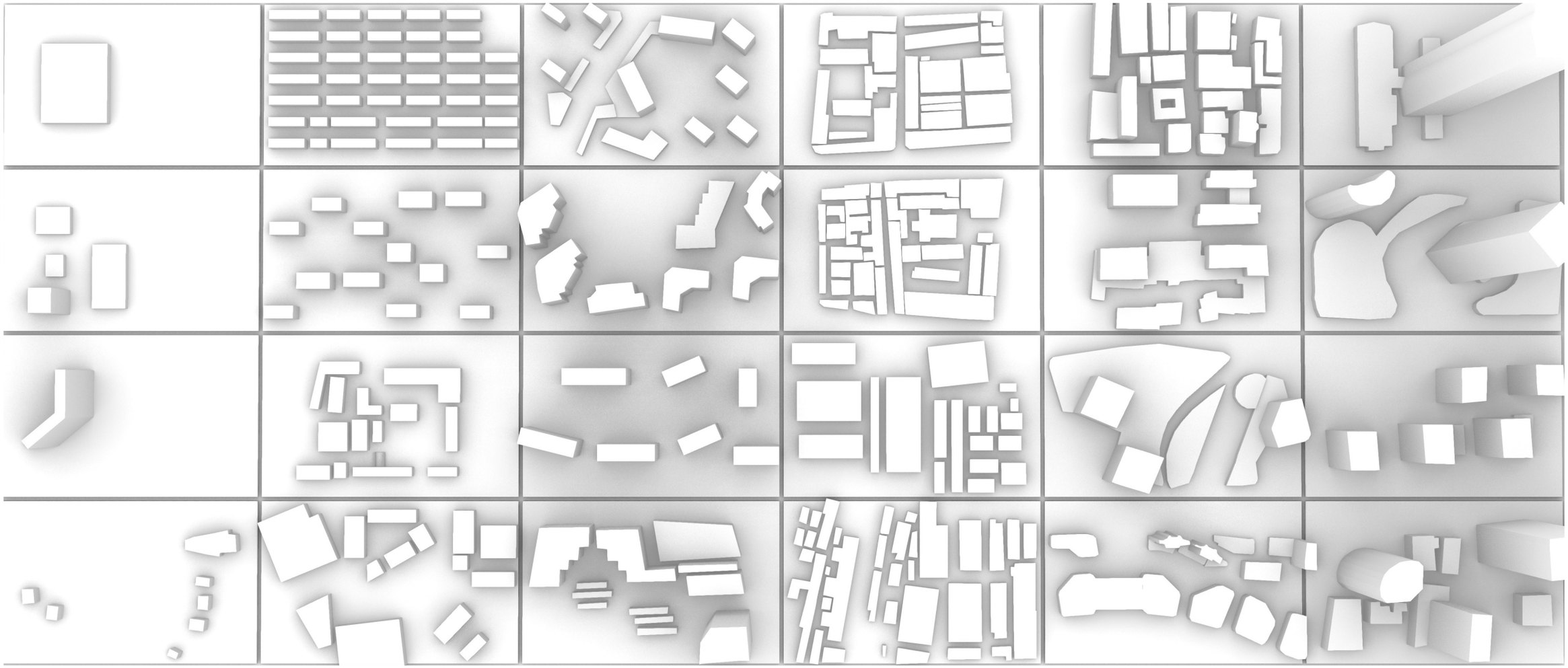


Den-City

Revitalize Former Industrial Riverbank In Shanghai

MSc Thesis Urbanism
Yiqi Ding 4814649
Email address: yqding950@outlook.com

First Mentor: Dipl.ing. B. Hausleitner
Second Mentor: Dr.ir. G.A. Verschuure-Stuip

P5 presentation 2.7.2020

Vision

Huangpu river

Vision

Connectivity

Mixed-use

Identity

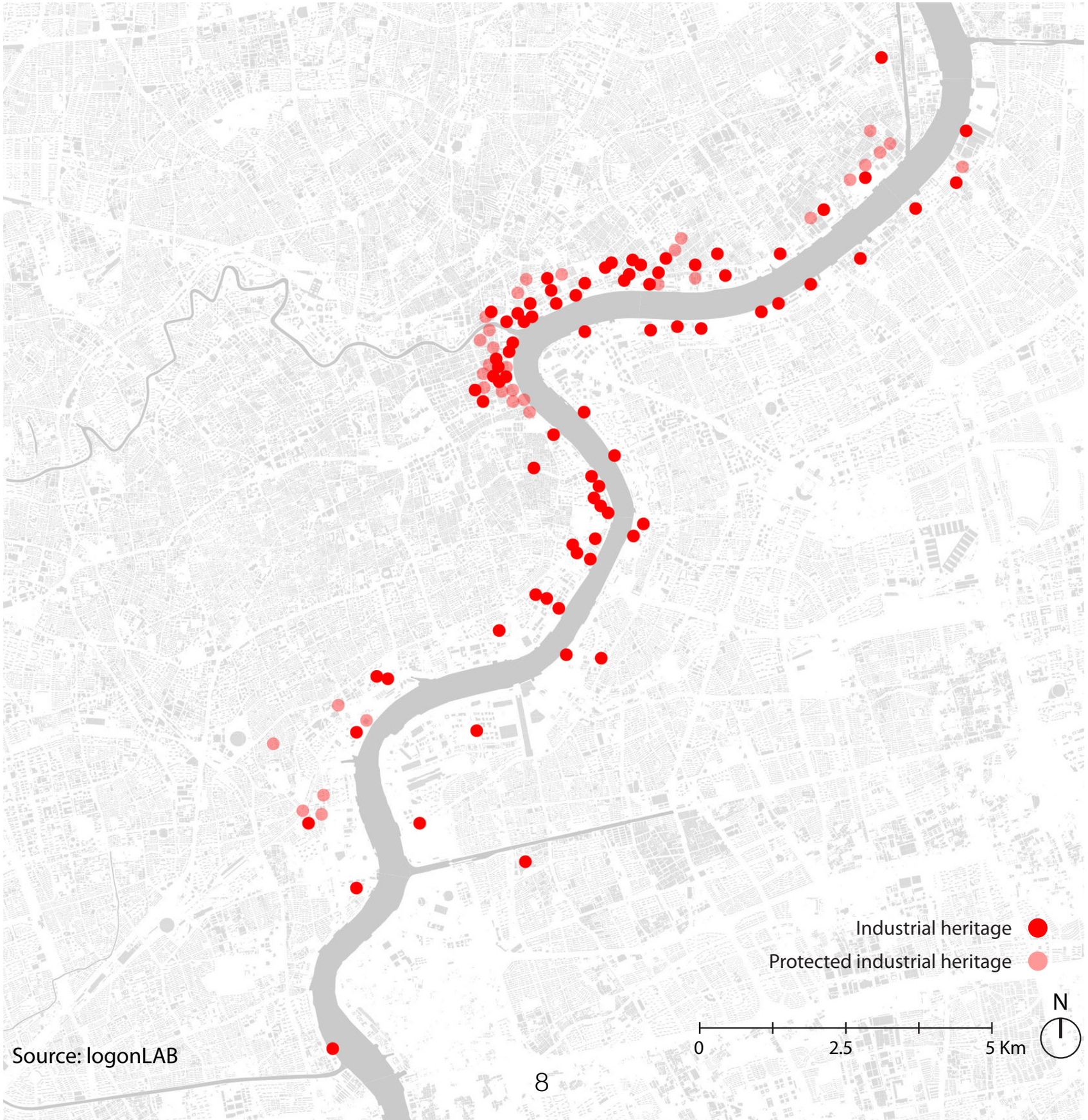
?
Google Earth
mage © 2020 Maxar Technologies
1 km

?
5

City of Shanghai and surrounding region map, industrial objects, 1937

Shanghai riverfront in1937

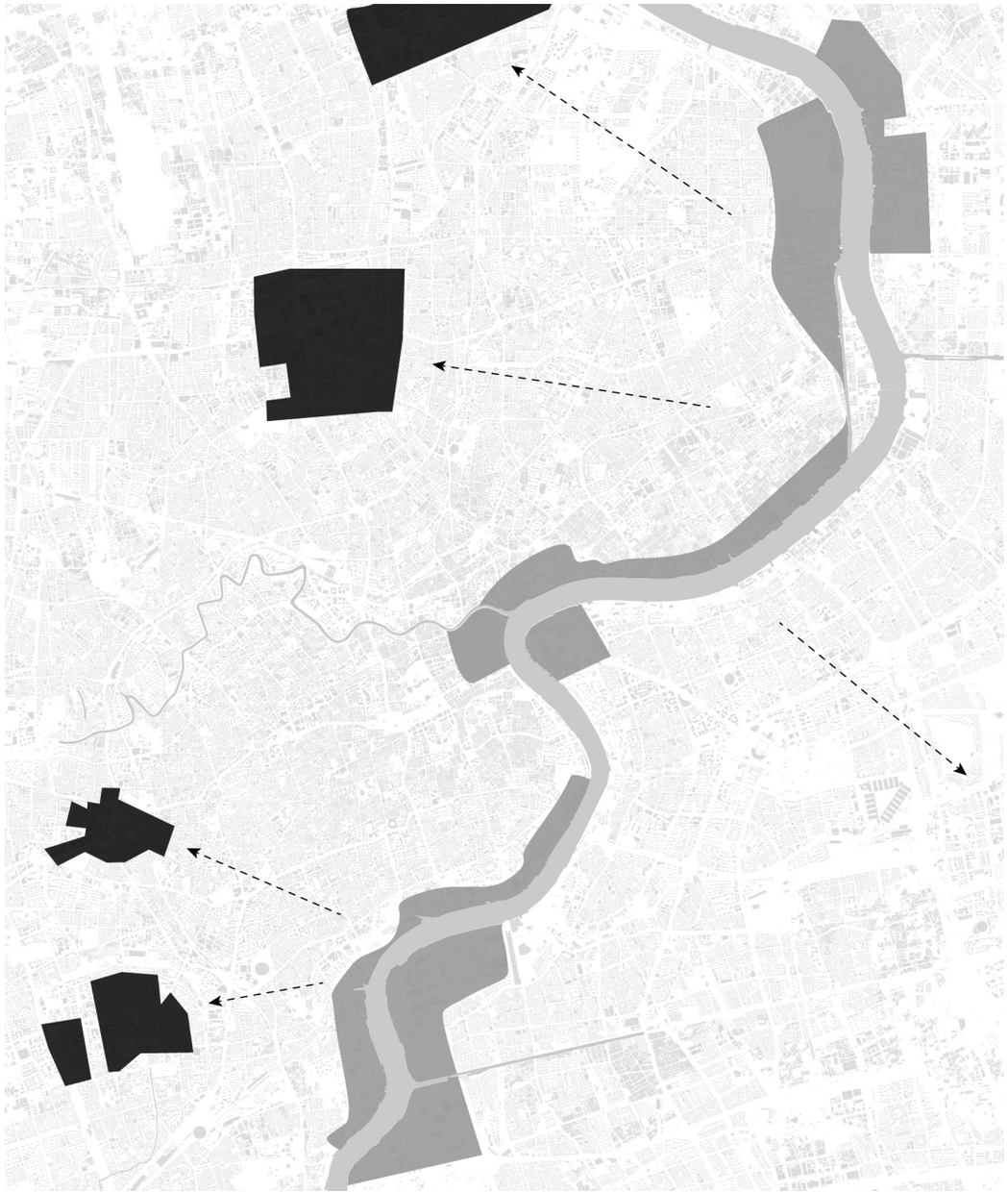
Remaining industrial buildings

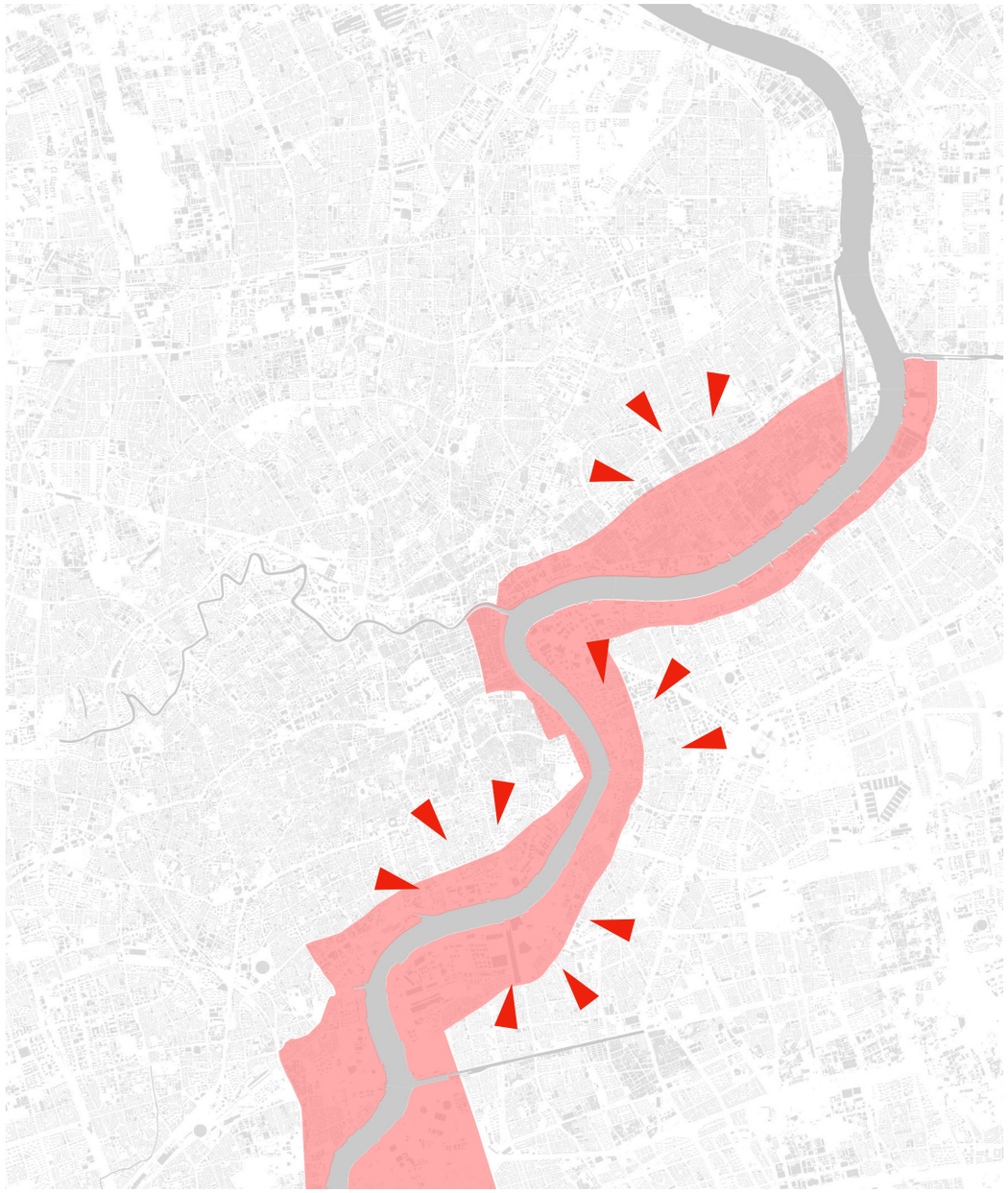


Source: logonLAB

Source: logonLAB

Transformation





1990 -2002

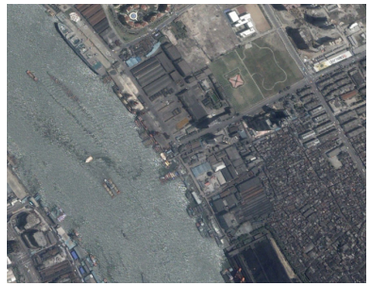
Heavy industry moved to the suburban, the Huangpu riverfront become abandoned

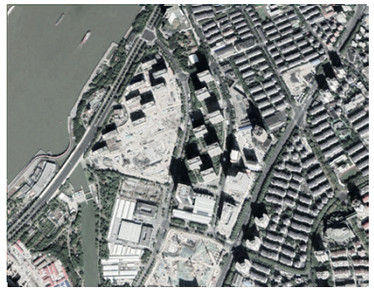
2002 - Now

Urban regeneration along riverfront the mordern urban functions

2000

2020



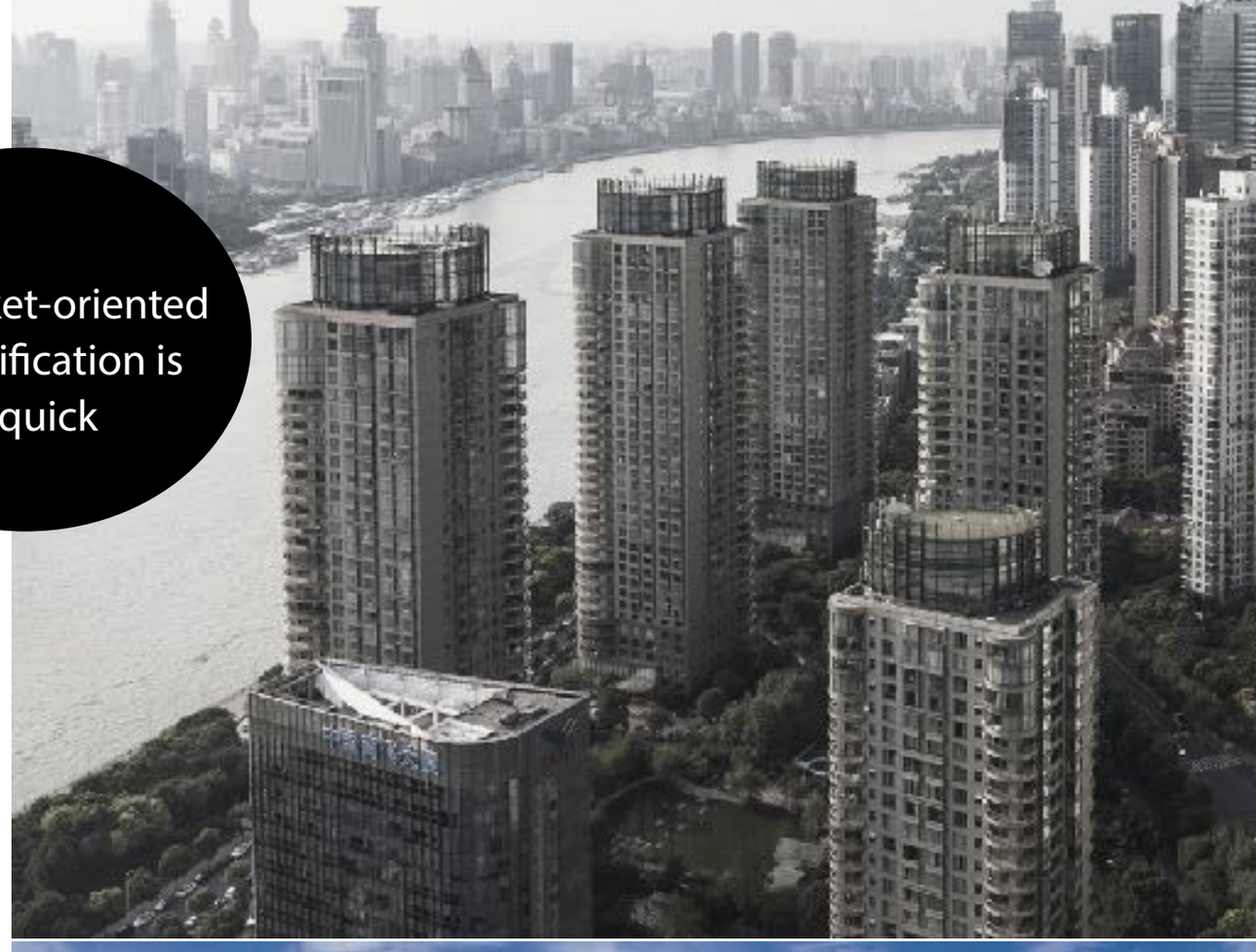


Googlemap, 2000

Googlemap, 2020

The Problem and Challenge

Market-oriented densification is very quick



Homogenious environment can not accomodate diverse people

Single function block

Yellow for residential

Big block not walkable street

- **Big block not walkable**
- **Single function block make no activity happens**
- **Homogenious forms could not serve diverse people**
- **Low quality green**
- **Poor connection with nearby neighbourhoods**
- **Lack of identity and dialog with past**

→ **Densification ignore the quality**

Use density as a starting point to learn our built environment, and its relation with Quality

The Quality of Density

Density
?
Quality

Density

Density

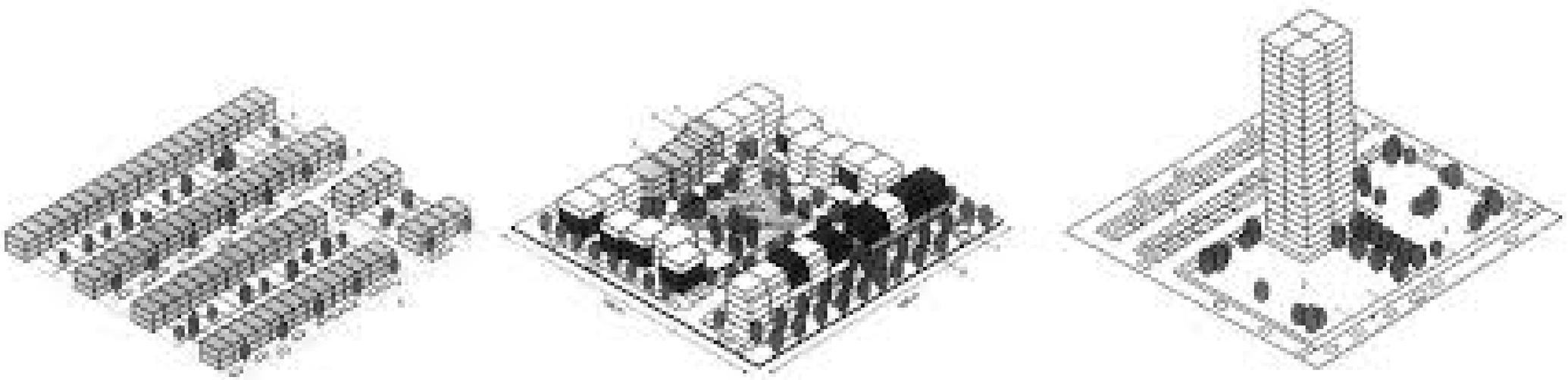
FSI = 3.5

Sha Tin Wo Che Estate

FSI = 3.5

Gang-sha Village, Urban Village

Density – Morphology type



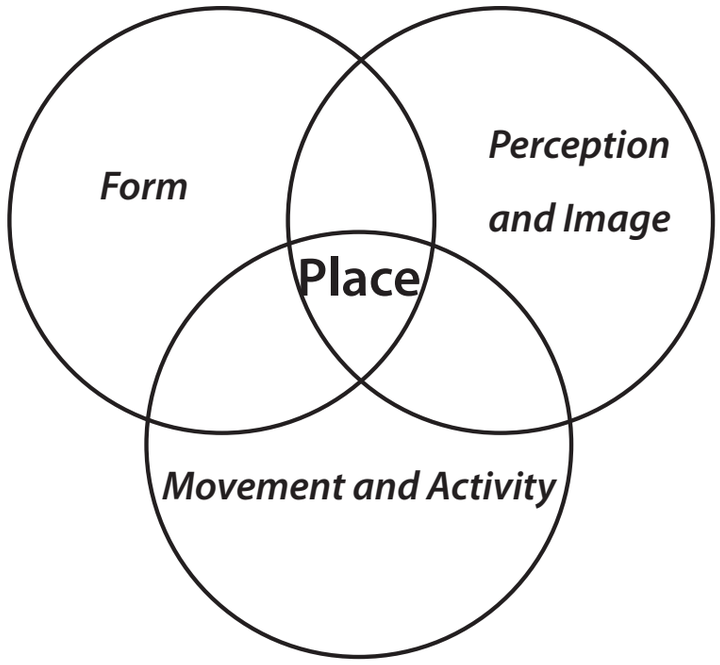
Source: Spacematrix (Berghauser Pont and Haupt, 2010)

Spacematrix describing the density by four variant: FSI, GSI, OSR and L. we get a more accurate description.

Density – Morphology type ? Quality

Density — Morphology type ? Quality

Place Quality



Source: Montgomery (1998).

Form

1. Accessible for bike, pedestrain

2. Street connectivity

3. Friendly public realm

4. Diverse block typology

Movement and Activity

5. Diversity in program and land use

6. Informal and formal social activities

7. Activities to meet diverse social groups

8. Social movement

Perception and Image

9. Physical identity: legibility path, landmark...

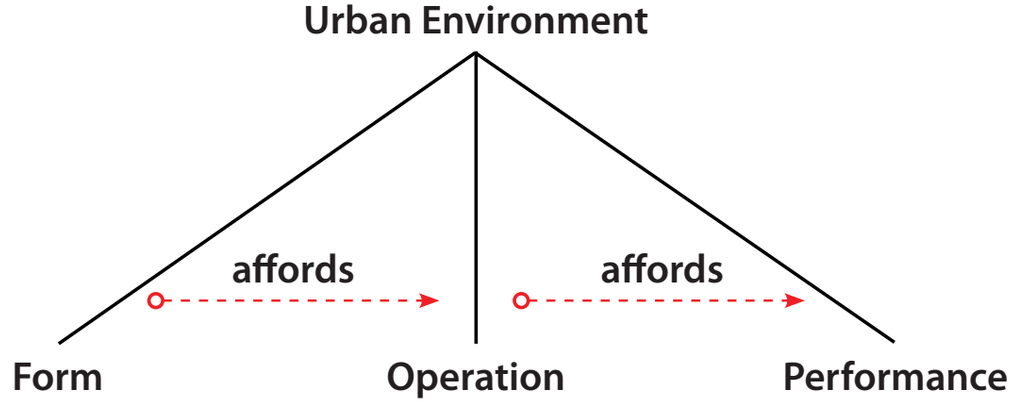
10. Social identity

11. Sensory identity

12. History and memory

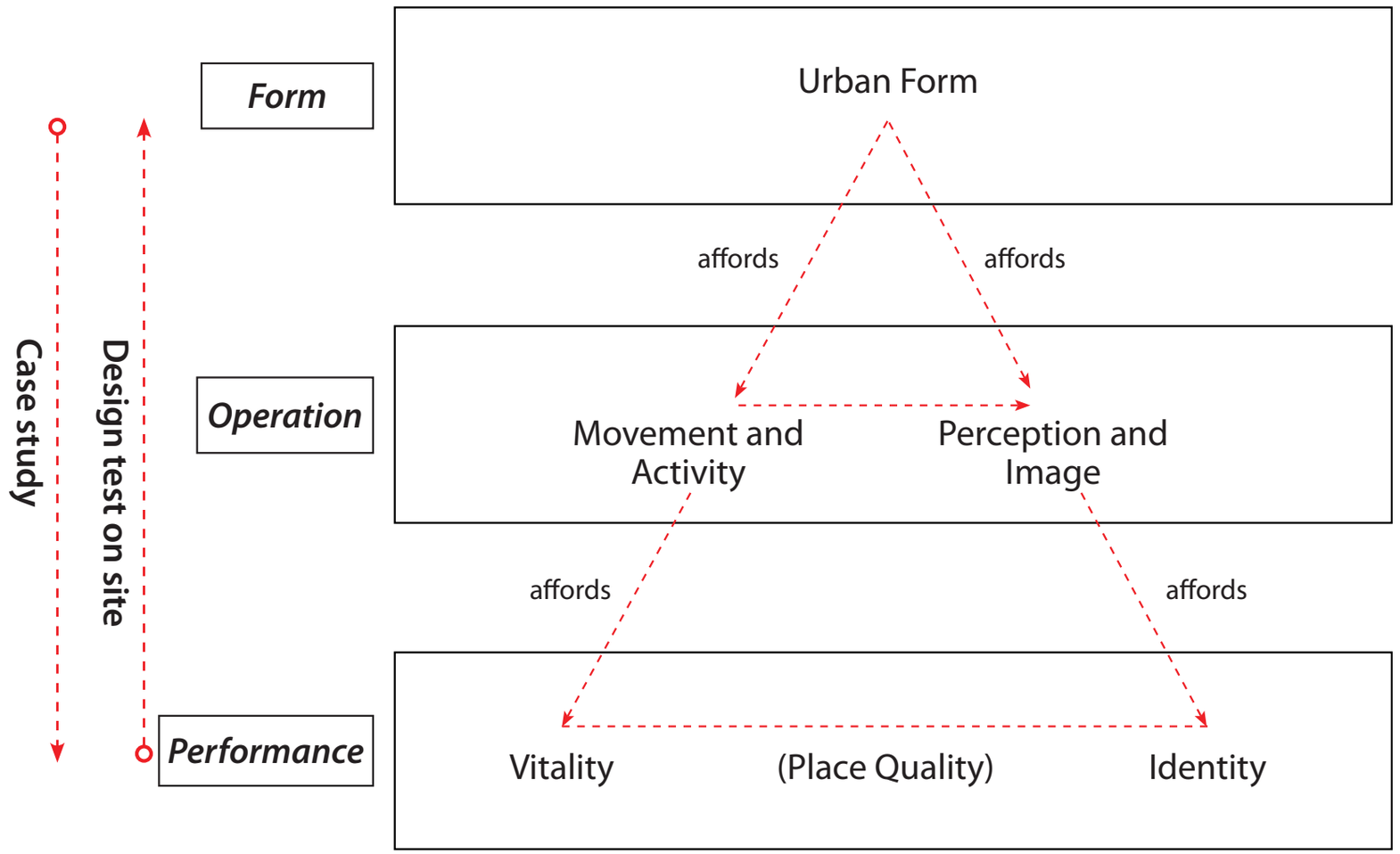
Morphology type — Quality

Method: Affordance model



Source: Adapted diagram from Guney (2008)

Conceptual Framework



Density – Morphology type — Quality

Density – Morphology type — Quality

1

Understand concepts from theory

Research question

SQ1: What quality means for Huangpu riverfront?

