Beyond the Street
街道之上

Transitional housing as a bridge for the roofless to reintegrate into local society, Brussels-Capital Region as the case

过渡性住房作为一种桥梁帮助流浪汉重新融入当地社会，布鲁塞尔大都市区作为场地

P5
MSc Architecture, Urbanism & Building Sciences
Technische Universiteit Delft
2024 - 2025

Yiling Yang
5991250

The trigger point

During the preparation of 2024 Paris Summer Olympics, police removed the homeless from Paris City Hall plaza and bussed them to the east France and even across the border into Belgium.

去年夏天的巴黎奥运会，法国警察赶走了在巴黎的流浪汉并且用大巴把他们送到法国东部，甚至穿过边界送去了比利时。

July 17

Why Brussels?

Political center

政治中心

Institutional proximity

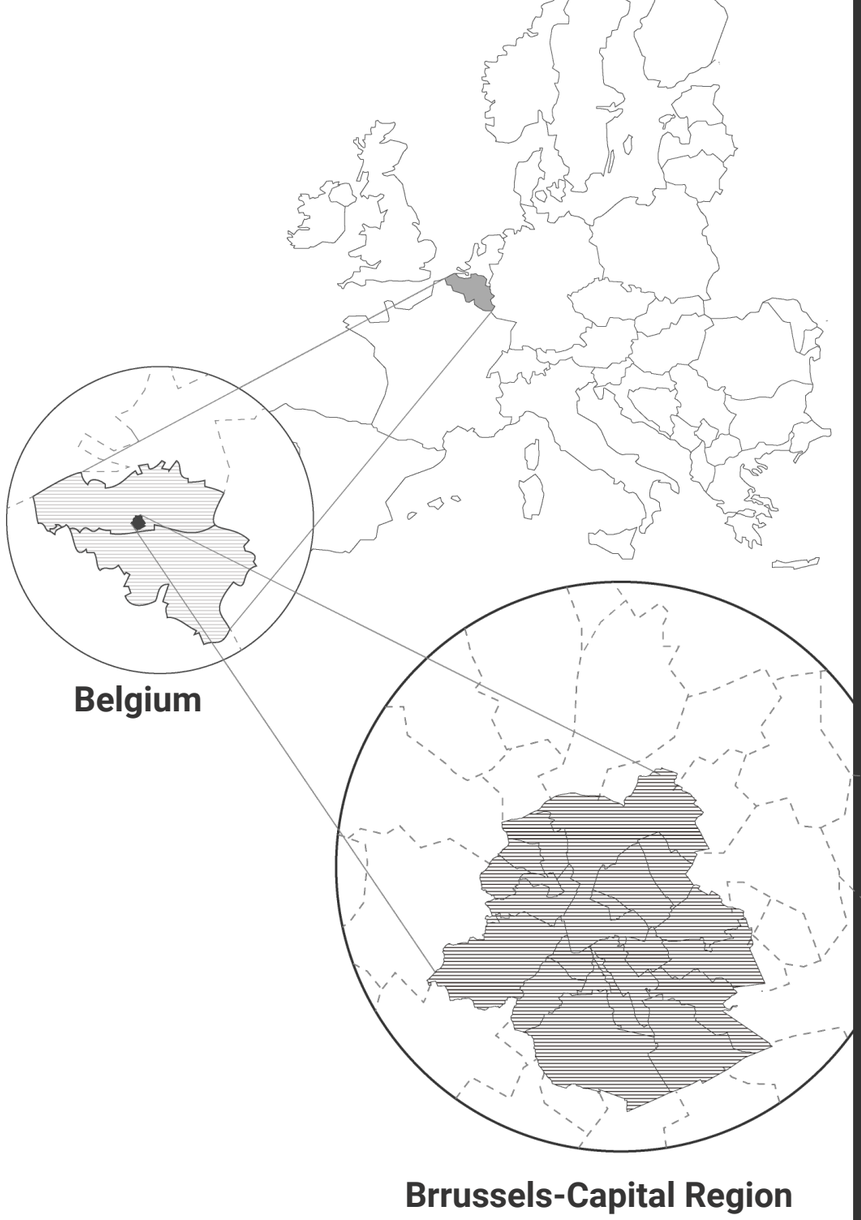
机构邻近性

Complex social issues

复杂的社会问题

Practical concerns

实际问题



Brussels-Capital Region

Basic Road structure map

0 1KM

Legend
Regional road
Road system

Where did they go?

2-FVA-762

1 Problem synopsis

1.1 Problem field

1.1.1 What is homelessness?

什么是流浪汉？

According to European Typology of Homelessness and Housing Exclusion (ETHOS), homelessness is identified into 4 main categories of living situation.

Conceptual Category		Operational Category		Living Situation		Generic Definition
Roofless		1	People living rough	1.1	Public space or external space	Living in the streets or public spaces, without a shelterthat can be defined as living quarters
		2	People in emergency accommodation	2.1	Night shelter	People with no usual place of residence who make useof overnight shelter, low threshold shelter
Houseless		3	People in accommodation for the homeless	3.1	Homeless hostel	Where the period of stay is intended to be short term
				3.2	Temporary accommodation	
				3.3	Transitional supported accommodation	
		4	People in women's Shelter	4.1	Women's shelter accommodation	Women accommodated to experience of domestic violence and where the period of stay is intended to be short term
		5	People in accommodation for immigrants	5.1	Temporary accommodation/recep-tioncentres	Immigrants in reception or short term accommo-dation due to their immigrant status
				5.2	Migrant workers accommodation	
		6	People due to be released from institutions	6.1	Penal institutions	No housing available prior to release Stay longer than needed due to lack of housing No housing identified (e.g. by 18th birthday)
				6.2	Medical institutions	
				6.3	Children'sinstitutions/homes	
Insecure		7	People receiving longer-term support (due to homelessness)	7.1	Residential care for older homeless people-Supported accommodation for formerly	Long stay accommodation with care for formerly-homeless people (normally more than one year)
				7.2	Homeless people	
		8	People living in insecure accommodation	8.1	Temporarily with family/friends	Living in conventional housing but not the usual place of residence due to lack of housing
				8.2	No legal (sub)tenancy	Occupation of dwelling with no legal tenancy
				8.3	Illegal occupation of land	Occupation of land with no legal rights
		9	People living under threat of eviction	9.1	Legal orders enforced (rented)	Where orders for eviction are operative
				9.2	Re-possession orders (owned)	Where mortagee has legal order to re-possess
		10	People living under threat of violence	10.1	Police recorded incidents	Where police action is taken to ensure place of safety for victims of domestic violence
Inadequate		11	People living in tempo-rary/non-conventional structures	11.1	Mobile homes	Not intended as place of usual residence
				11.2	Non-conventional building	Makeshift shelter, shack or shanty
				11.3	Temporary structure	Semi-permanent structure hut or cabin
		12	People living in unfit housing	12.1	Occupied dwellings unfit for habitation	Defined as unfit for habitation by national legisla-tion orbuilding regulations
		13	People living in extreme over-crowding	13.1	Highest national norm of overcrowding	Defined as exceeding national density standard for foor-space or vesable rooms

