

2022.09.01

AR SCAPE.

Pioneering Inclusive and Flexible PHYGITAL
Spaces in the Digital Era

2023.06.22



I Background

- 1 Context
- 2 Motivation
- 3 Introduction to AR



Context.

Digital Transition



Urbanization



SEGREGATION

0X Low-headed people
People in Japan are looking at their phones

<https://www.cna.com.tw/news/firstnews/201909120273.aspx>

EXCLUSIVE



0X Hudson Yards, NYC
An example of "place" being installed, rather than growing organically
Photo by Joe Shlabotnik, Flickr Commons

<https://www.pps.org/article/gentrification>

Spatial Segregation

&

Social Segregation

Augmented reality as an opportunity.



04 Pokémon Go
Turning Data Collection into a Game

<https://www.nextgov.com/emerging-tech/2020/06/pokemon-go-wants-make-3d-scans-whole-world-planet-scale-augmented-reality-experiences-good/166232/>



05 Pokémon Go players crowd a popular Pokéstop in Bern near the Kulturcasino.
Fred Shaerli/Wikimedia Commons (CC-BY-SA 4.0)

Motivation.

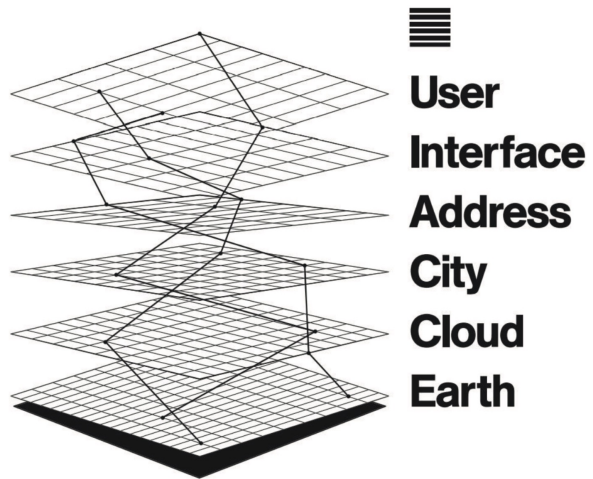


Problem



Low utilisation
2/7 open market

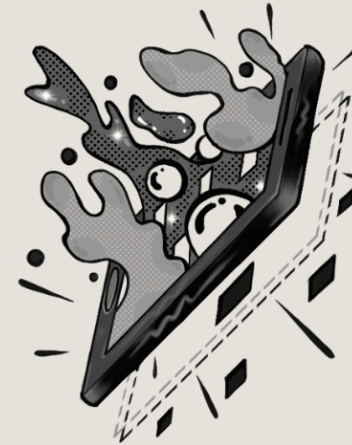
AR Applications



06 Conceptualization of the accidental megastructure of planetary computation, *The Stack: On Software and Sovereignty*

Bratton (2016)

○ Introduction



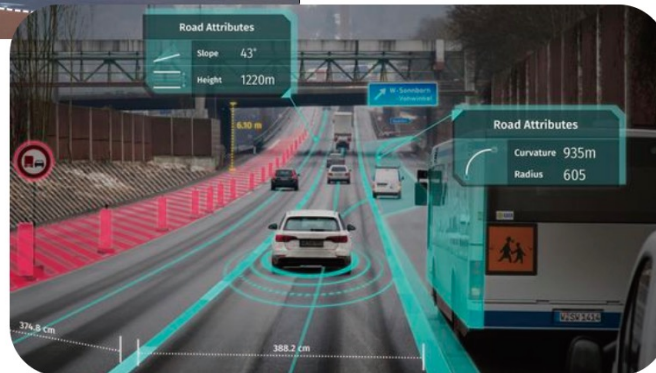
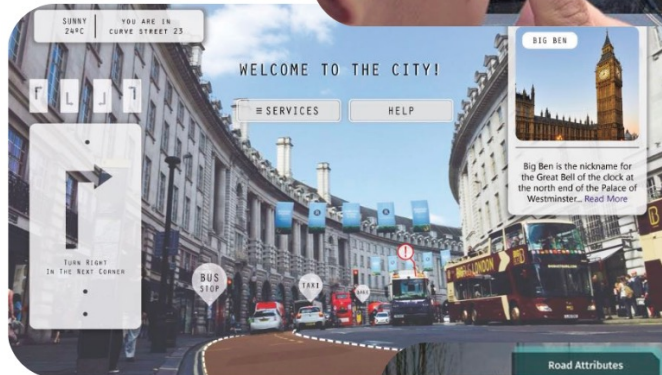
Augmented Reality

[*ög-'men-təd rē-'a-lə-tē*]

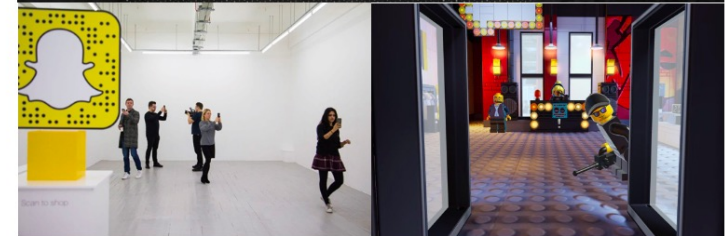
A type of technology that allows digital images and information to be displayed onto the physical environment.

 Investopedia

Travel & Tourism



Commercial & Retail



Culture and Heritage



Public Art





Hyper reality
—Keiichi Matsuda



'Ready Player One'
By Steven Spielberg

A threat or an opportunity ?

AR is the technique to combine digital world with physical environment.
**People's lives should not be dominated by technology,
but technology could be in their lives.**

Inclusive, accessible and diverse URBAN SPACE



II

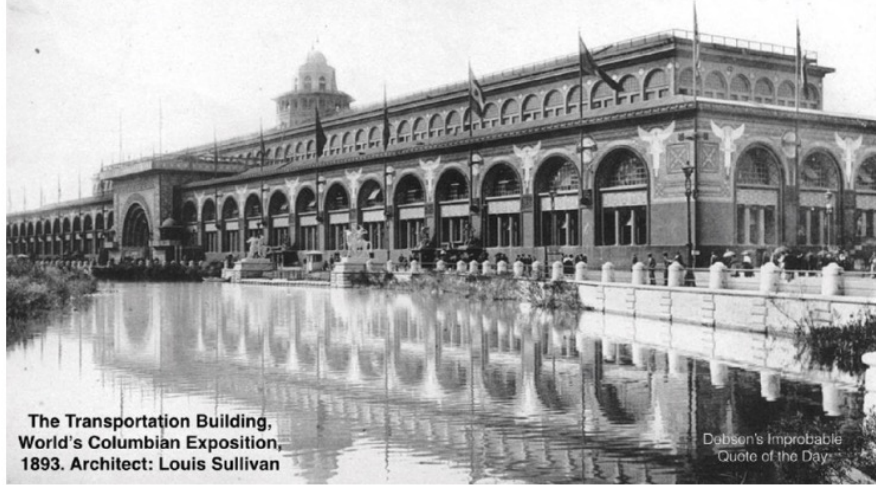
Research

- 1 Spatial transformation
- 2 Social consideration
- 3 Conceptual framework

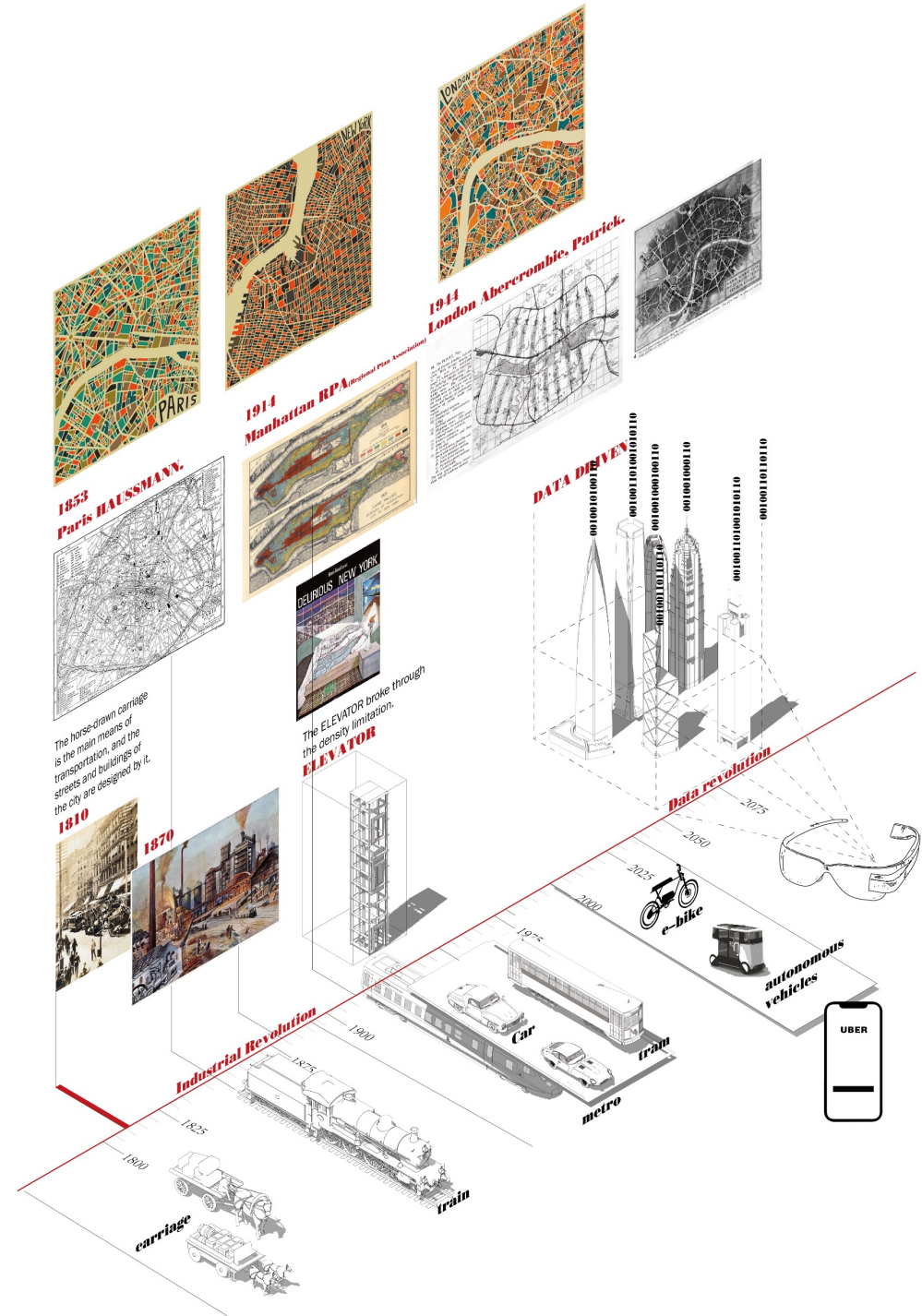
THE ELEMENTS OF A CITY KEVIN LYNCH



“Form ever follows function,
and that is the law.”
*Louis Sullivan, architect,
born September 3, 1856*

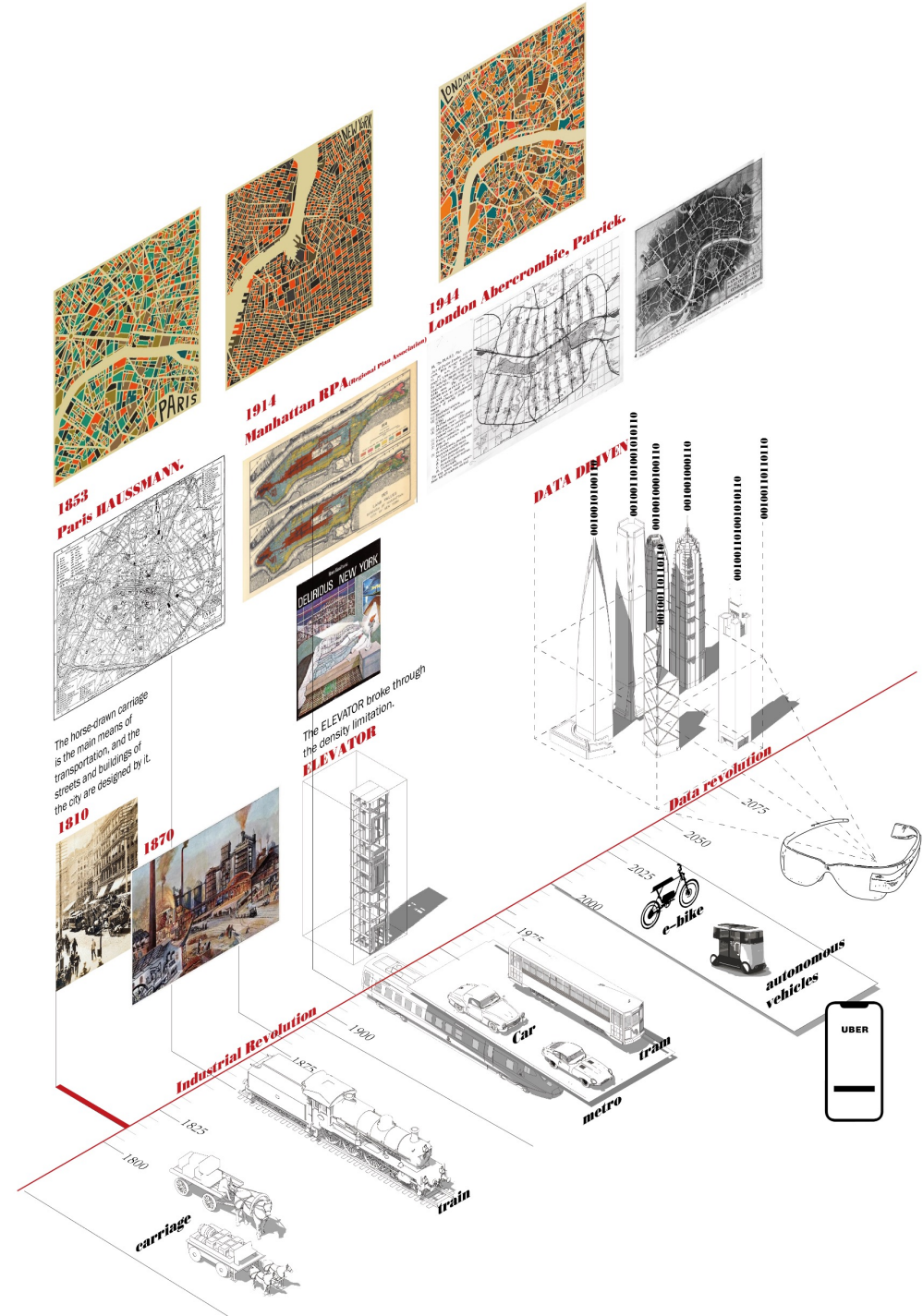


Spatial Transformation

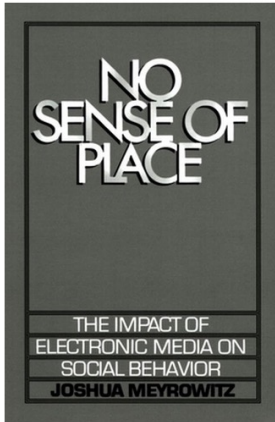




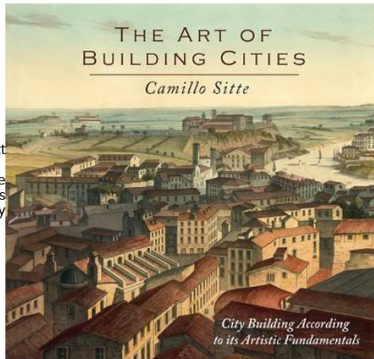
Spatial Transformation



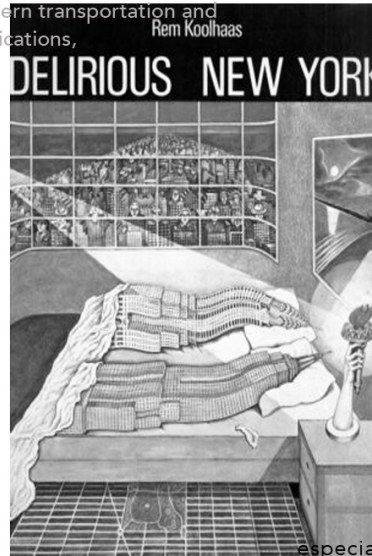
Social Considerations



Joshua Meyrowitz 1985 No Sense of Place: The Impact of Electronic Media on Social Behavior
The logic of scene behavior is closely related to the pattern of information flow, and the media reshapes social and material space by reconfiguring the way people send and receive social information.

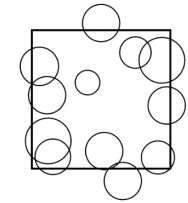


The idea of being able to design cities is based on unexamined philosophical assumptions, and modern transportation and communications,

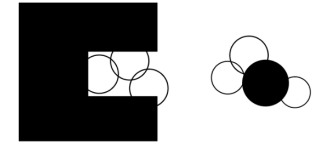


especially the Internet, have made traditional urban spaces a thing of the past.

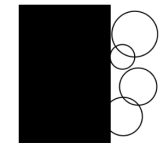
Boundary



Niche



Interface



Human interaction is no longer limited by geographical association and no longer has to be carried out in physical space. And the same situation is actual for human-space interaction.

Staying public space -- Jan Gehl

Social Considerations

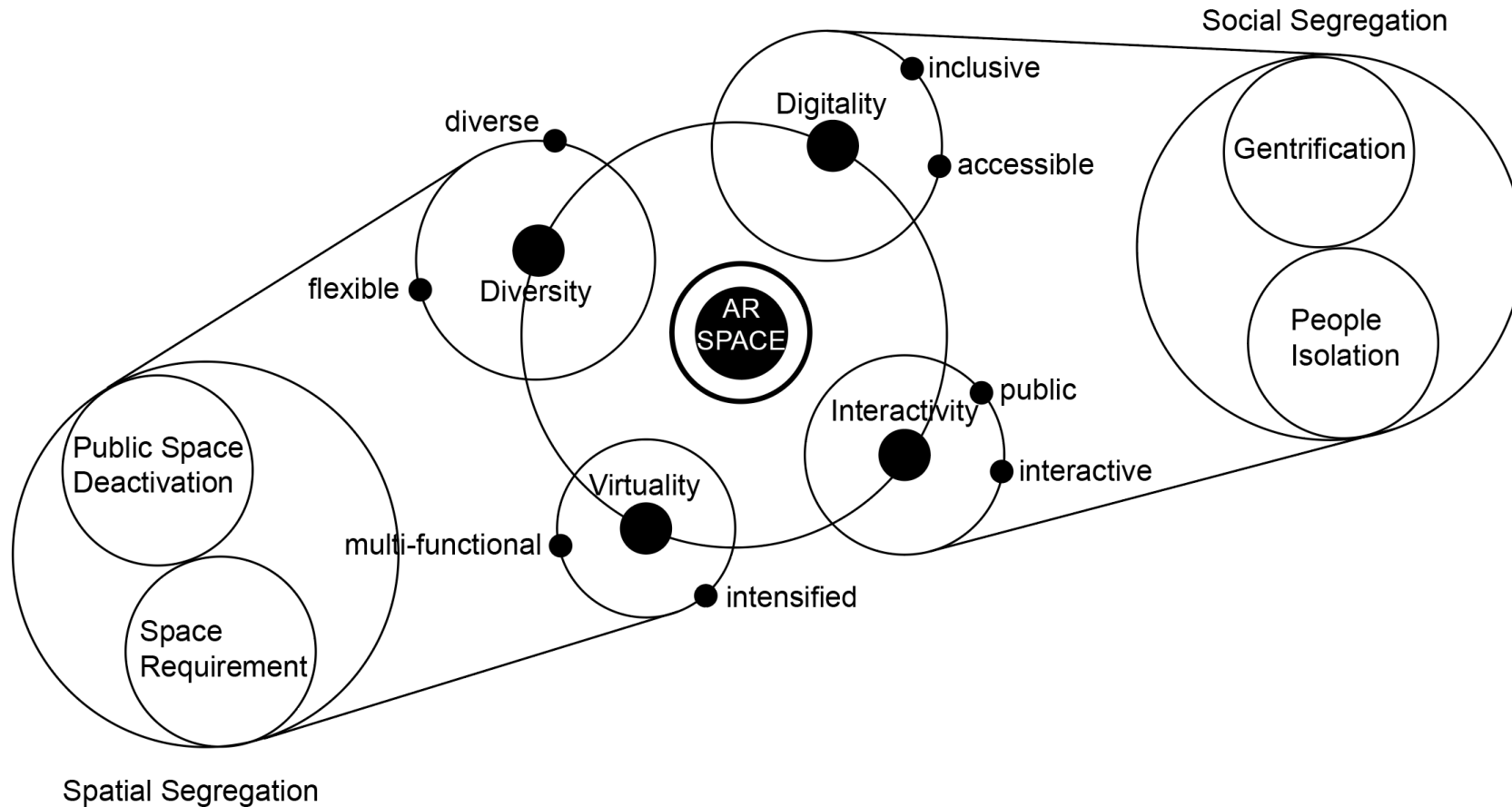


The emergence of shopping streets allows the combination of **public and commercial space**.