SQ2: What is the riverfront density morphological type

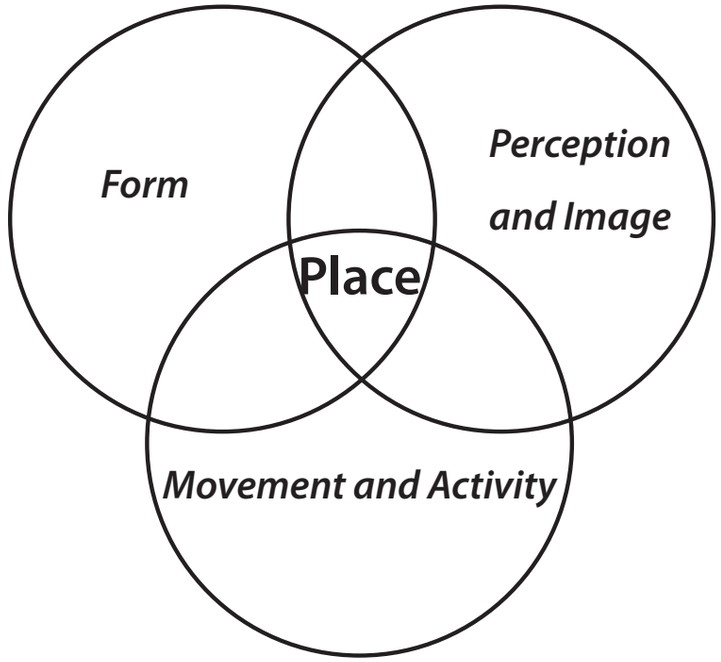
How to improve the place quality (urban vitality and identity) in the post-industrial riverfront along the Shanghai Huangpu River by understanding and modifying urban form during the densification and intensification process?

SQ3: Link the quality and density

2

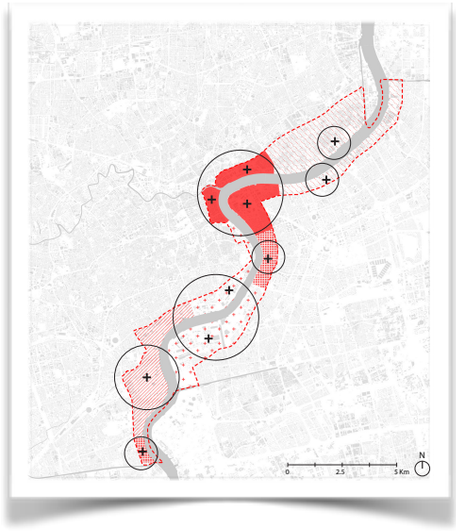
SQ1: What quality means for Huangpu riverfront

Analyse Framework

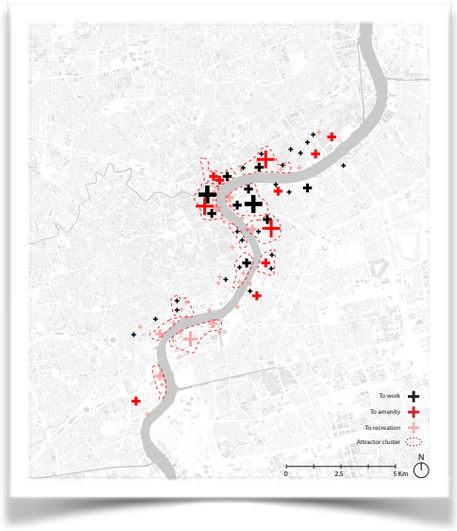


Source: Montgomery (1998).

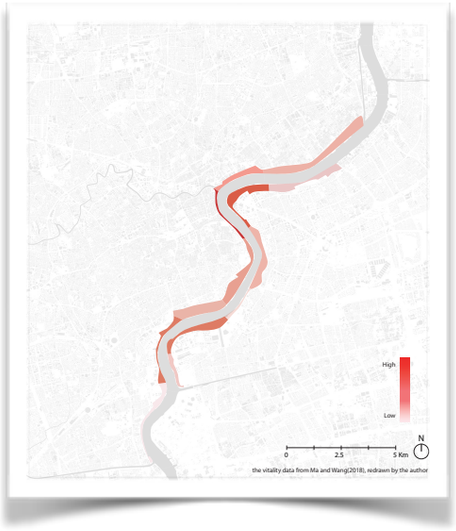
Riverfront Character



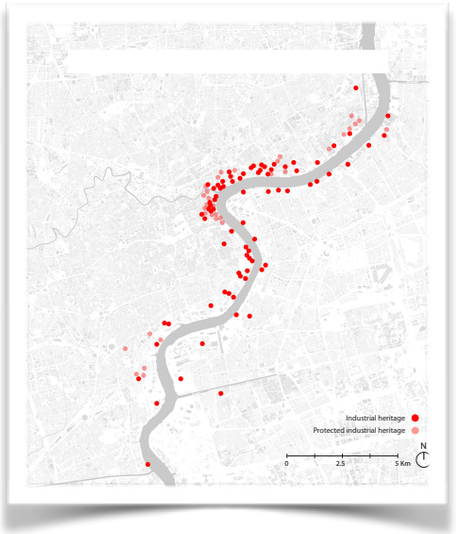
Attractors



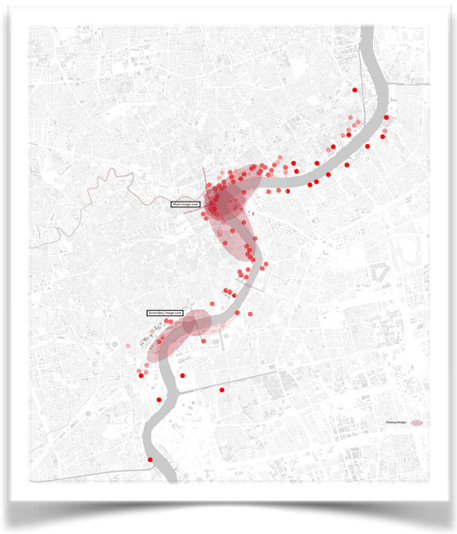
Vitality



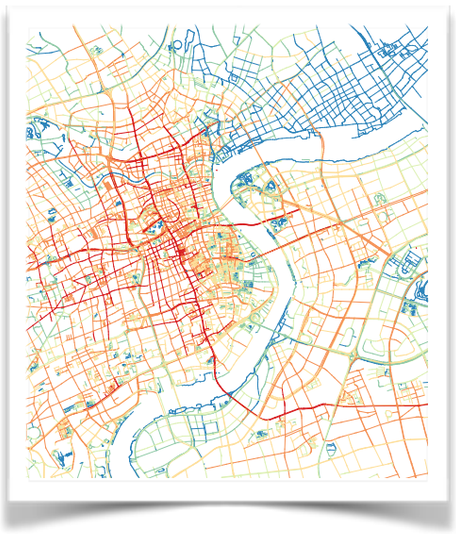
Historical protected buildings



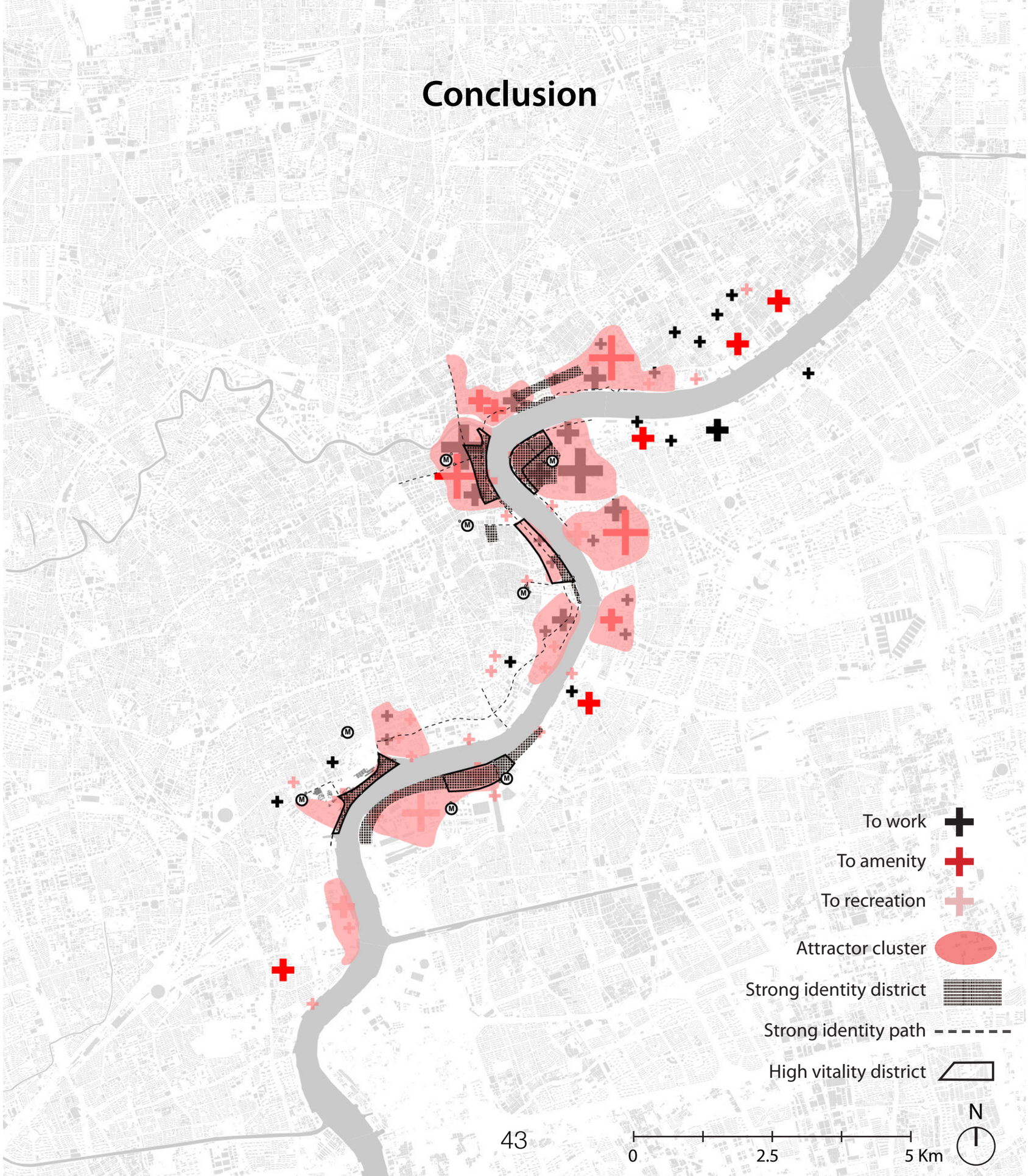
Strong image area



Street connectivity



Conclusion


To work
To amenity
To recreation
Attractor cluster
Strong identity district
Strong identity path
High vitality district
N
0
2.5
5 Km