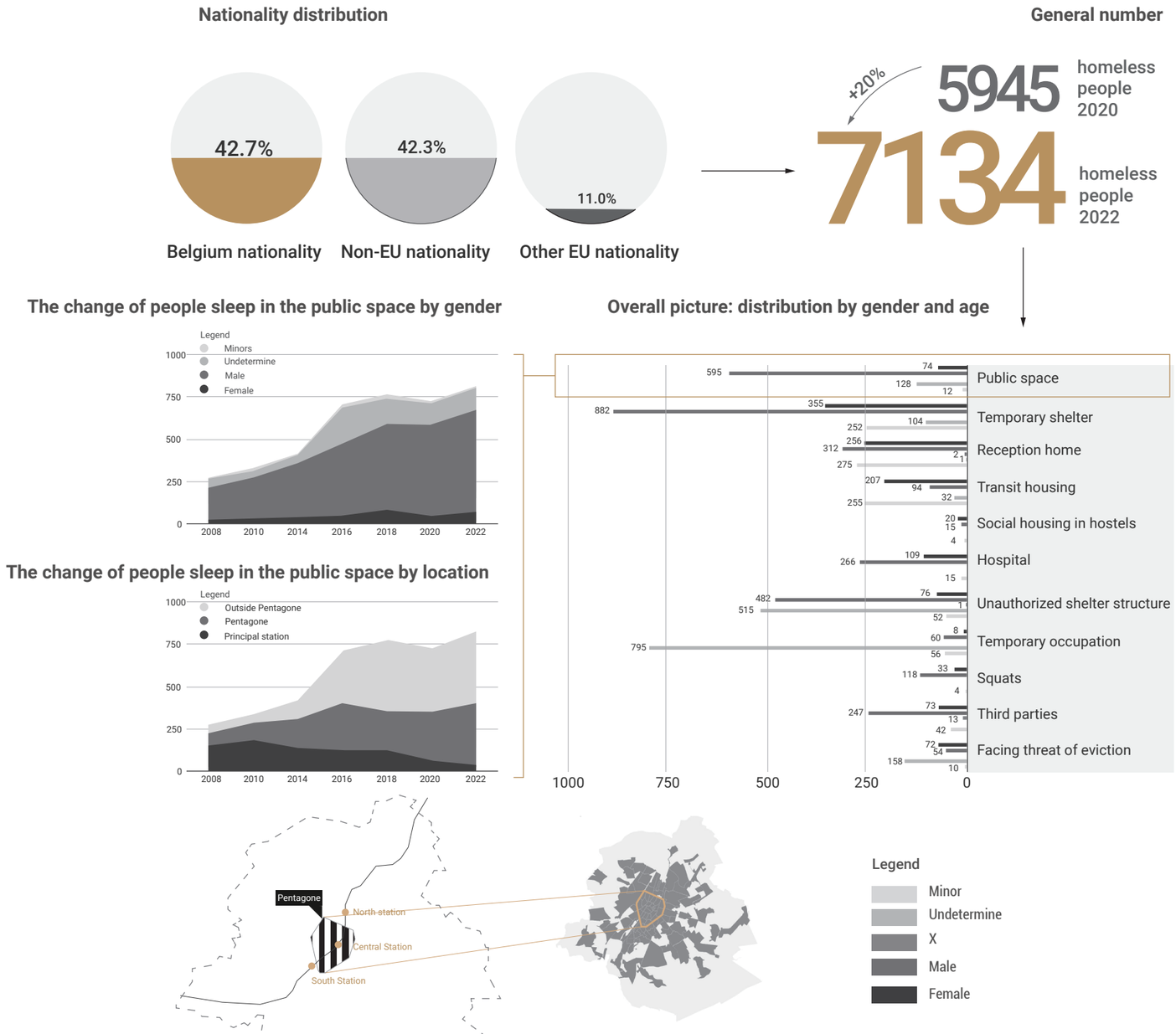
Data source: ETHOS, FEANTSA
Figure 01: Made by author

1 Problem synopsis

1.1 Problem field

1.1.2 Demographic background of homelessness in the Brussels-Capital Region

布鲁塞尔的流浪汉的统计数据



1 Steady Increase in Homelessness

流浪汉数量稳步增长

The number of the homeless in BCR tripled in last 12 years resulting with a number above 7000 peple and it keeps increasing.

2 Nationality distribution

国籍分布情况

42.7% of homeless people have Belgian nationality, a proportion similar to the 42.3% who hold non-EU nationality, while 11% hold EU Nationality other than Belgian.

3 Alarming picture in the Most Vulnerable Category: Roofless

睡在接头的人是最值得注意的那部分最脆弱的人

By 2022, 33.7% of homelessness are sleeping on the street.

4 Geographic Distribution

地理分布

The distribution of rooflessness across the three main train stations is declining.

Data source: Dénombrement des personnes sans-chez-soi en Région de Bruxelles-Capitale Septième édition, 8 novembre 2022
Made by author

1 Problem synopsis

1.1 Problem field

1.1.3 Affordable housing issue in BCR

布鲁塞尔的经济适用房问题

Obsession of homeownership

Post-war period

↓

Absence of spatial planning restriction

- middle class — City fringes and rural areas
- Lower class — City center

7%

of houses in the BCR are owned by social housing companies

Until 2019, there are only **36117** rented social housing units, while there are more than **48804** households on the waiting list.

