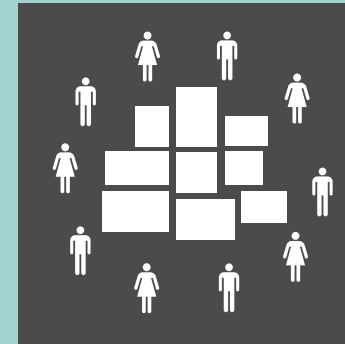
Climate goals



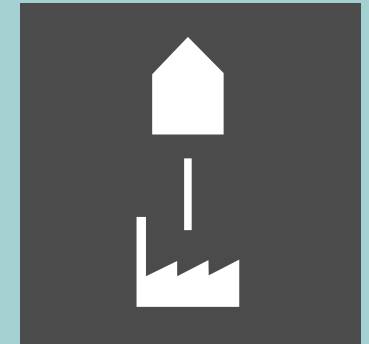
Waste as a resource



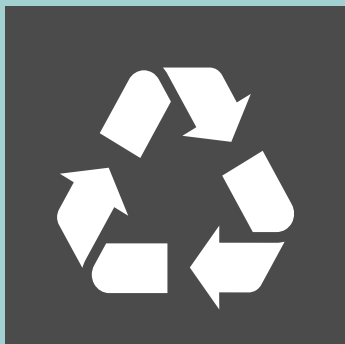
Opportunities in work and investment



Social inclusion and interaction



Connecting the areas



New decentralized upcycling centre typology



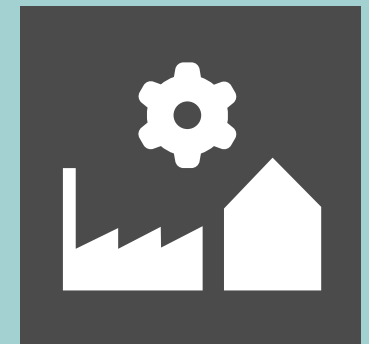
Providing space to create and sell new products



Social entrepreneurial work environment



Low profile meeting space



Synergy of the two sides

UPCYCLING CENTRE **ZUIDOOST**

→ FROM WASTE TO RESOURCE