Conclusion

Attractor clusters

Strong image

Attractor cluster

Strong identity district

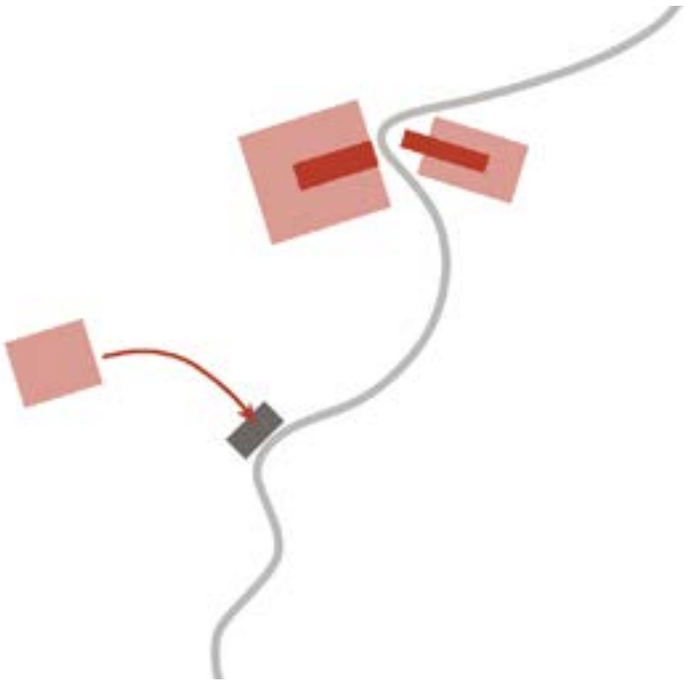
Strong identity path

High vitality district

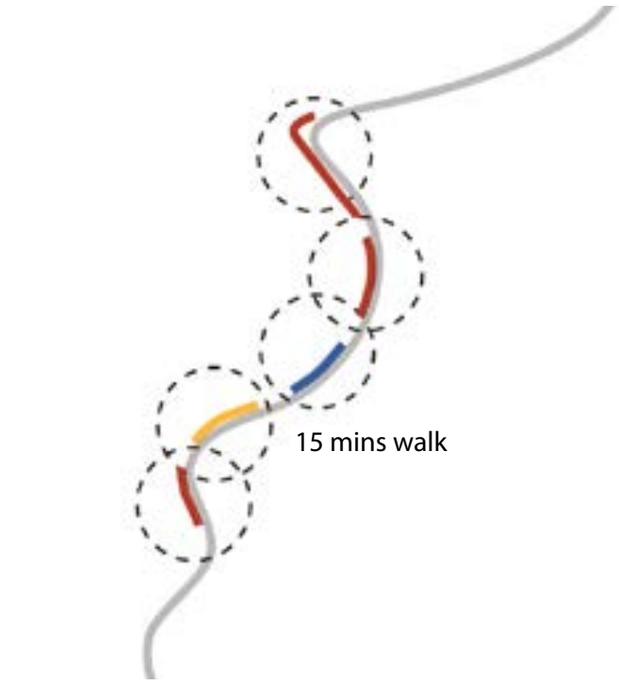
Conclusion

High connectivity street

Three quality concepts



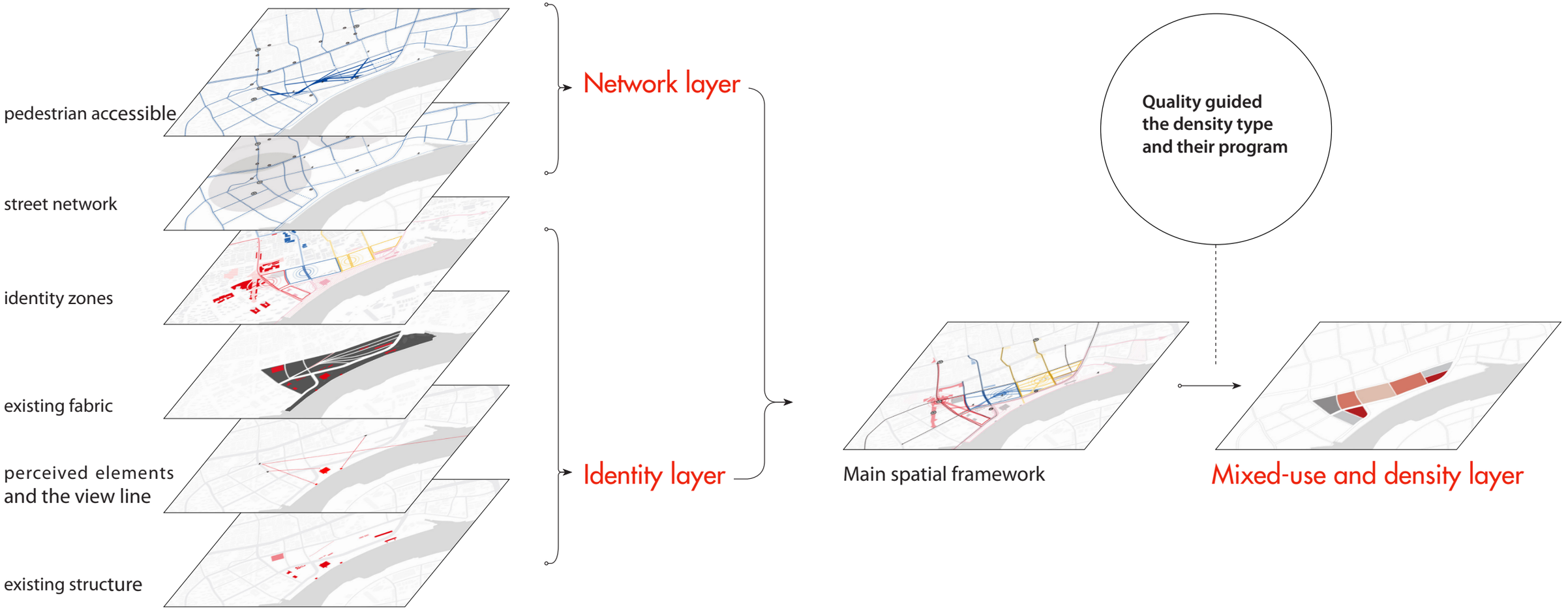
1. Network : Well link with hinterland



2. Mixed-use and certain density

3. identity

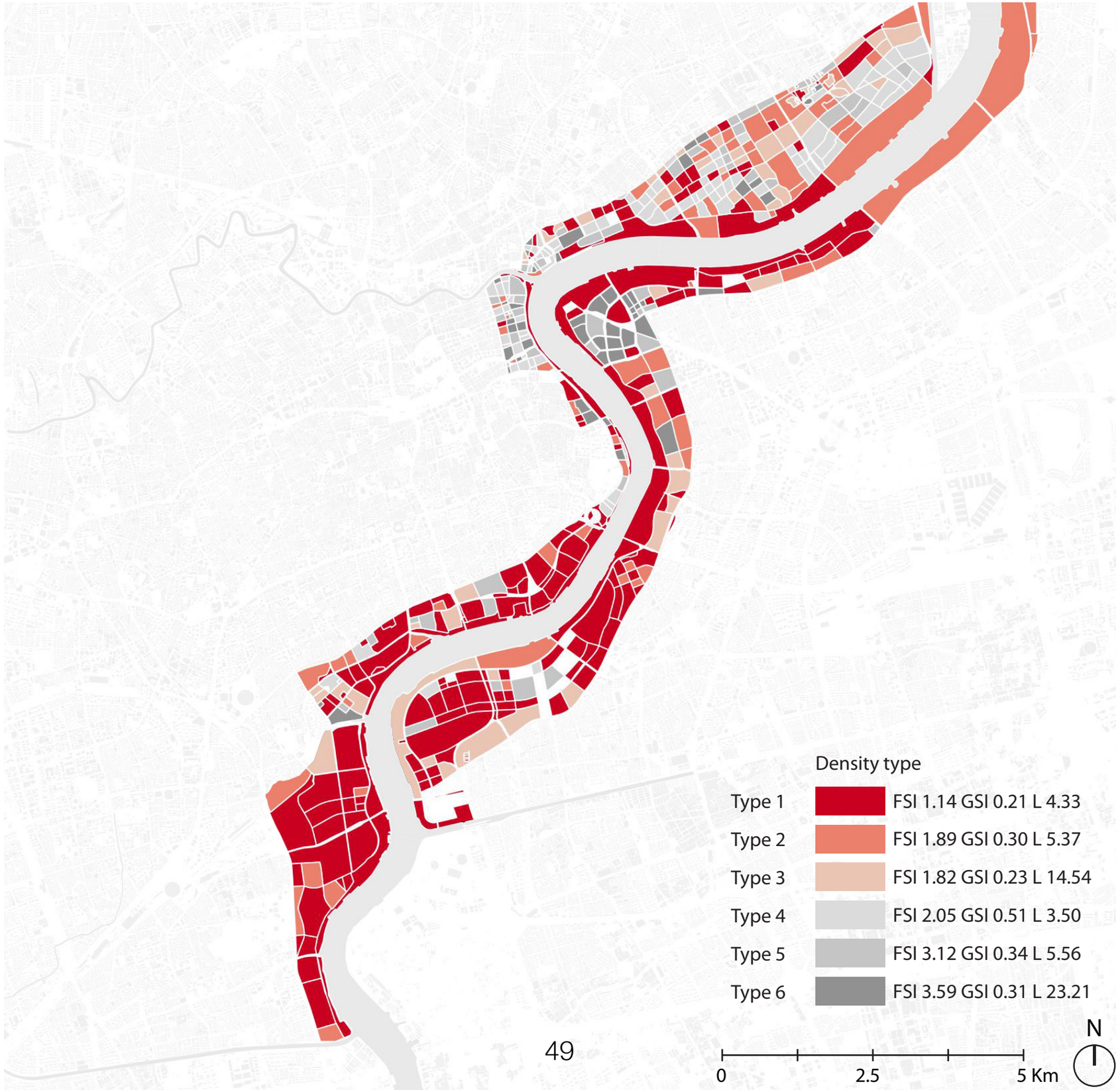
Analyse the main spatial framework



3

SQ2: Understand Huangpu riverfront density morphological type

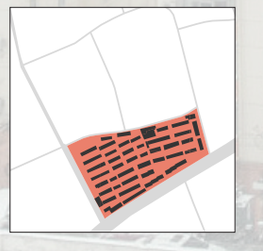
Morphology type



Type 1

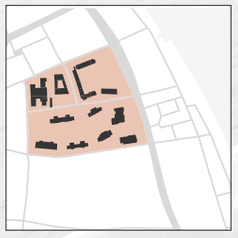
Open block with low-rise point

Public Facilities



Type 2

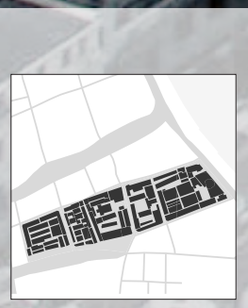
Mix of mid-rise and low-rise



Type 3

High-rise spacious point type

Residential



Type 4

Low-rise compact type

Residential

Type 5

Mid-rise compact block type

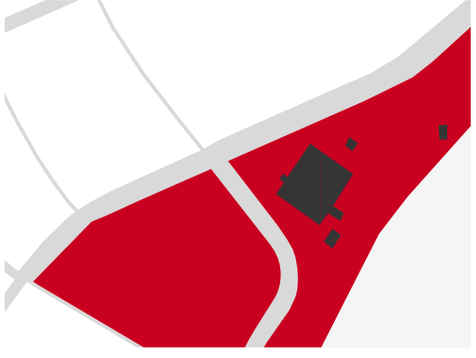
Commercial & Office

Type 6

High-rise compact point type

Commercial & Office

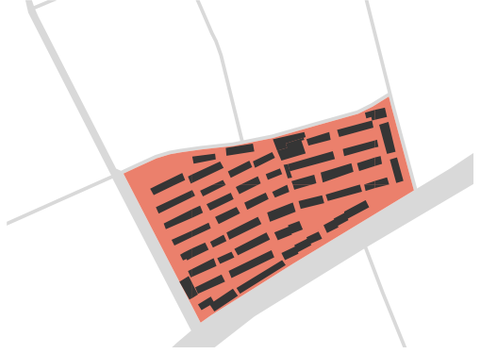
Morphological type



Type 1

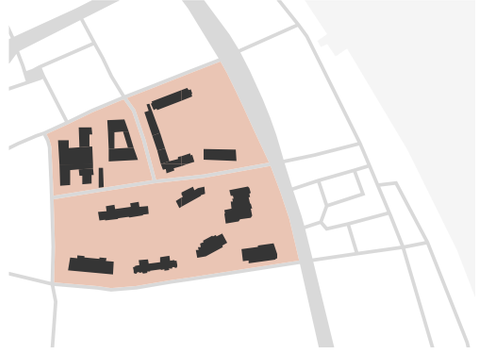
Open block with low-rise point

Public Facilities



Type 2

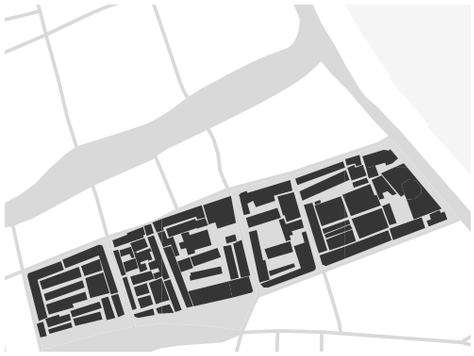
Mix of mid-rise and low-rise



Type 3

High-rise spacious point type

Residential



Type 4

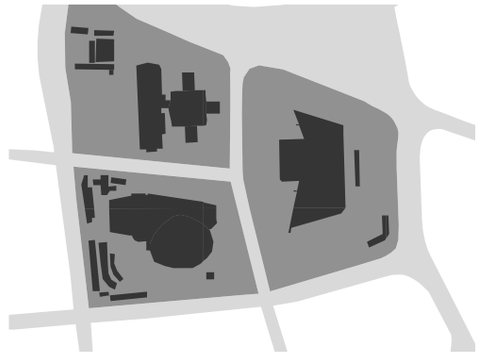
Low-rise compact type

Residential

Type 5

Mid-rise compact block type

Commercial & Office

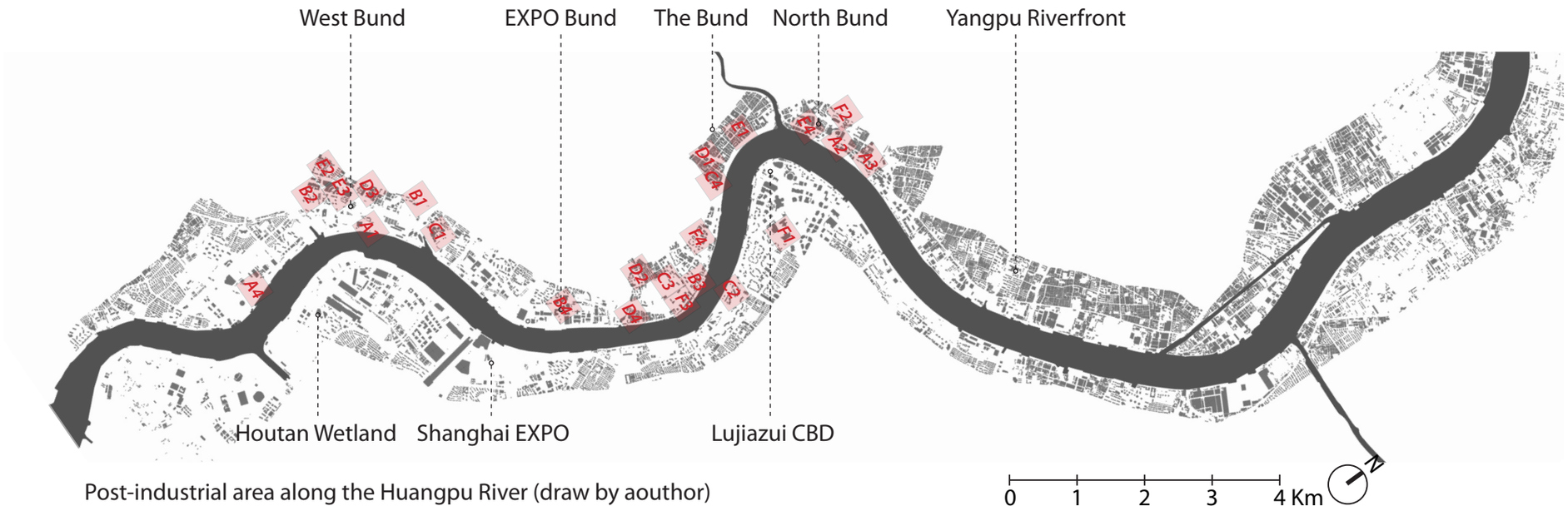


Type 6

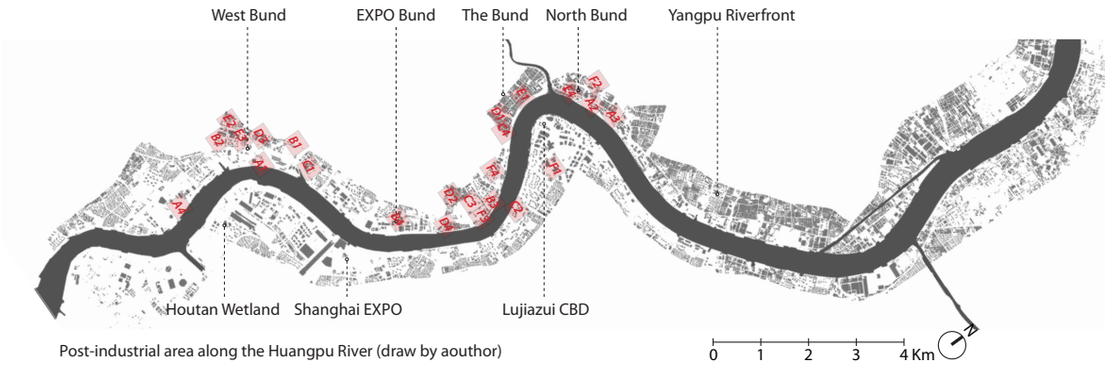
High-rise compact point type

Commercial & Office

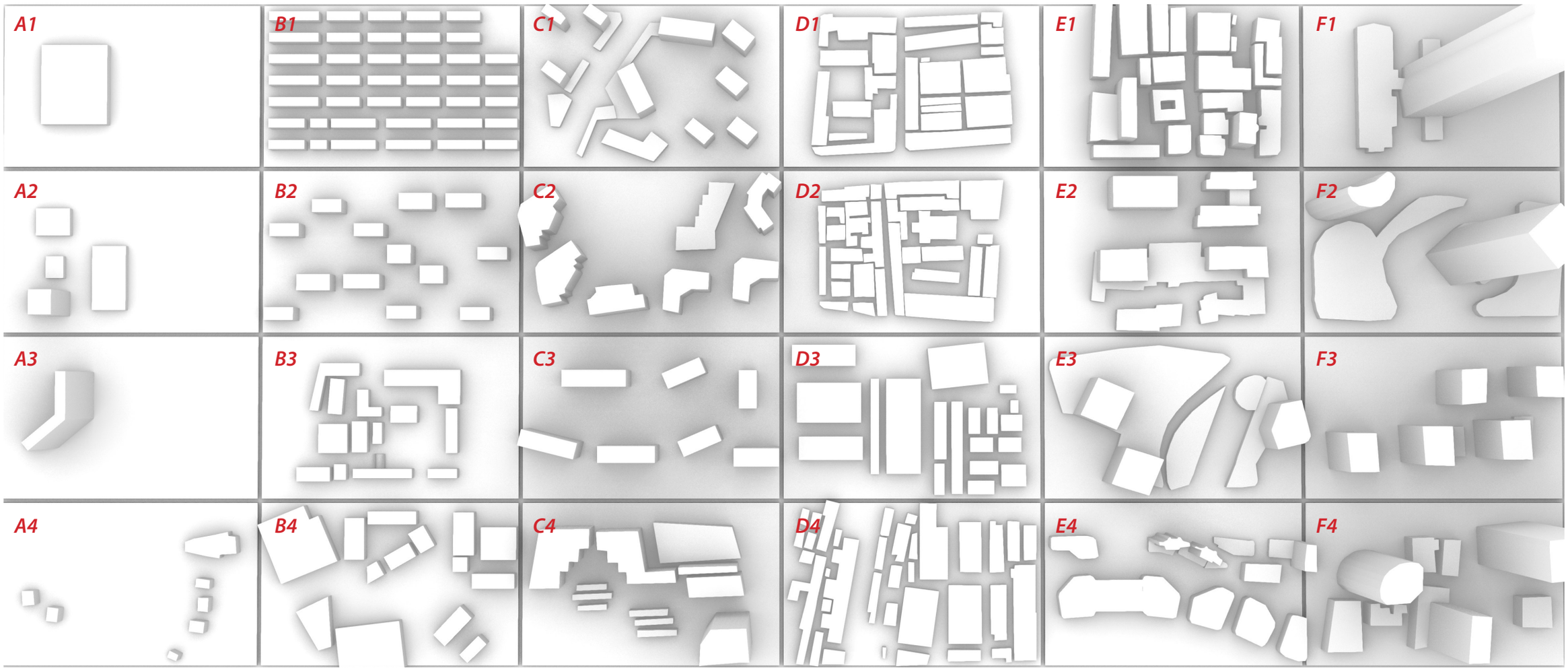
Huangpu riverfront



Post-industrial area along the Huangpu River (draw by aouthor)



Post-industrial area along the Huangpu River (draw by aouthor)



Type 1
Open block with low-rise point

Type 2
Mix of mid-rise and low-rise

Type 3
High-rise spacious point type

Type 4
Low-rise compact type

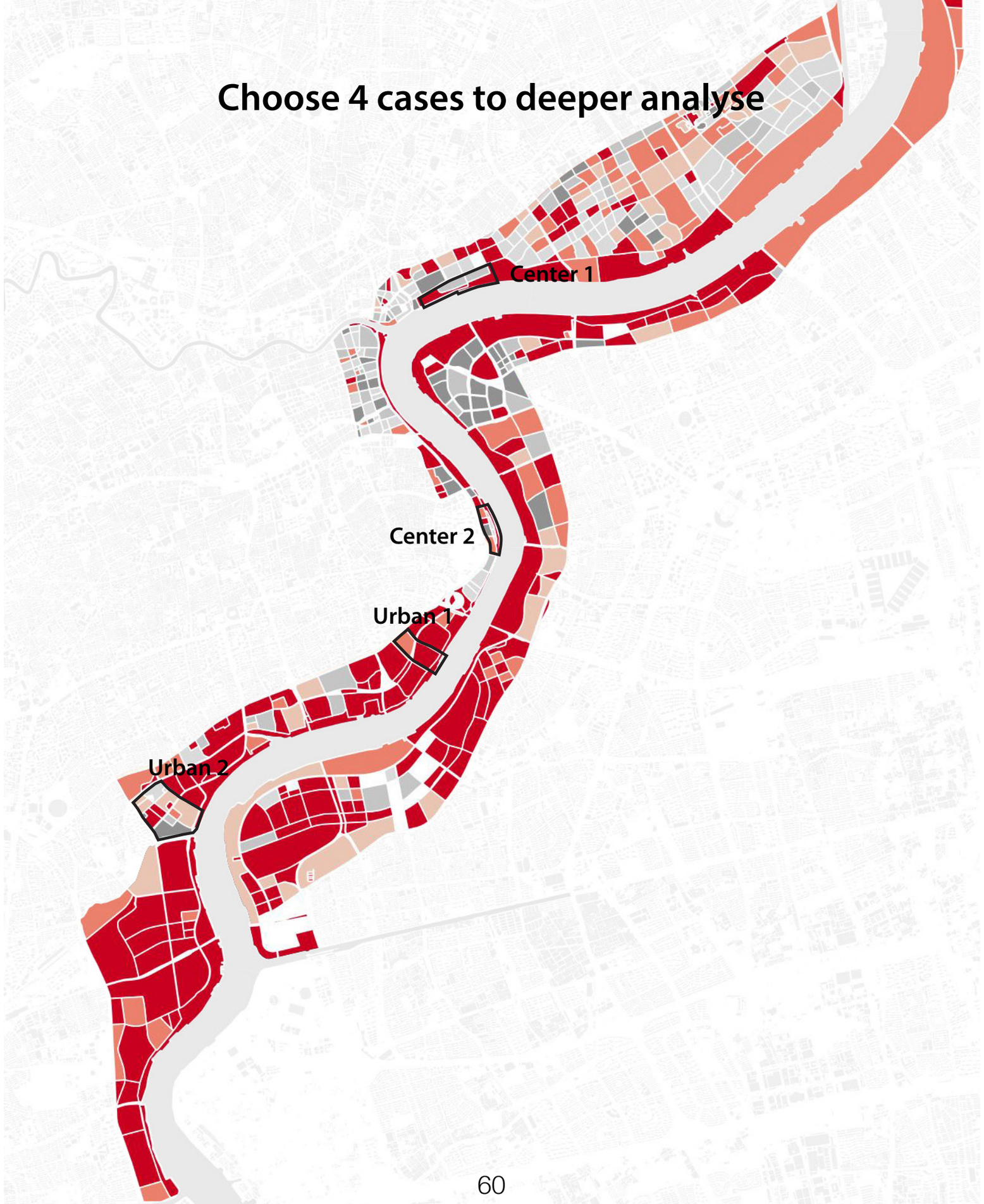
Type 5
Mid-rise compact block type

Type 6
High-rise compact point type

4

SQ3: Quality of density type

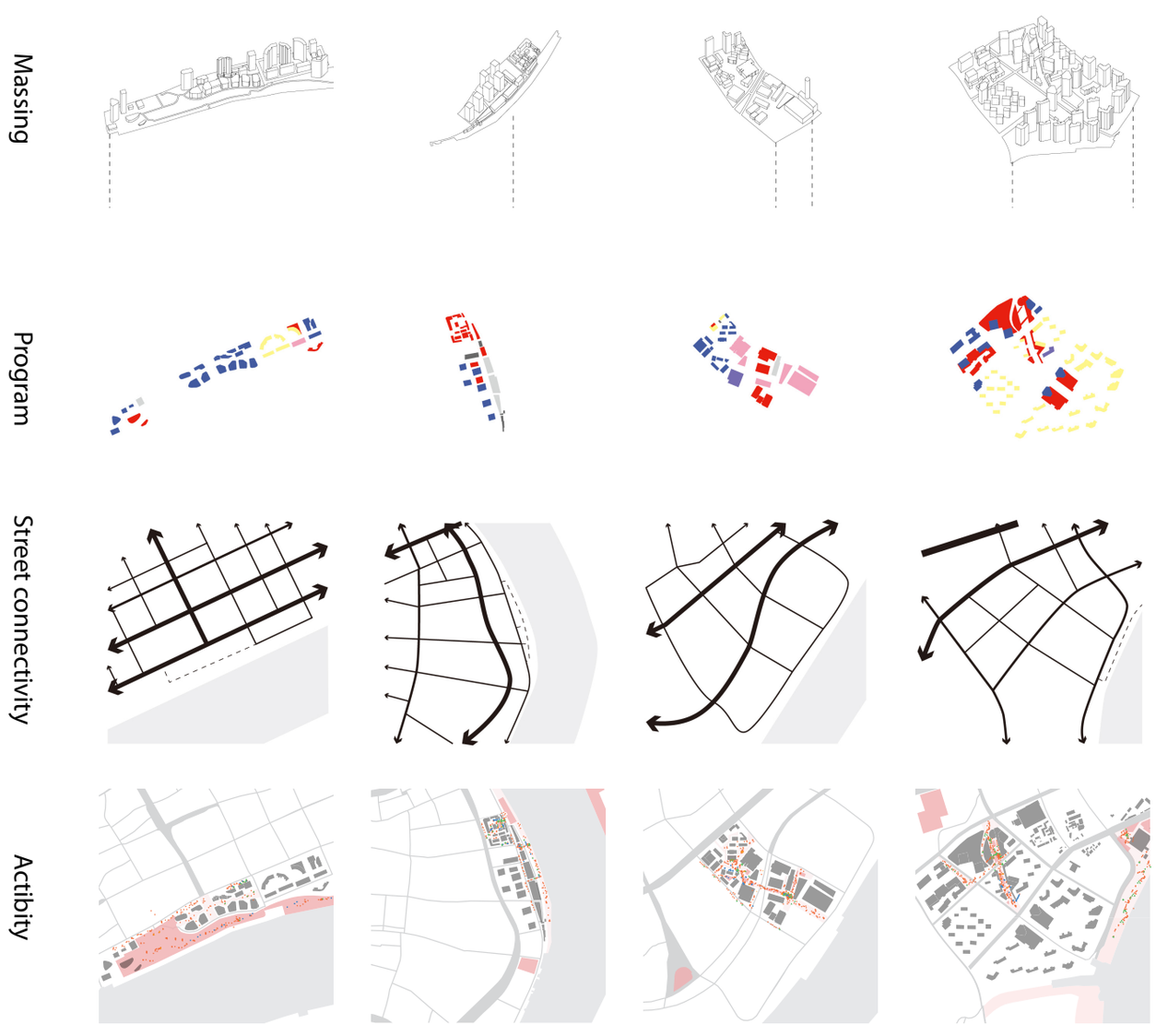
Choose 4 cases to deeper analyse



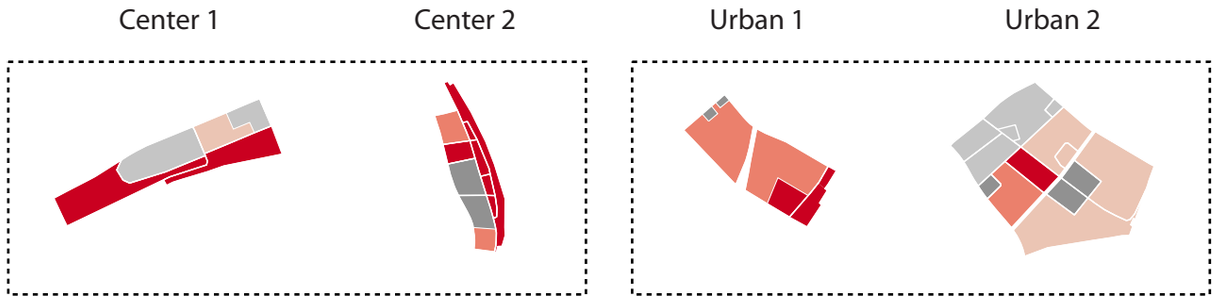
Density distribution

Center 1 | Center 2 | Urban 1 | Urban 2

Spatial Quality



Density distribution



small size block

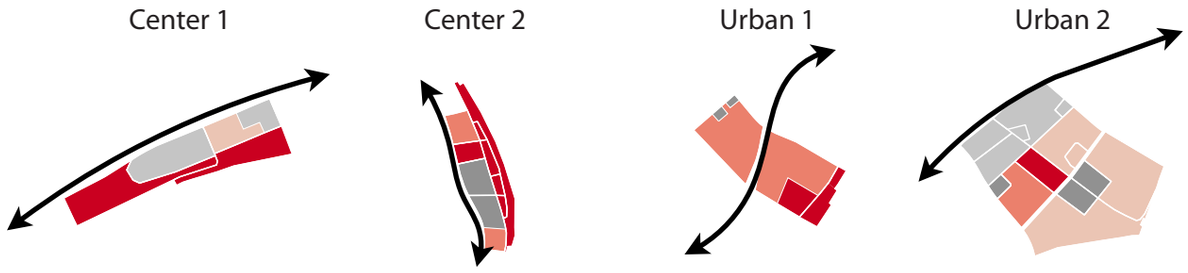
Big size block

Conclusion

1. Density type organisation have relation with block size

2. The adjacent block show different type can create more diversity

Density distribution



Conclusion

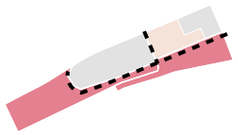
1. Density type organisation have relation with block size

2. The adjacent block show different type can create more diversity

3. Higher-rise shown along main street

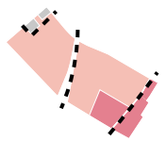
Density distribution

Center 1

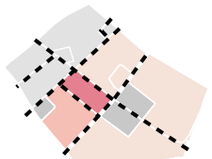


Center 2

Urban 1



Urban 2



Conclusion

1. Density type organisation have relation with block size

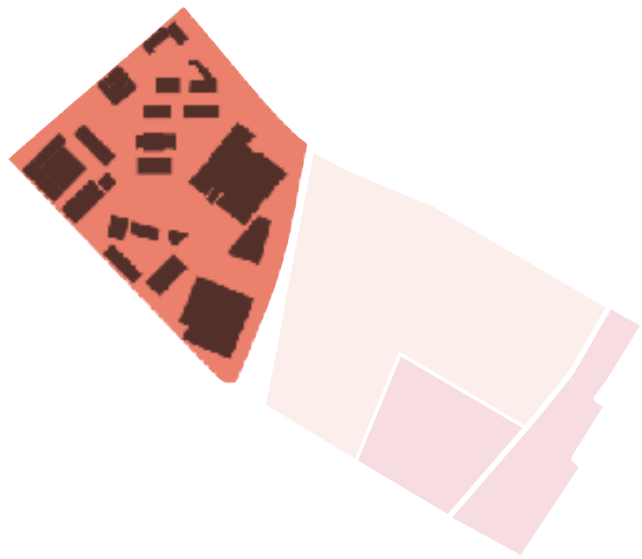
2. The adjacent block show different type can create more diversity

3. Higher-rise shown along main street

4. In-between density type

Not only the block organisation

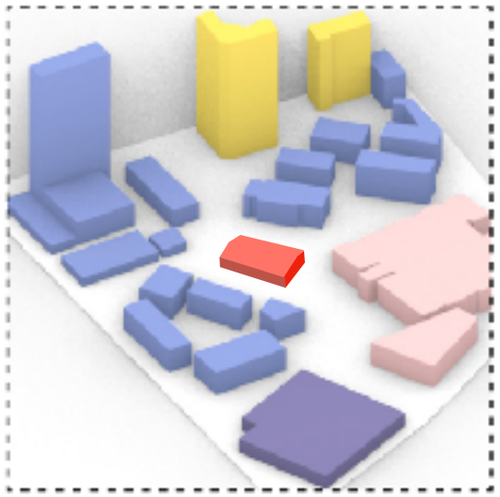
One block as an example



Quality of block

B4 block

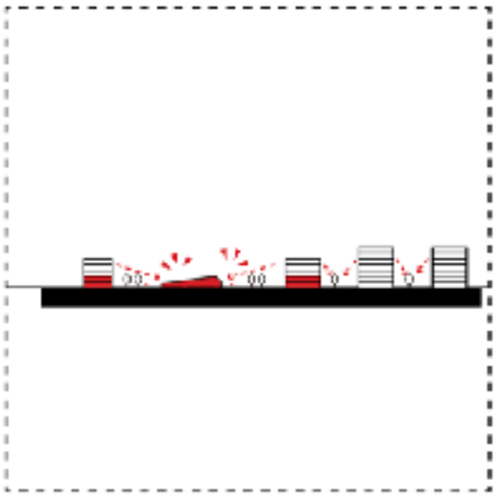
Mixed-use



Interior public space

Connectivity

Section and view

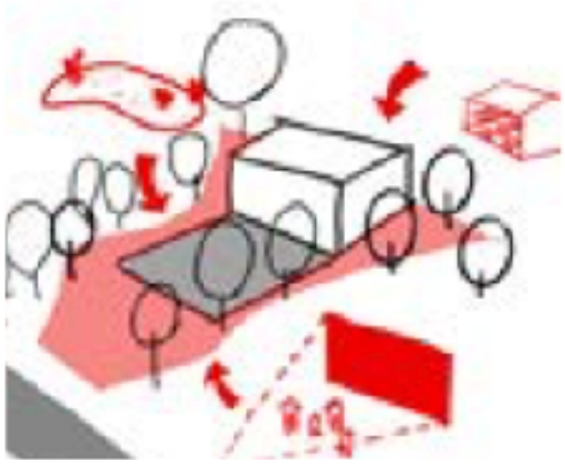


Activity mapping

Activity mapping

Design action

Facade and small scale commercial increase the vitality



Different playground as attractors

Quality of density type

Small size block

Medium size block

Large size block

F3 B3 B4 E2 E4 C1 C2 A2

Interior public space

Connectivity

View

Mixed-use

Residential
Office
Commercial
Educatiuon
Culture
Historical building

High-rise compact point

Mix of mid-rise and low-rise type

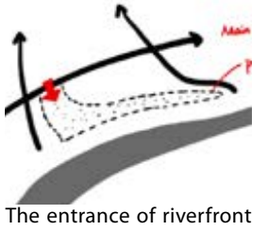
mix of high-rise and mid-rise compact block type

High-rise point type

Open block with Low-rise point

Design action from fieldwork

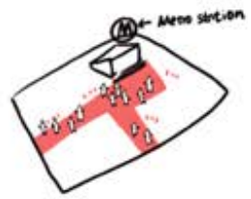
Form



The entrance of riverfront public space link well with main street

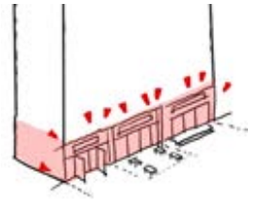
Semi-public fascade increase the vitality

Link to closed blocks with public path

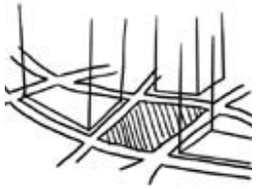


Public transport stop link with block space

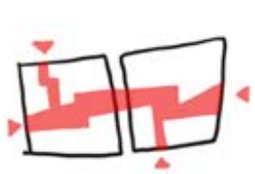
Highlighting public space which lead the people move to important build-ings



Active fascade can attract people

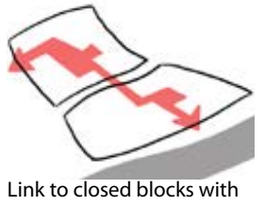


Flexible space can used for temporary programs



Maxing pedestrain porosity

Walkable path prevent from cars with nice scale

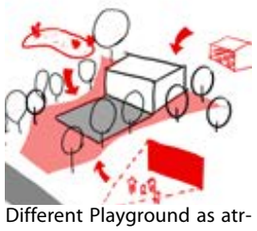


Link to closed blocks with public path

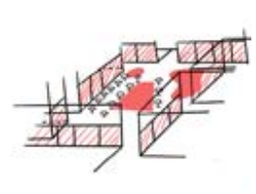
Enough parking

High-rise tower lobby can open to the public

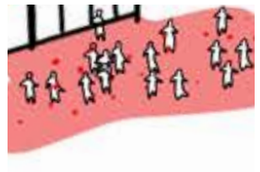
Activity



Different Playground as atr-ractors



Enclosed courtyard with cafe, small scale business



A density of living and working population

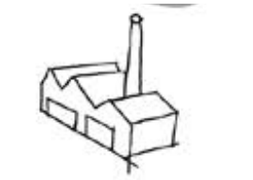
The territory in front of the public buildings is attrac-tors

Mixed-use building the groundfloor entrance atr-racted informal activities

Mixed-use zonning

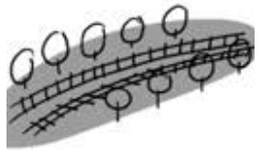
Perception

Keep open riverfront view

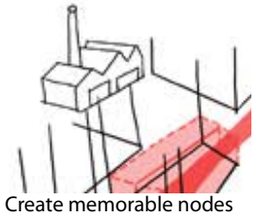


Transform historical ware-house and keep memora-ble buildings

Keep view line



Leave history memory by landscape



Create memorable nodes

Imagable building and place

Design

5

Design action: How to archive quality riverfront

Place quality: From theory to vision

Place quality conclude from theory

Form

1. Accessible for bike, pedestrain
2. Street connectivity
3. Environmental Friendly public realm
4. Diverse block typology

Movement and Activity

5. Diversity in program and land use
6. Informal and formal social activities
7. Activities to meet diverse social groups
8. Social movement

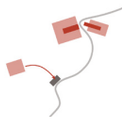
Perception and Image

9. Physical identity: legibility path, landmark...
10. Social identity
11. Sensory identity
12. History and memory

3 concepts

Mixed-use

Street connection



Identity

Vision

Mixed-use — D P S G

- Mix different density typology
- Diverse urban program and land use
- Diverse public space
- Green space

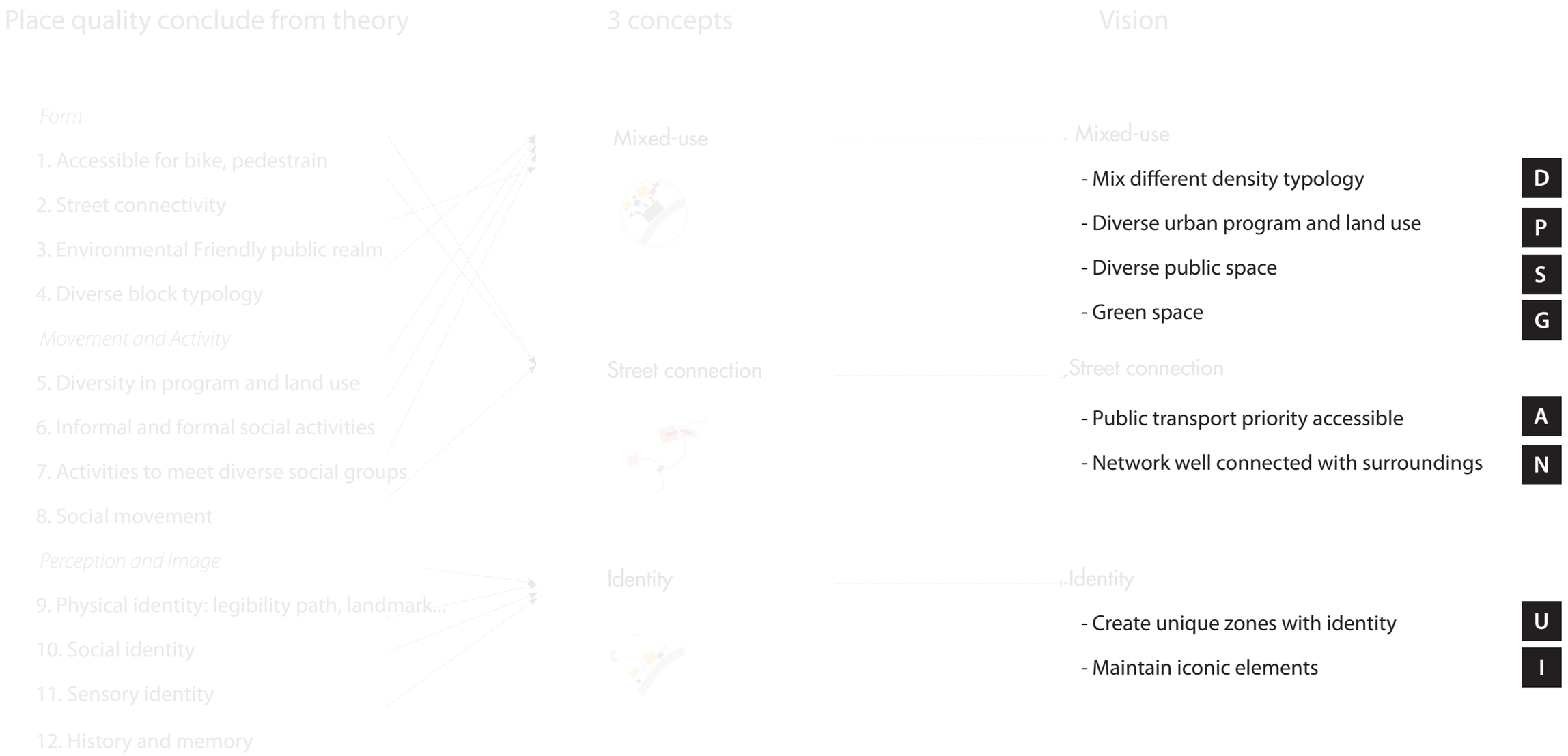
Street connection — A N

- Public transport priority accessible
- Network well connected with surroundings