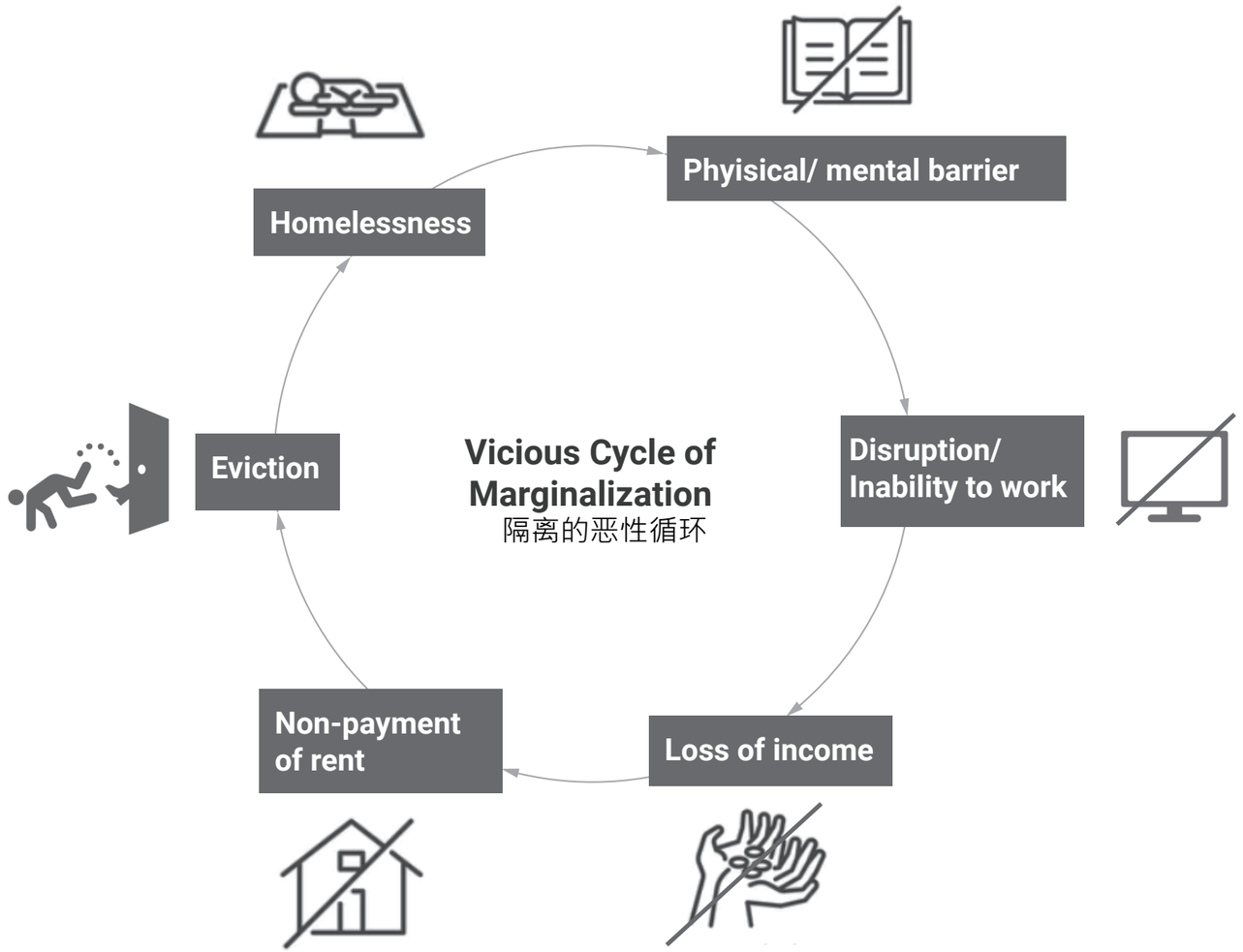


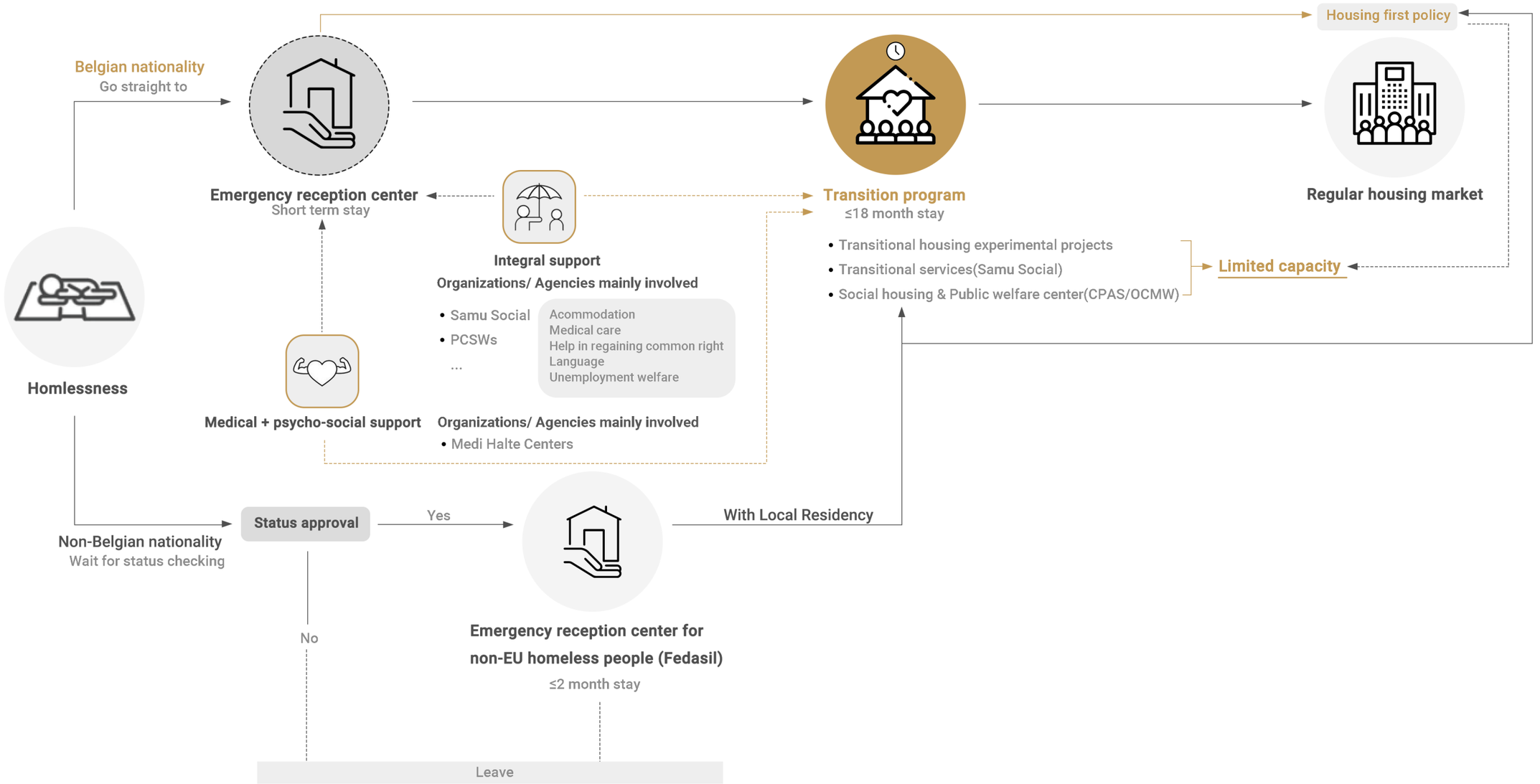
Figure 06: Vicious cycle of marginalization
Made by author

1 Problem synopsis

1.1 Problem field

1.1.4 The procedure of getting an accommodation for homelessness

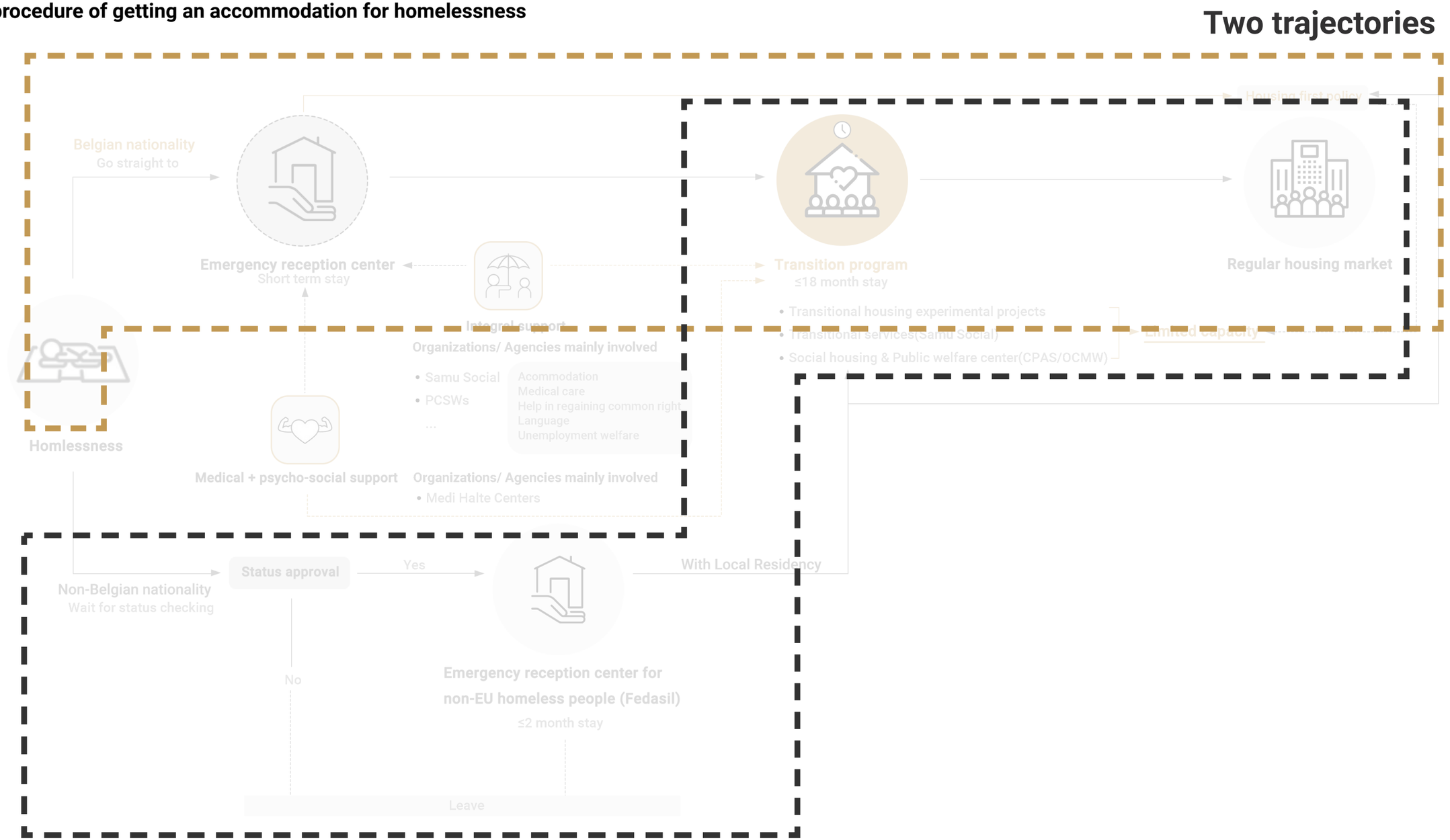
流浪汉获得住房的路径



1 Problem synopsis

1.1 Problem field

1.1.4 The procedure of getting an accommodation for homelessness



1 Problem synopsis

1.1 Problem field

1.1.5 Master plan of ending homelessness

减少流浪汉计划 2030

In April 2024, Bruss'help proposed a master plan to end homelessness in Brussels by 2030, as a guideline for the government.

- *strengthening prevention*
- *improving rapid action*
- *optimising support*
- *combating institutional violence*

Transit system

Two-thirds of emergency shelters should be transformed into transit places, so people don't stay there too long and enter the regular network more quickly.

Sets a target of allocating 1,200 transitional housing units and flexible rental agreements annually, providing immediate and adaptable housing solutions.

Image 02: Masterplan of ending homelessness
Source: Bruss' Help

1 Problem synopsis

1.2 Problem statement

很少的经济适用房

Limited affordable housing

增长的街头流浪汉

Increasing rooflessness

路径依赖

Trajectory dependency

隔离的恶性循环

Vicious cycle of Segragation

looking for more transitional housing opportunities for belgian roofless people has become an urgent task. This effort is essential to enabling them to re-enter the formal housing market within a shorter timeframe and to avoid endless socio-economic marginalization.