The presence of **brand and chain stores** exacerbates this issue eroding the uniqueness and diversity of the urban environment. Moreover, this corporate appropriation of space is often reinforced by architecture.

Public space is no longer a site of engagement and social interaction but rather a conduit for passive consumerism and economic voyeurism.

Conceptual framework



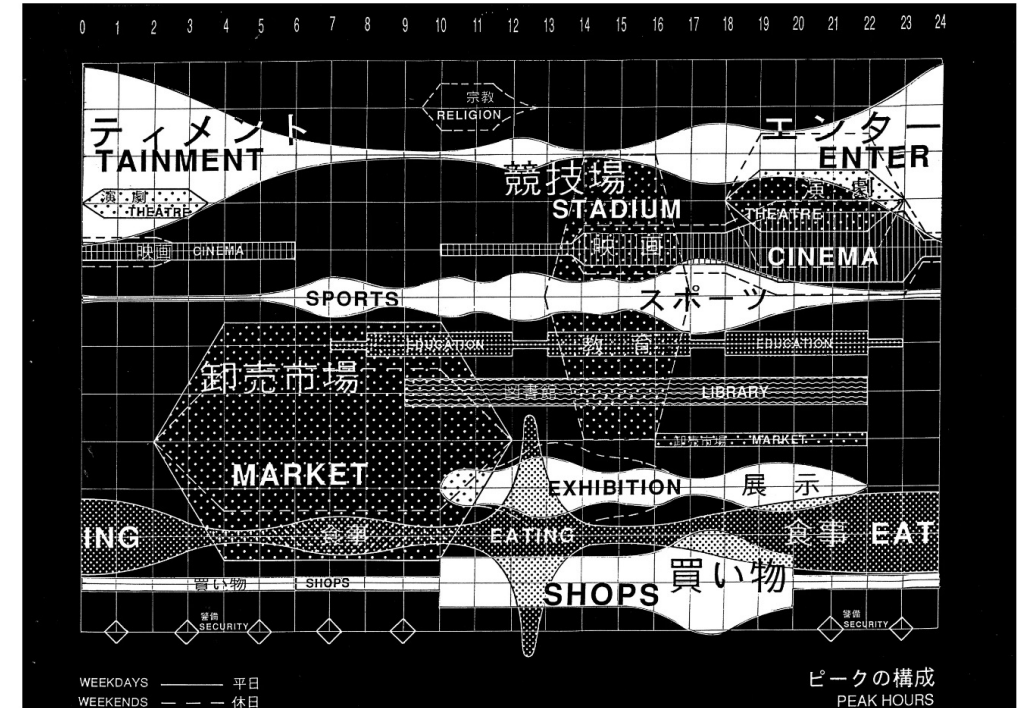
AR urbanism

A DIGITAL RESHAPE OF PUBLIC SPACES



a digitally enhanced public realm, shift both the everyday experiences and political economies of architecture and cities. — Failed Architecture

Towards a Redistribution of Spatial Value



A time-based programmatic masterplan of Yokohama, OMA (1991).

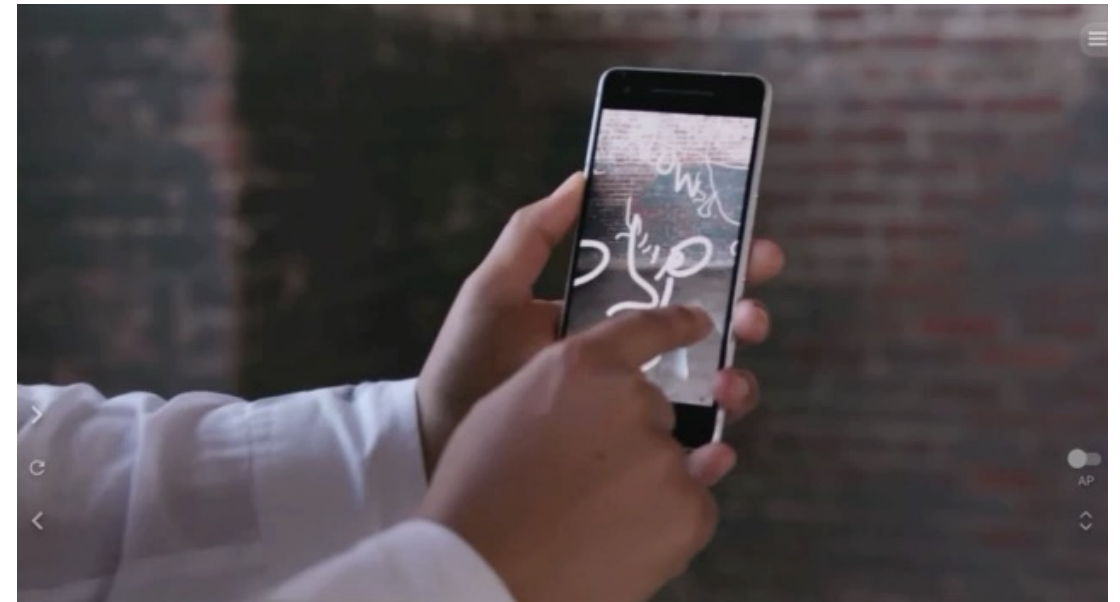
The emergence of AR technology has brought about a new way of interacting with physical space, where the concept of ownership and possession is becoming less relevant.

AR urbanism

Enhance social interaction between people



Personalized information and an inclusive space



The use of AR technology can make physical space more complex and dynamic, allowing for more direct and efficient interactions with the physical world.

AR implication

AR is an digital layer to shape the space



Function-oriented architecture

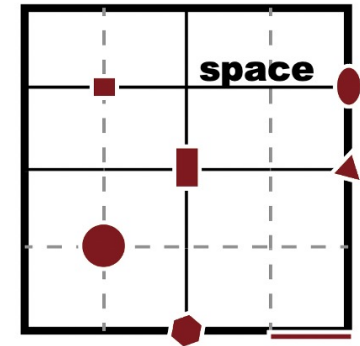
A NEUTRAL FORM



Neutral Form (physical) + Flexible space (mix)
+ AR programs (digital)



**A NEUTRAL
FORM**



Programs

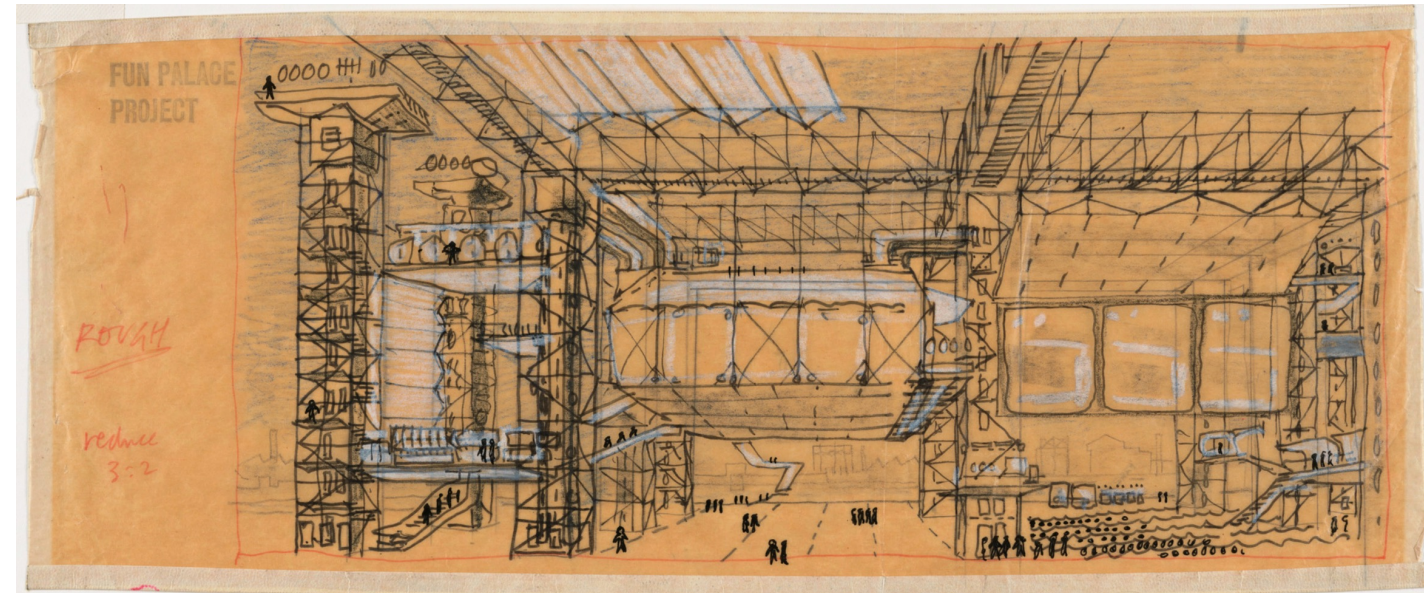
Architecture reference

Joan Littlewood described her intention to build a new kind of cultural center appropriate for modern life.

Price and Littlewood saw **impermanence** and **informality** at the heart of their project

“short-term experimental toy with built-in expendability—a total life-span of no longer than ten years.”

Flexibility, change, and growth were prized over monumentality and durability.



Fun palace

Architecture reference

Described by Piano as a "big urban toy", Centre Pompidou contains six-storeys of large column-free spaces.

The building is designed so that **the internal spaces can be easily rearranged** – made possible by placing the building services, corridors, elevators and structural members on its exterior.



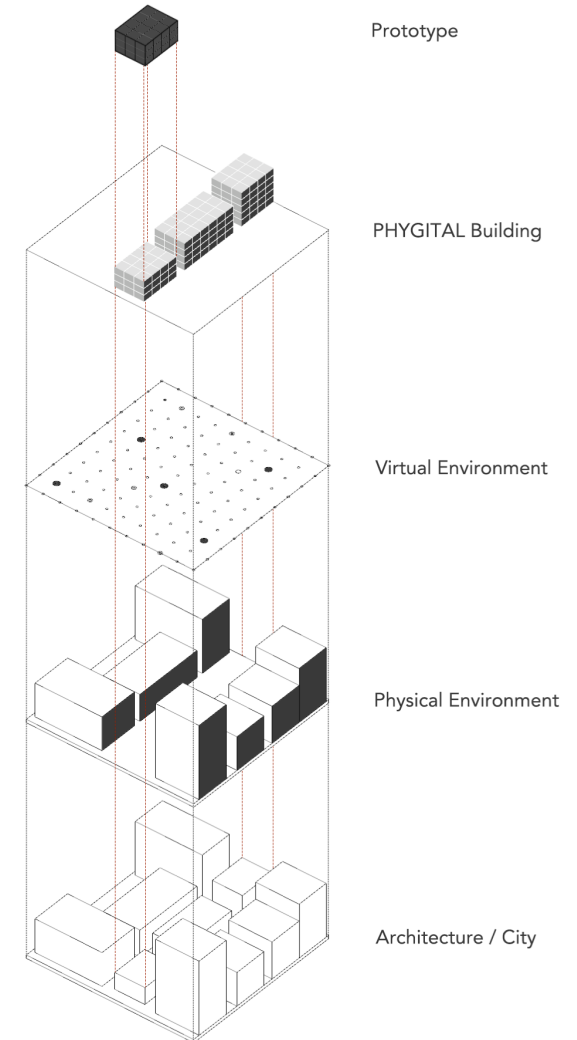
Centre Pompidou

AR PHYGITAL Building

Physical + digital

The physical space of the building itself needs to be more neutral, stable and inclusive.

And digital space can be more flexible and dynamic.