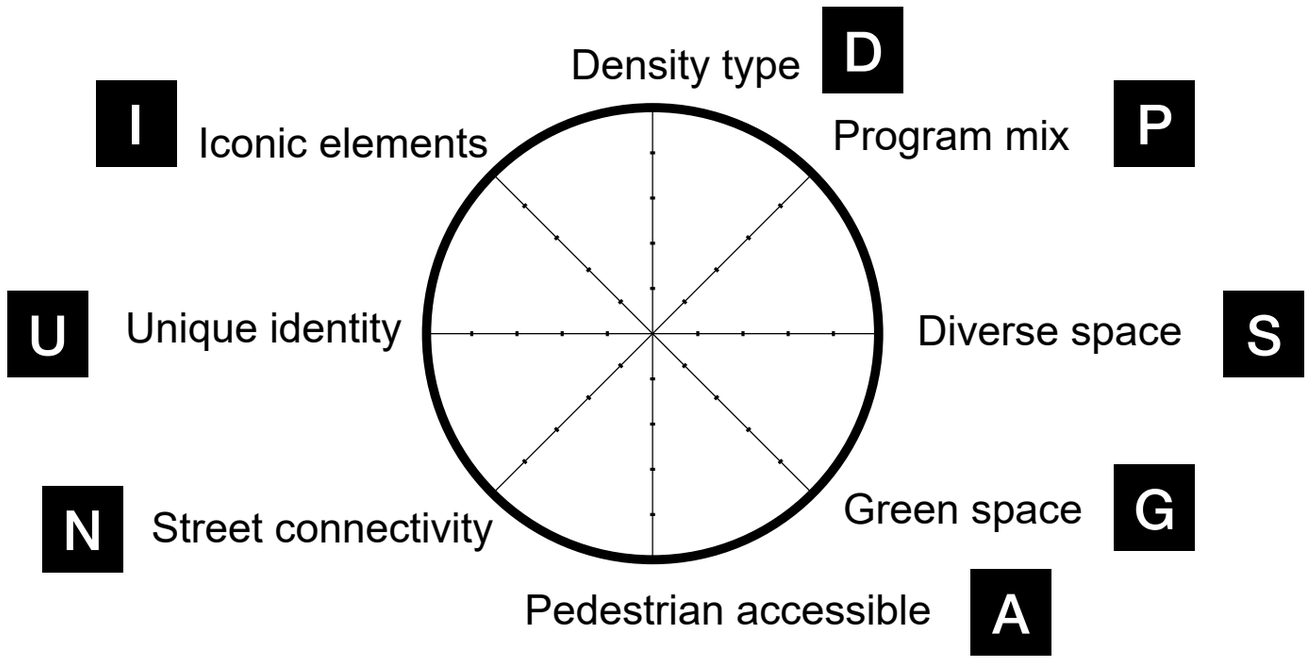
Identity — U I

- Create unique zones with identity
- Maintain iconic elements

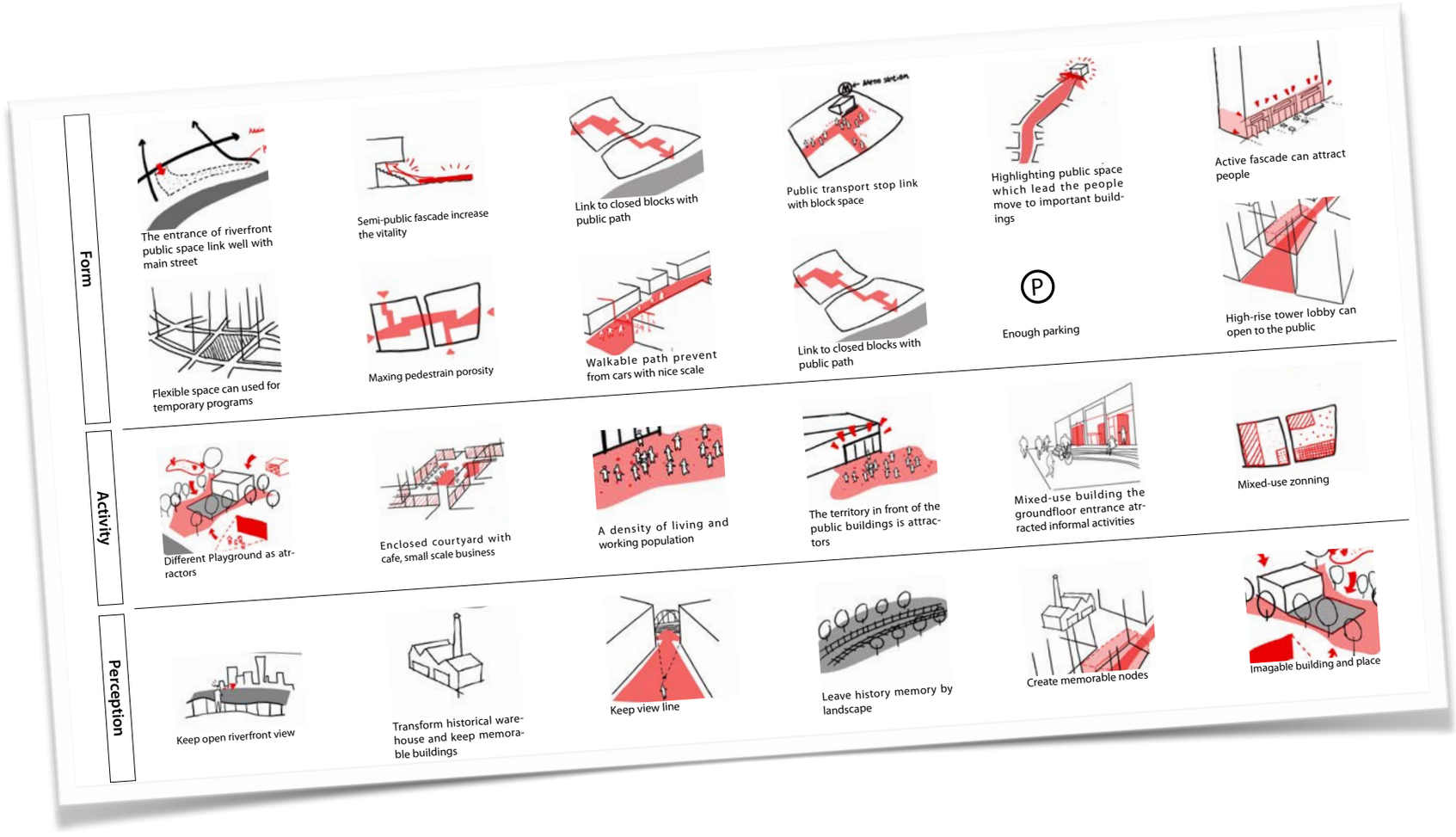
Place quality: From theory to vision



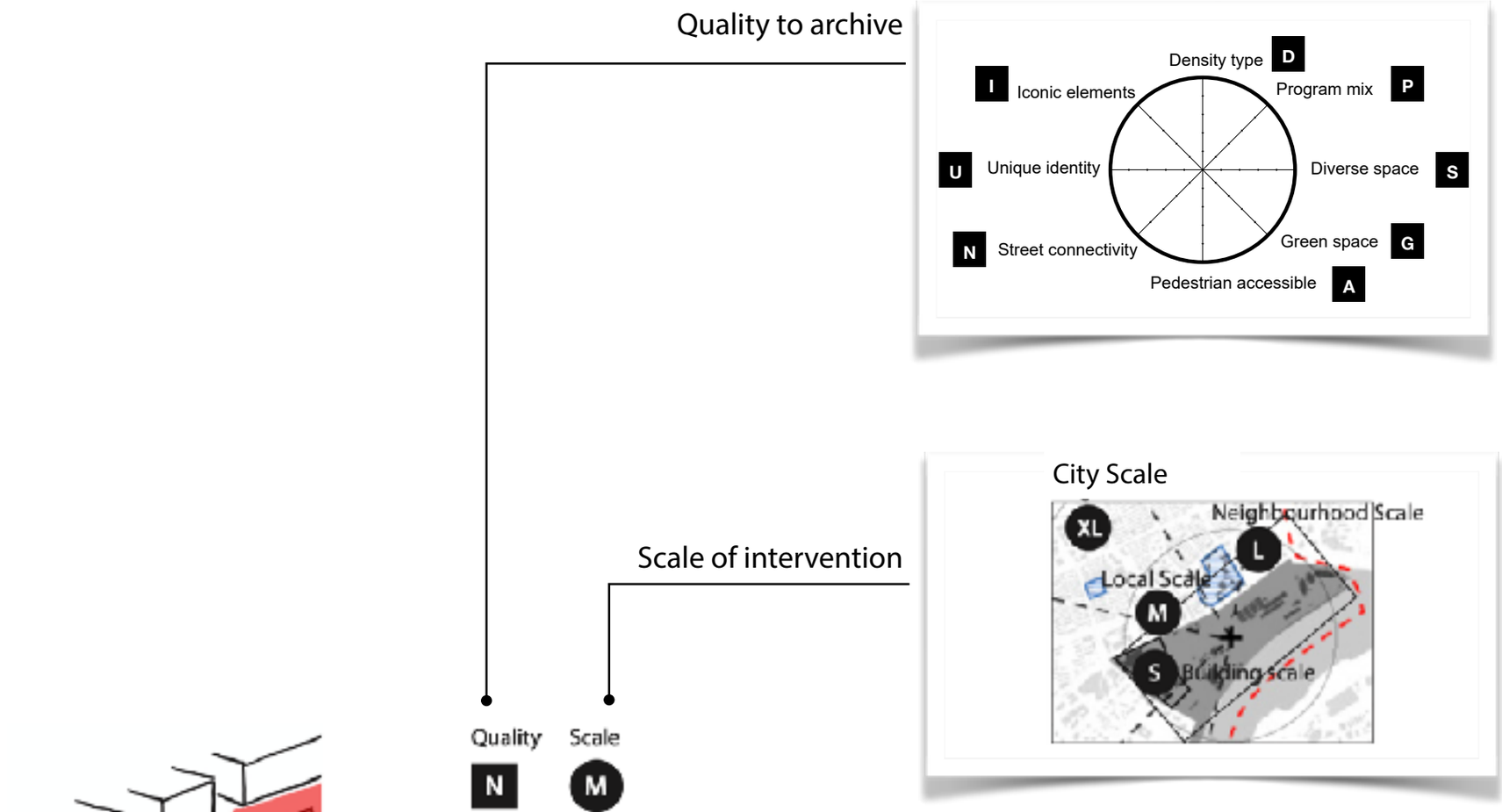
Quality vision

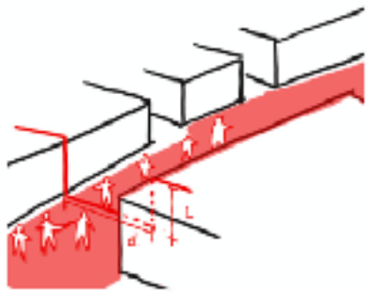


Design action from fieldwork



Design action from fieldwork





Give priority to using public transportation and reduce the number of roads used for cars. Make it easier to walk, ride a bicycle, or use personal travel equipment.

Come from Shanghai fieldwork [P. 202]

Design action

XL City Scale

Source: HS Kwartier The Hague [NL], KCAP

Quality A Scale L

Create urban axes to link with surrounding. At the same time the green public spaces will give the corridor an open character.

Come from case study, HS Kwartier The Hague [NL], KCAP [P. 204]

Quality N Scale L

The district will be well connected internally and to the rest of the city

Come from case study, HS Kwartier The Hague [NL], KCAP [P. 204]

L Neighbourhood Scale

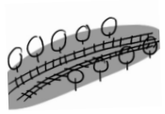
Quality I Scale L

Keep the view line in site

Quality I Scale L

Preserve the old industrial existing building transformed to a signature building

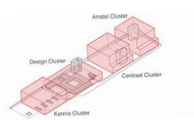
Come from Shanghai filedwork [P. 201]



Quality I Scale L

preserve the existing landscape: The existing harsh infrastructure and lost ecosystems will be transformed into a complex of repaired ecosystems and people friendly resilient urban structures.

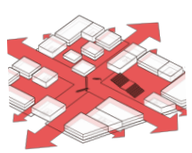
Come from Shanghai filedwork [P. 196]



Quality U Scale L

Subdivide the design area into clusters with specific qualities and limitations so that each block is different and has its own identity

Come from case study, Bajes Kwartier, Amsterdam, The Netherlands, OMA [P. 204]



Quality D Scale L

Creating flexible podium typology: The porous ground floors, court yards and through-block pedestrian links create generous public spaces that encourage interaction, networking and a lively public realm.

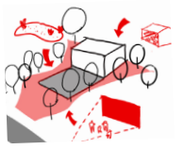
Come from case study, Jurong Lake District Singapore [SG], KCAP [P. 204]

Quality D Scale L

Mixed density type and building typology

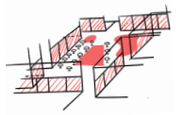
Come from Shanghai filedwork [P. 203]

M Local Scale



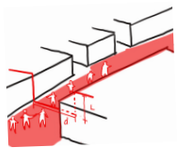
Quality S Scale M

Nodes with different public program and Different programmed public space.



Quality S Scale M

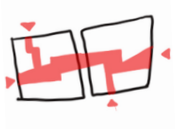
Pop-up event spaces, Modular building systems



Quality N Scale M

Give priority to using public transportation and reduce the number of roads used for cars. Make it easier to walk, ride a bicycle, or use personal travel equipment.

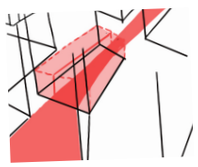
Come from Shanghai filedwork [P. 202]



Quality A Scale M

Maxing pedestrain porosity

Come from Shanghai filedwork [P. 200]



Quality I Scale M

adaptive re-use buildings and materials

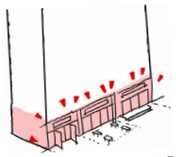
Come from Shanghai filedwork [P.197]

Quality U Scale M

shape the skyline

Come from Shanghai filedwork [P. 198]

S Building Scale

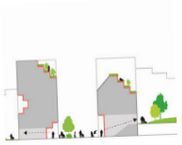


Quality P Scale S

Mixed-use building: The first five to six floors are mainly aimed at a shared experience. From shared spaces for residents to public spaces catering for visitors.

Quality S Scale S

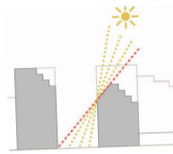
Vibrant plinths
Put the public program on the groundfloor, entrance will atrract informal activities



Quality G Scale S

Horizontal and vertical relief maintains the human dimension and add green space

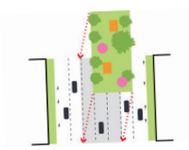
Come from case study, HS Kwartier The Hague [NL], KCAP [P. 204]



Quality S Scale S

Creating a varied street scene with lots of daylight and sunlight for all buildings.

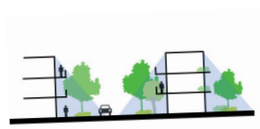
Come from case study, HS Kwartier The Hague [NL], KCAP [P. 204]



Quality A Scale S

make street as valuable public space: green street

Come from case study, Jurong Lake District Singapore [SG], KCAP [P. 204]



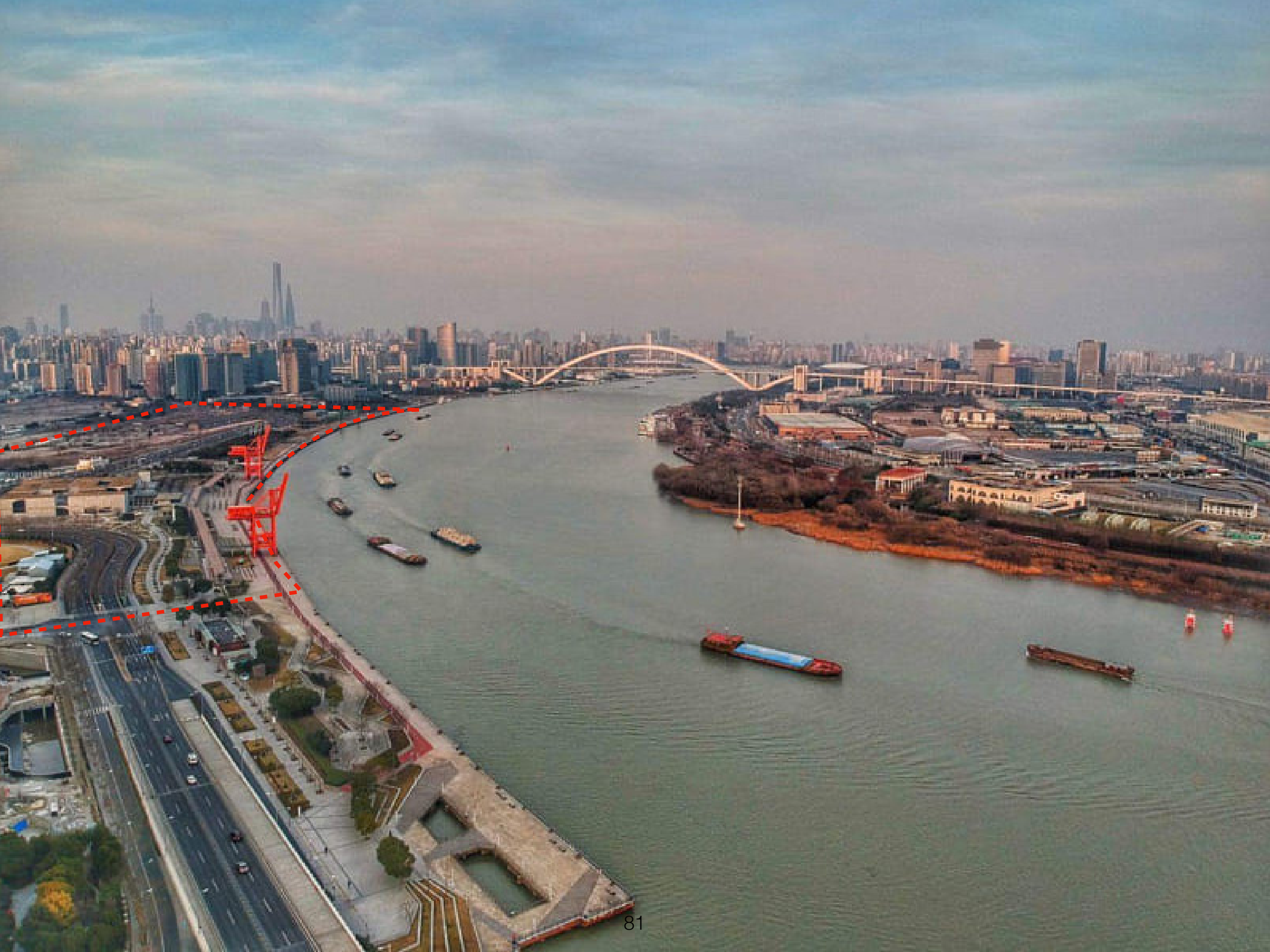
Quality N Scale S

Street oriented typology

Come from case study, VDMA, OMA [P. 204]

6

Design



Nanpu Railway Station

Vision
for stakeholders

Make full use of Xuhui District's abundant resources in Science and Technology, the advantages of cultural and artistic in the west bund, and the advantages of waterfront location to form a mixed-use district.

Government

A Place where young high-tech graduates can afford to live and work here. More opportnuity for start-ups.

Ming, and Ma **24**

Graduates and high tech people

Keep the important program for our life. The closure of the supermarket caused great inconvenience to the elderly and nearby residents like us, who could not skillfully use smart devices for online shopping.

Uncle Zhou and his wife **72**

Nearby neighbourhood residents

Nanpu Station is a very important place for Shanghai. I took the last photo before the demolition It is important to keep the historical memory.

Now, the landmark always remind me this history

Uncle Liu **62**

Citizen

We want it deliver high-quality public realm. So in the morning, we could use the area to walk or jog through the park on our way to work.

Miss Huang **32**

Office workers

A vibrant district that deliver high-quality commercial space and cultural function which we could come to waste some time on weekends.

Miss Wu, Miss Zhang and Mr. He **20+**

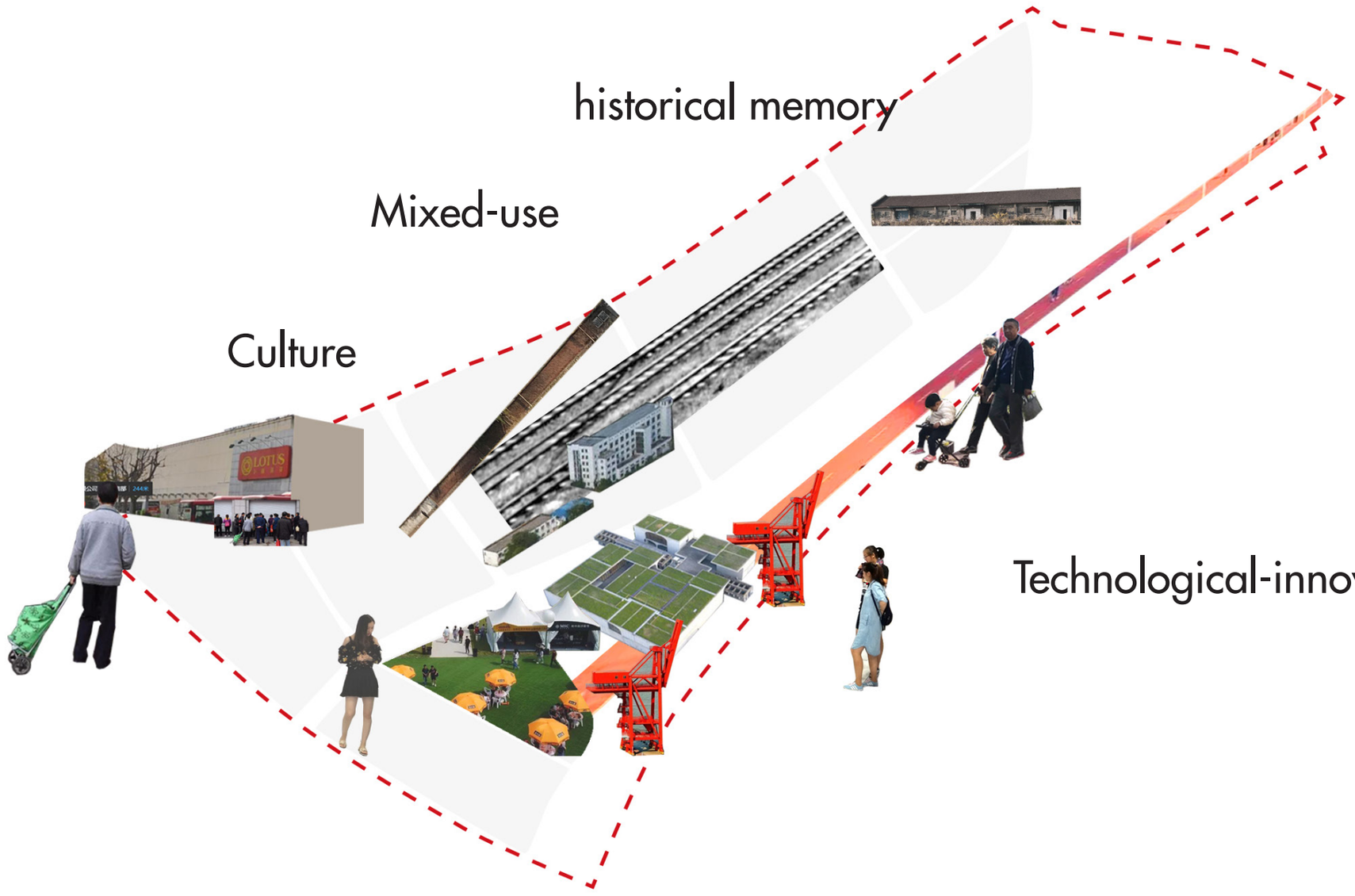
Citizen come for cultural visit

deliver high-quality green space, quiet and safe.