为比利时无家可归者寻找更多过渡性住房机会已成为一项紧迫任务。这一努力对于帮助他们更快地重新融入正式住房市场、避免长期社会经济边缘化至关重要。

1 Problem synopsis

1.2 Problem statement

> ***Even though shelter as well as housing in the intermediate phase are temporary situations, they should be seen as proper residential contexts. The locations, scales and typologies of these projects should be assessed in relation to potential social and spatial interactions.***

为比利时无家可归者寻找更多过渡性住房机会已成为一项紧迫任务。这一努力对于帮助他们更快地重新融入正式住房市场、避免长期社会经济边缘化至关重要。

Wyckaert, Leinfelder and De Decker

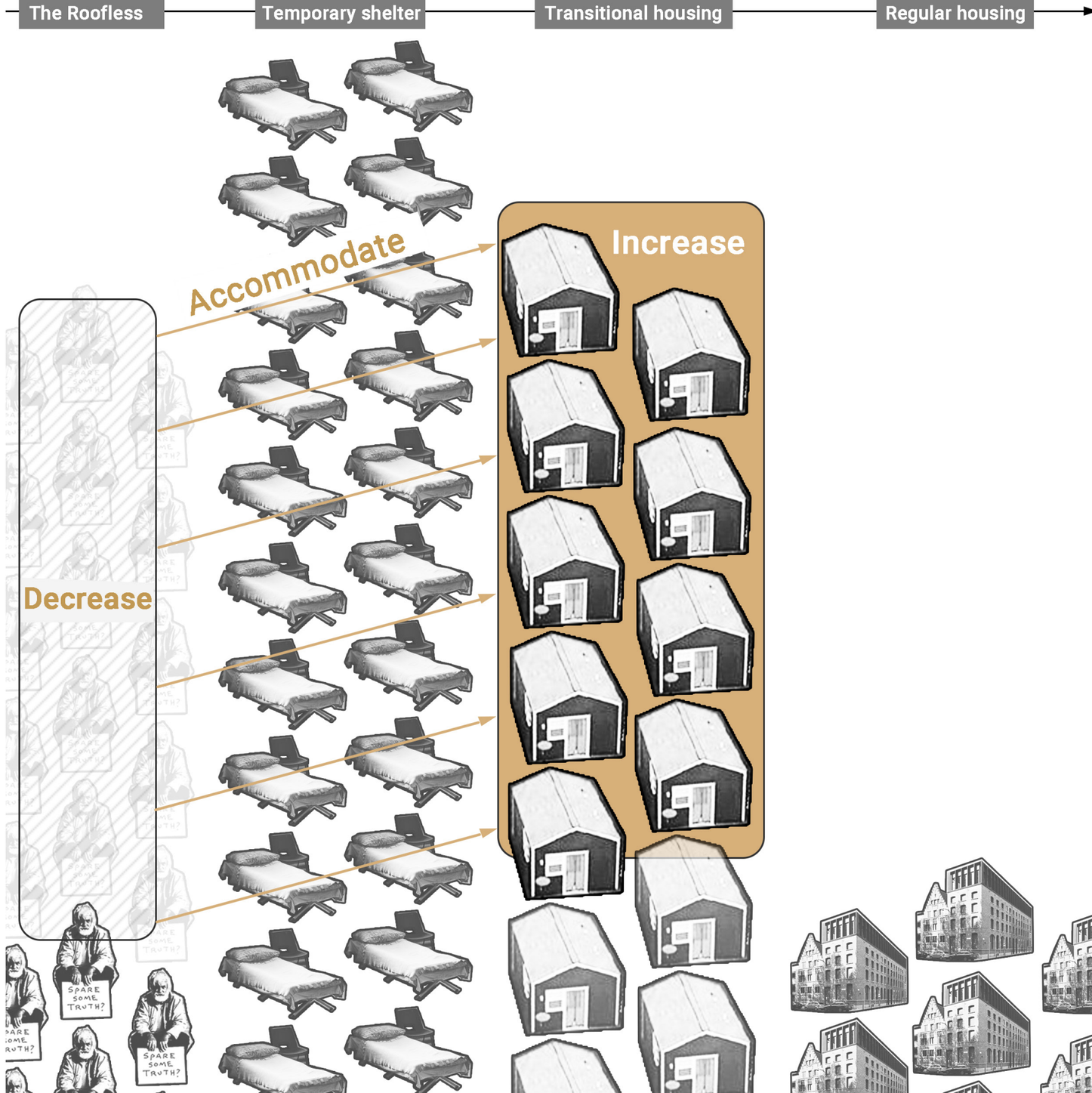
Stuck in the middle: The transition from shelter to housing for refugees.

2 Research aim

研究目的

The aim of the thesis is to develop a transitional housing stage that can mitigate the housing problem of Belgian nationality roofless people, ultimately enable them to transit more quickly and stably into the regular housing market.

本论文旨在开发一个过渡性住房阶段，以缓解比利时籍无家可归者的住房问题，最终使他们能够更快速、更稳定地过渡到常规住房市场。



3 Research question

研究问题

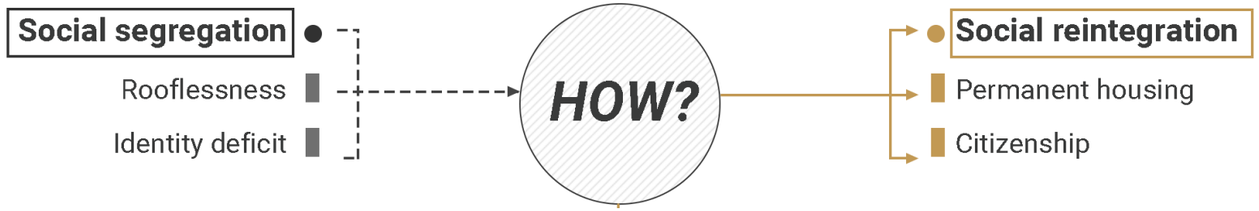
How can the transitional housing stage mitigage the housing shortage issue among the Belgian nationality roofless in the Brussels-Capital Region?