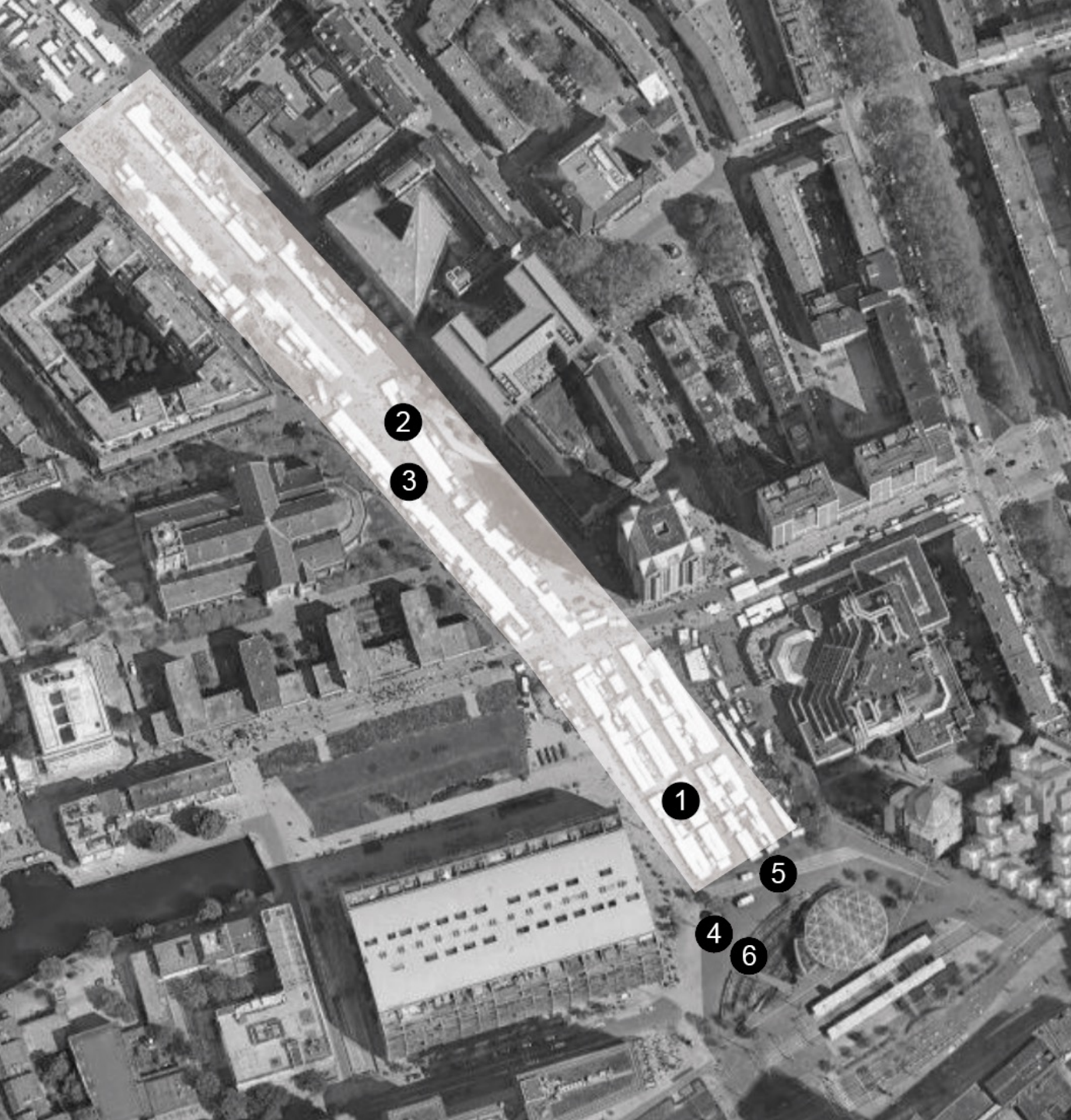


III Pilot Analysis

1 History

2 Site Analysis

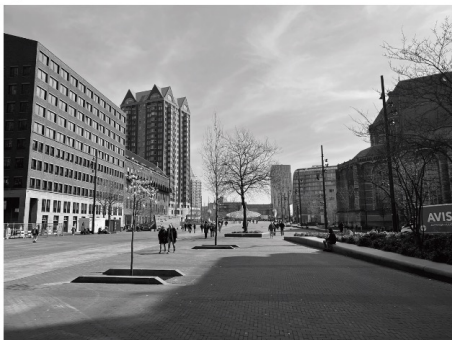
3 Pilot Location



1



2



3



4

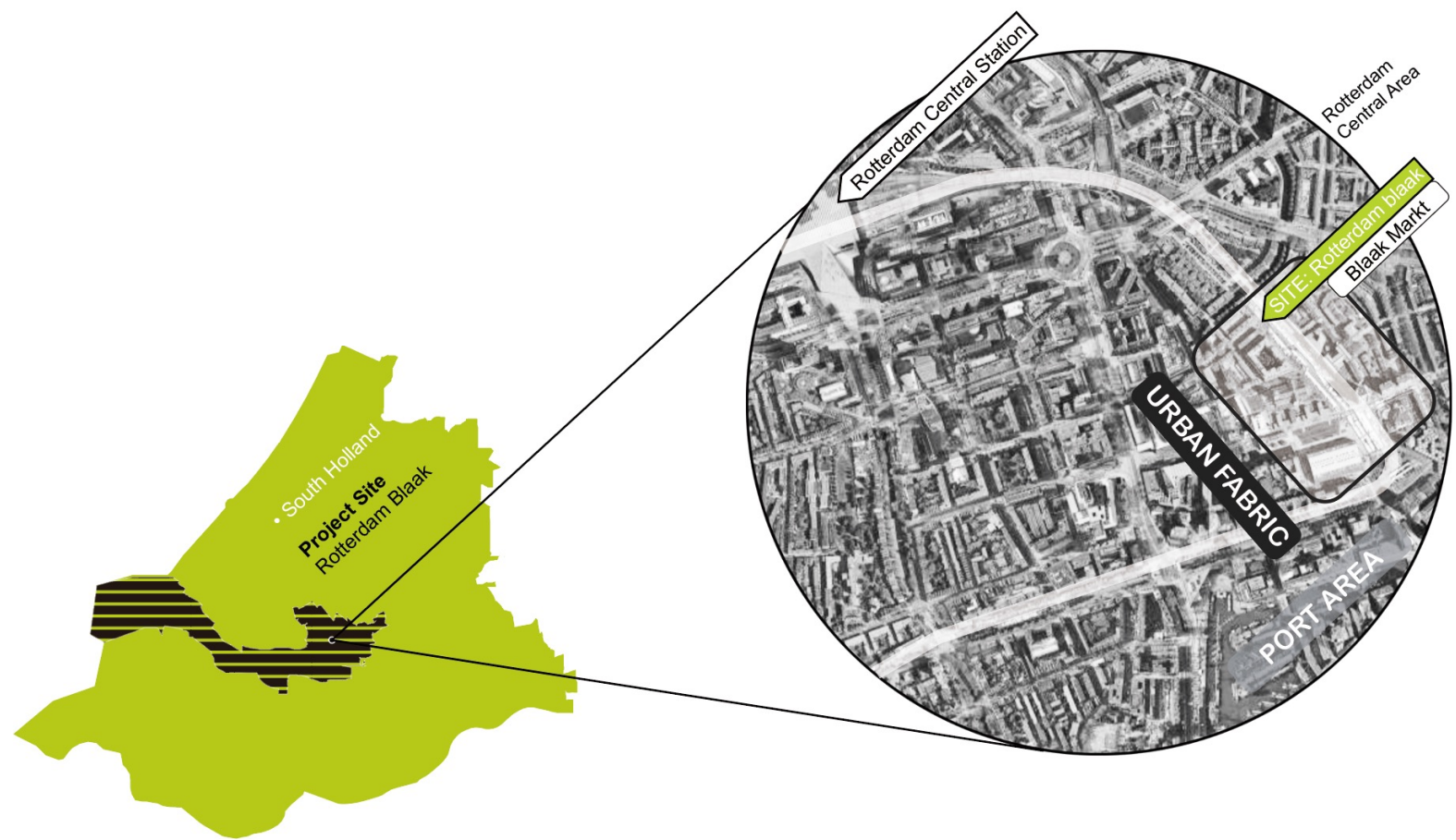


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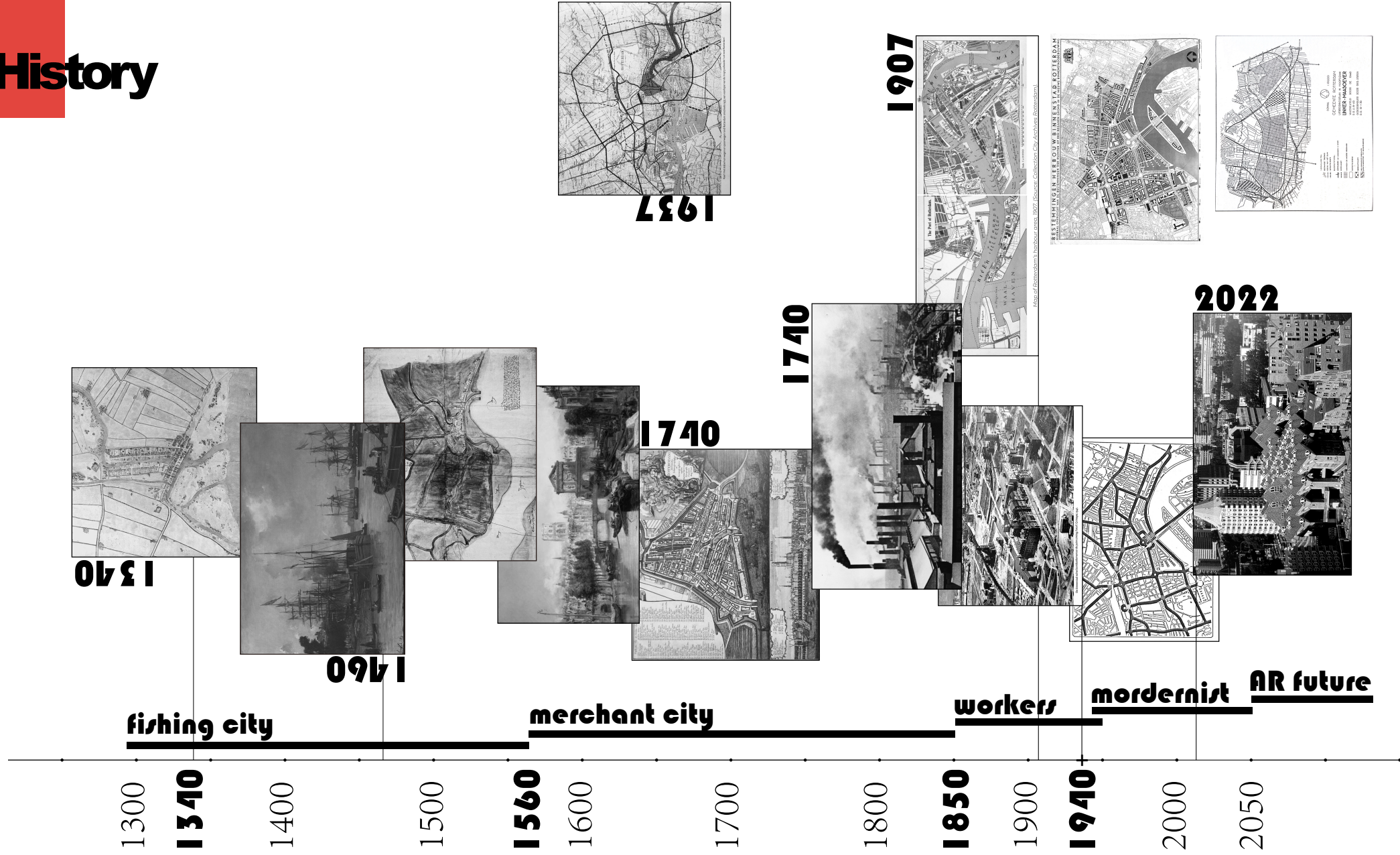
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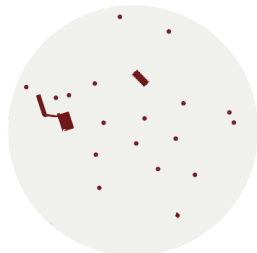
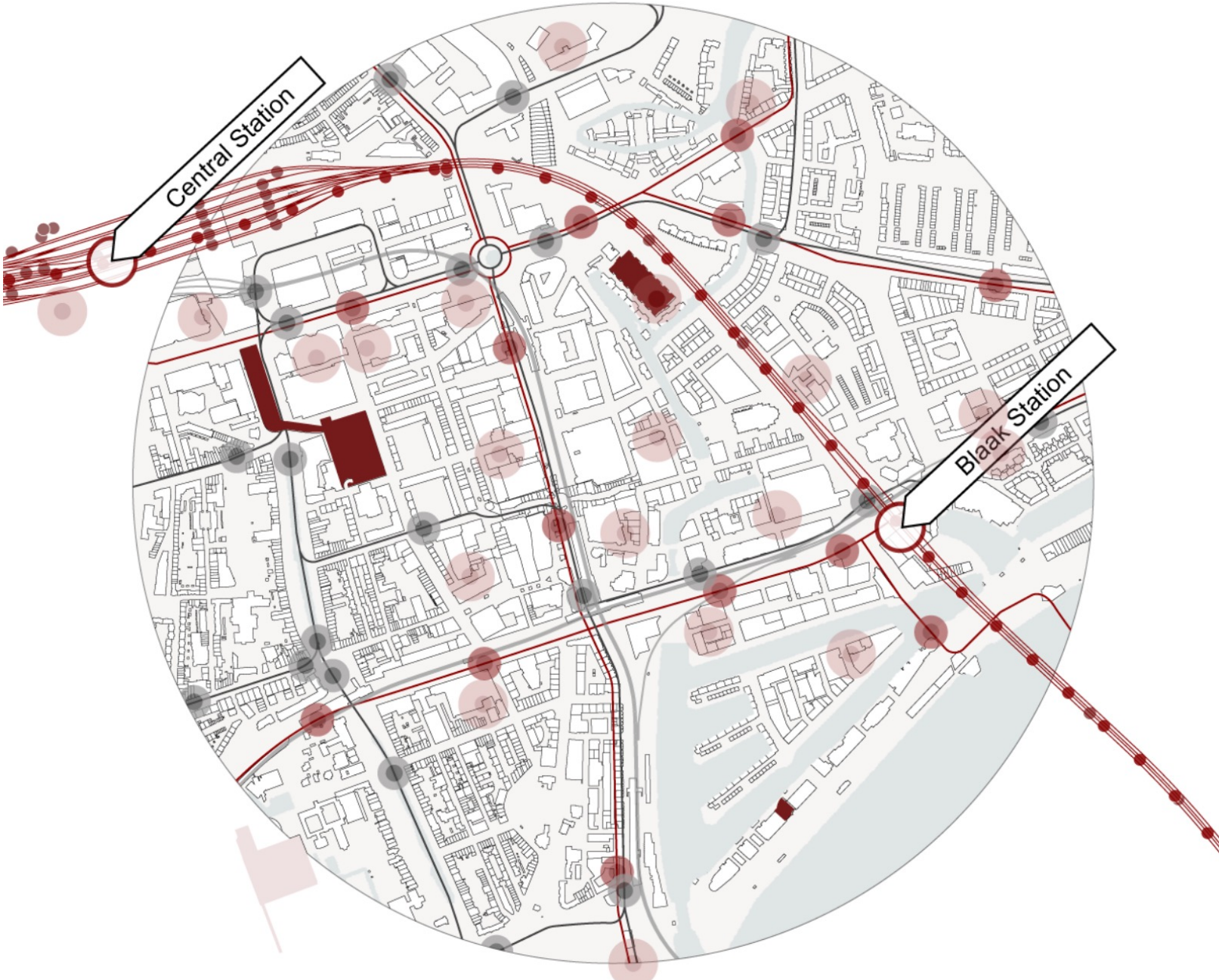
Pilot Location



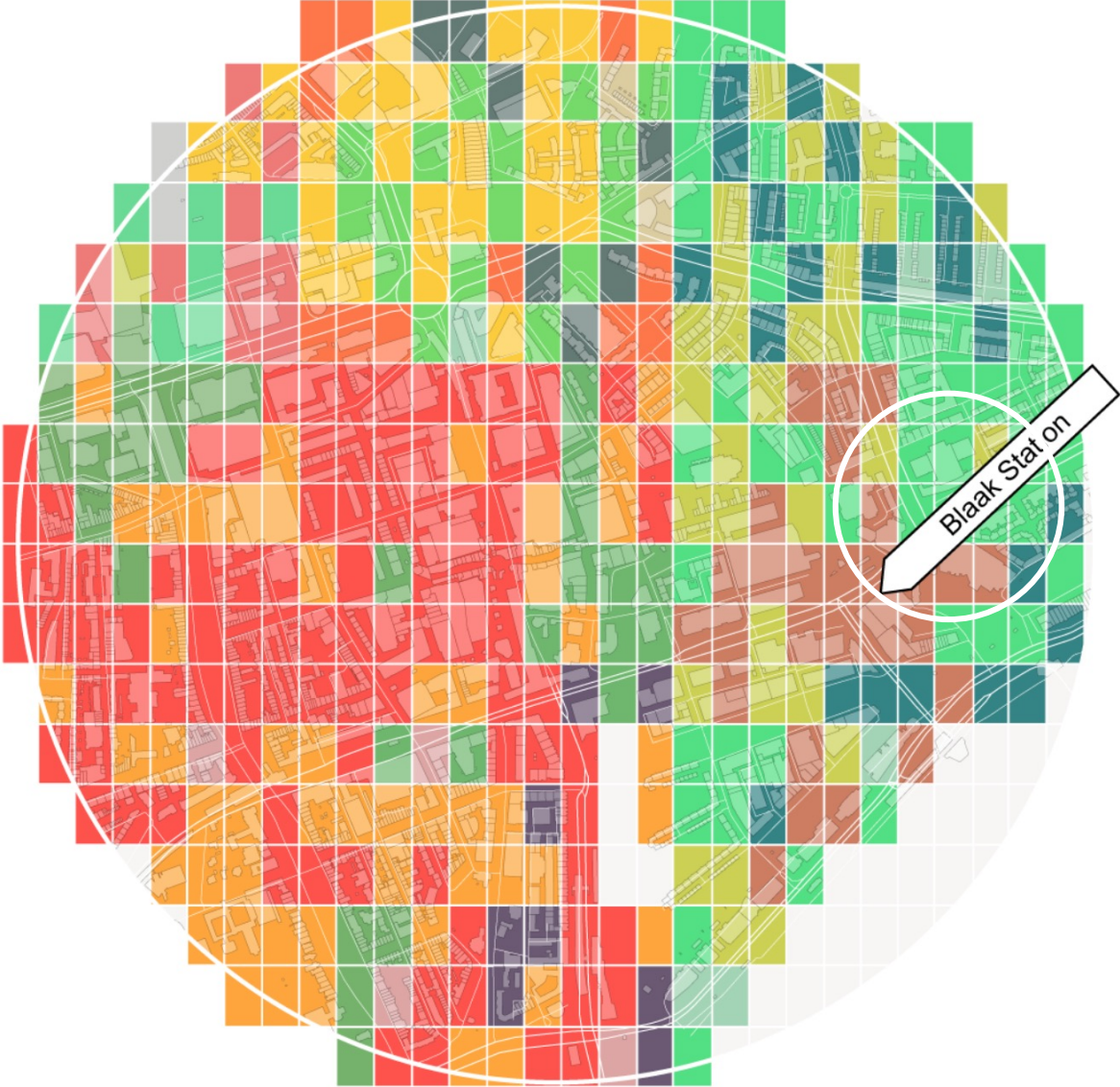
Vibrant and diverse urban spaces with many spatial elements but less dynamic public spaces.

History

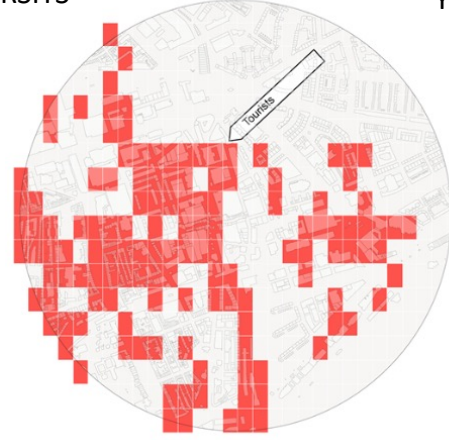




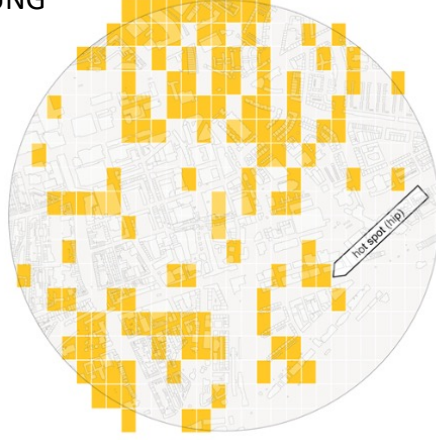
Distributions



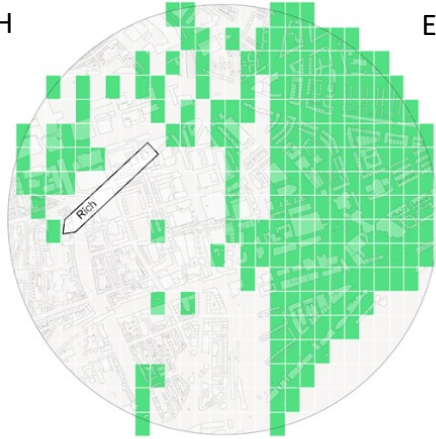
TOURSITS



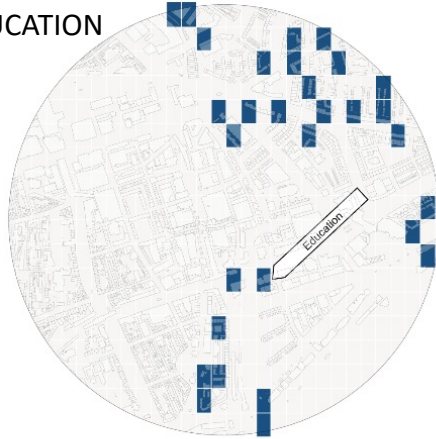
YOUNG



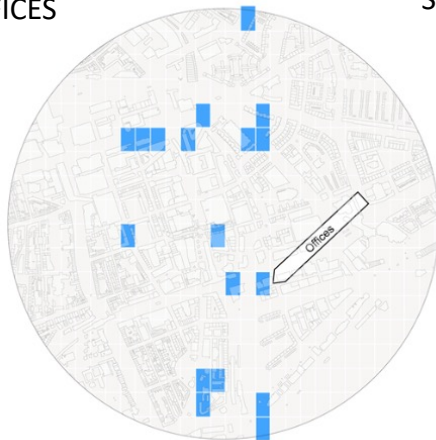
RICH



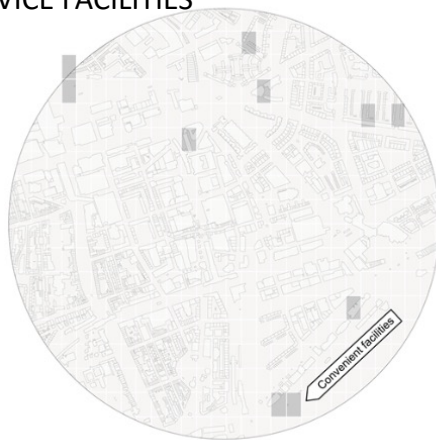
EDUCATION



OFFICES



SERVICE FACILITIES



Function distribution – center gentrification/young generation + tourist
– potential pilot to be transformed

Porosity mapping

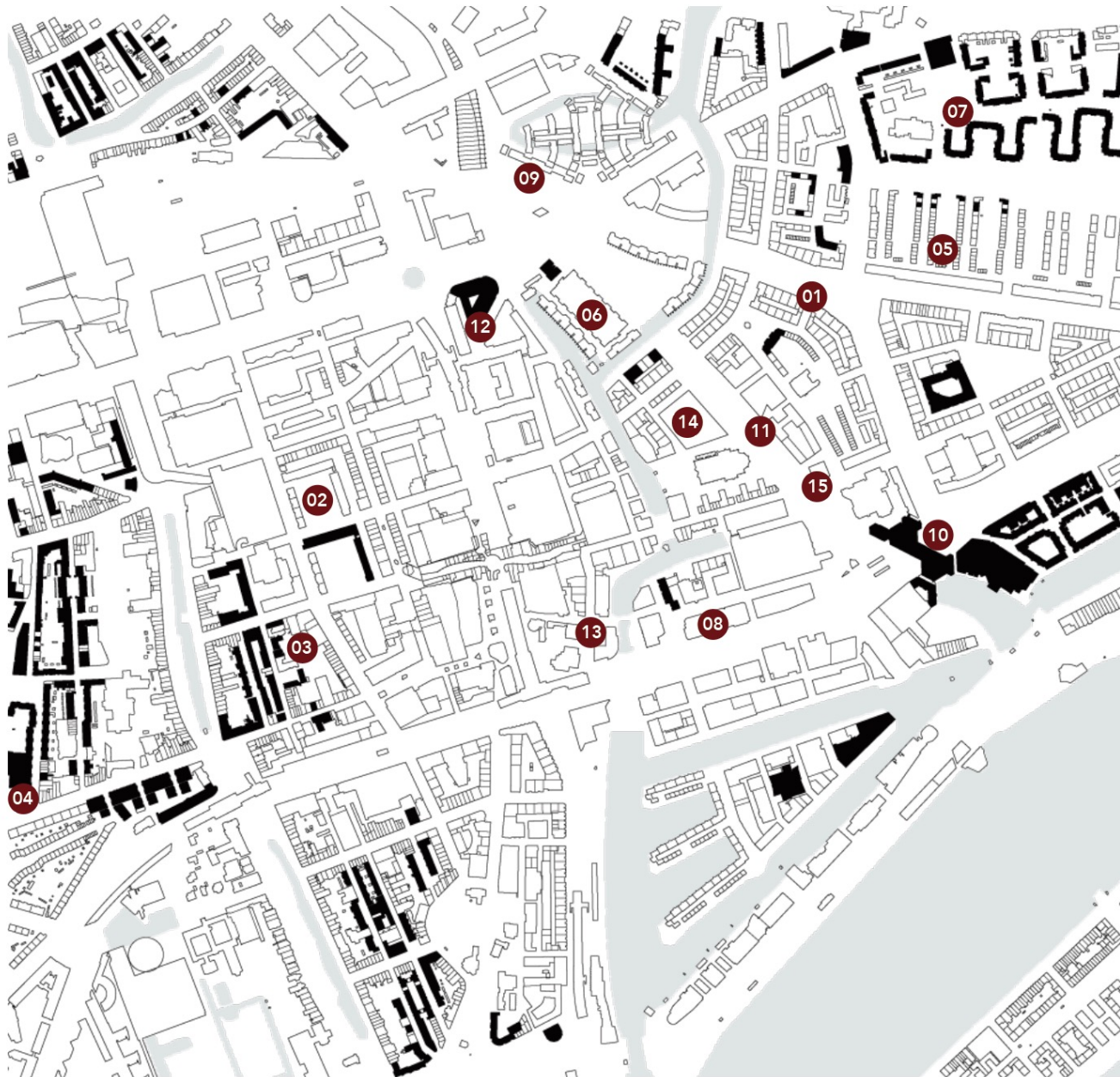


Identify the physical space which could be transformed in the future.