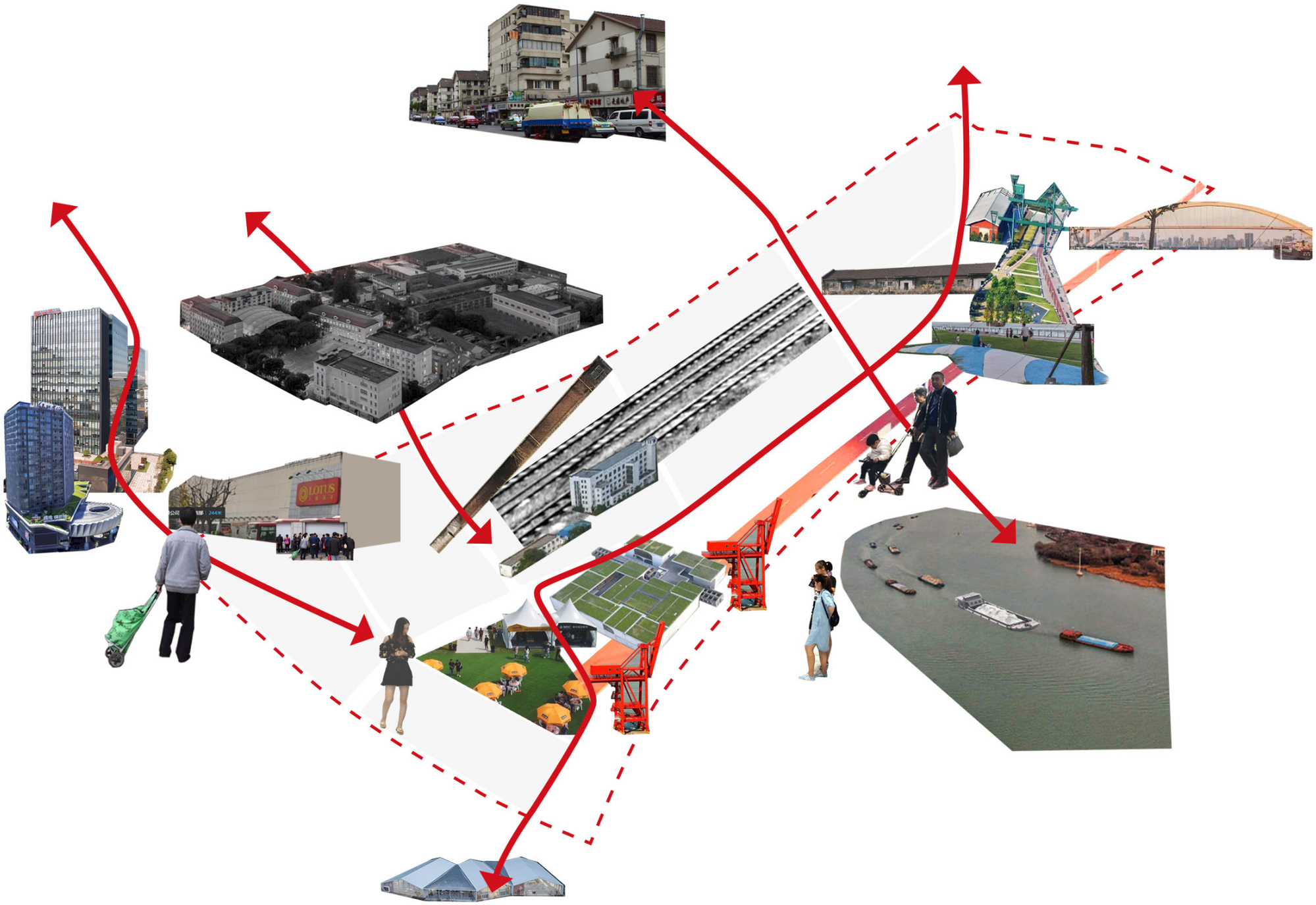
Mr. Wang and his 6 year old son **38**

Residents

Vision: Identity layer



Vision: Connectivity layer



XL City Scale

L District Scale

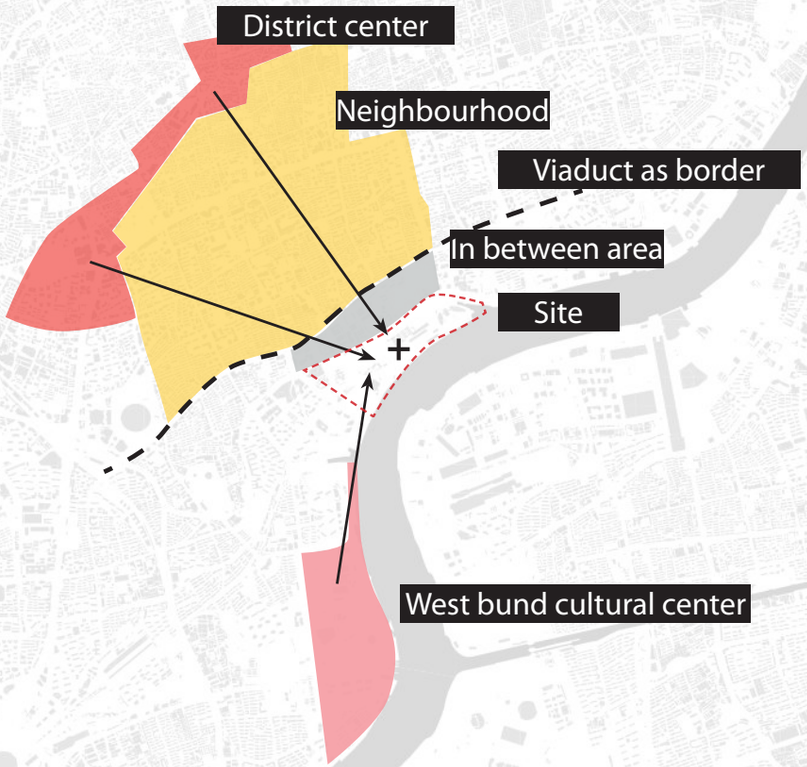
M Block Scale

S Local Scale

XL City Scale

Design site

Surrounding environment



Relation with surrounding

Neighbourhood

Viaduct as border

In between area

Site

To West bund
cultural center

0 250 m 500 m

N

Relation with surrounding

Neighbourhood

Viaduct as border

In between area

Site

To West bund
cultural center

Hospital
Office
Commercial
Cultural
Grreen
Education
Industry
Residential

0
250 m
500 m
N

Four corridors

Fudan University

Chinese Academy of Science

This way relations will be established with education and technology

This way relations will be established with commercial

This way relations will be established with living experience

This way relations will be established with cultural

Damuqiao Rd

Zhaofeng Rd

Inner ring viaduct

Xiaomuqiao Rd

Longhua middle road

Feiglin Rd

Longteng avenue

Chuangxing Rd

Dongan Rd

Ruining Rd

Technological instituation & Education priority

Business priority

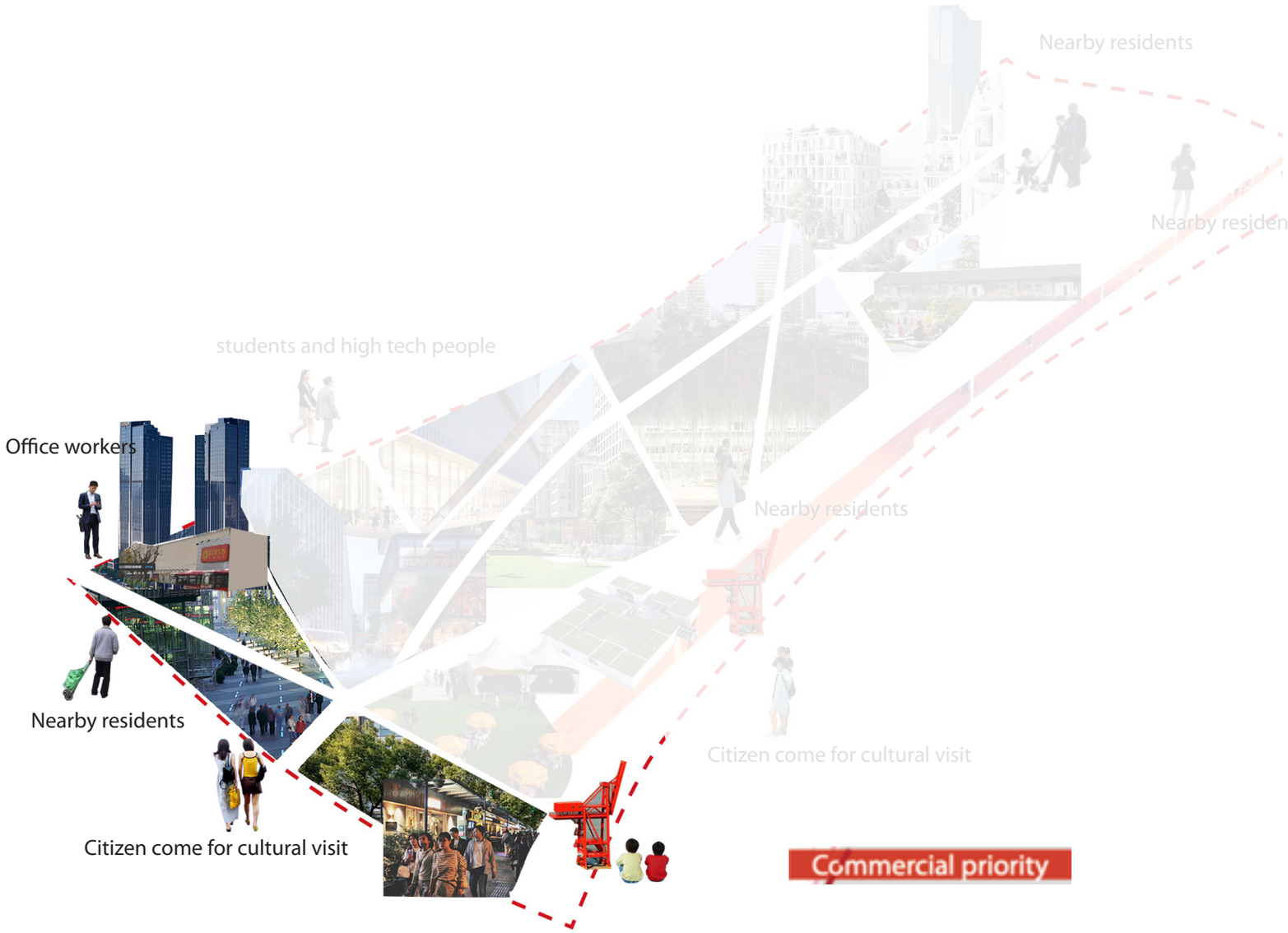
Cultural priority

Living priority

0 250 m 500 m

N

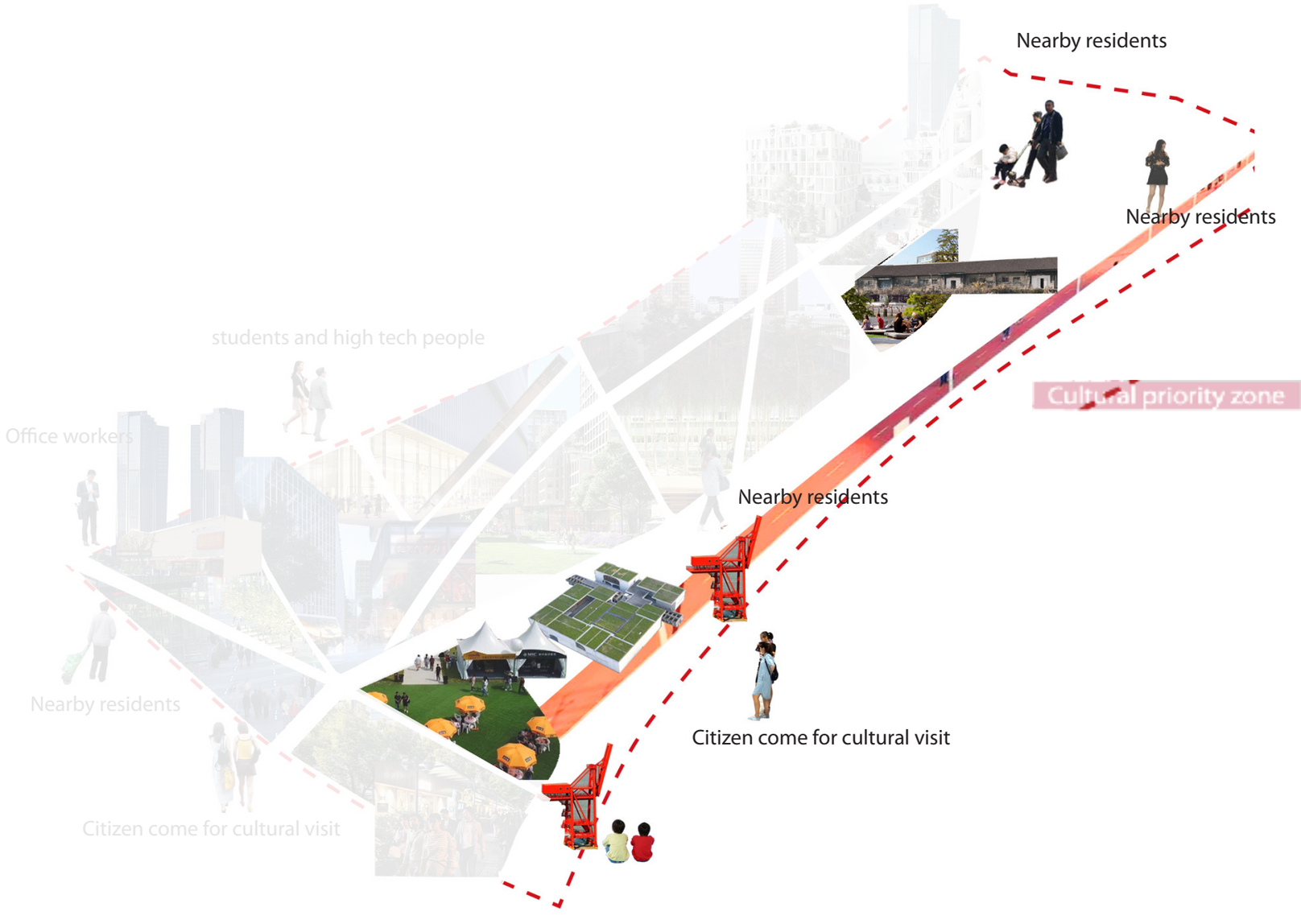
Clusters of different identity



Clusters of different identity

Clusters of different identity

Clusters of different identity



XL City Scale

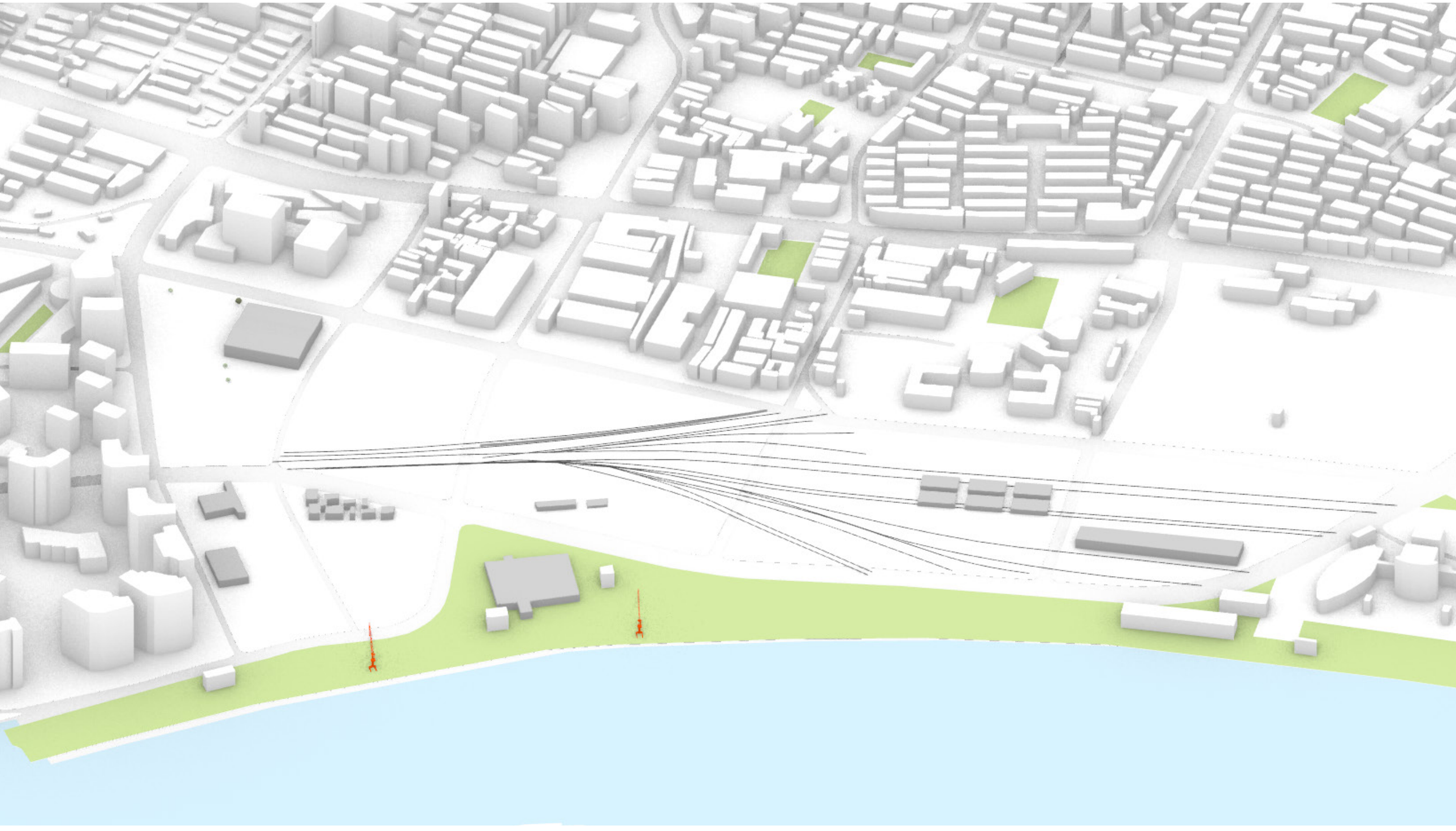
L District Scale

M Block Scale

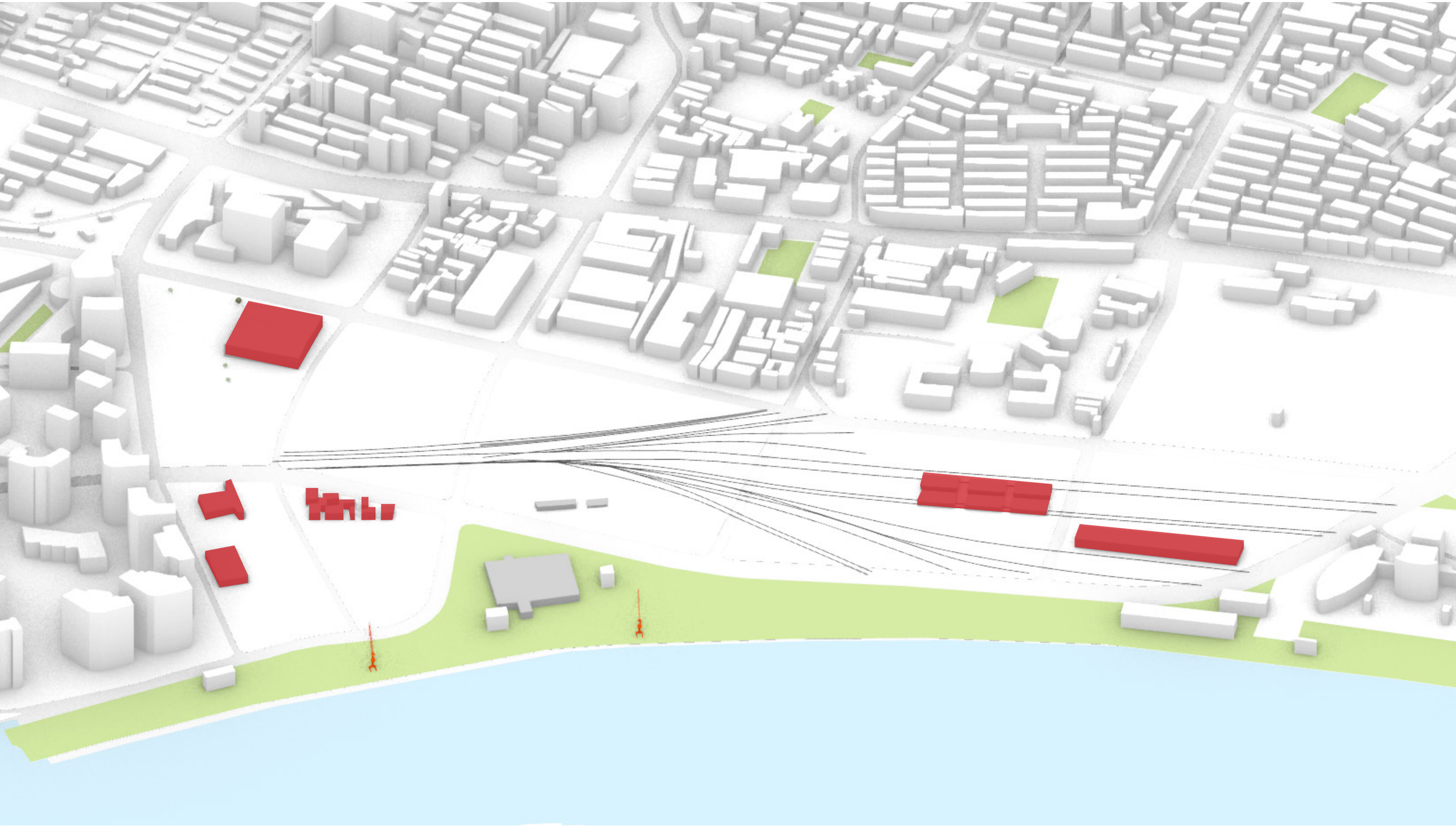
S Local Scale

L District Scale

Existing structure



Maintain Iconic elements



Begin with three options

Option 1

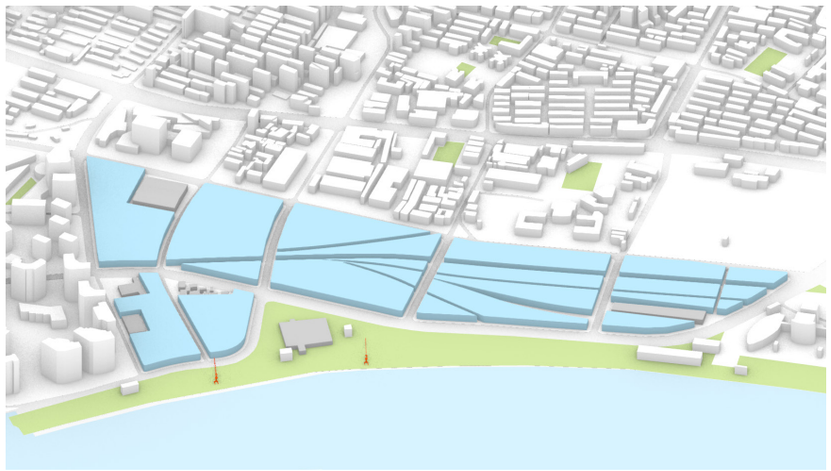
Emphasize the existing structure to rebuild the memory of the railway station

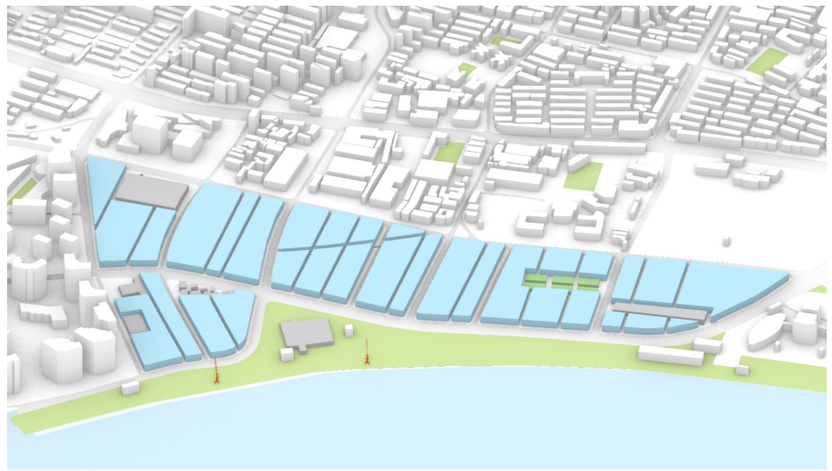
Option 2

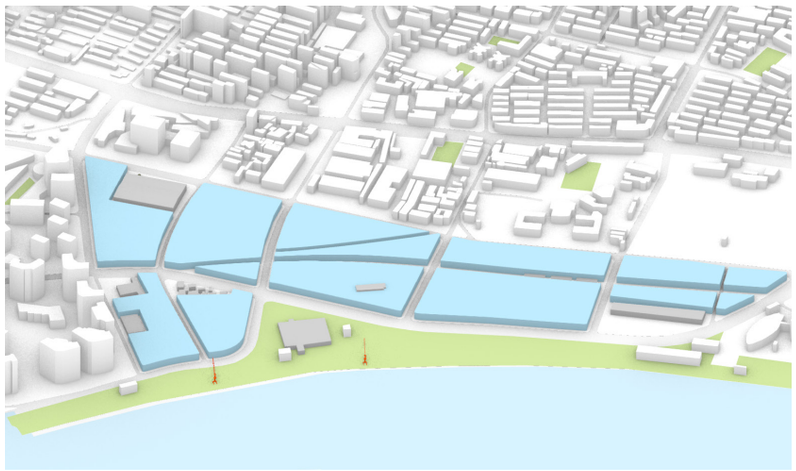
Emphasize the route from the city to the river, maximize the street to the river

Option 3

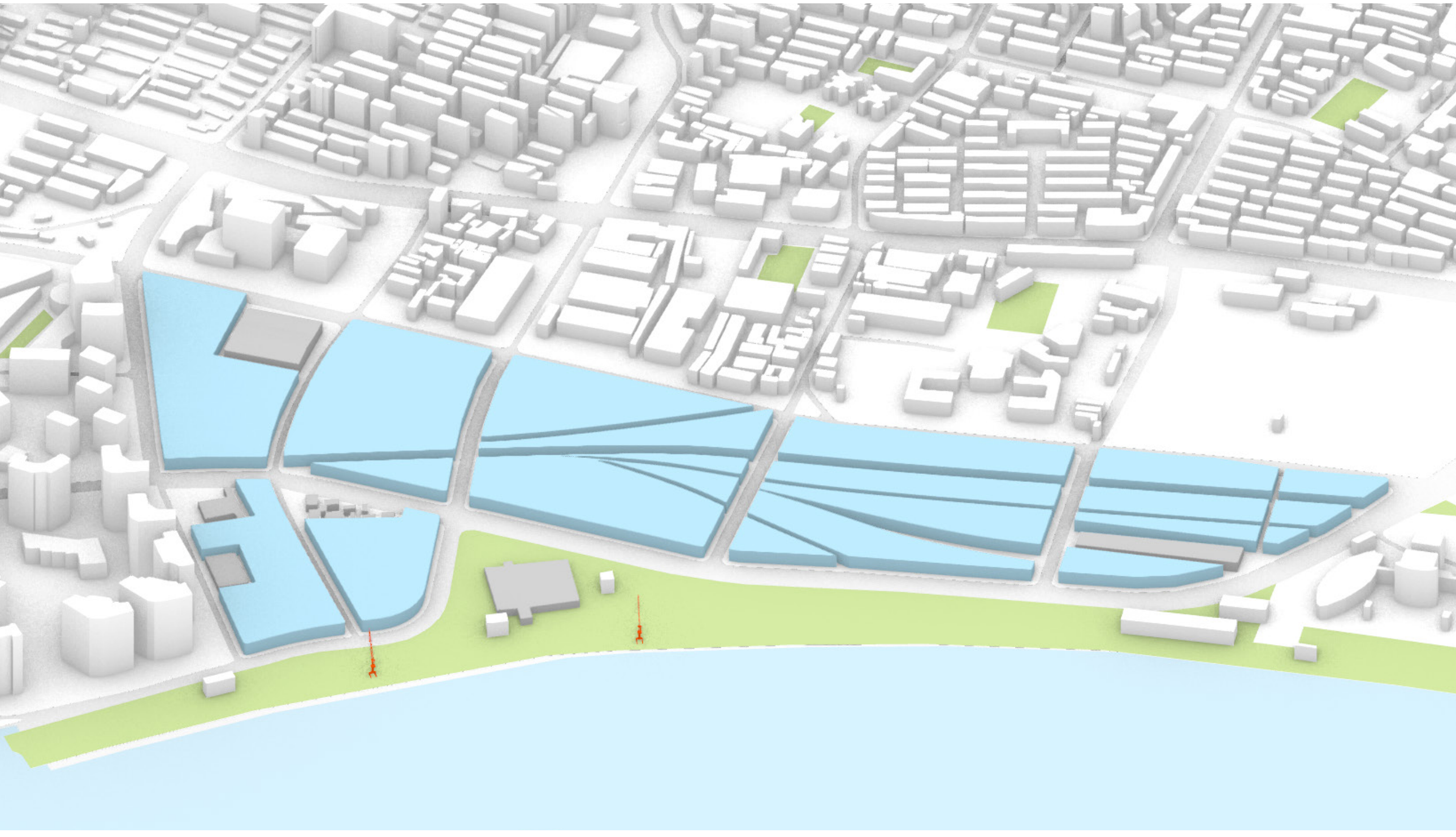
Gradual change from city to more natural.