过渡性住房阶段如何缓解布鲁塞尔首都大区比利时籍无家可归者的住房短缺问题？

4 Theory and concept

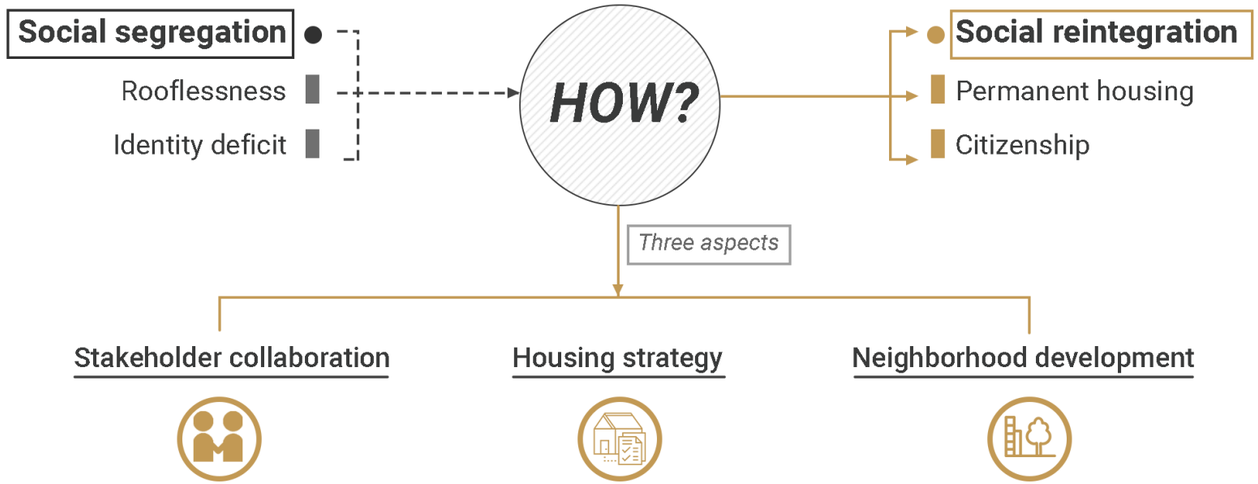
4.2 Conceptual framework

概念框架



4 Theory and concept

4.2 Conceptual framework



4 Theory and concept

4.2 Conceptual framework

Analytical process

Conceptual framework

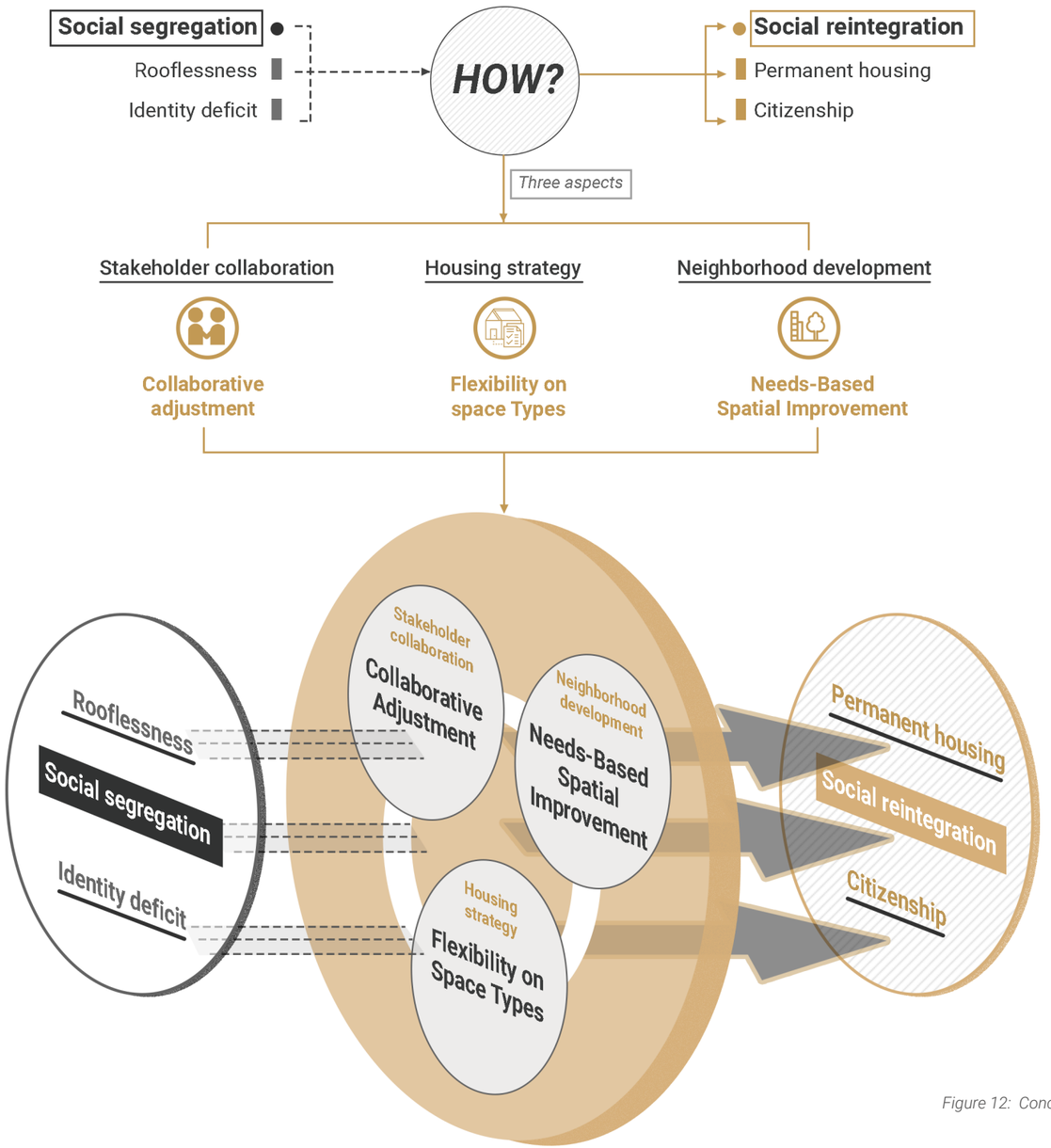
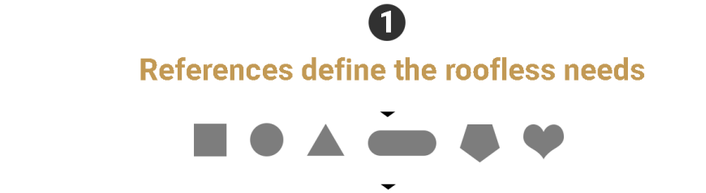


Figure 12: Conceptual framework
Made by author

5 Quantification and fieldwork

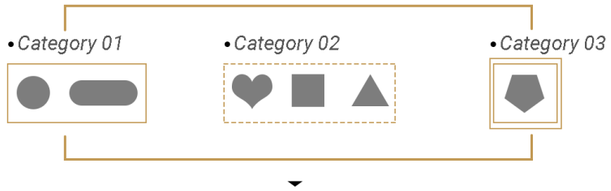
5.1 Analytical framework

分析框架



References define the roofless needs

Classification by List of Nine Human Needs



Adjust

Forming questionnaire

about evaluating each variable importance for the roofless from perspective of experts, the roofless and residents

Interview: Scoring method

Scoring

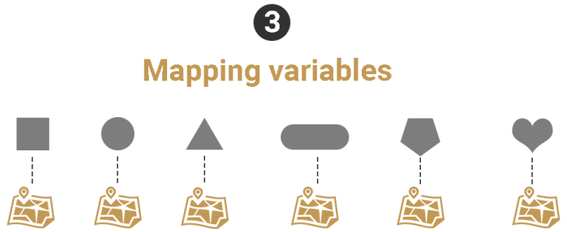
Experts | The roofless | Residents

Summary results

The importance of elements

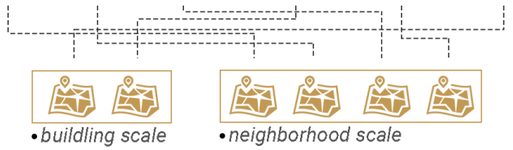
weights:

Spcialize variables



Mapping variables

Reclassify by scale



Extract value in attribute table

Index of Reintegration Supportiveness

Min-max Normalization data

For the "bigger is better" variables

$$x_{\text{normalized}} = \frac{x - x_{\min}}{x_{\max} - x_{\min}}$$

For the "smaller is better" variables

$$x_{\text{normalized}} = \frac{x_{\max} - x}{x_{\max} - x_{\min}}$$

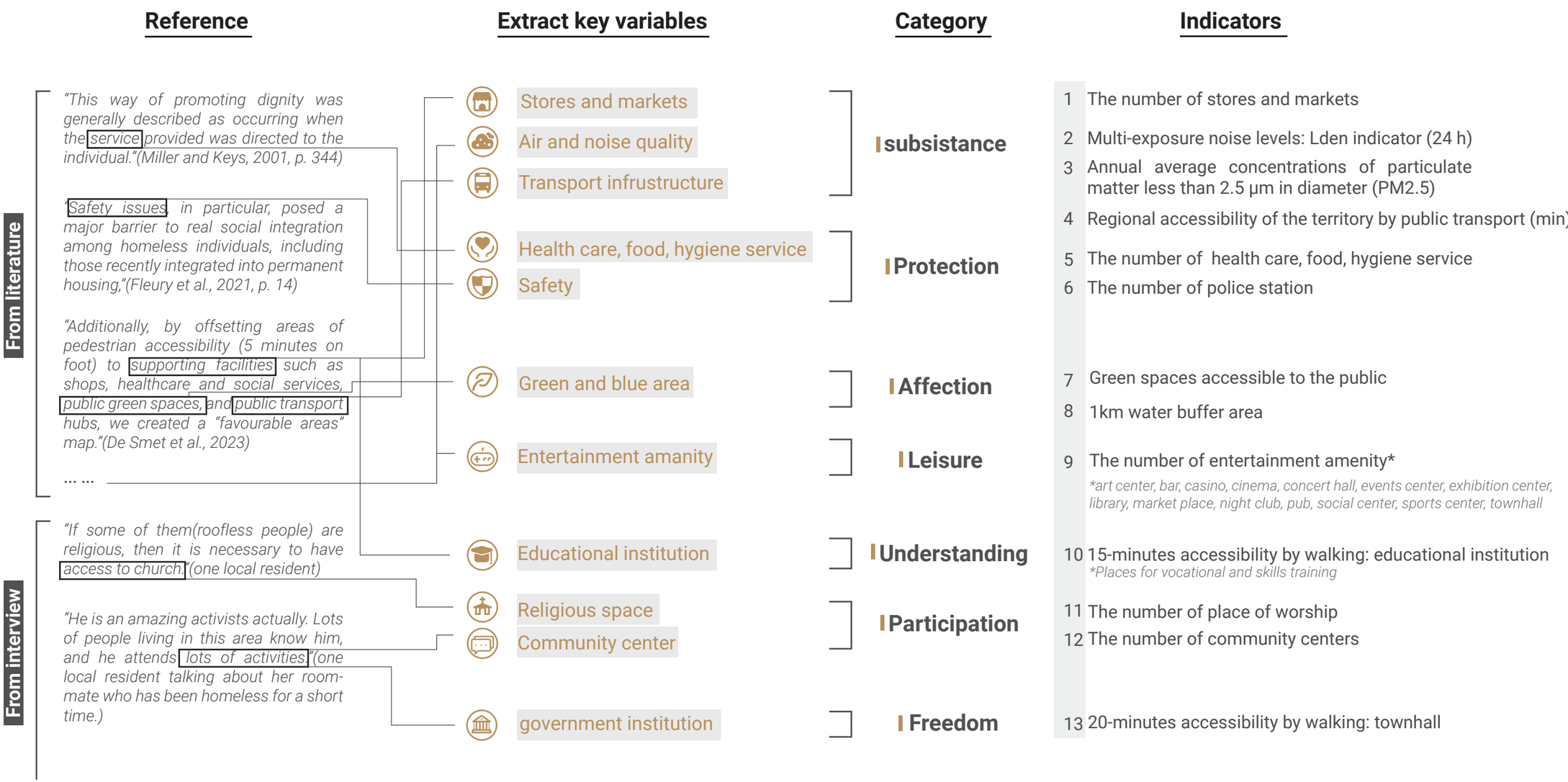
$x_{\text{normalized}}$ $[0,1]$ $w =$ weight of importance