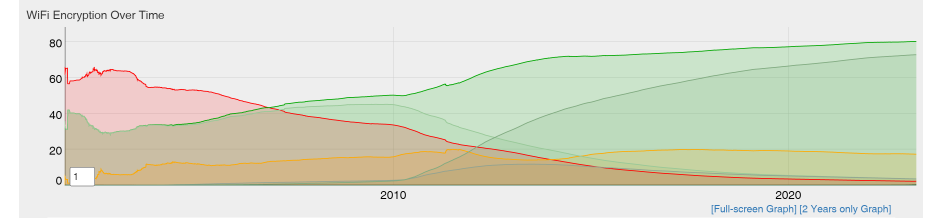
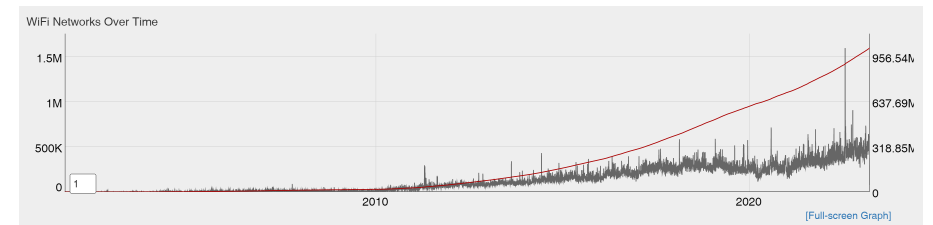
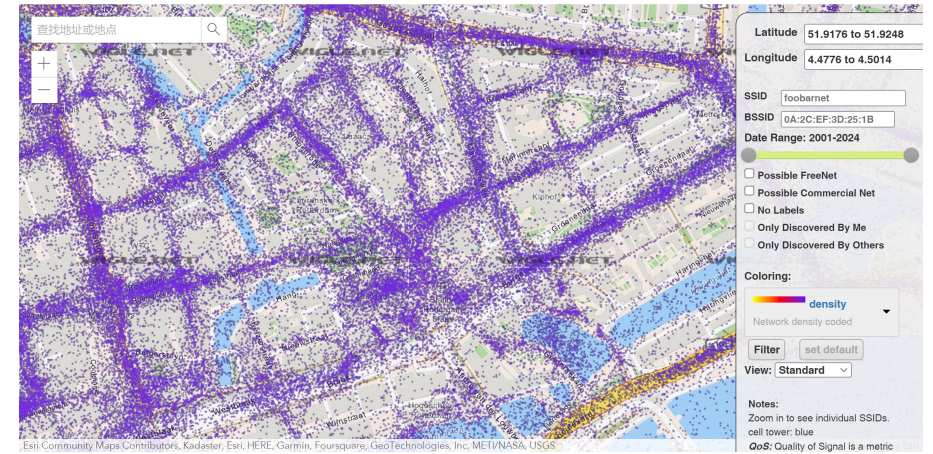
Lack of public space-squares and parks

Building typology



01	02	03	04	05
function	retailing living	living social house	social house retailing	social house
building	1954	1874-1985	1892-1990	1941
ages				
06	07	08	09	10
function	living	social house	living	airbnb living
building	1978	1978	1981	1983
ages				
11	12	13	14	15
function	living	social house living	living	retailing living
building	2003 2010 1940	1992	1996	2007
ages				

Accessibility of Internet



CONCLUSIONS

MOBILITY	A busy area
FUNCTION	Diversification of the population and surrounding functions
PUBLIC SPACE	Lack of public space
INTERNET	Complete network coverage

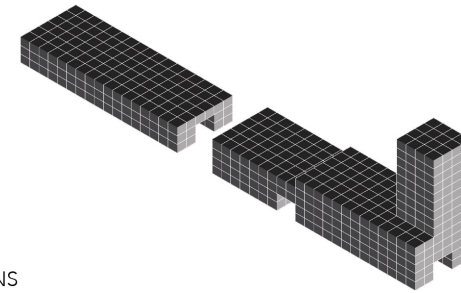
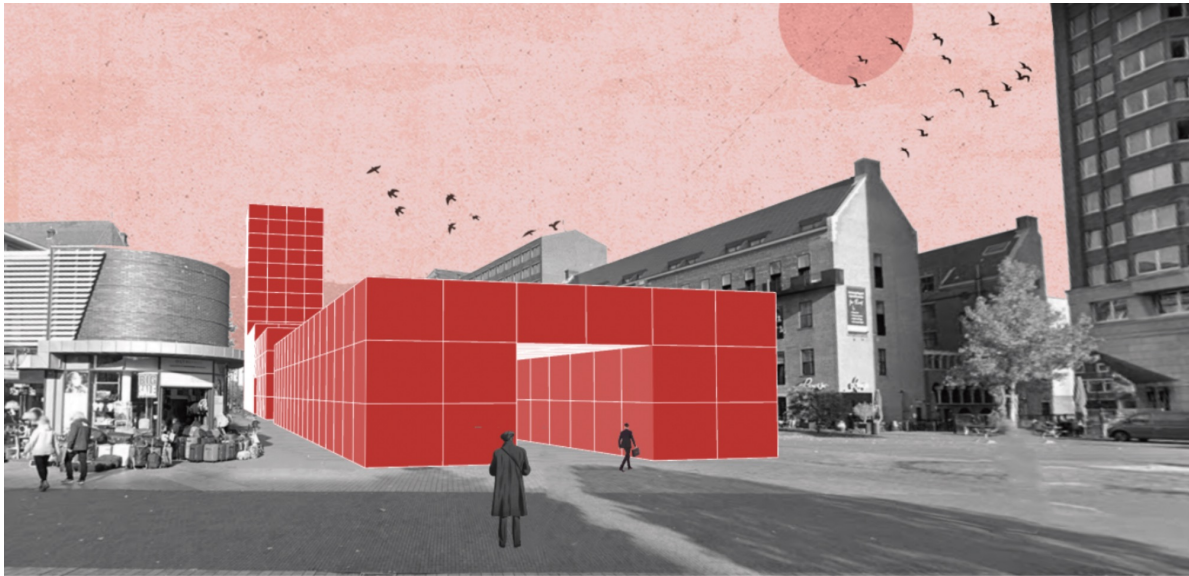
A POTENTIAL PLACE TO TEST THE AR TRANSFORMATION WITH ALL RELEVANT ELEMENTS

IV Physical Design

5.1 Physical Limitations

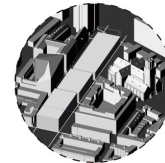
5.2 Physical Building Prototype

Physical limitations

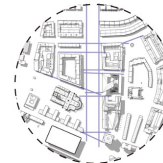


PHYSICAL LIMITATIONS

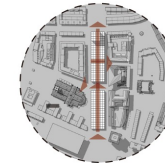
Site Constraints



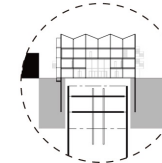
Zoning Regulations



Access and Mobility



Structural Considerations



Sustainability

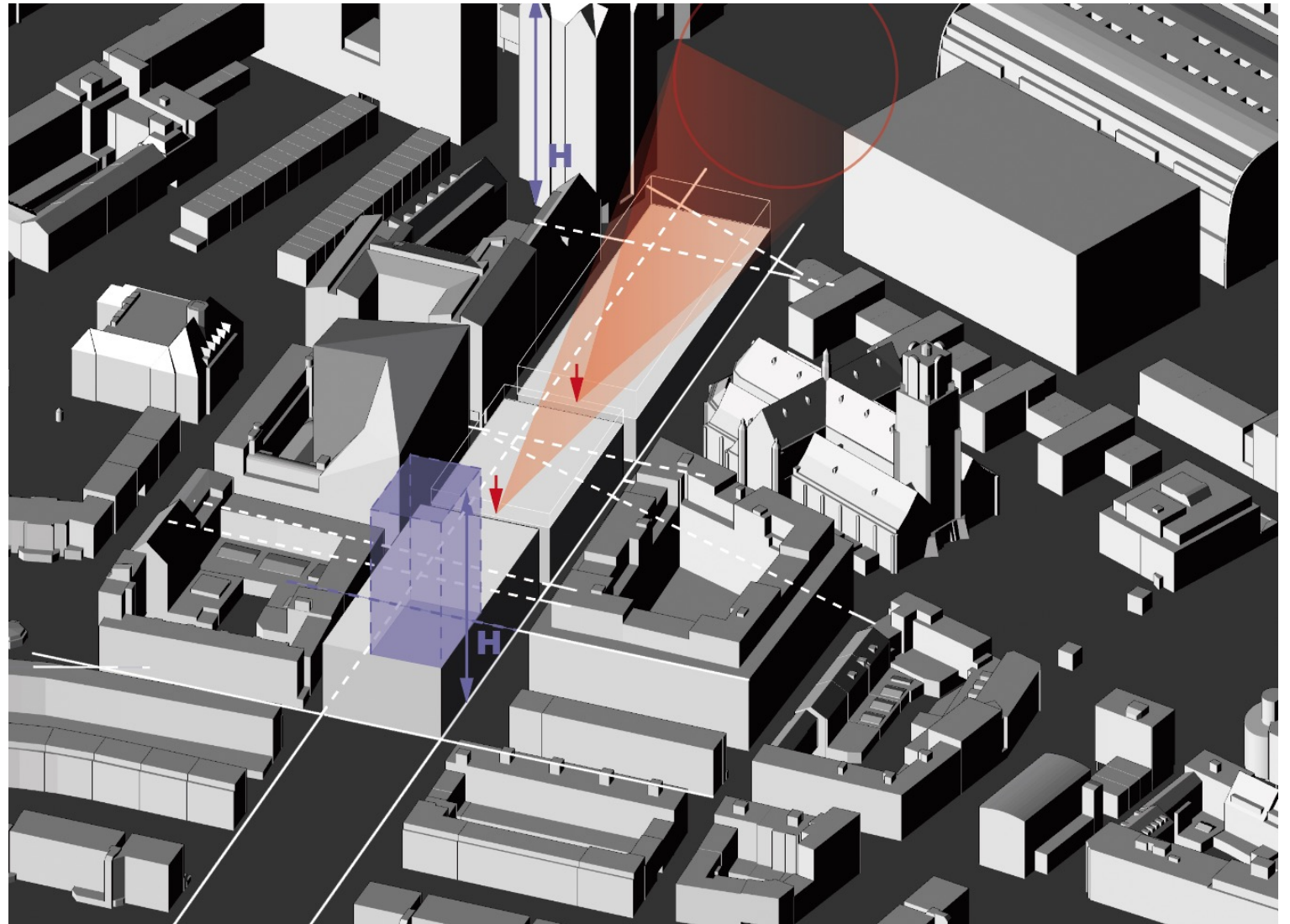


Site constraints

Site Constraints: The **size, shape, and orientation of the site** can limit the design and placement of the building.

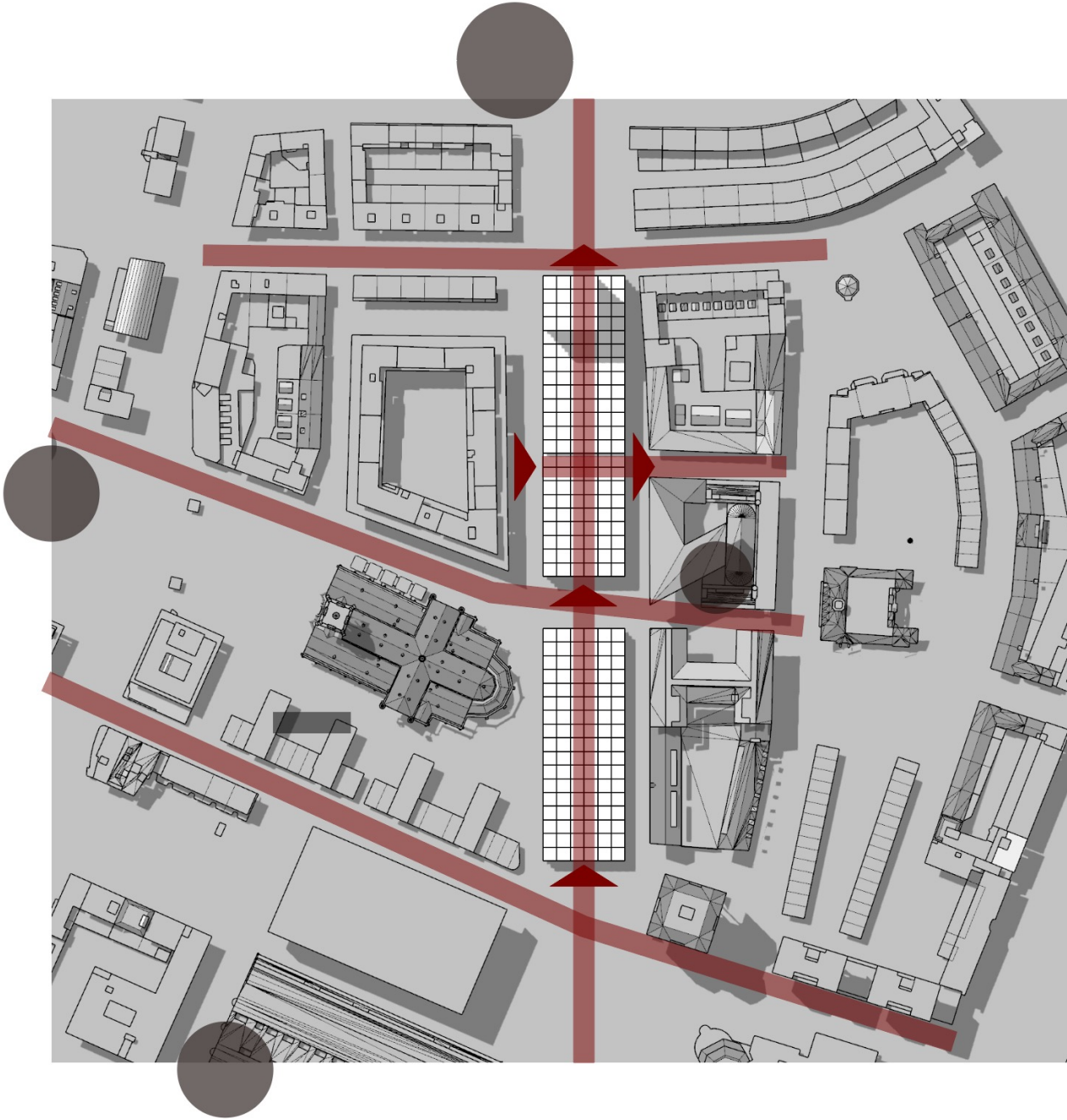
Zoning regulations

Zoning regulations can impose physical limitations on building design, such as **height restrictions, setbacks, view corridor** and other site-specific requirements. The building design must comply with these regulations to ensure that it can be built and occupied legally.