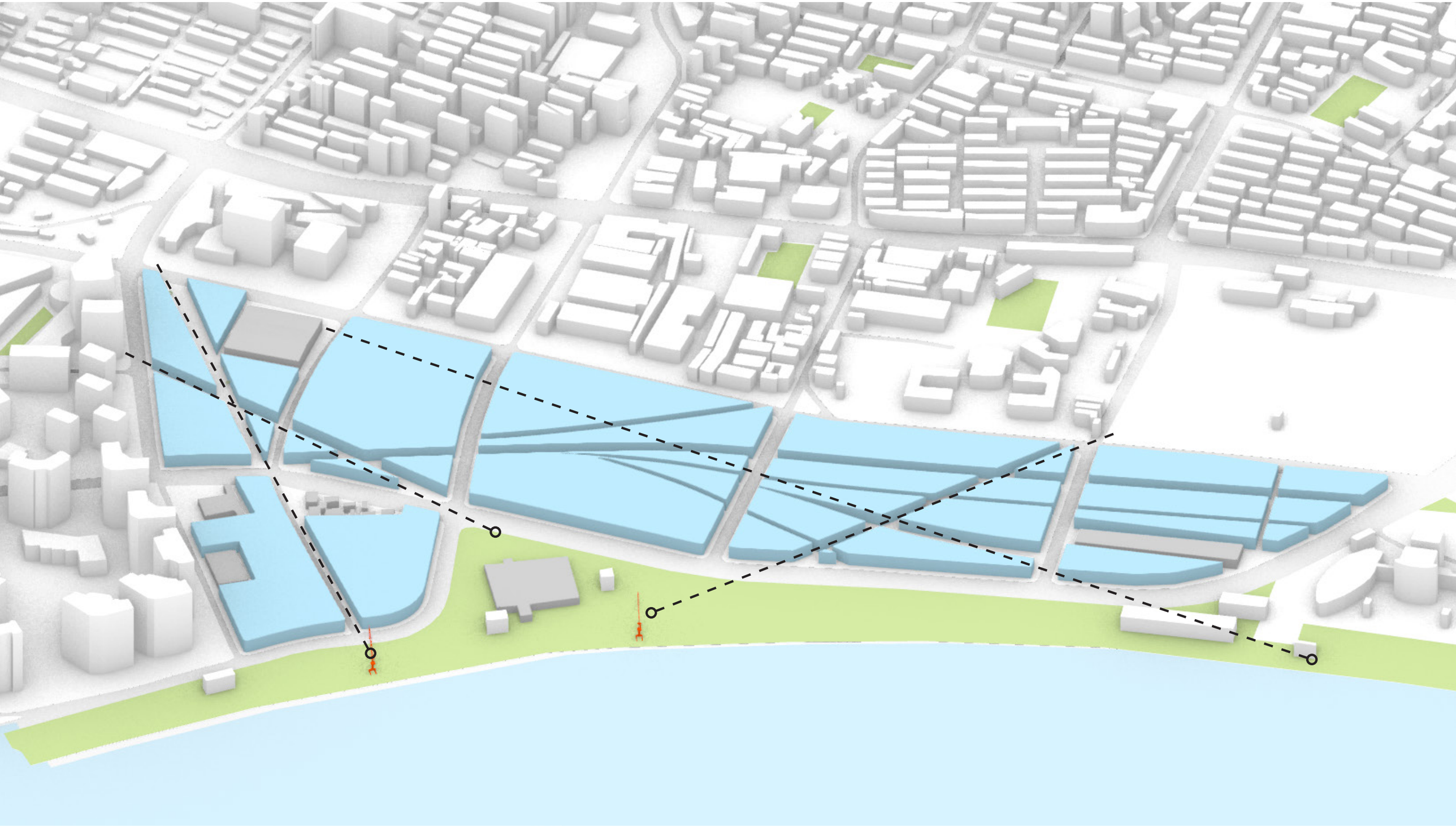




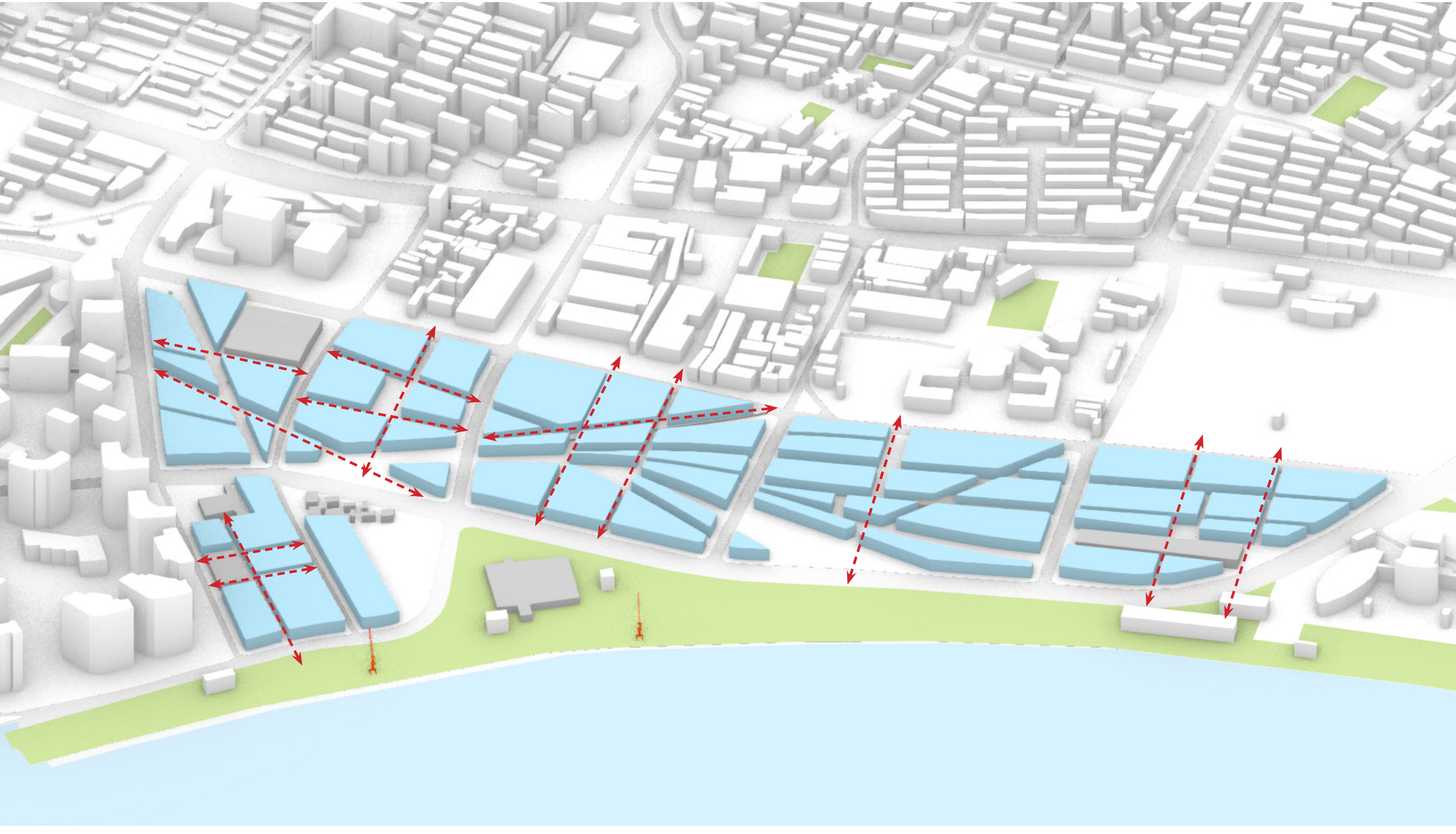
Maintain Iconic elements



Maintain Iconic view line

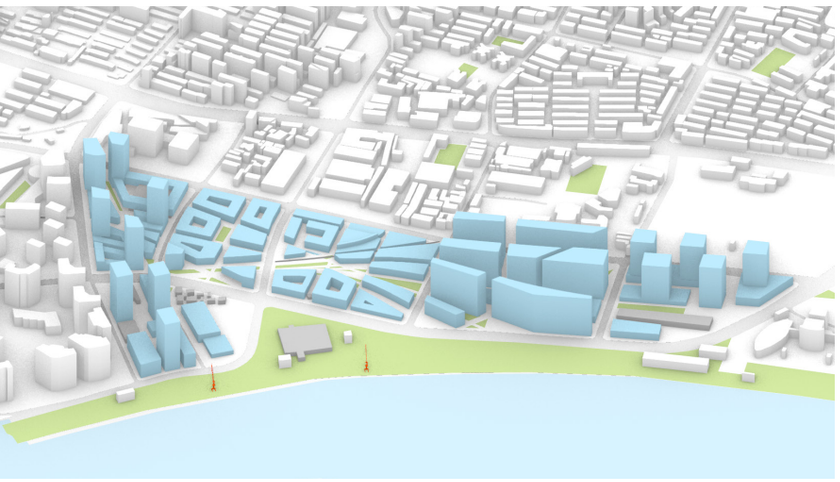


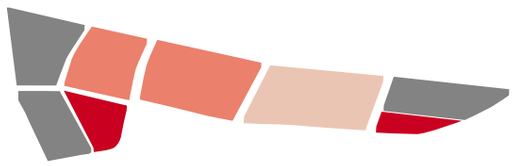
Public transport accessible

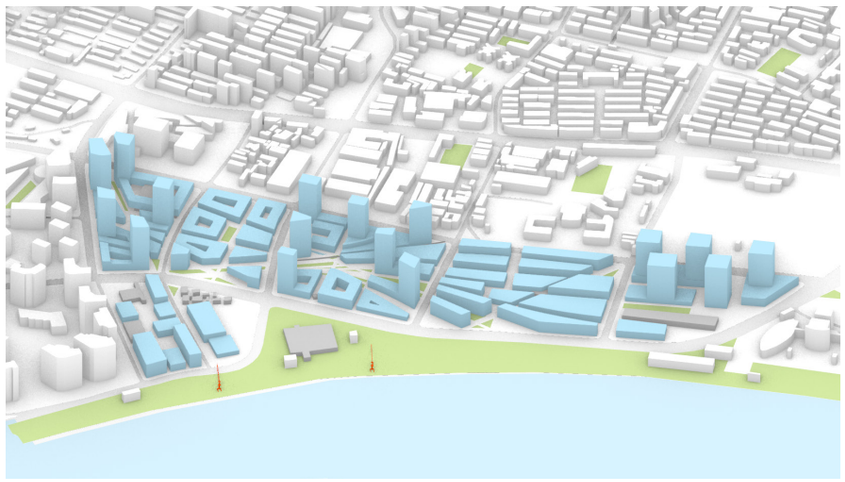


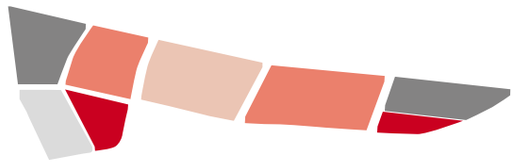
Unique identity zones

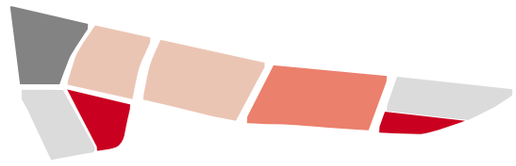
Mix density typology



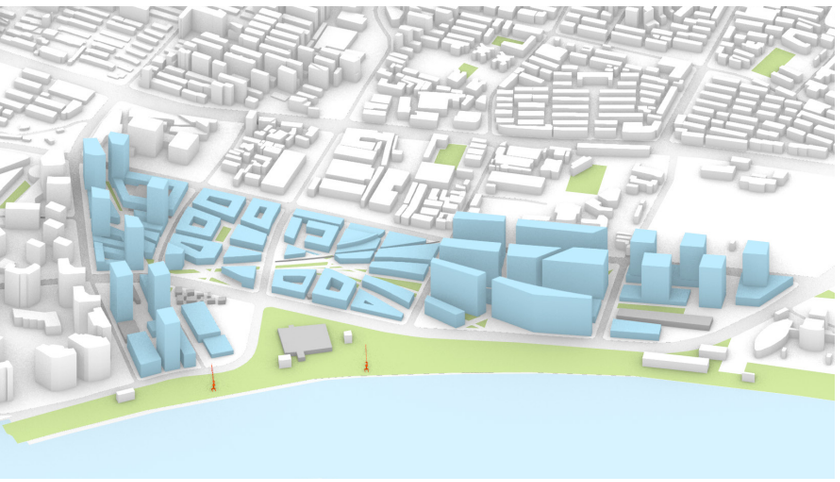


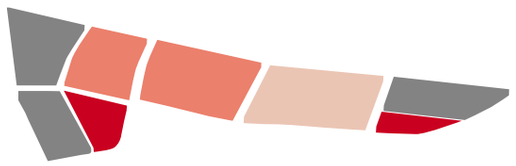


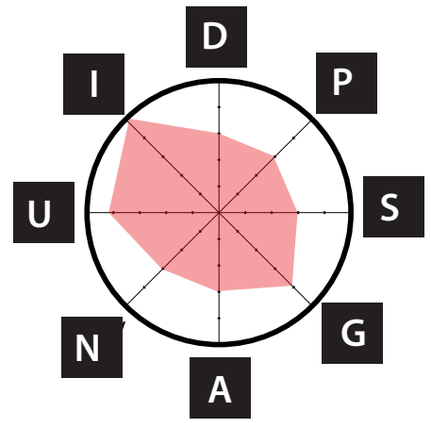


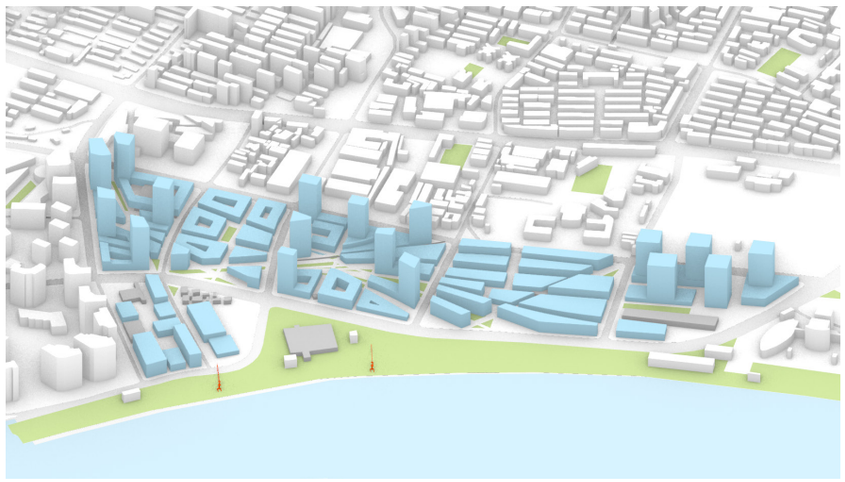


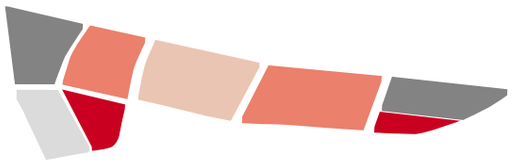
Evaluate density test

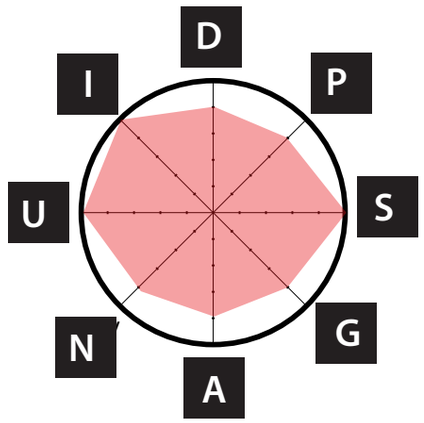


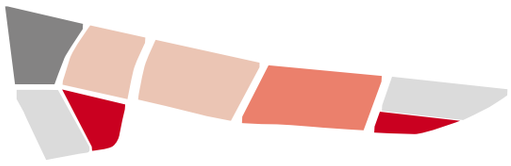


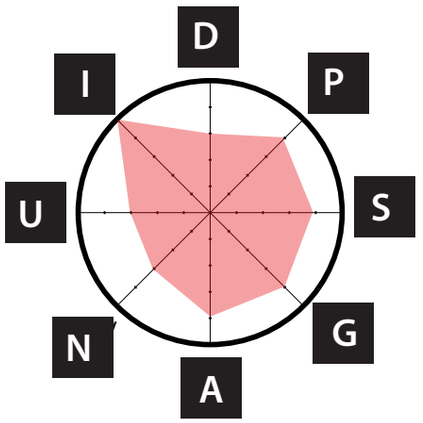




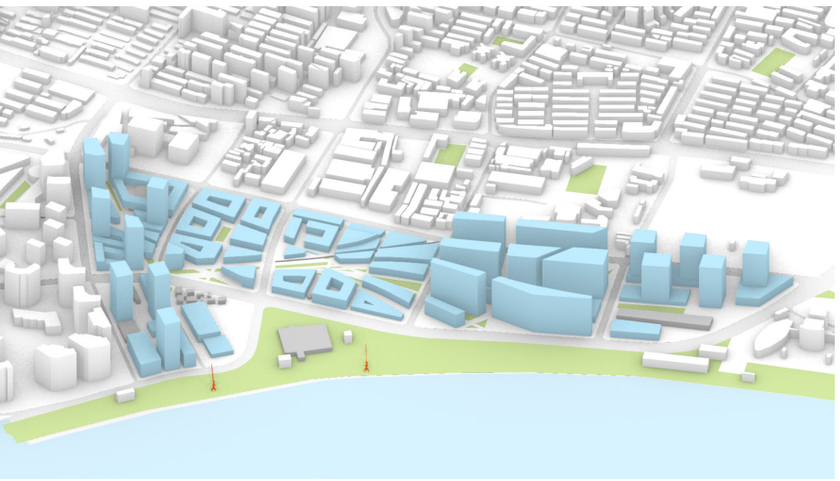


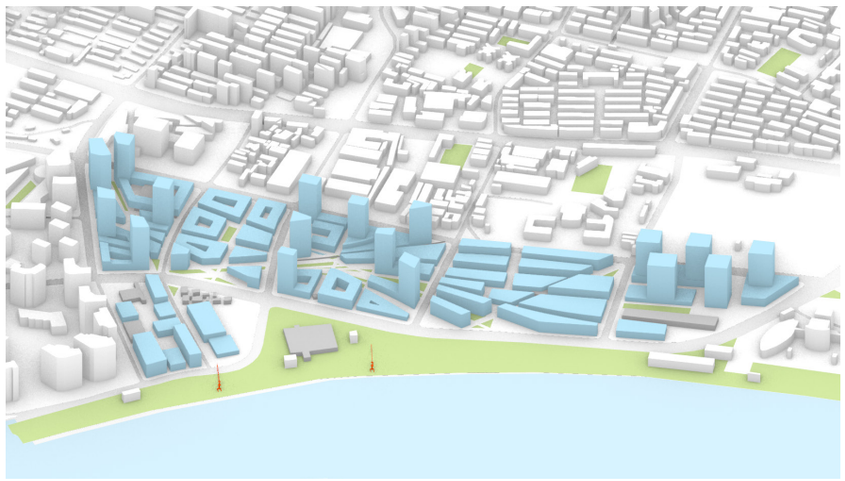


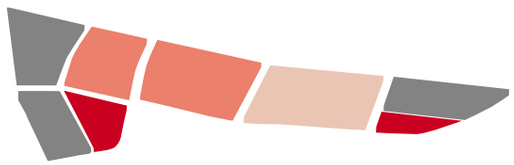


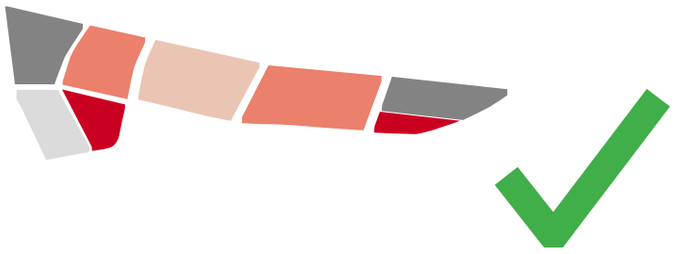


Evaluate density test







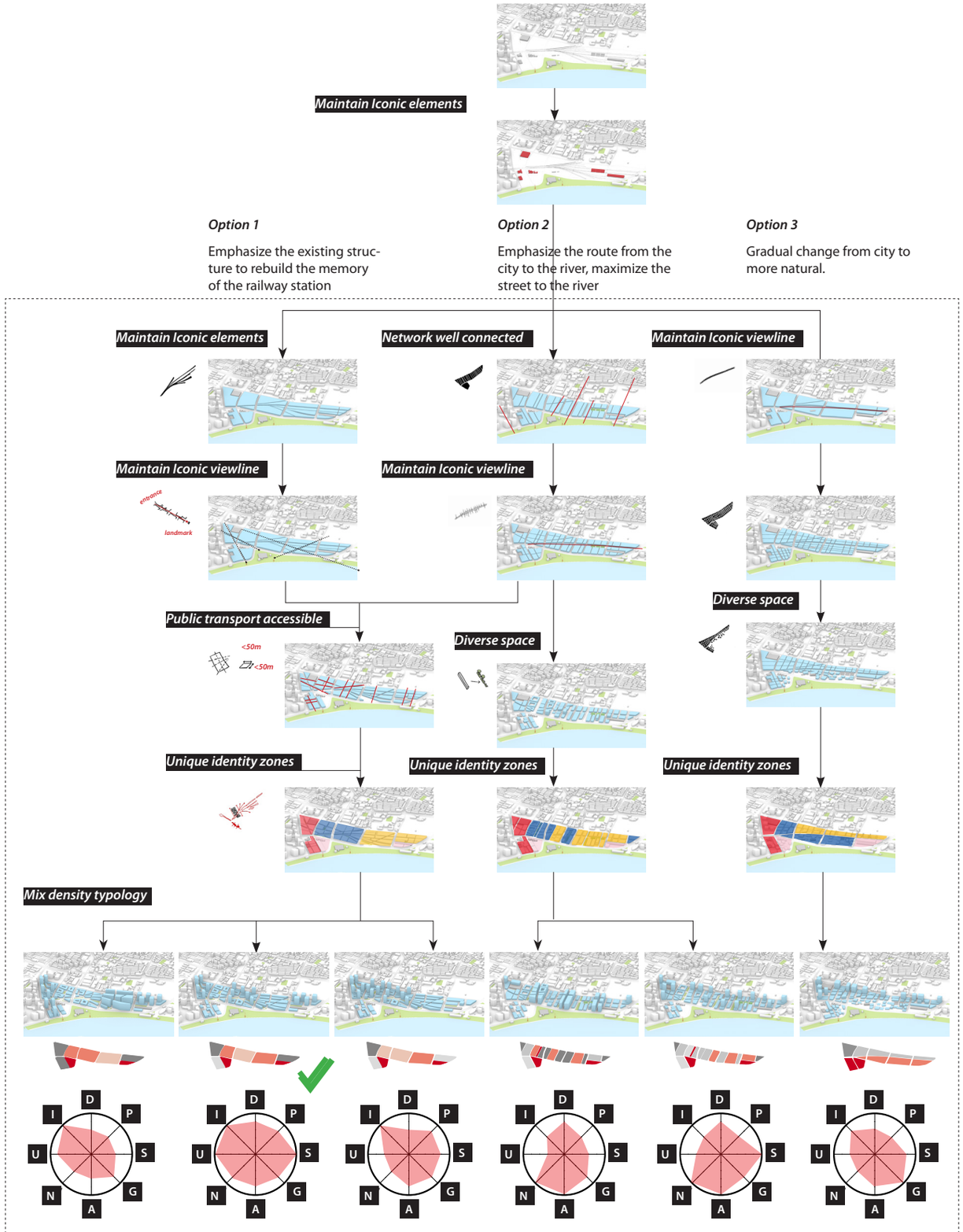


Conclusion

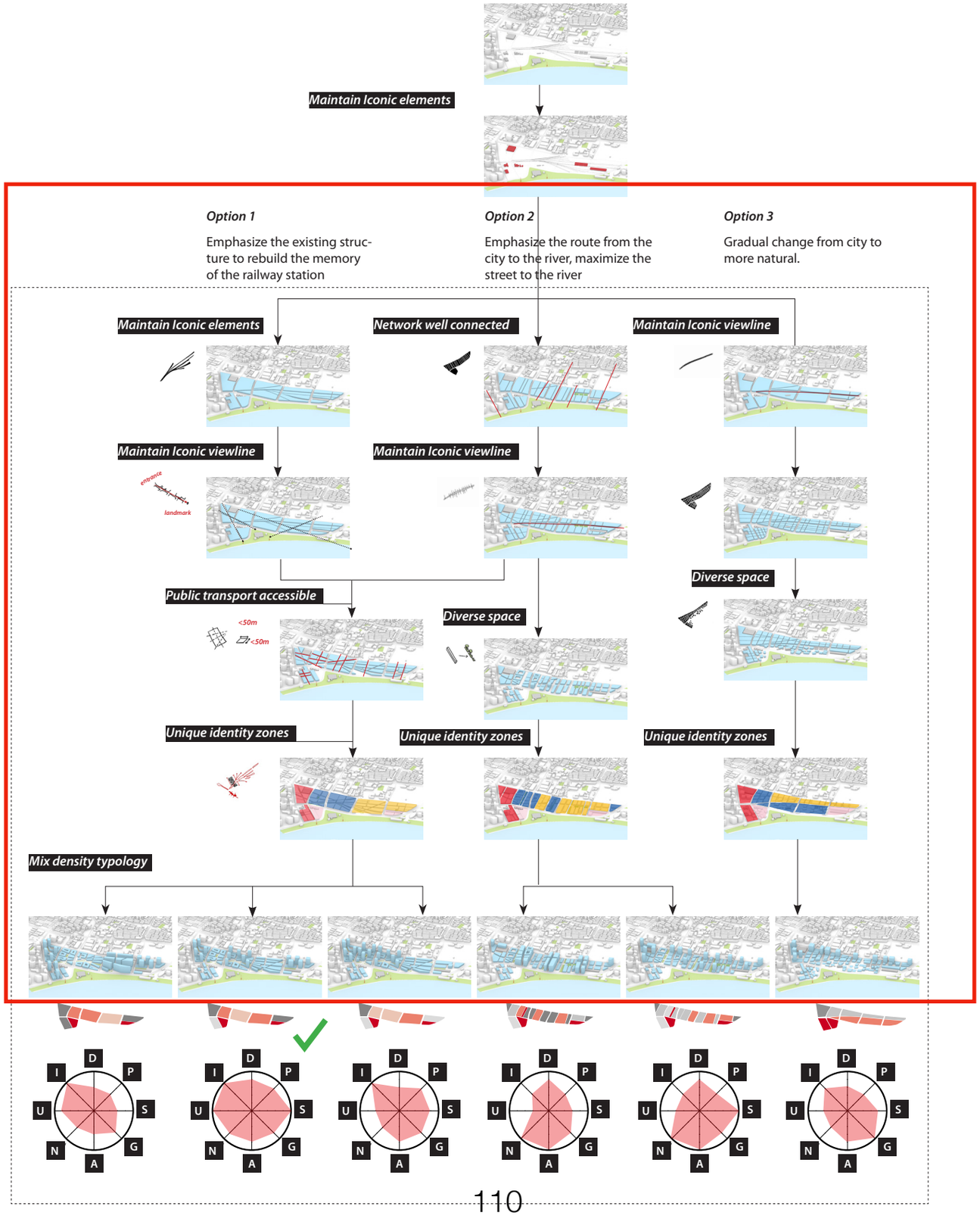
- Building high-rise buildings along the main streets can make full use of the waterfront conditions

- The high-rise block might be distributed in non-adjacent blocks, creating the rhythm of the tower