$$\text{Index} = \sum_{i=1}^{n} w_i \cdot x_{i,\text{normalized}}$$

5 Quantification and fieldwork

5.2 Needs of homelessness

需求分析过程



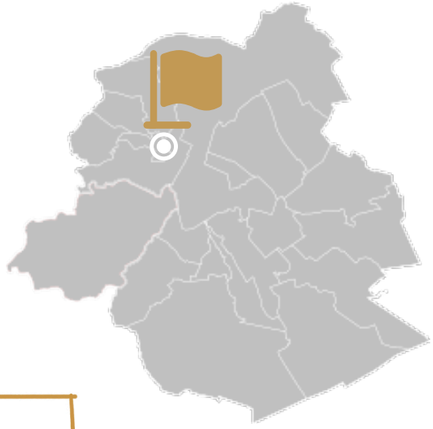
FIELD WORK

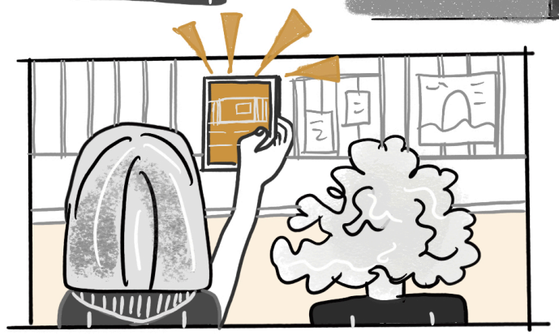
5 Quantification and fieldwork

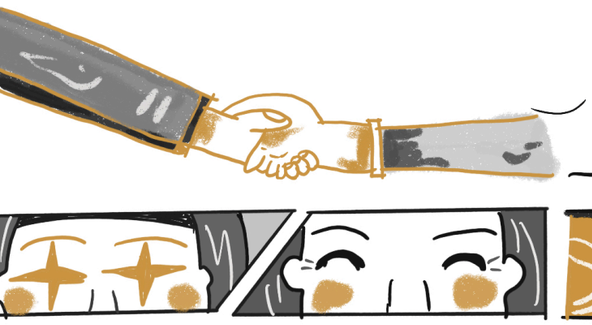
5.3 Field work

5.3.1 The process of fieldwork

Interview with experts from NGO and KU Leuven who are woring with Solidary Mobile Housing Pilot Project in BCR







STAD STAD STAD STAD STAD
My
Ville
Ville
Ville
Ville
UTOPIE
NO ONE is ILLEGAL
LONE
VE
BIENVEILLANCE
CITY
Ville
Ville Ville
Ville
Pas de v
GEMBA
Safety

FIELD WORK

STOP

CENTRAAL

CENTRAL STATION

FROM CENTRAI TO MIDI

BRUSSELS-MIDI

NEXTTRIP

ANDERLECHT

TCHEN

DREAM KITCH

8 YEARS

How many years have you been homeless?