Access and Mobility

- Entry and Exit points
- Parking
- Transportation infrastructure

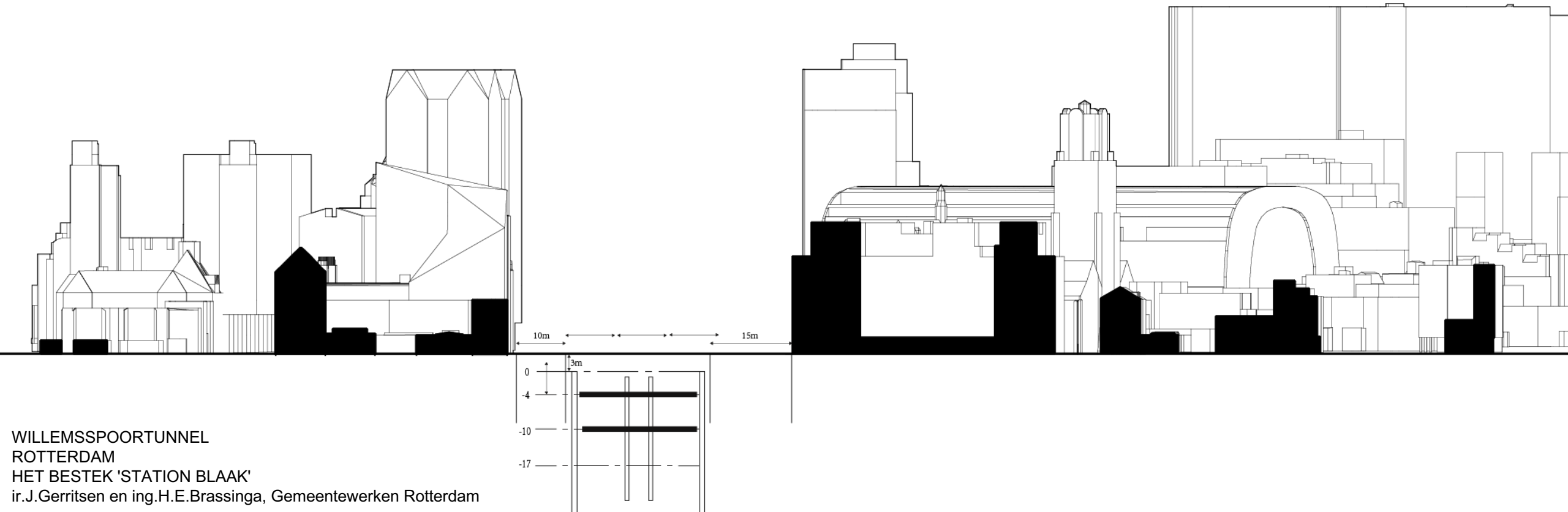
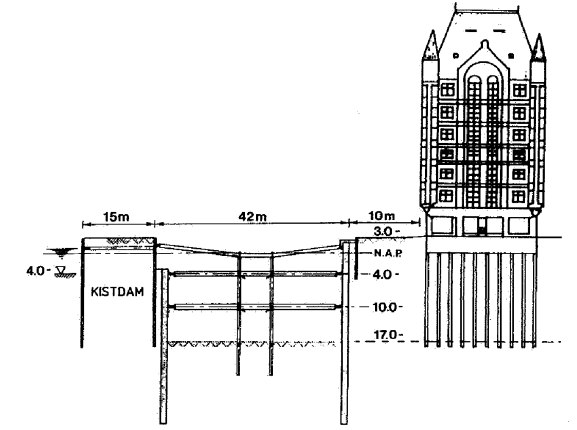


Structural Considerations

Underground structure



4 Bouwput ter hoogte van het 'Witte Huis'



WILLEMSSPOORTUNNEL
ROTTERDAM
HET BESTEK 'STATION BLAAK'
ir.J.Gerritsen en ing.H.E.Brassinga, Gemeentewerken Rotterdam

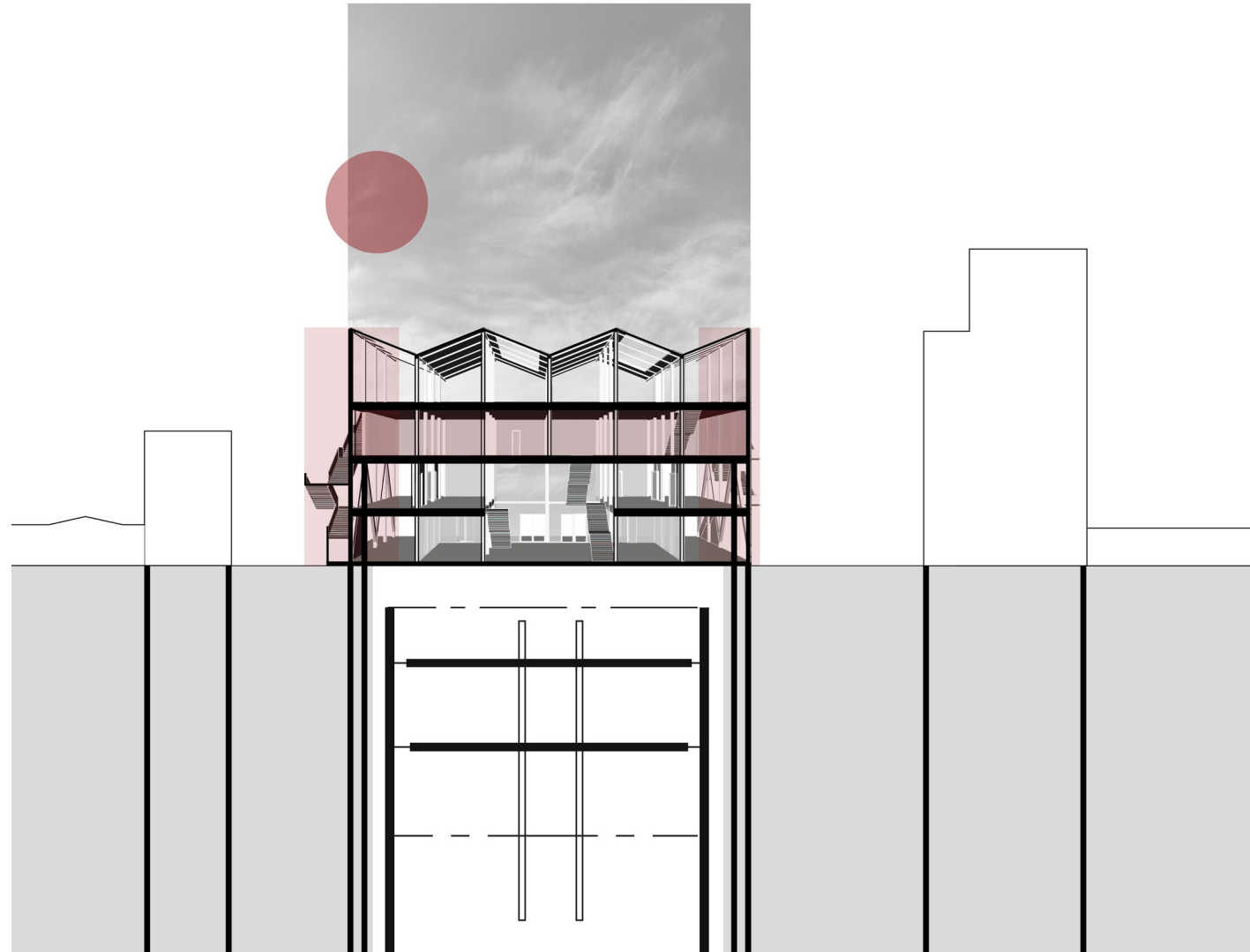
Structural Considerations

Foundation

Load-bearing walls

Staircases & Elevator

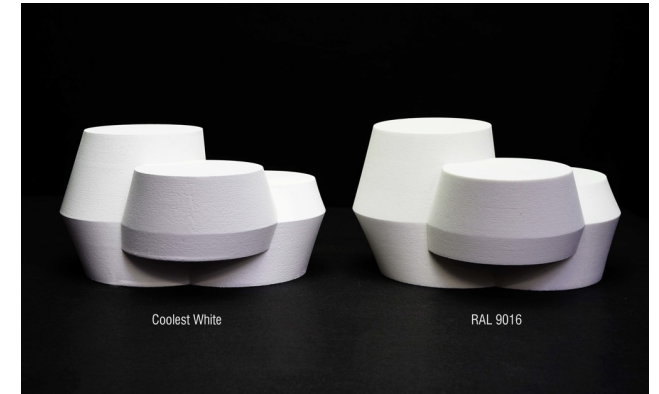
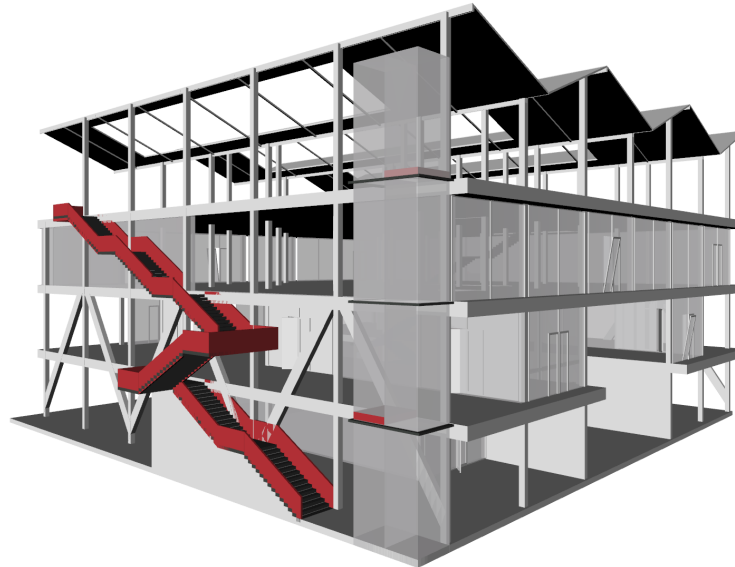
Roof



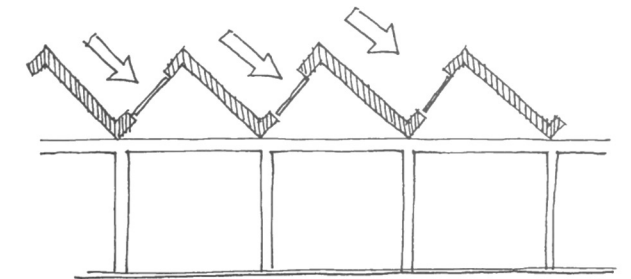
Sustainability

The building design must be sustainable and energy-efficient, taking into account factors such as natural light, ventilation, and insulation.

The building should also be designed to minimize its environmental impact, such as through the use of renewable energy sources and green materials.

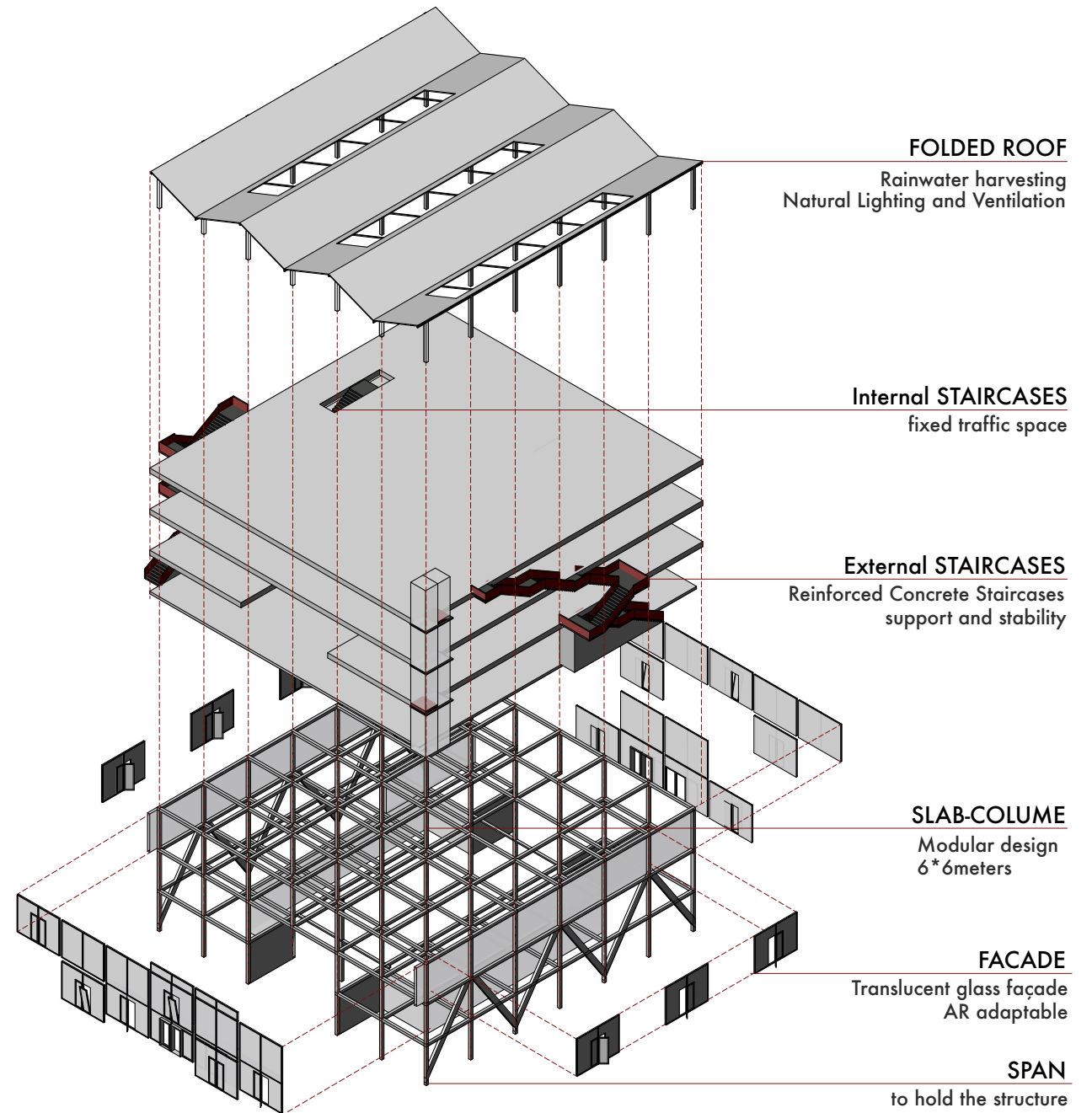


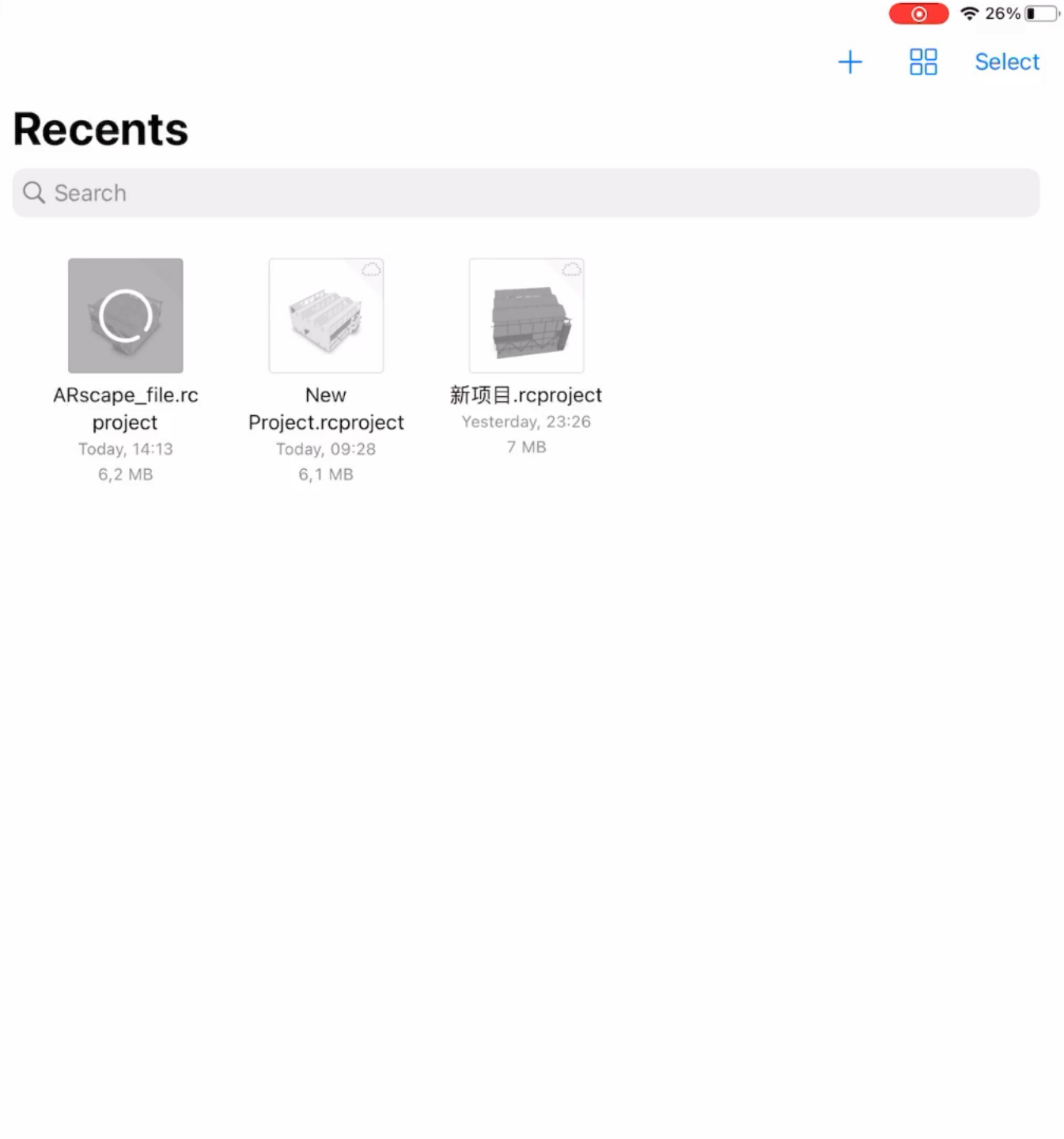
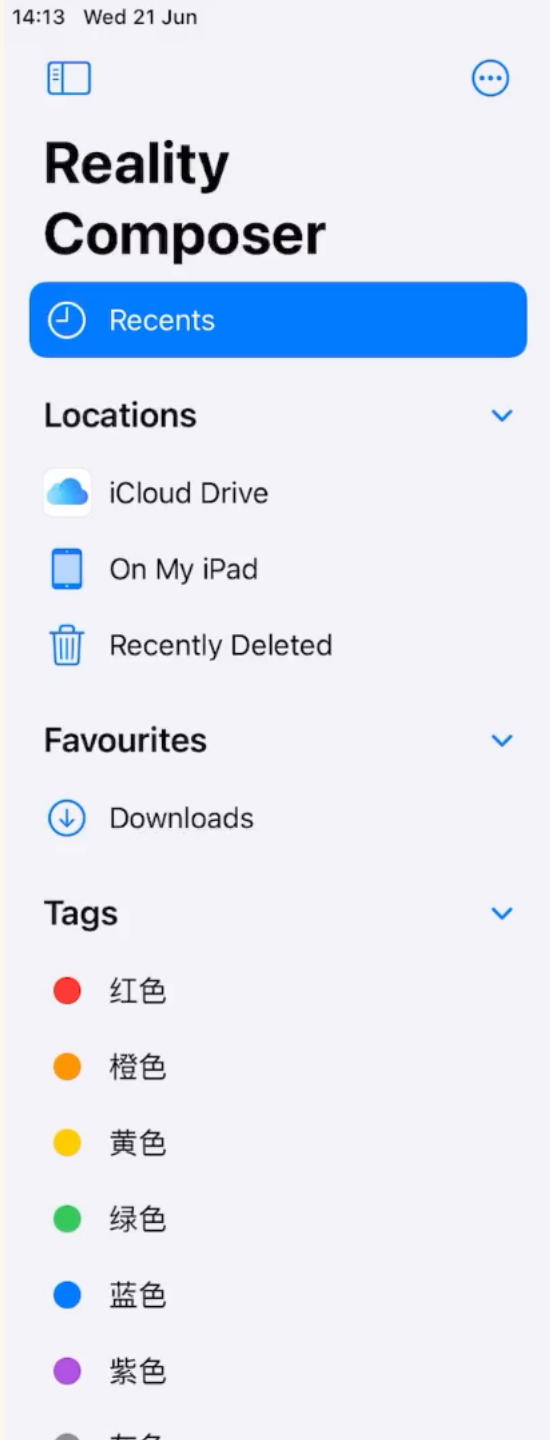
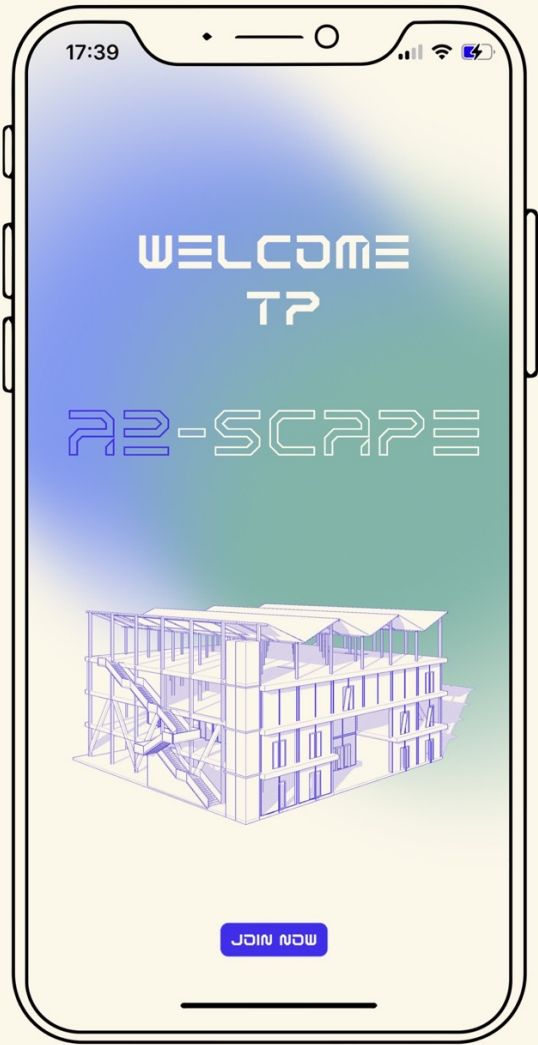
UNStudio has partnered with Monopol Colors to develop 'The Coolest White', an ultra-durable paint that protects buildings and urban structures from excessive solar radiation – thus slowing down the urban heat island effect.