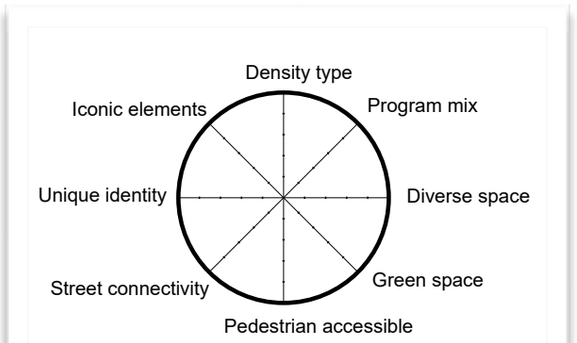
Design evolution



Design evolution



Quality criteria



XL City Scale

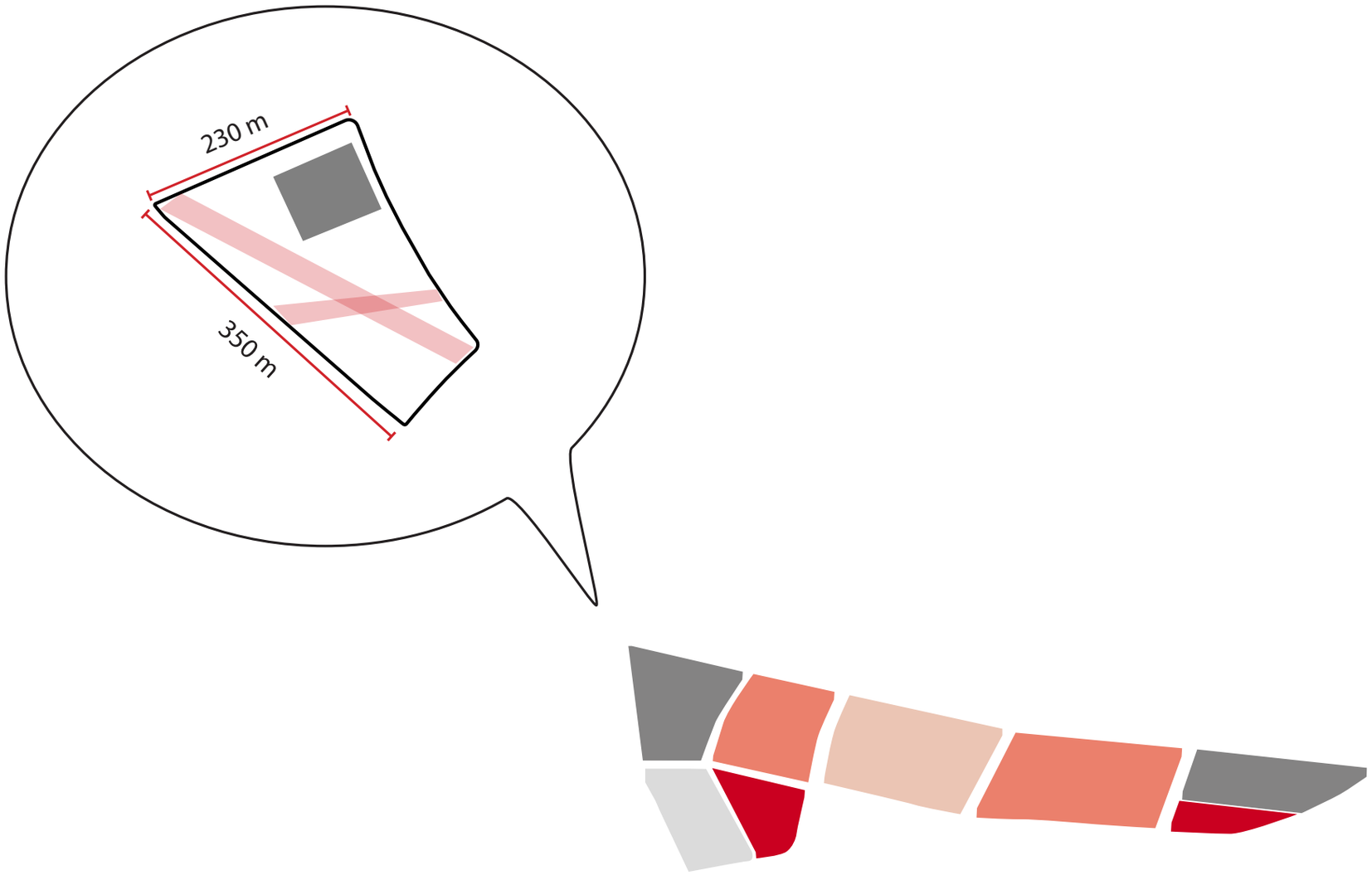
L District Scale

M Block Scale

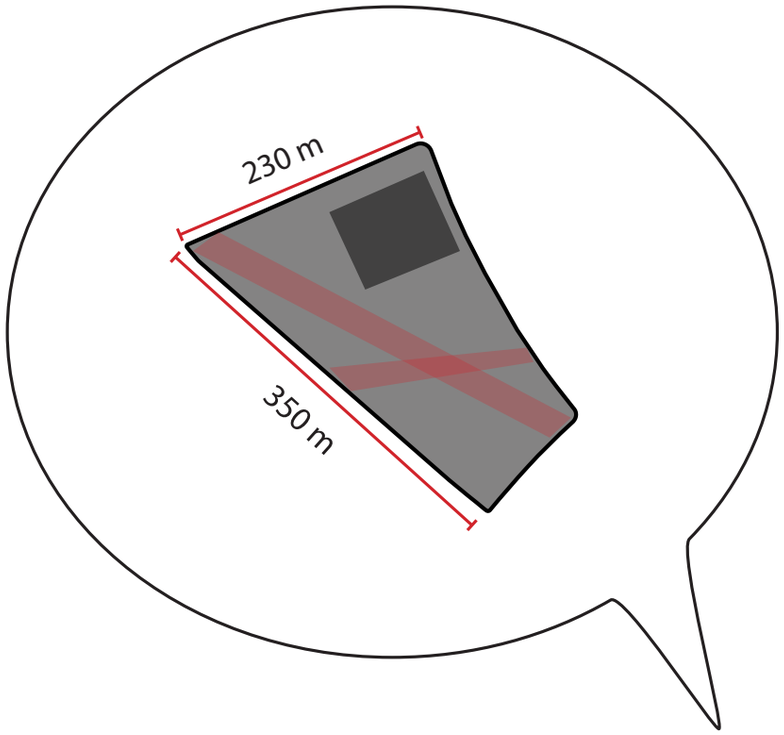
S Local Scale

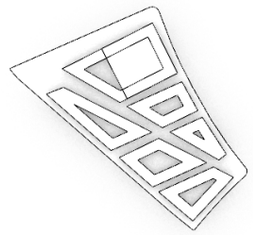
M Block Scale

Take one block as an example



Design evolution on block scale

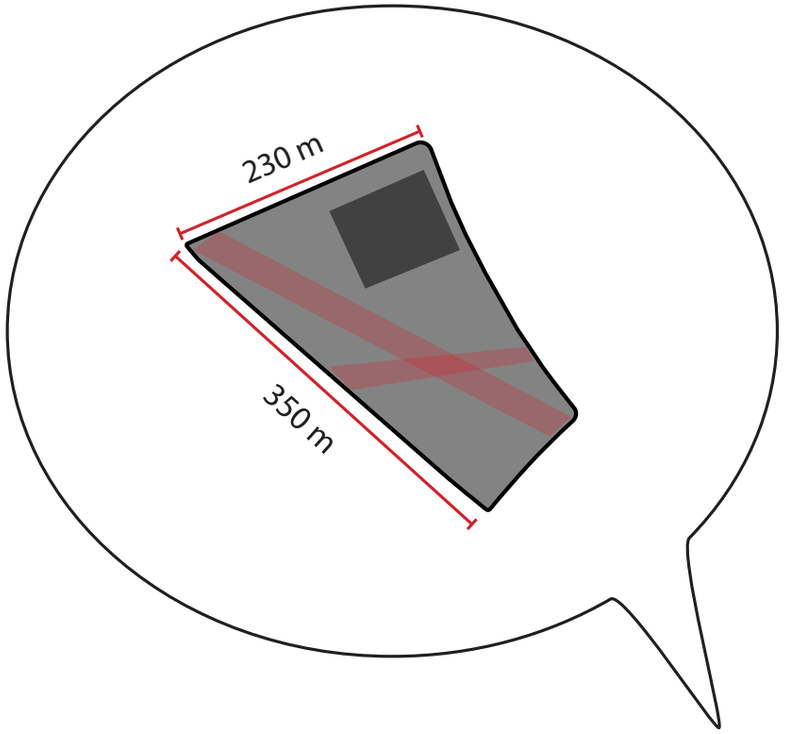




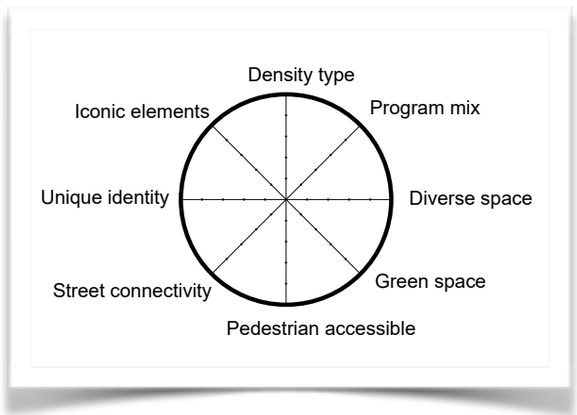
Step 1: choose typology

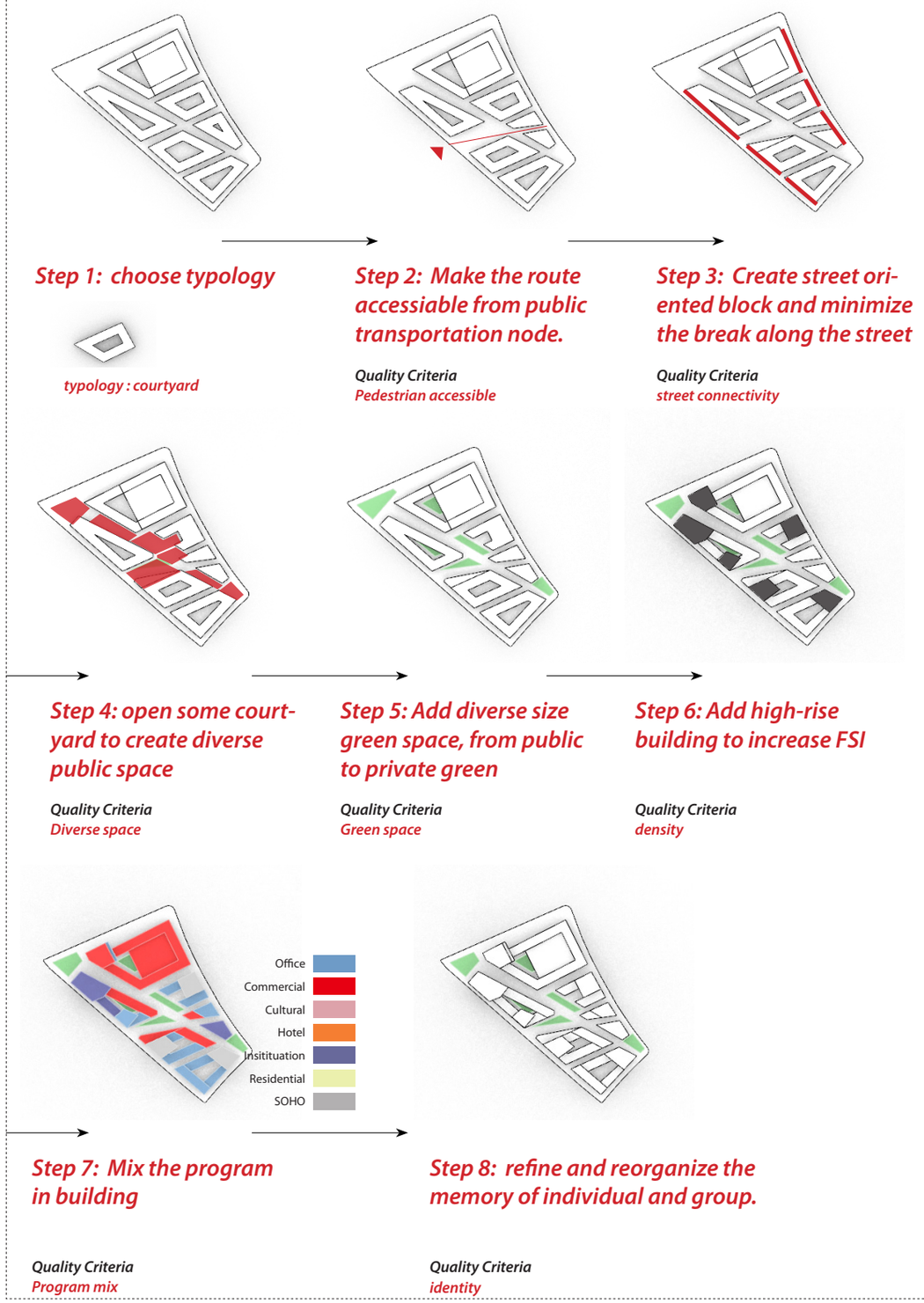
typology : courtyard

Design evolution on block scale

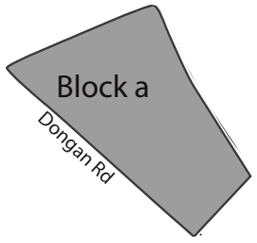


Quality criteria



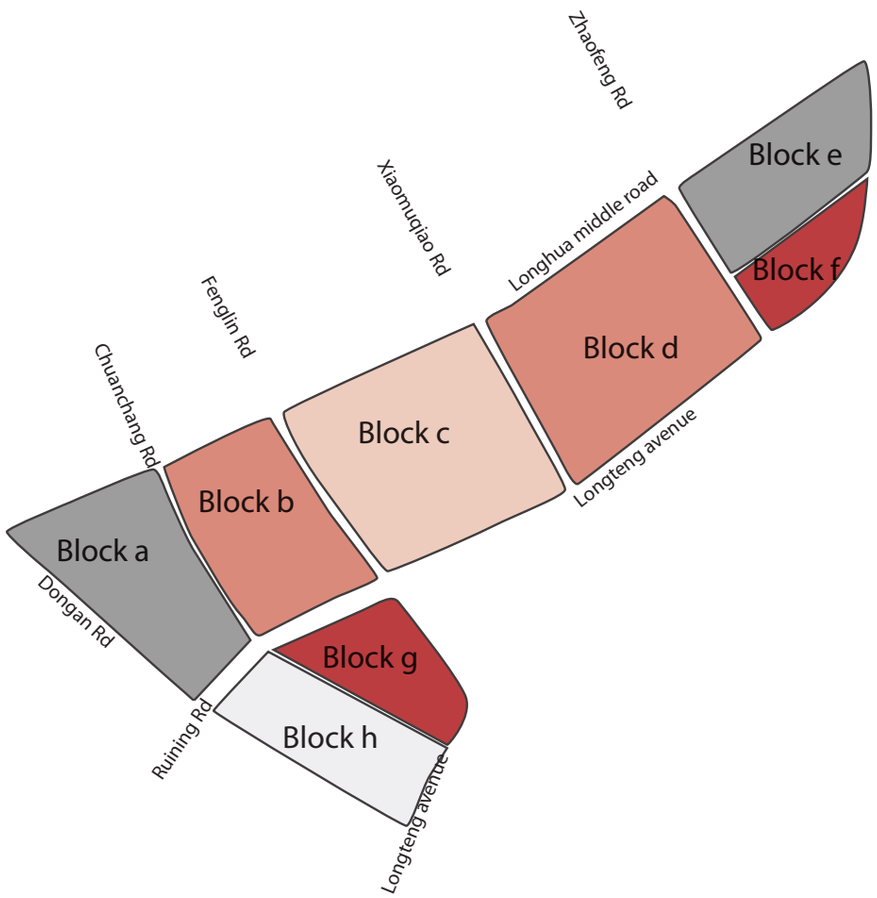


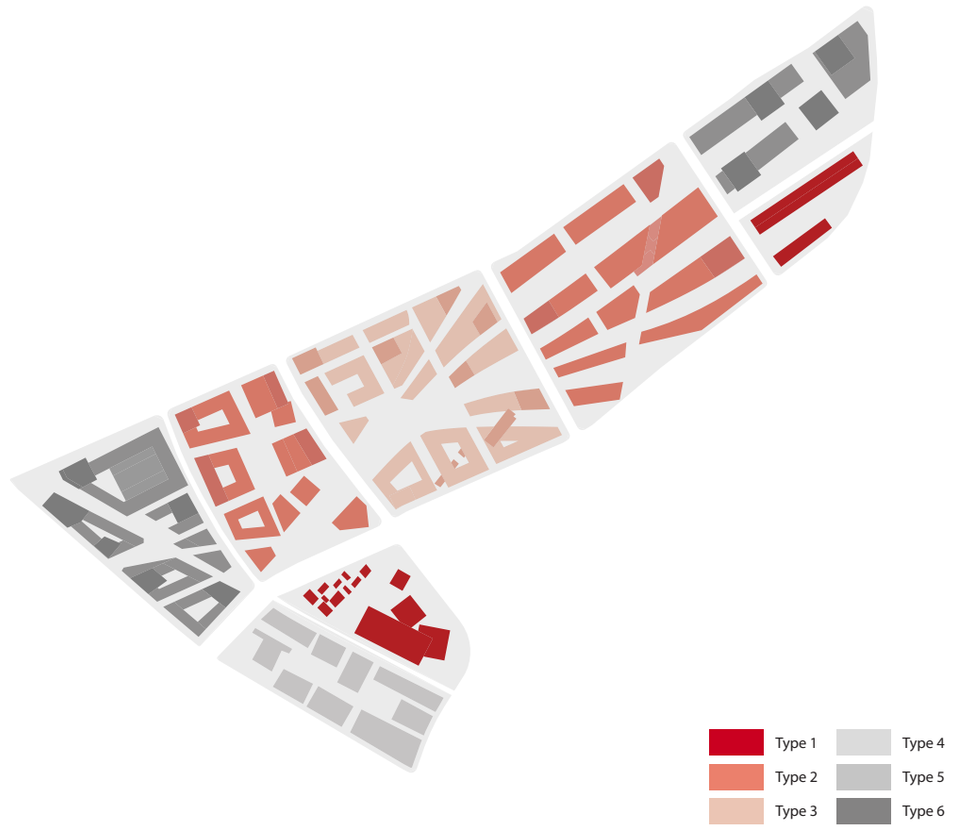
Block typology



Block typology

For the different identity blocks, according to its quality and program, choose different building typology





XL City Scale

L District Scale

M Block Scale

S Local Scale

S Local Scale

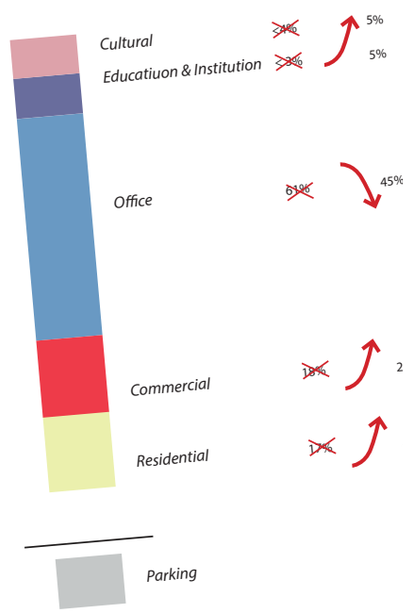
Mixed-use

PROGRAM DIVISION AFTER OPTION TEST

residential population: 2.3w

Total

Floor space:1560.000 m²
FSI: 4.5



Cultural: 78.000 m²
Instituation: 78.000 m²

Office: 780.000 m²

Commercial: 252.000 m²
Hotel: 60.000 m²

Rental housing: 260.000 m²
Commercial housing: 50.000 m²
Social housing: 3.000 m²

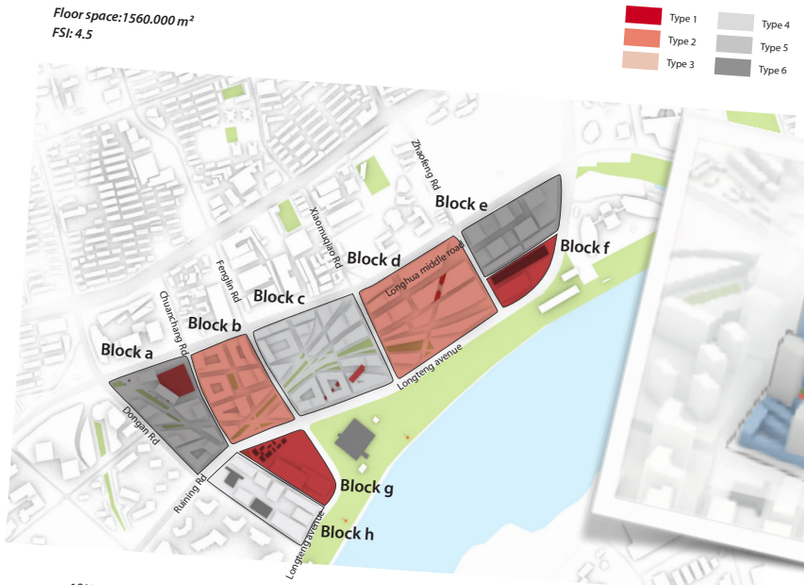
Parking: 650.000 m²

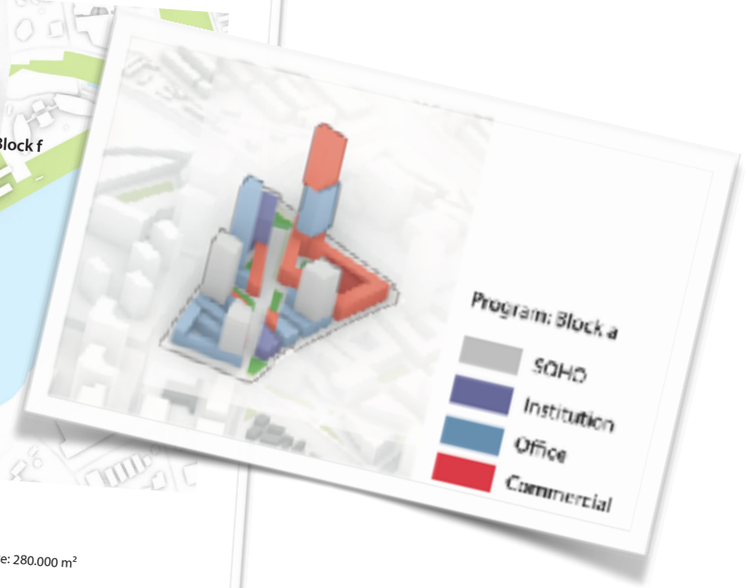
Program	Block a	Block b	Block c	Block d	Block e	Block f	Block g	Block h	Total area
total floor area (*10³ m2)	295	167	320	300	280	32	36	130	1560
Cultural (*10³ m2)						0.8	0.6	0.2	73.2
education (*10³ m2)	0.1	0.1	0.1				0.1		81.8
office (*10³ m2)	0.5	0.8	0.8	0.2	0.3	0	0.1	0.6	762.7
commercial (*10³ m2)	0.4	0.1	0.1	0.2	0.2	0.2	0.2	0.2	322.3
residential (*10³ m2)				0.6	0.5				320

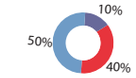
166

Total

Floor space:1560.000 m²
FSI: 4.5



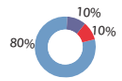




Block a

Floor space:.295.000 m²

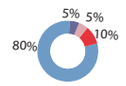
FSI: 6.4



Block b

Floor space:167.000 m²

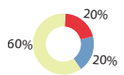
FSI: 3.8



Block c

Floor space: 320.000 m²

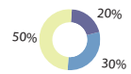
FSI: 4.4



Block d

Floor space: 300.000 m²

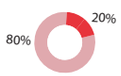
FSI: 4.0



Block e

Floor space: 280.000 m²

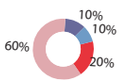
FSI: 7.0



Block f

Floor space: 33.000 m²

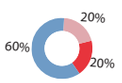
FSI: 2.0



Block g

Floor space: 36.000 m²

FSI: 1.5



Block h

Floor space: 130.000 m²

FSI: 3.6

167

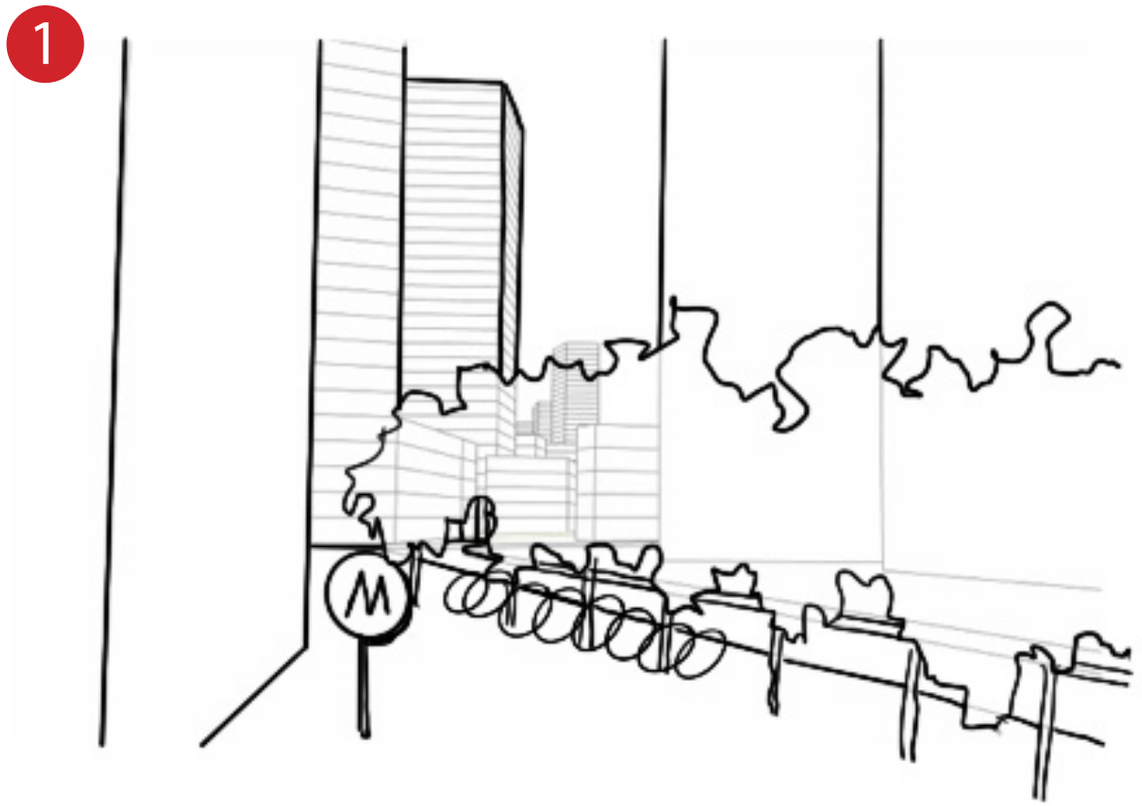
Connectivity: Sequence of movement

We could get off from Longhua Middle Road metro station, and walking to the Long museum to see the exhibition!