CULTUREGHEM

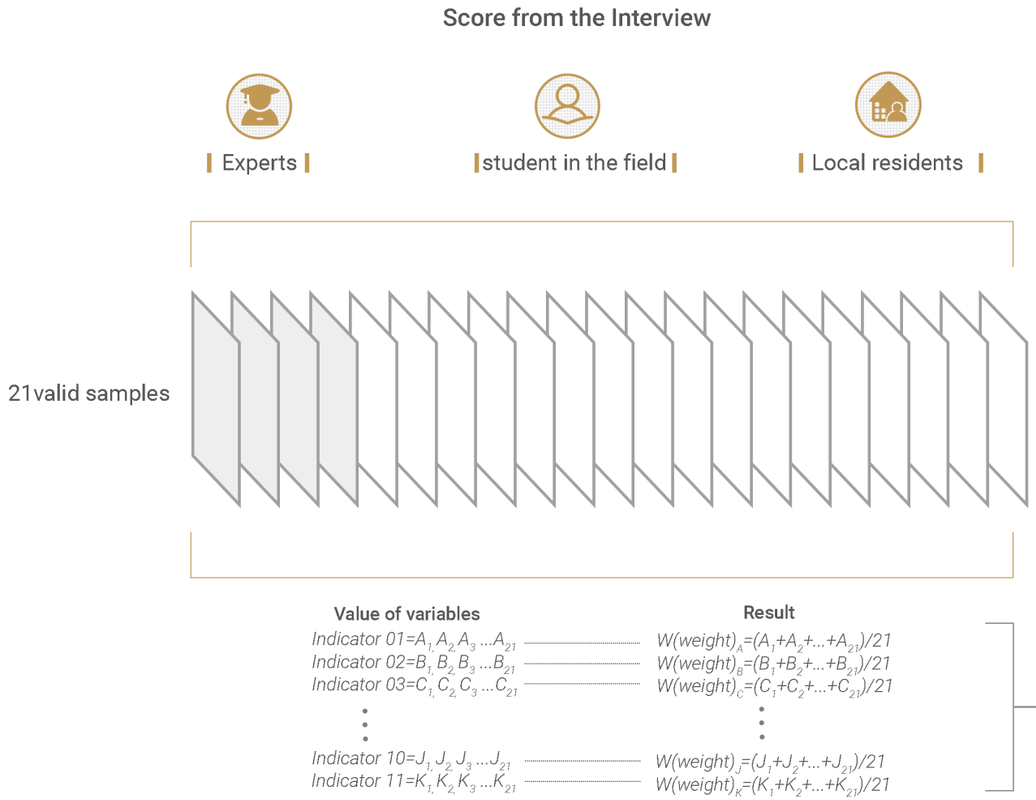
LOKET

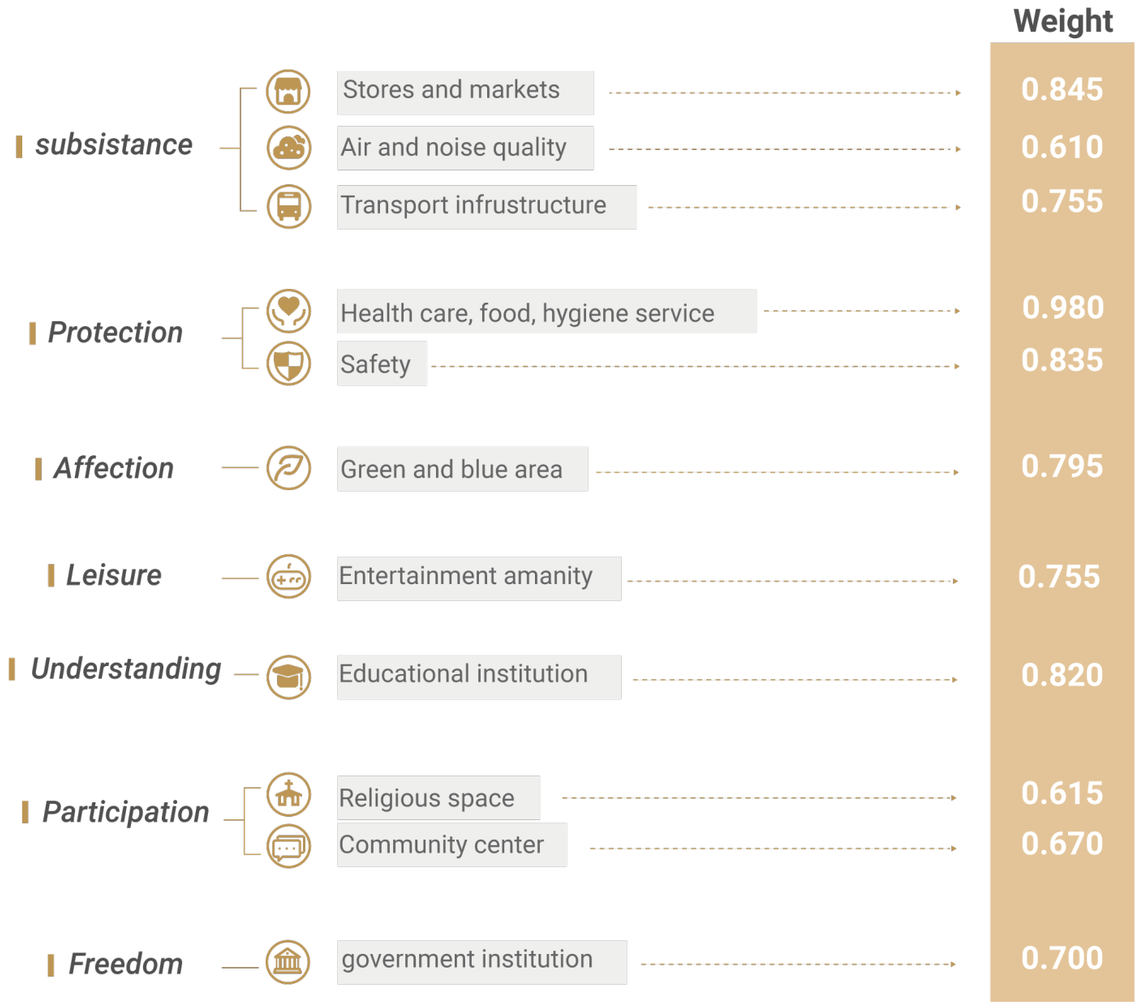
5 Quantification and fieldwork

5.3 Field work

5.3.2 Data proccessing

数据处理

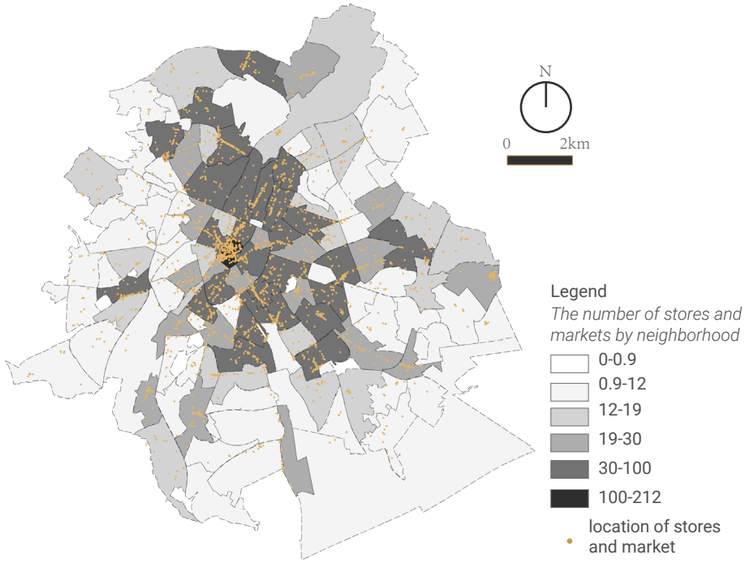




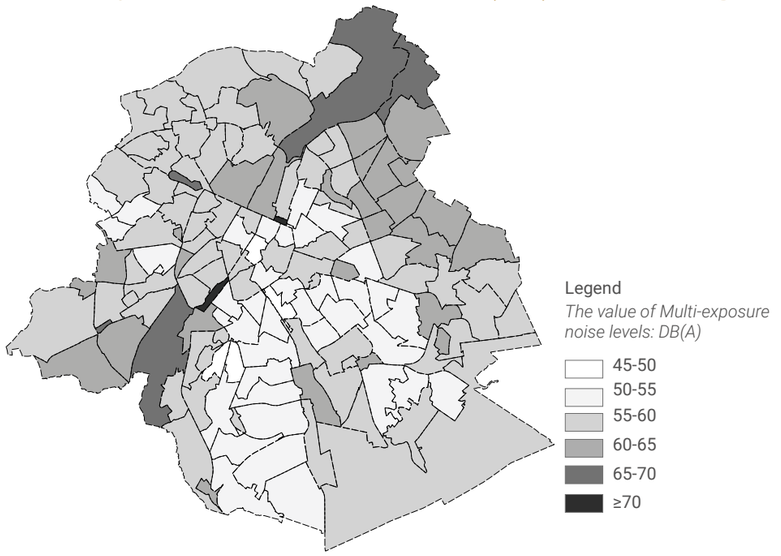
6 Reintegration supportiveness evaluation

6.1 Spatialize variables

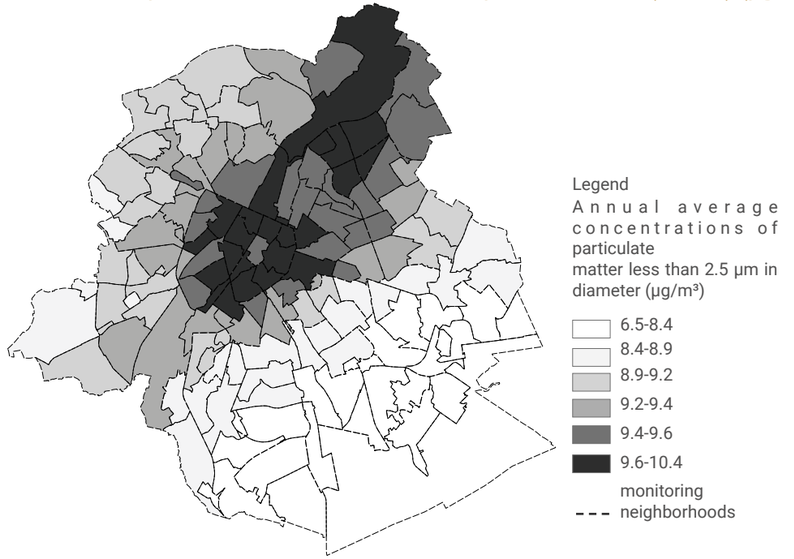
Indicator01(I_1)
The number of stores and markets by neighborhood



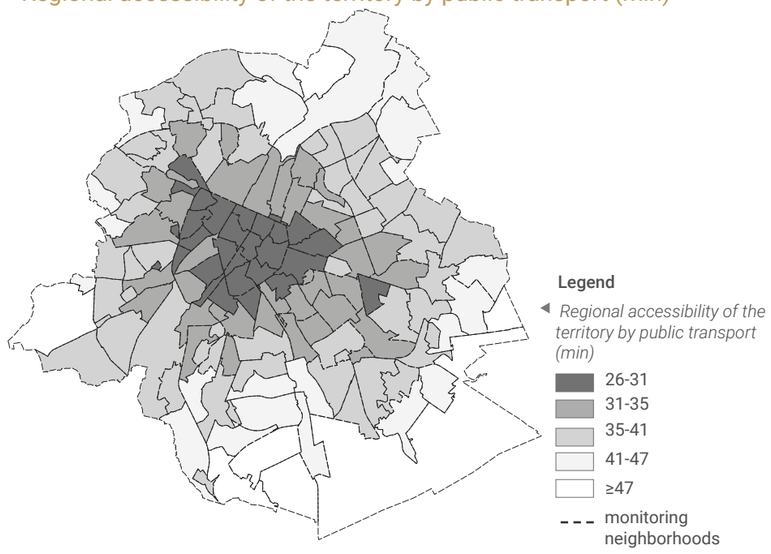
Indicator02(I_2)
Multi-exposure noise levels: Lden indicator (24 h)



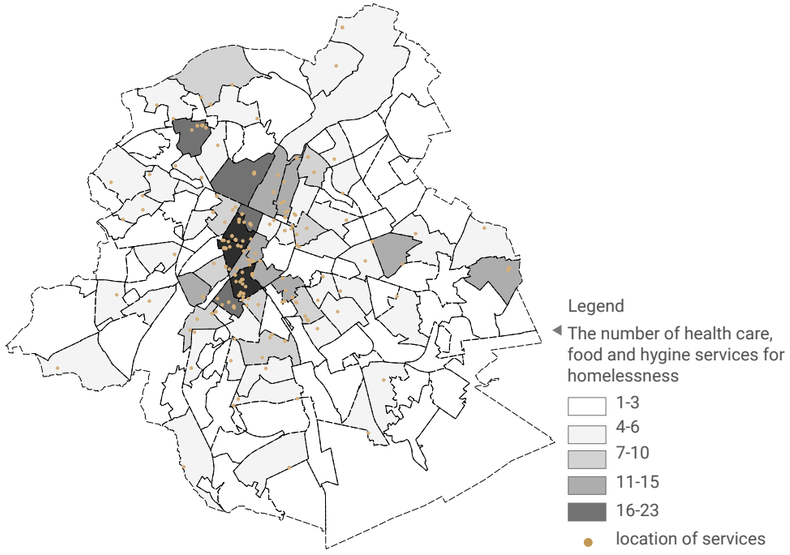
Indicator03(I_3)
Annual average concentrations of particulate matter less than 2.5 μm in diameter (PM2.5) (μg/m³)