- Rainwater harvest
- Natural Lighting and Ventilation
- Integration of renewable energy technologies
- Enhance thermal performance

Physical building prototype







v

Virtual

Design

- 1 Program types
- 2 Apply in physical space
- 3 Experiment
- 4 Physical + Virtual Scenarios

Mechanism Configuration

FIXED

FLEXIBLE

STRUCTURE

SPATIAL DIVISION

MULTI-LAYER

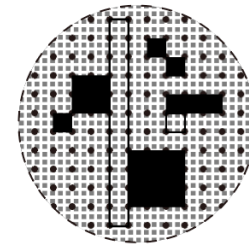
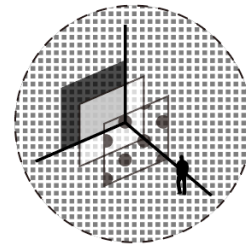
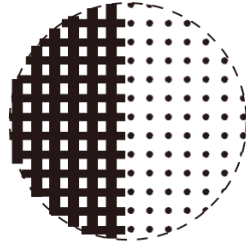
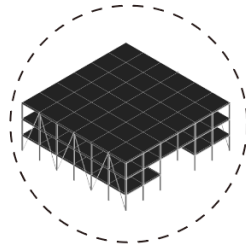
ACTIVITIES

neutral & concrete
physical mass

private & public spaces
Zoning

transformable mix-reality

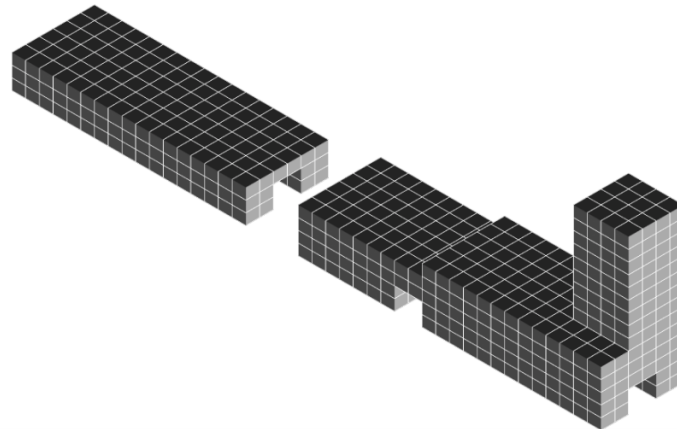
public program
as toolbox



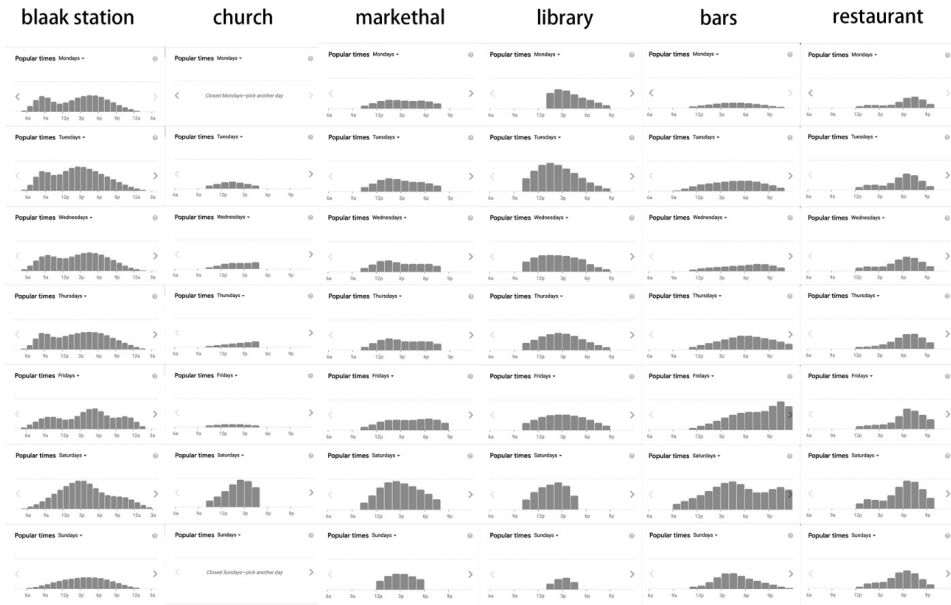
Structural stability
Spatial Inclusion

Clear definition of spatial properties
Functional Intensification
Spatial accessibility/Inclusiveness

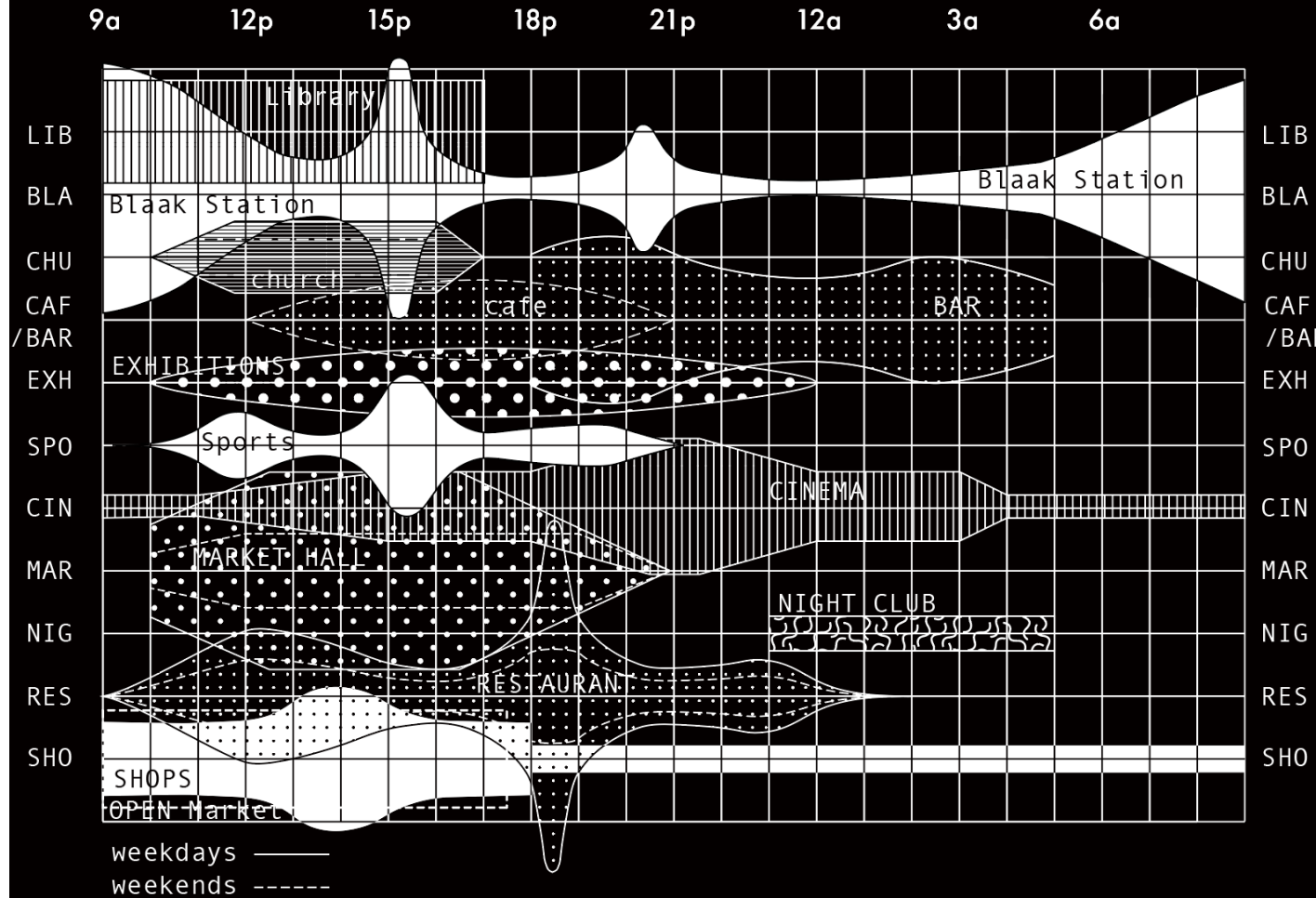
Spatial flexibility
Public participation



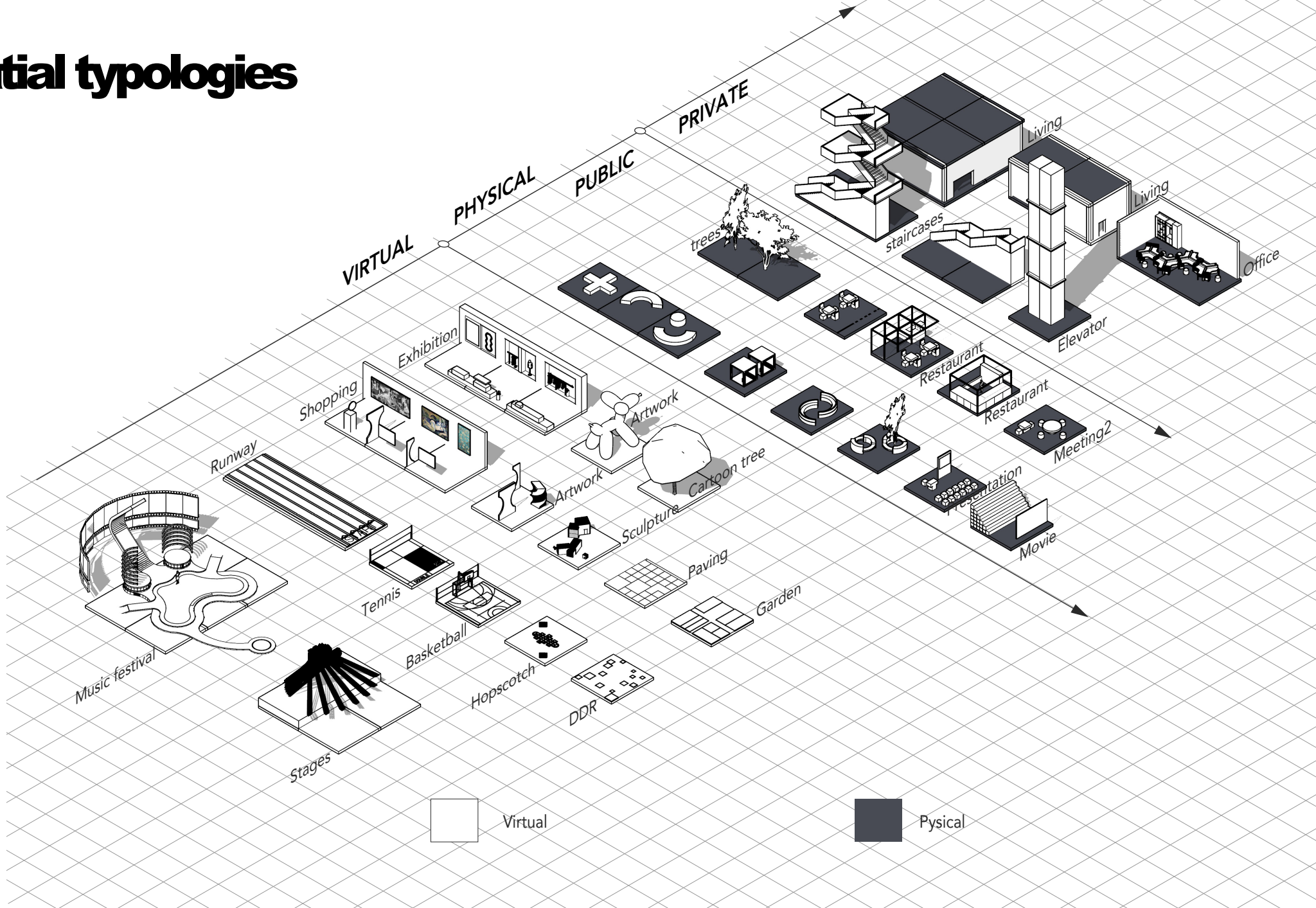
Programs on site



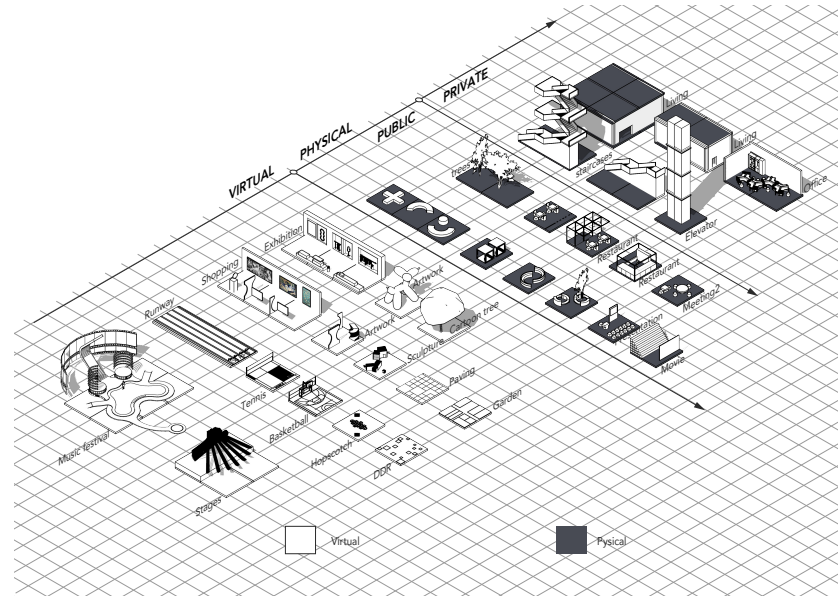
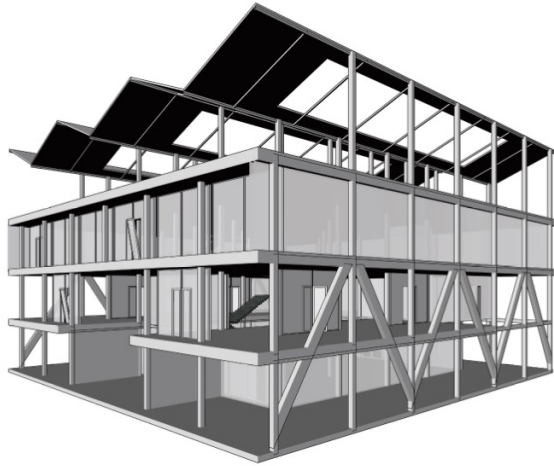
Timeline