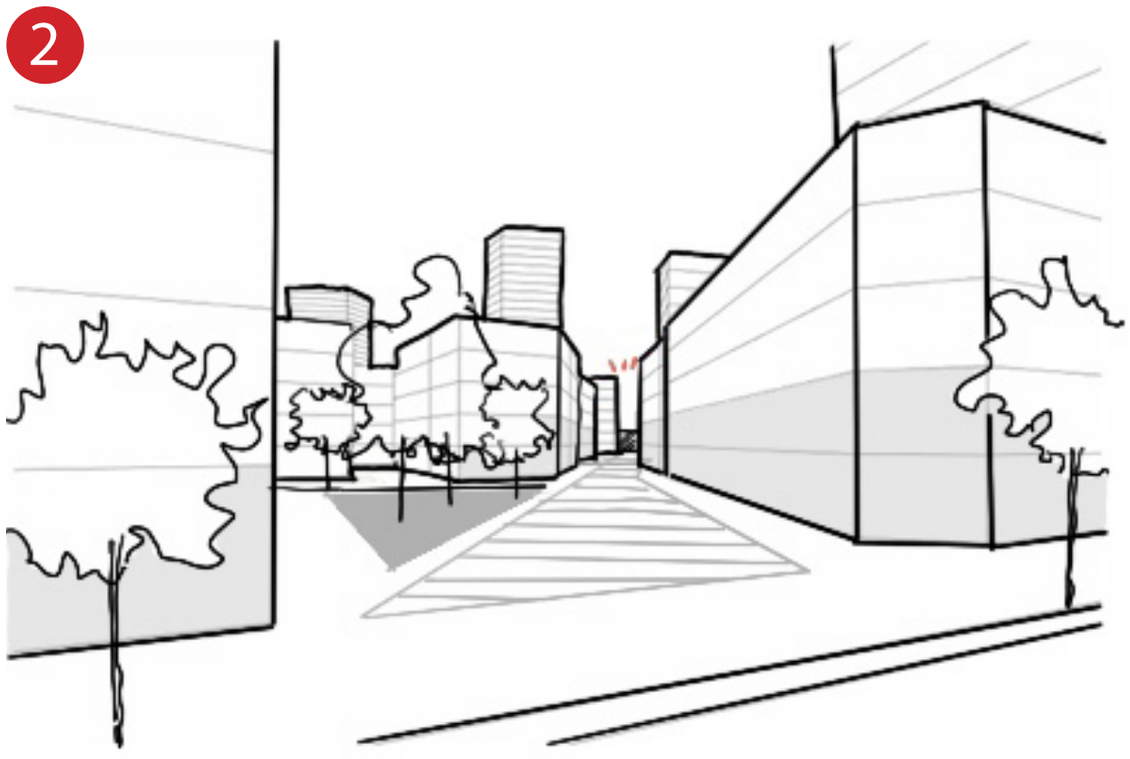
Miss Wu, Miss Zhang and Mr. He

20+

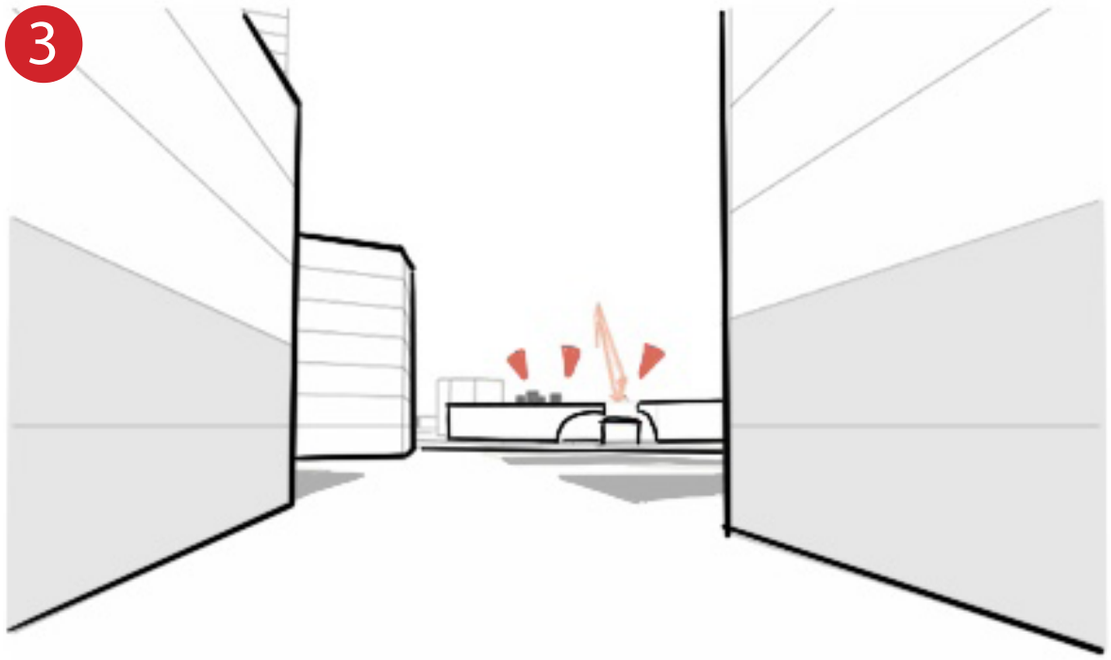
Long museum
1


1

2
Long museum


2

3
Long museum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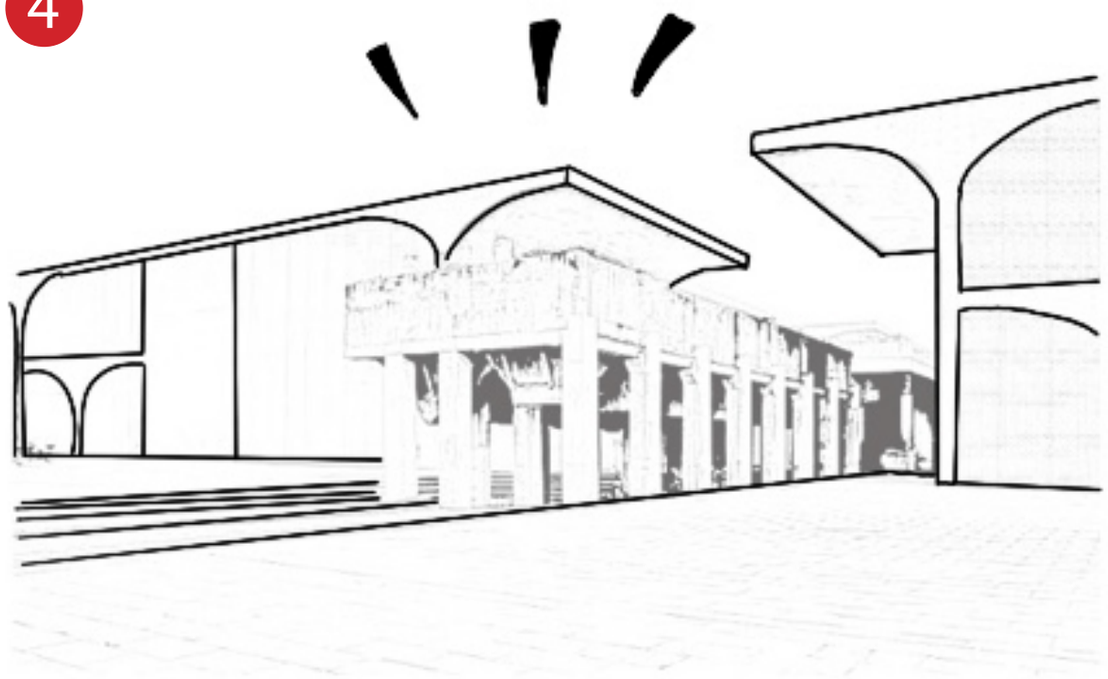
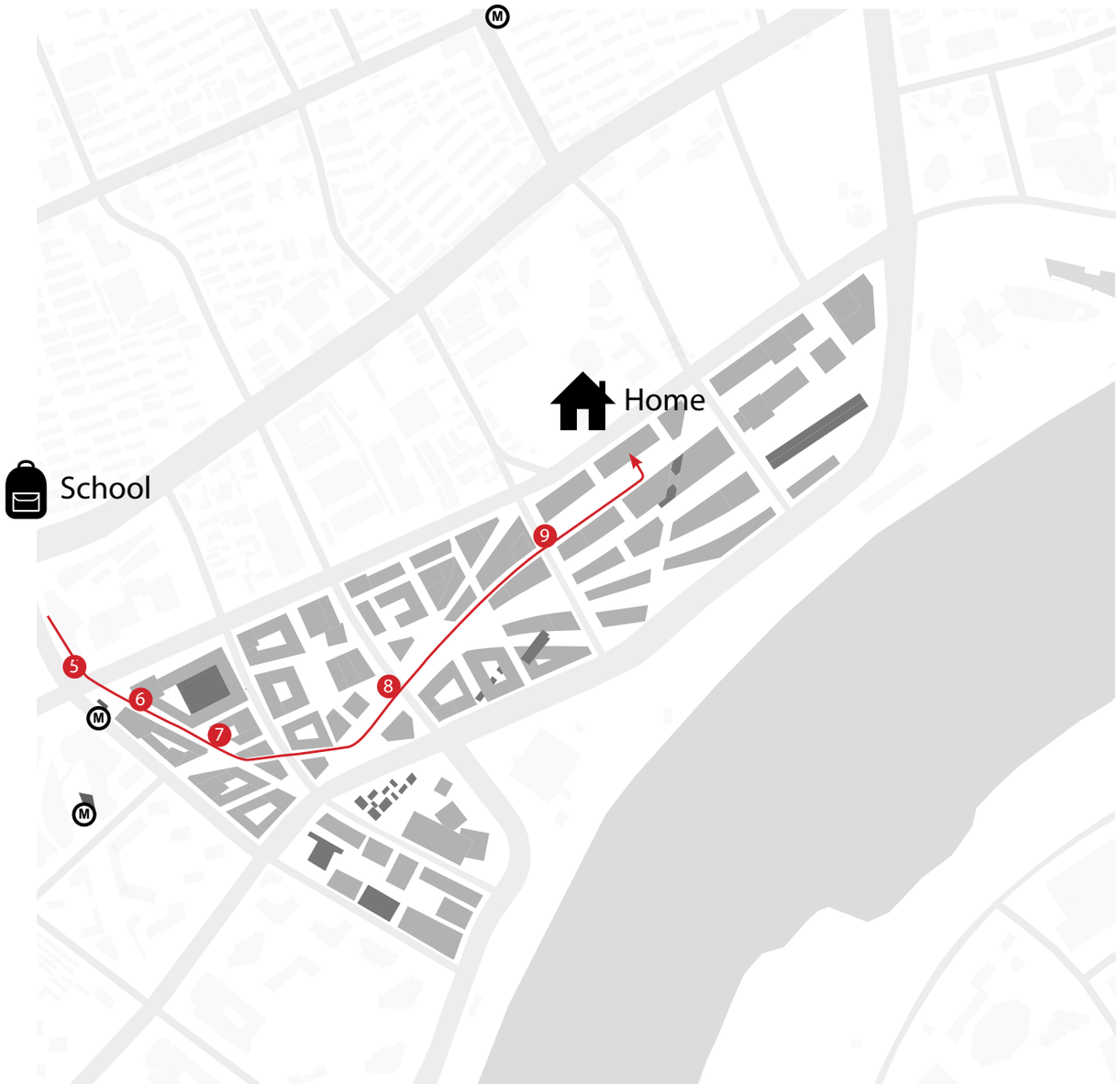
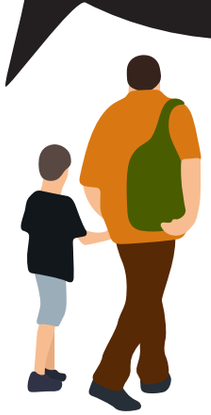
4



Connectivity: Sequence of movement



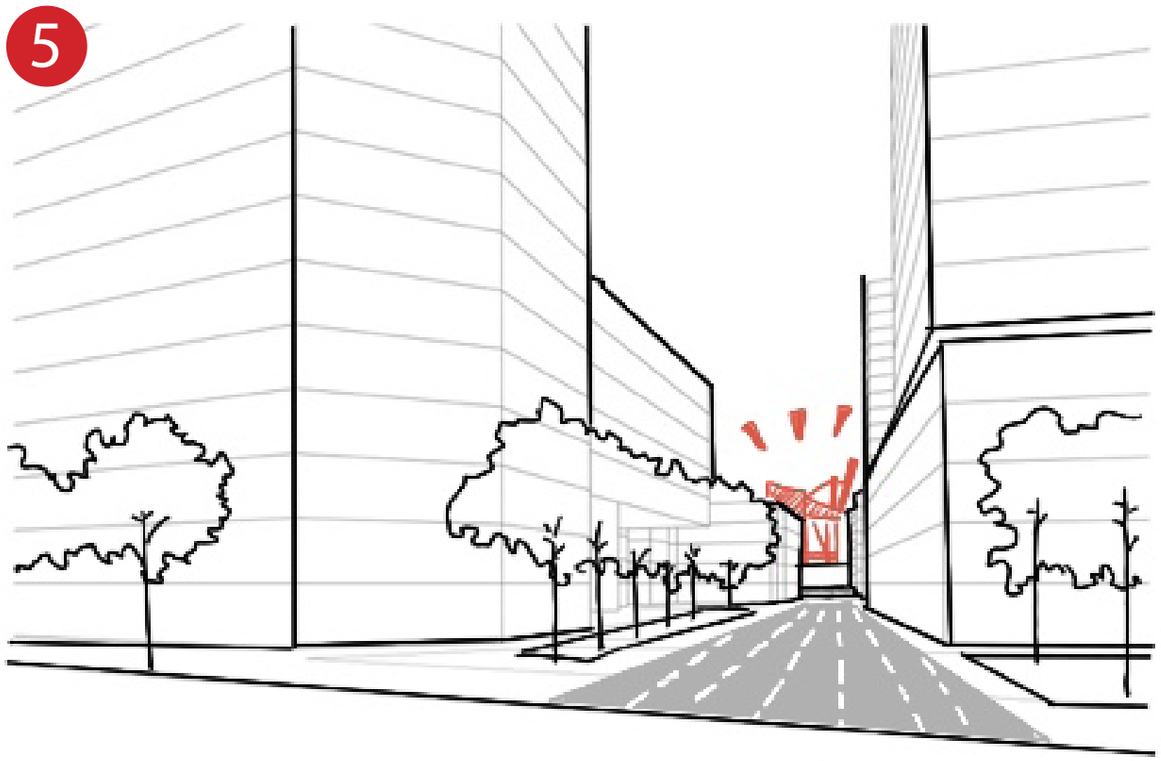
I am a primary school student, everyday my father pick me up from school and we would walk back home through a commercial zone and an innovation square



Mr. Wang and his 6 year old son

38

Home
School
5


5

Home
School
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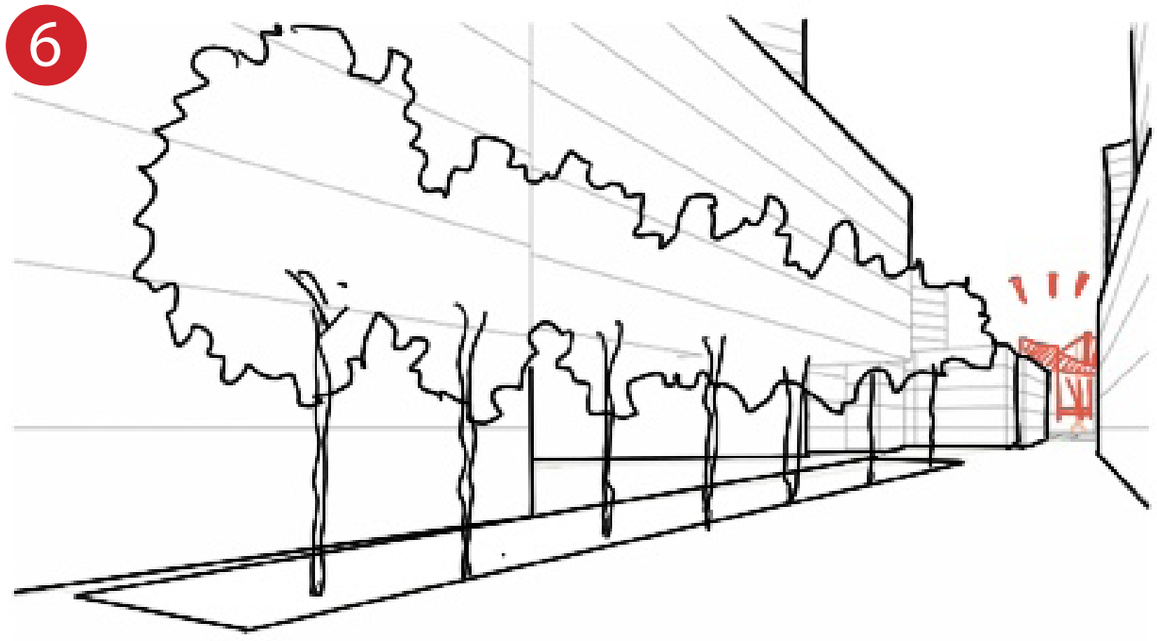
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Home
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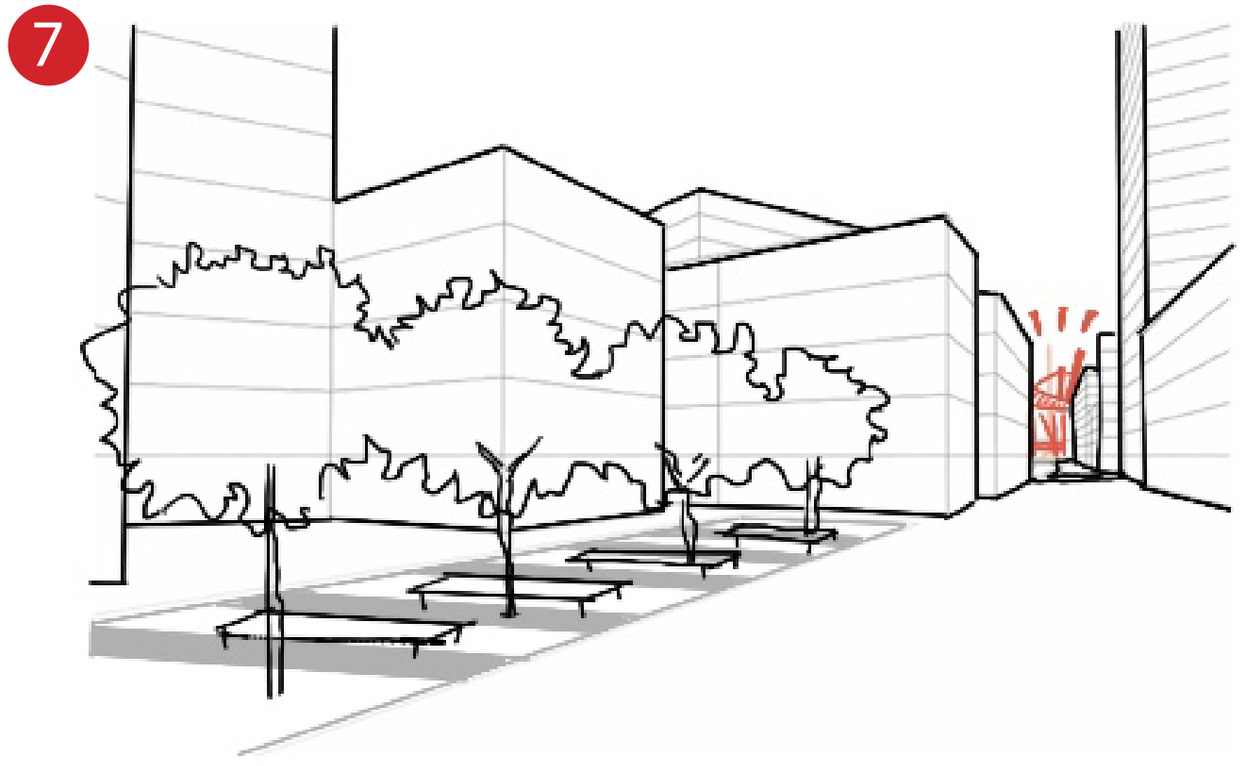
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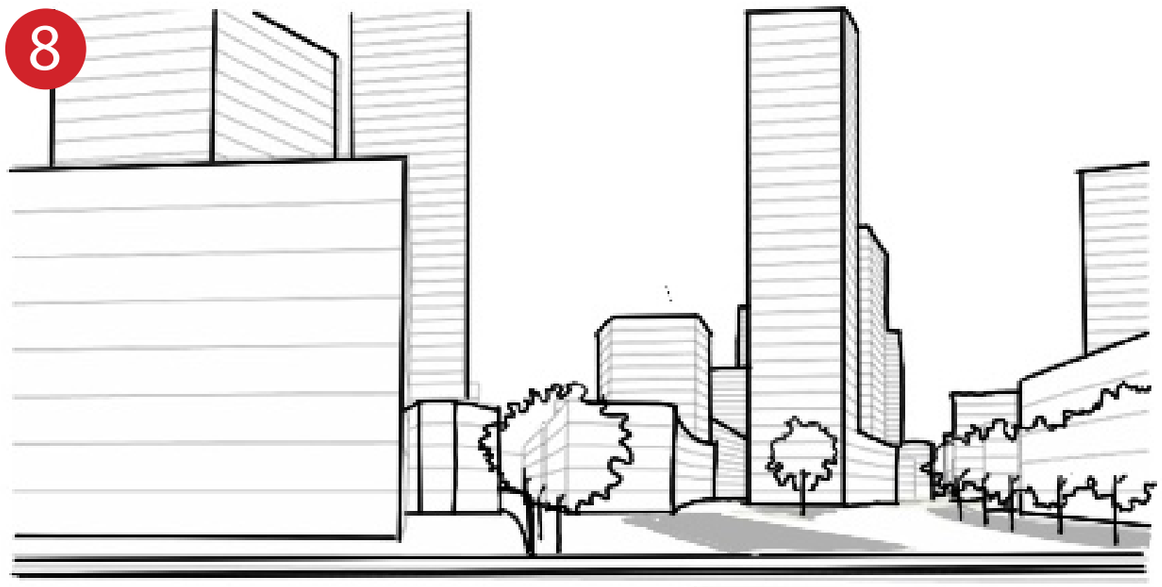
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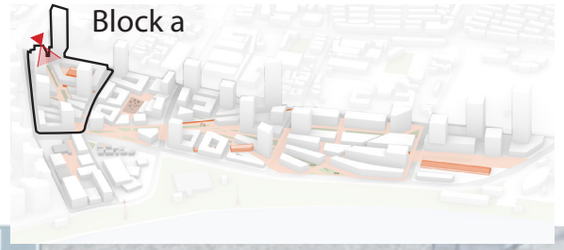
Identity of block



This used to be the Lotus Supermarket which is quite important for our life.

A vibrant district that deliver high-quality commercial space and cultural function which we could come to waste

Nearby residents Zhou:

Identity of block

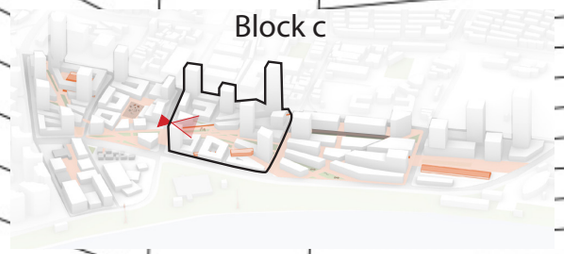
deliver high-quality public realm

A Place where young high-tech graduates can afford to live and work here. More opportnuity for start-ups.

Office workers

students and high tech people

Identity of block



Nanpu Station is a very important place for Shanghai. The linear open space, The wall keep the historical memory.

Citizen Liu

Identity of block

deliver high-quality green space, quiet and safe.

Residents Wang and his 6 year old son

View line

Existing landmark

Newly-built landmark

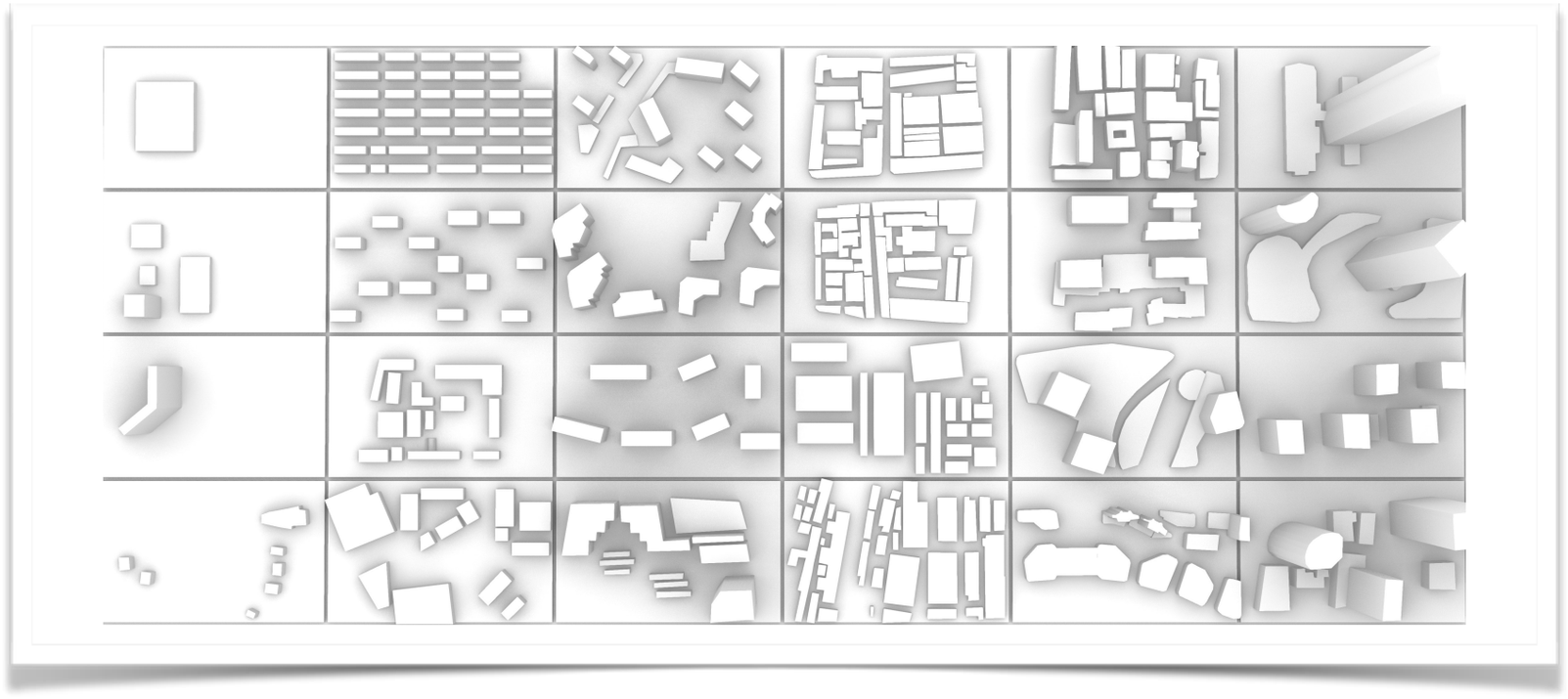
View line

Conclusion

How to improve the place quality (urban vitality and identity) in the post-industrial riverfront along the Shanghai Huangpu River by understanding and modifying urban form during the densification and intensification process?

Conclusion

- Density forms can play a role in creating quality urban spaces, helping to create more diverse environments and serve diverse populations. This is important today to reduce the negative impact of homogeneous real estate in the Chinese environment, and achieve mixed-use, identity environment.



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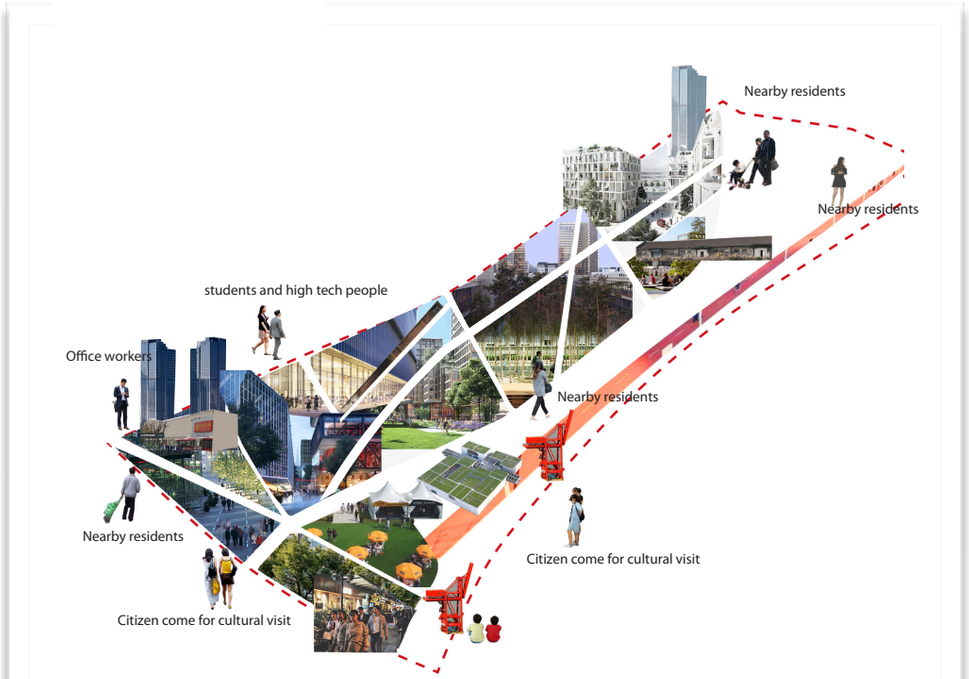
- Density forms can play a role in creating quality urban spaces, helping to create more diverse environments and serve diverse populations. This is important today to reduce the negative impact of homogeneous real estate in the Chinese environment, and achieve mixed-use, identity environment.

- The identity and historical heritage are important elements for us to create a dialog between the present and the history of the site. and create attractors for people to gathering. Not only the tangible elements, but also the story and memory can help in create quality post-industrial riverfront.



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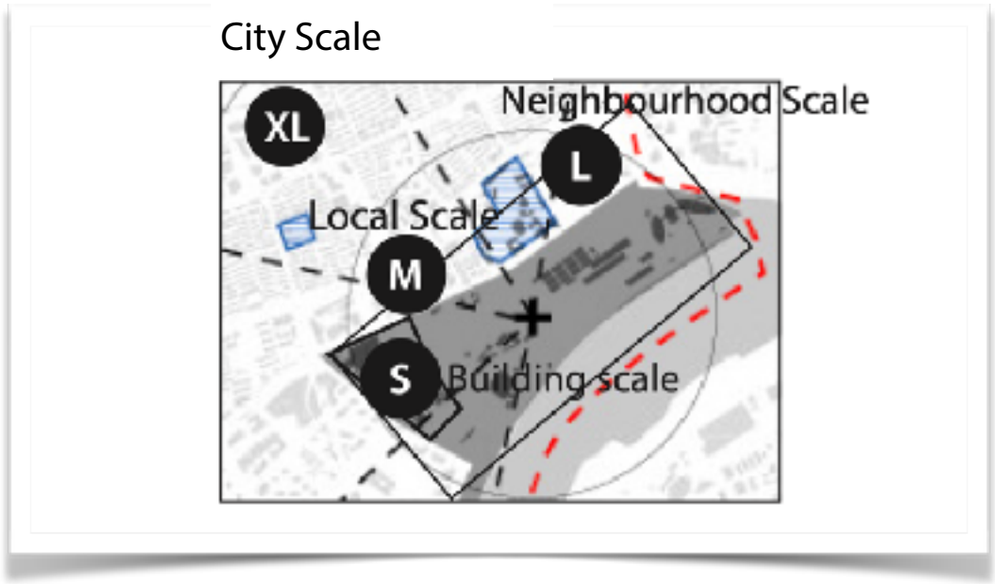
- The design should design from scale. Not only built up the connection between community and the city, but also the connectivity of walking experience.



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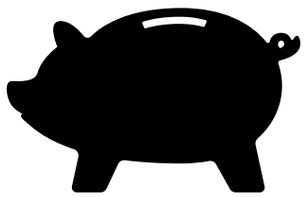
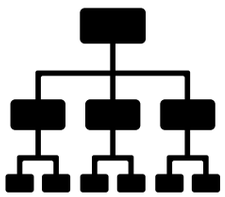
- The design is a highly optimise scenario, it does not reflect the financial feasible.

- Although I already did different options to respond to the design site, but still, with the help from parametric program, we urban designer and architects can investigate more unprecedented community form.



- financial feasible.



- more options

Thank you!