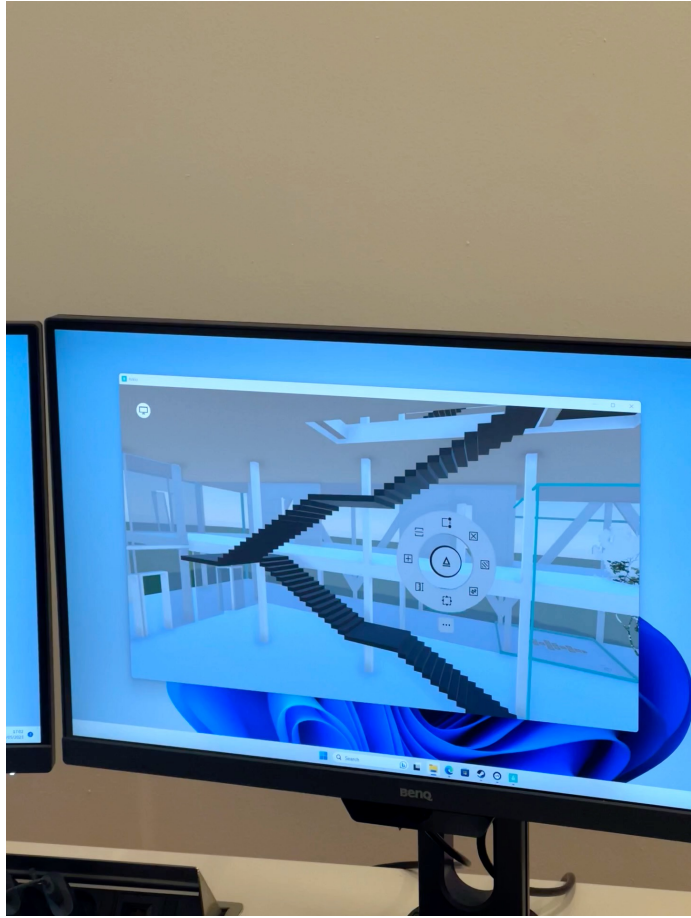
Spatial typologies



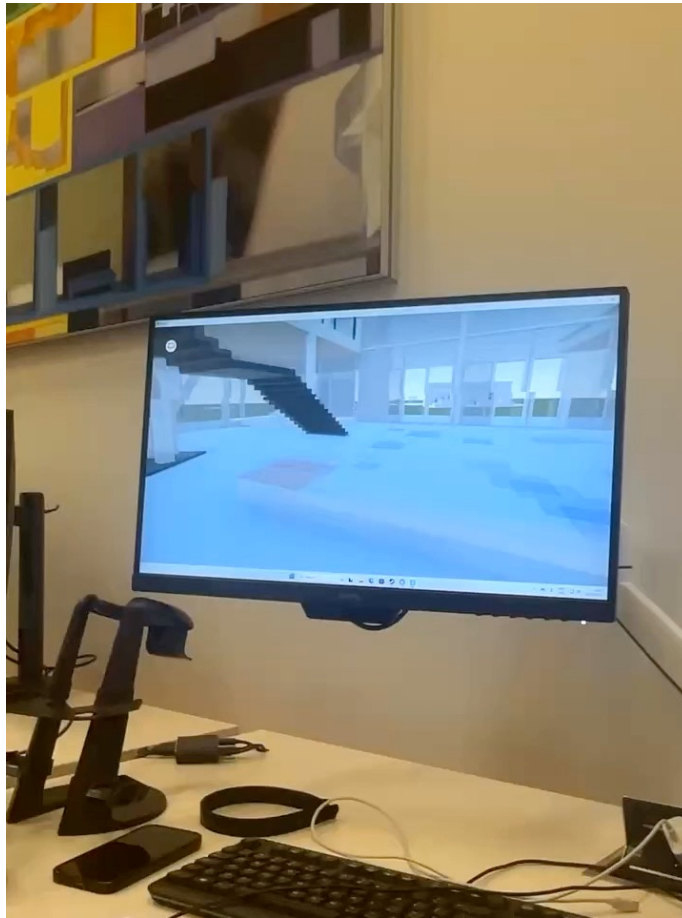
AR Experiment



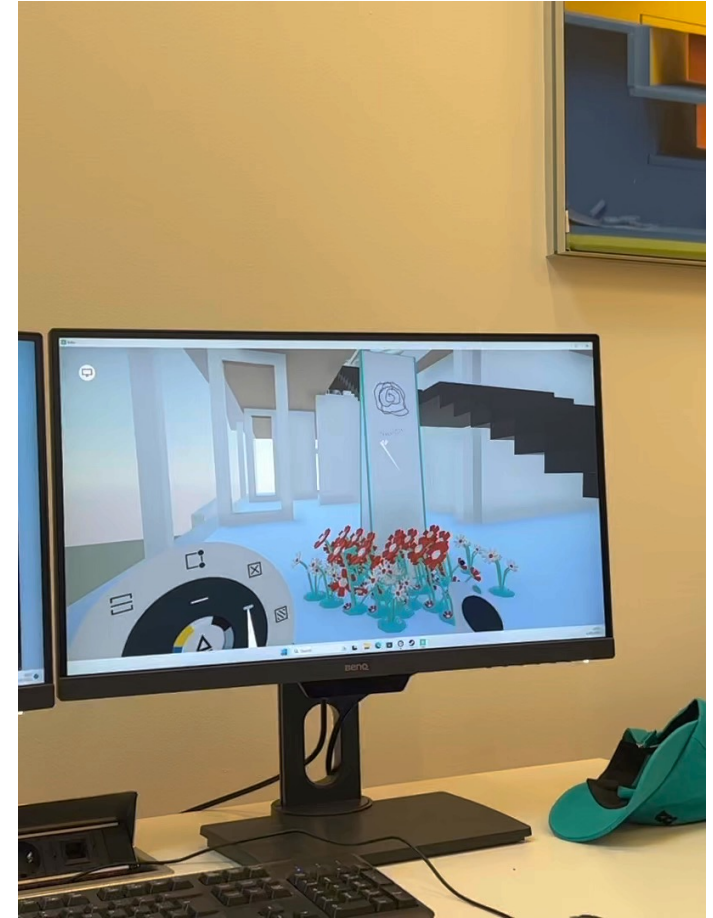
- Explore the building prototype and arrange the activities into the building
- 10 groups : 3-4 people
- VR glasses - Arkio
- Observe the action and interaction



Look around in 3D reality



Operation panel



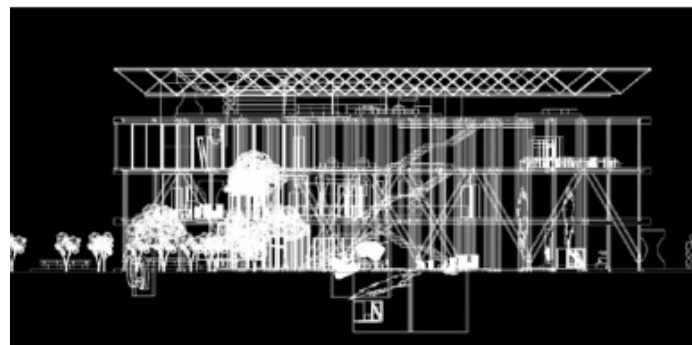
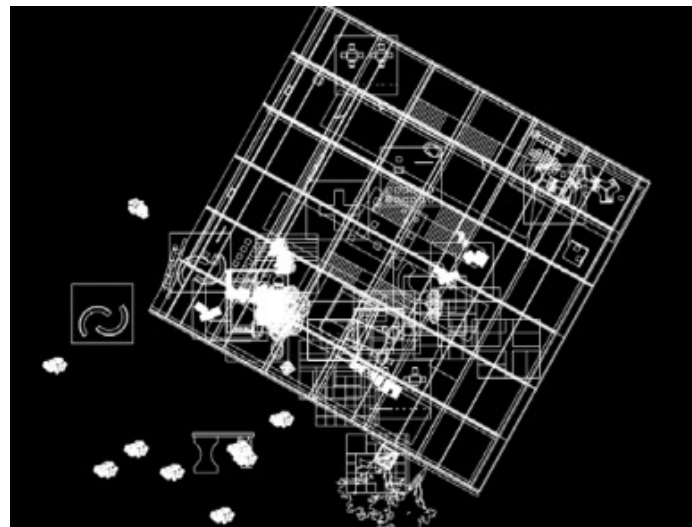
Personalized design

1st round Experiment

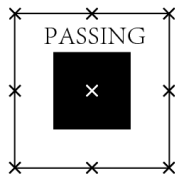
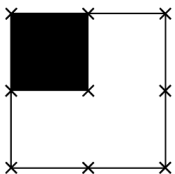
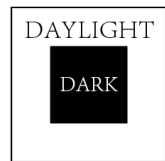
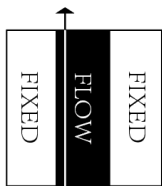


Participants: Free Exploring Phase
2 groups

Observations and Record: **Actions & Interactions**
Analysis and Optimisation



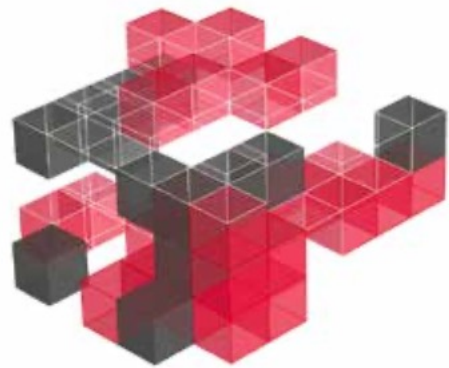
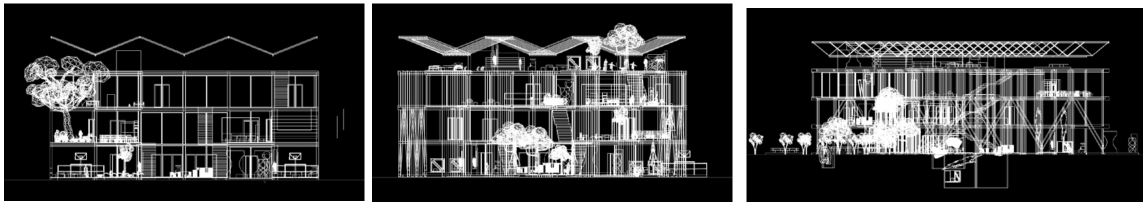
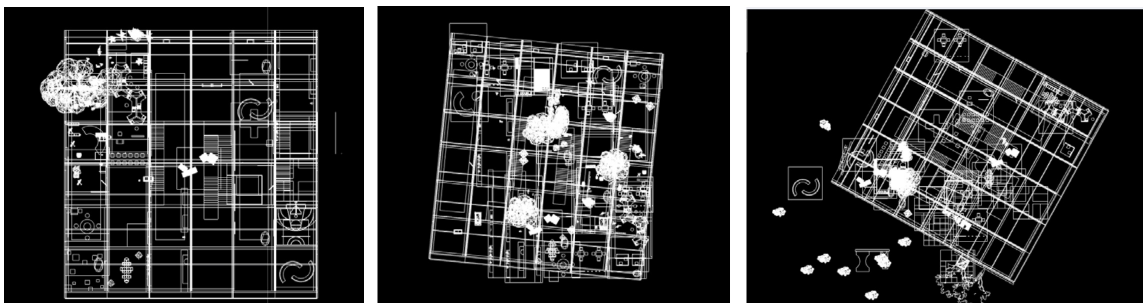
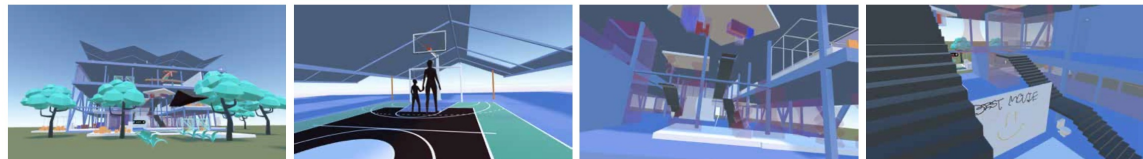
2nd round Experiment



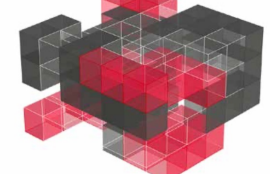
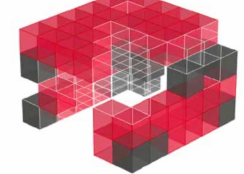
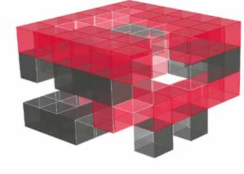
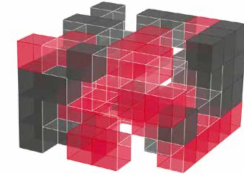
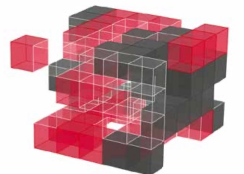
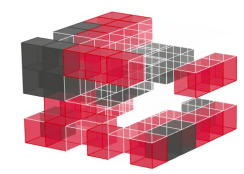
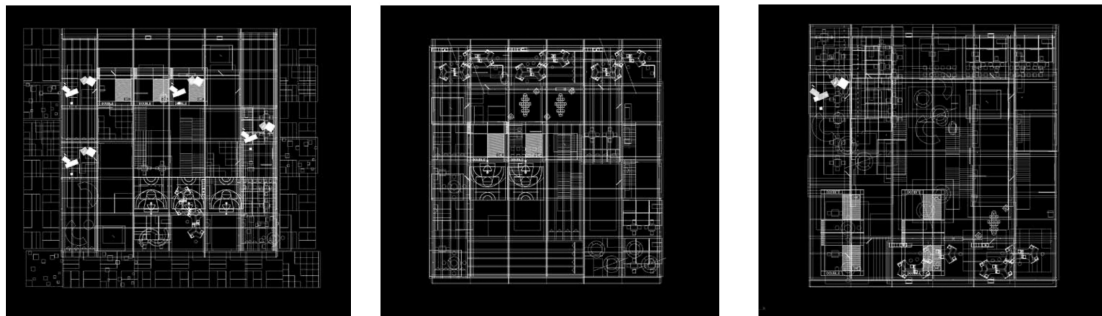
Participants: following some basic rules about flow

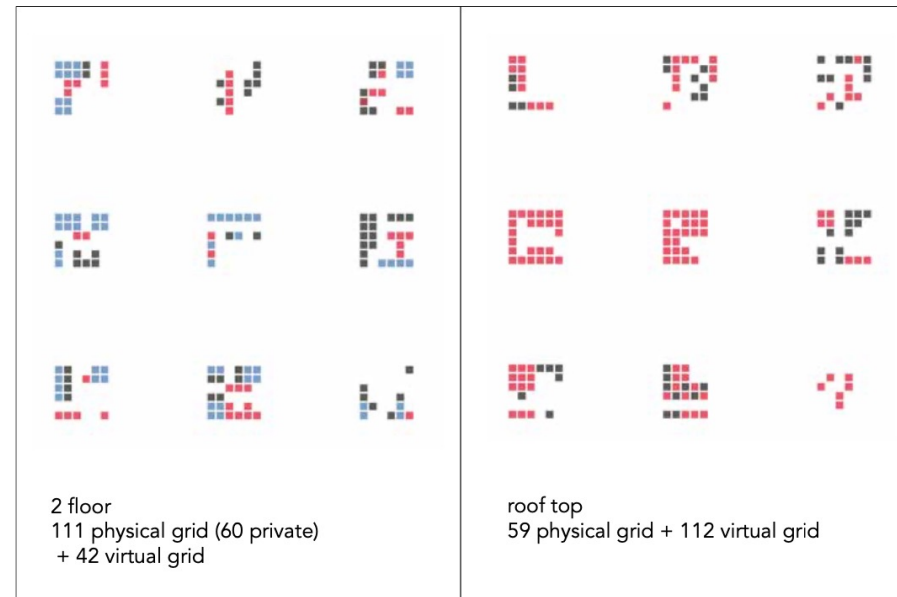
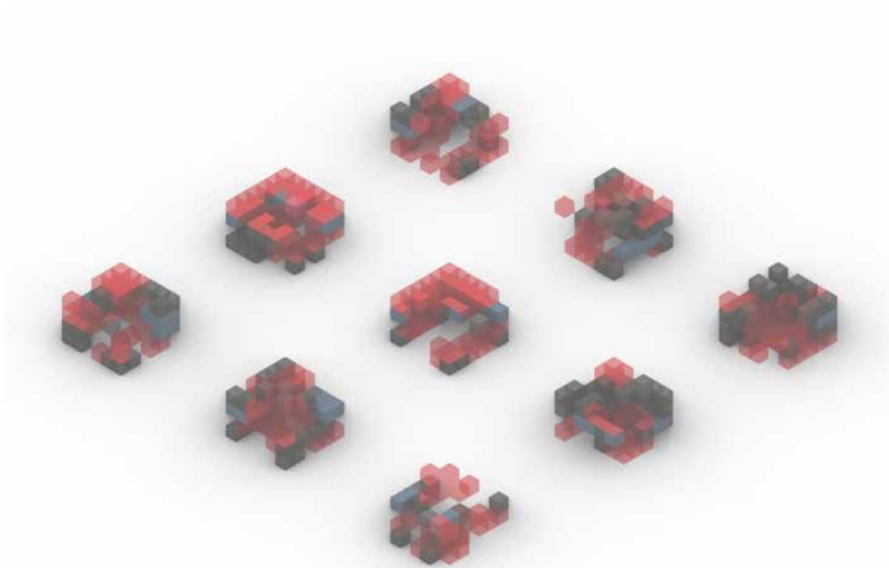
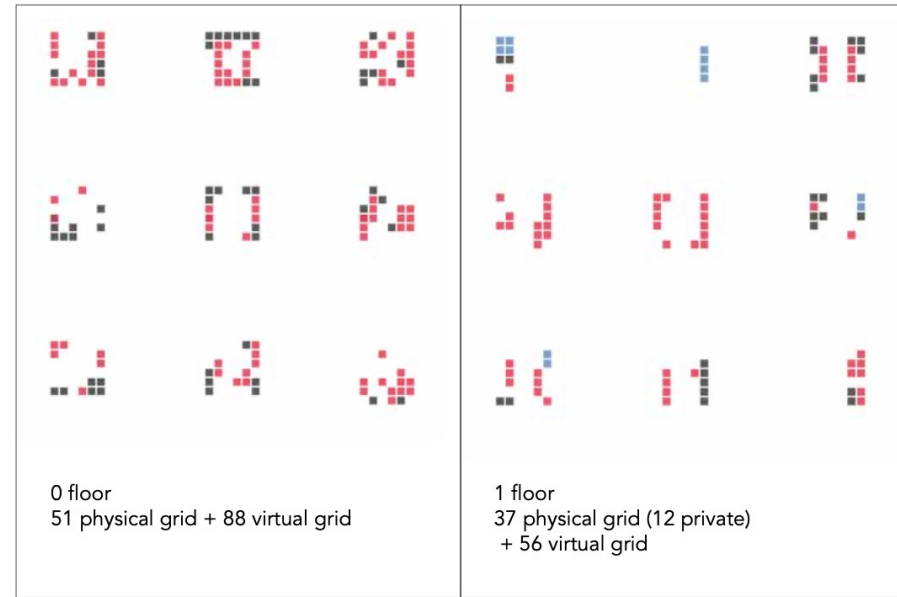
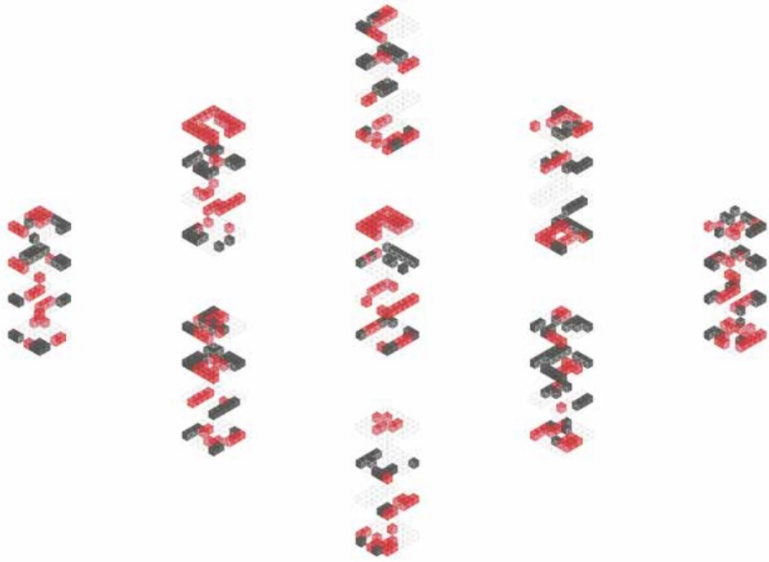
8 groups

Observations and Record: **Actions & Interactions**



■ virtual
■ physical





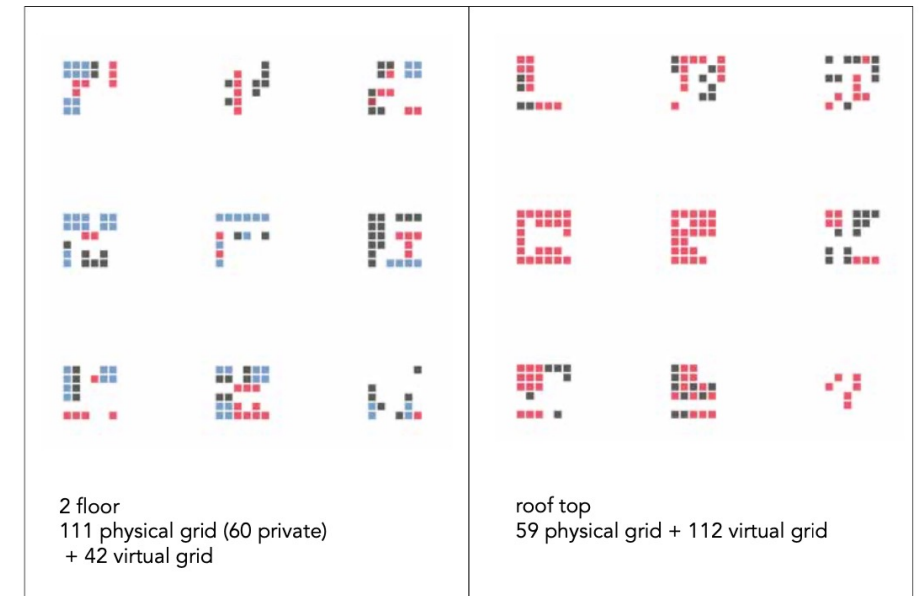
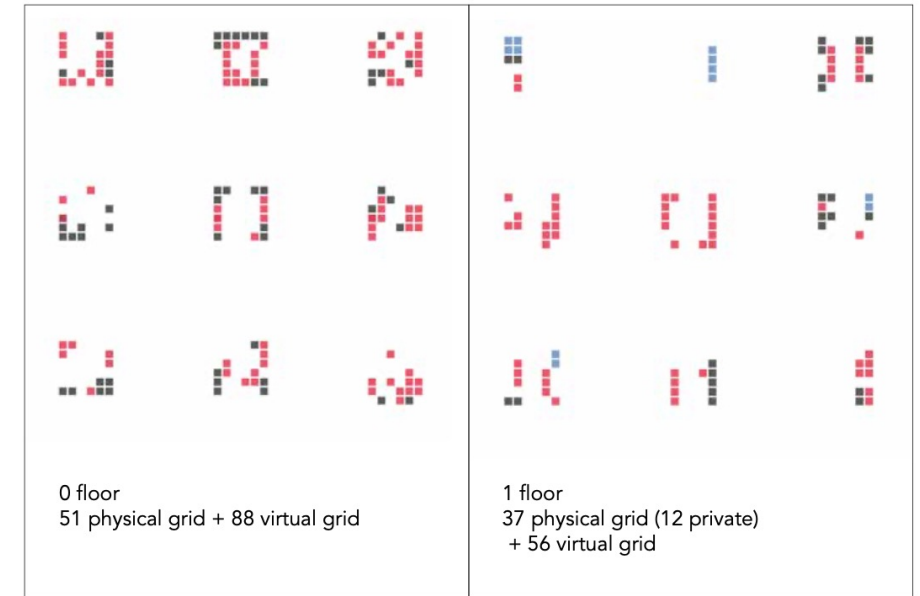
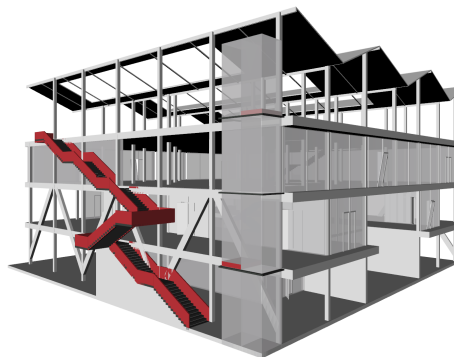
- physical (private)
- physical
- virtual

private 2F>1F>0&R
physical 2F>R>0>1
virtual R>0>1F>2F

Conclusions and Observations

FLOOR	DISTRIBUTION	VIRTUAL/PHYSICAL	PUBLIC/PRIVATE	ELSE
0		virtual>physical	public, no private space	
1	· People prefer to stay on the border · Empty around traffic space	virtual>physical	public, little private space	
2		Physical>virtual	public, more private space	most private
3(ROOF)		virtual>physical	public, no private space	most popular

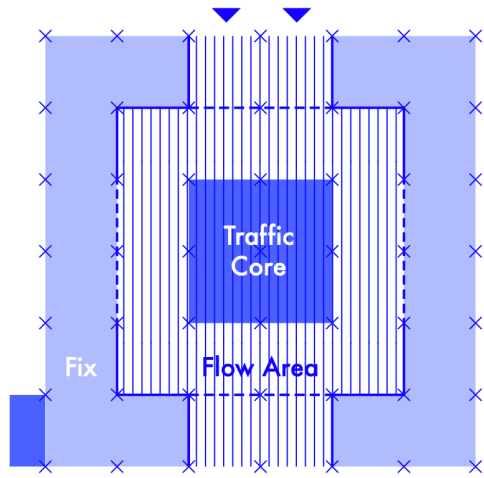
R
2
1
0



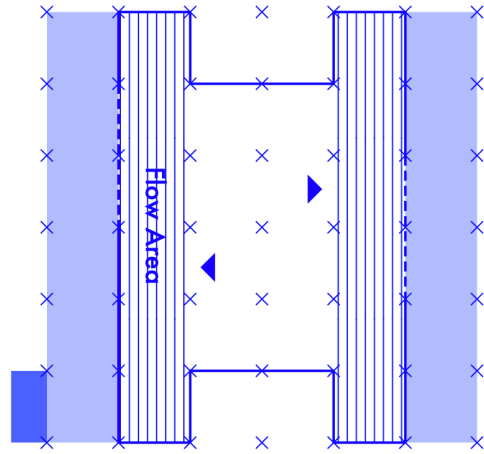
- physical (private)
- physical
- virtual

private 2F>1F>0&R
physical 2F>R>0>1
virtual R>0>1F>2F

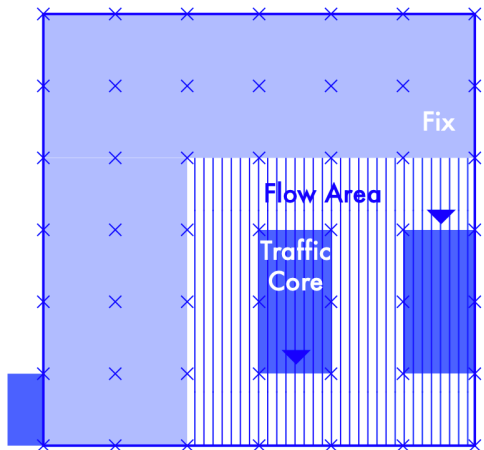
Design Principles



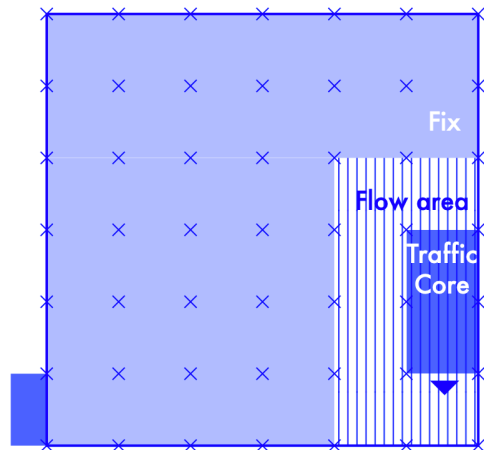
First floor



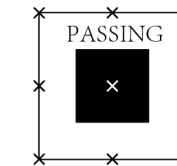
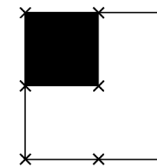
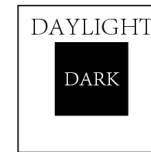
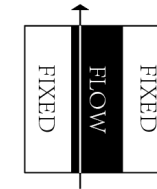
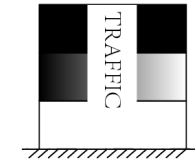
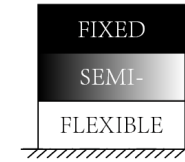
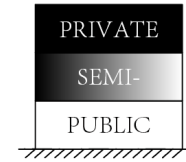
Second floor



Third floor



Roof floor



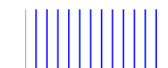
Doors



Walls



Fix Area — All programs

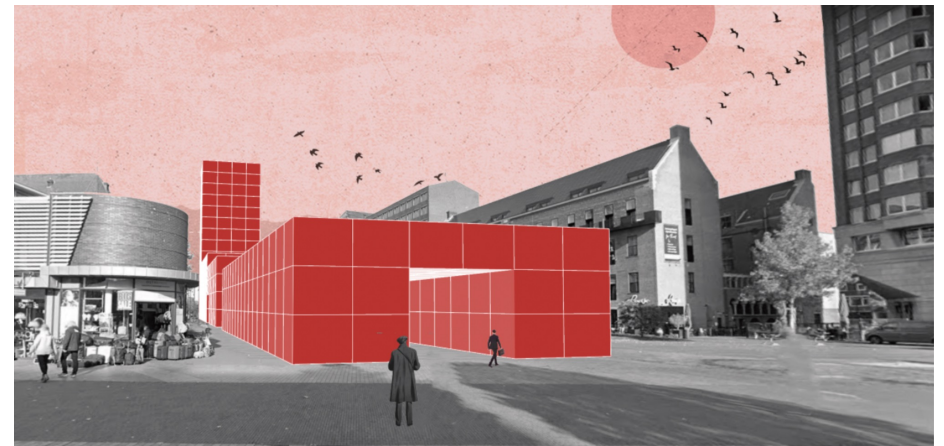
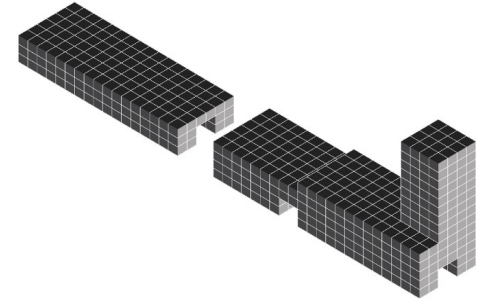
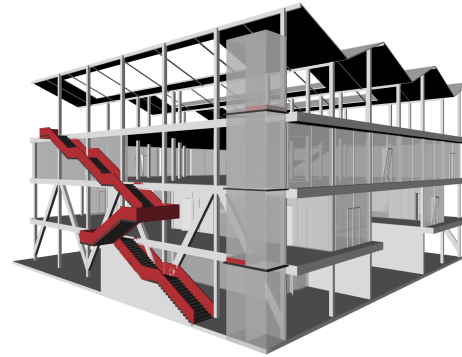


Flow Area — Flowing space - only virtual programs



Traffic Core — Staircases and Elevator

Implementations on Blaak

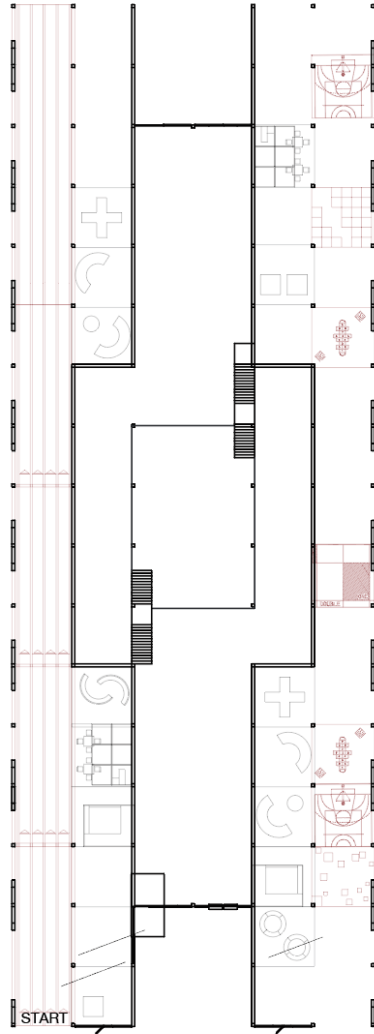


12-18



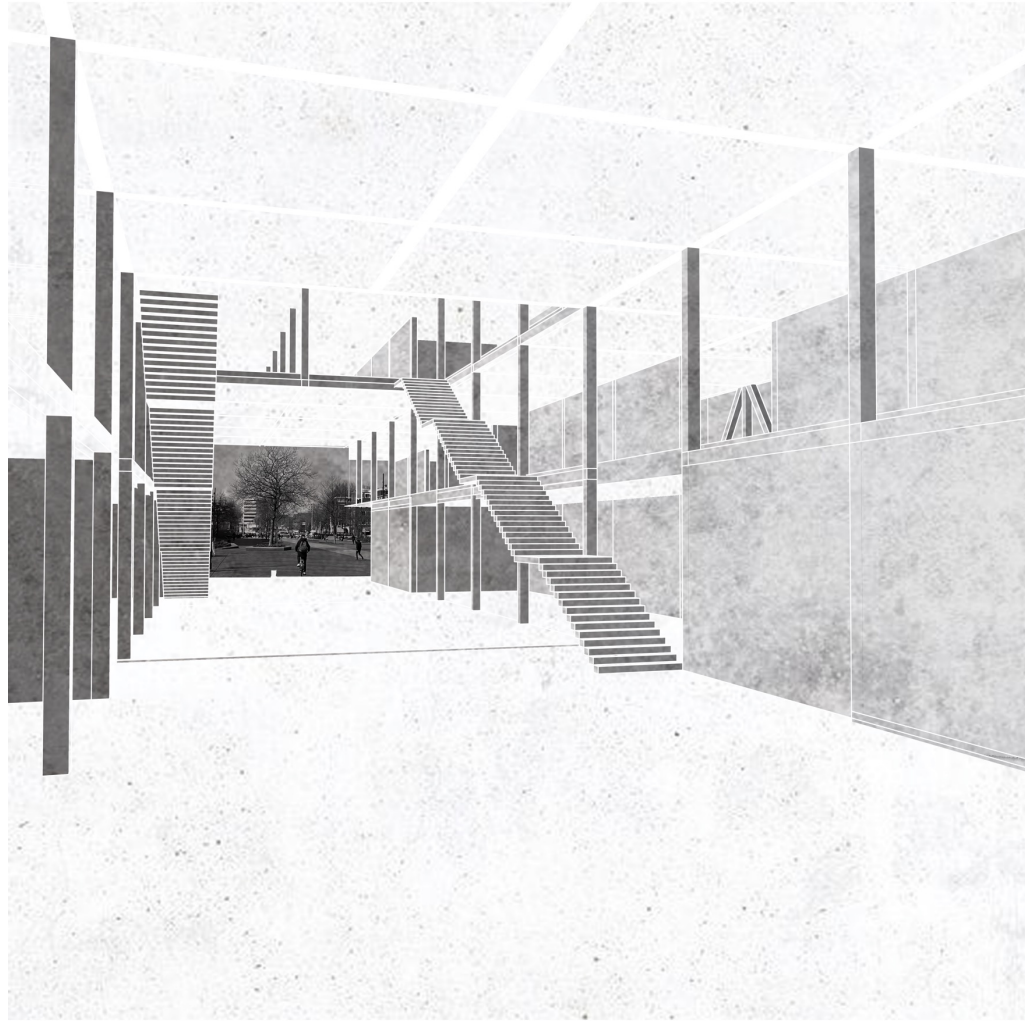
exhibition **library**
church **shops**
market **restaurant**

18-03



cinema bar **night club**
sports gym **running**













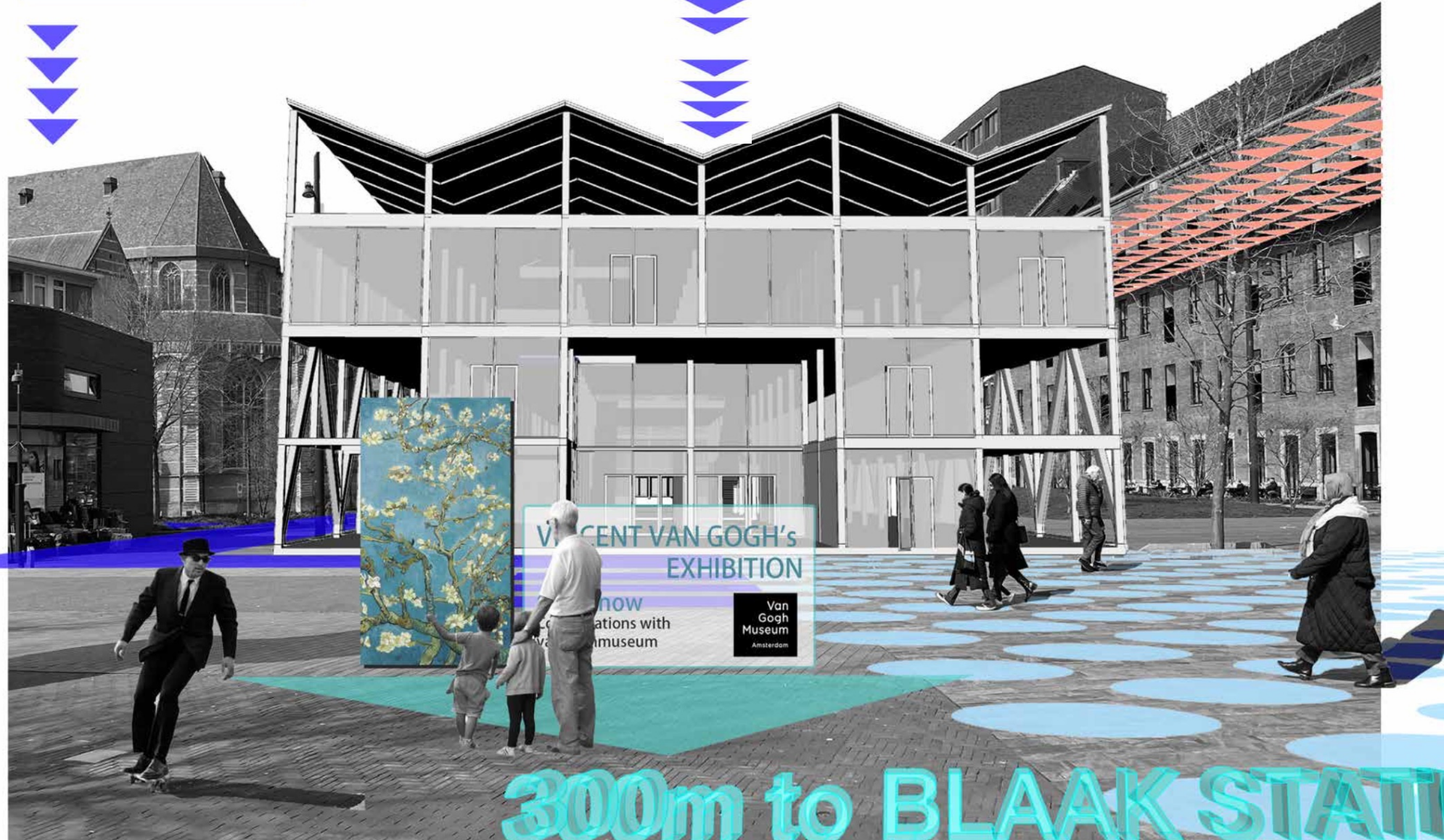
St. Lawrence Church

4.5 ★★★★★ ⓘ

Museum

Open now
Open today from
10:00 AM to 5:00 PM

CREATE YOUR ROOF GARDEN HERE



300m to BLAAK STATION

VI Conclusion & Reflection



Conclusion

Spatial Dimension:

Flexible Design: Utilize AR technology to create neutral buildings that can adapt to various functions and activities, allowing for flexibility in the use of space.

Universal Accessibility: Apply universal design principles to ensure that the virtual and physical spaces are accessible to individuals of diverse abilities, providing equal opportunities for participation.

Dynamic Environments: Design virtual and physical spaces that can be easily reconfigured to accommodate different activities and user needs, promoting diversity and adaptability.

Social Dimension:

Enhanced Collaboration: Foster social integration and collaboration by designing spaces that encourage interaction and communication among users. AR technology can facilitate collaborative working, shared resources, and interactive displays, promoting engagement and cooperation.

Inclusivity: Consider the diverse needs and preferences of individuals when designing virtual and physical spaces, ensuring that they are inclusive and welcoming to all users.

Community Engagement: Involve the community in the design process to gather insights and incorporate their feedback, ensuring that the spaces reflect their needs and aspirations.

Cultural Sensitivity: Take into account the cultural context of the urban environment to design spaces that respect and reflect the local culture, promoting a sense of belonging and identity.



A solid red square is positioned on the left side of the image, partially overlapping the text.

**Thanks for joining my
AR-scape!**