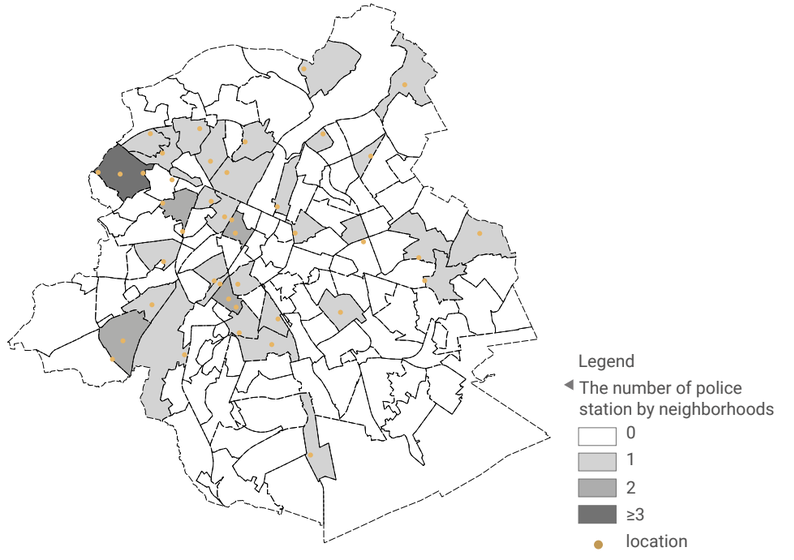
Indicator04(I_4)
Regional accessibility of the territory by public transport (min)



Indicator05(I_5)
The number of health care, food and hygine services for homelessness by neighborhood



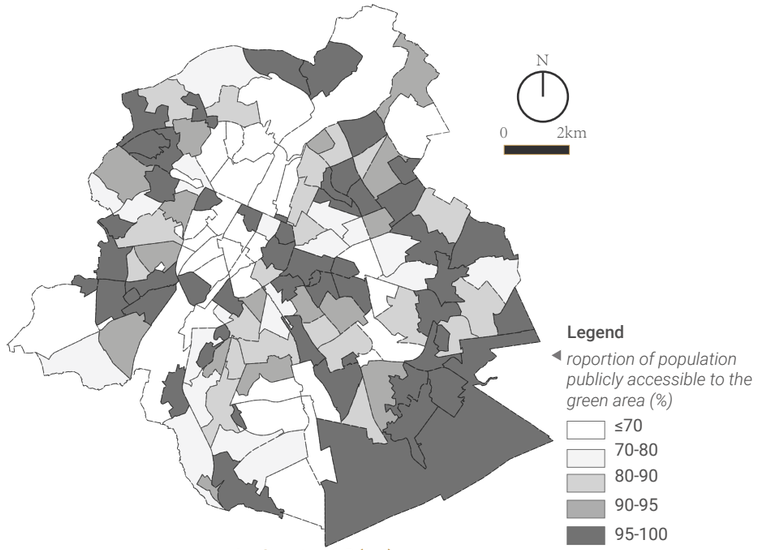
Indicator06(I_6)
The number of police station by neighborhood



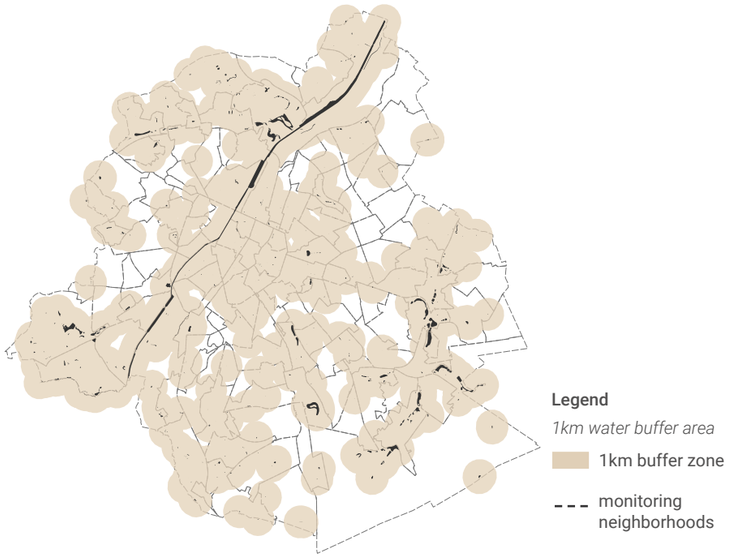
6 Reintegration supportiveness evaluation

6.1 Spatialize variables

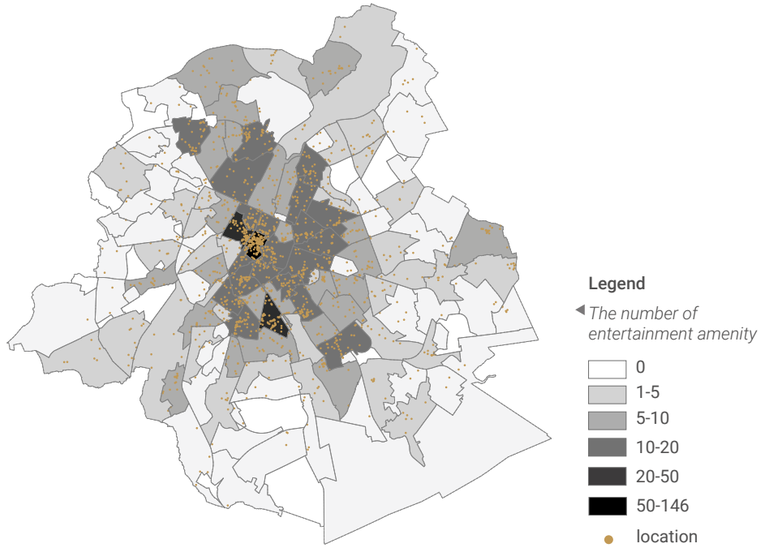
Indicator07(I_7)
Proportion of population publicly accessible to the green area (%)



Indicator08(I8)
1km water buffer area of water

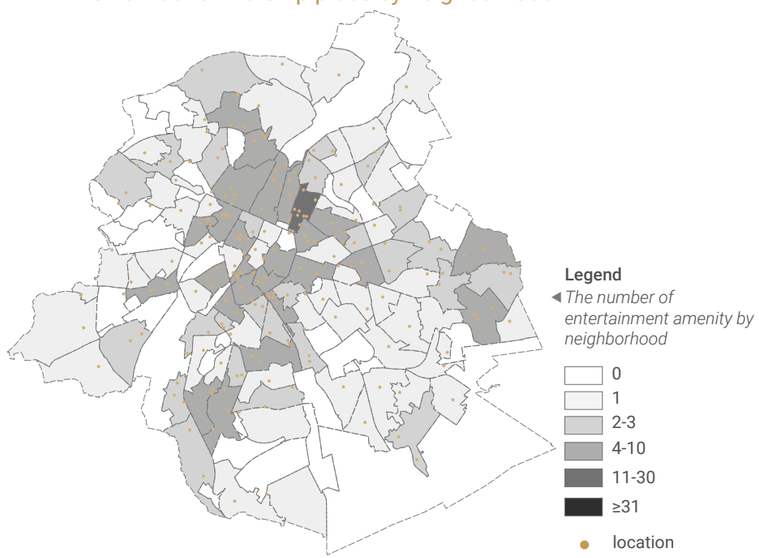


Indicator09(I_9)
The number of entertainment amenity by neighborhood

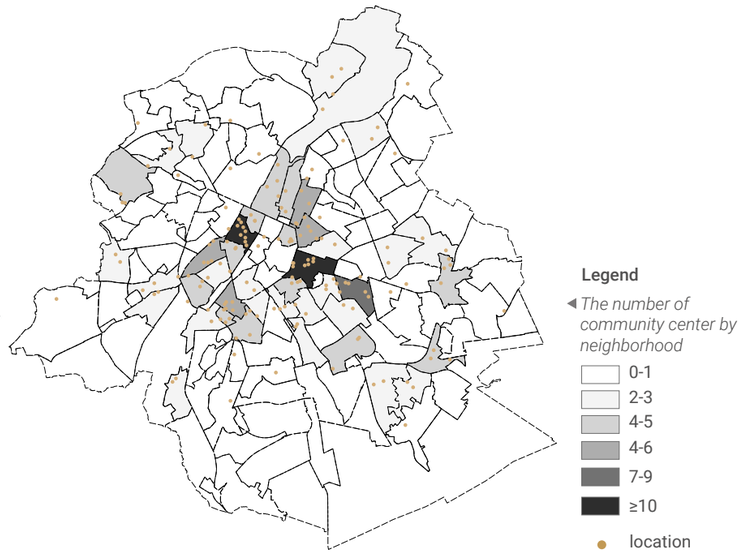


Indicator10(I_{10})
15-minutes accessibility by walking: based on road network

Indicator11(I_{11})
The number of worship place by neighborhood



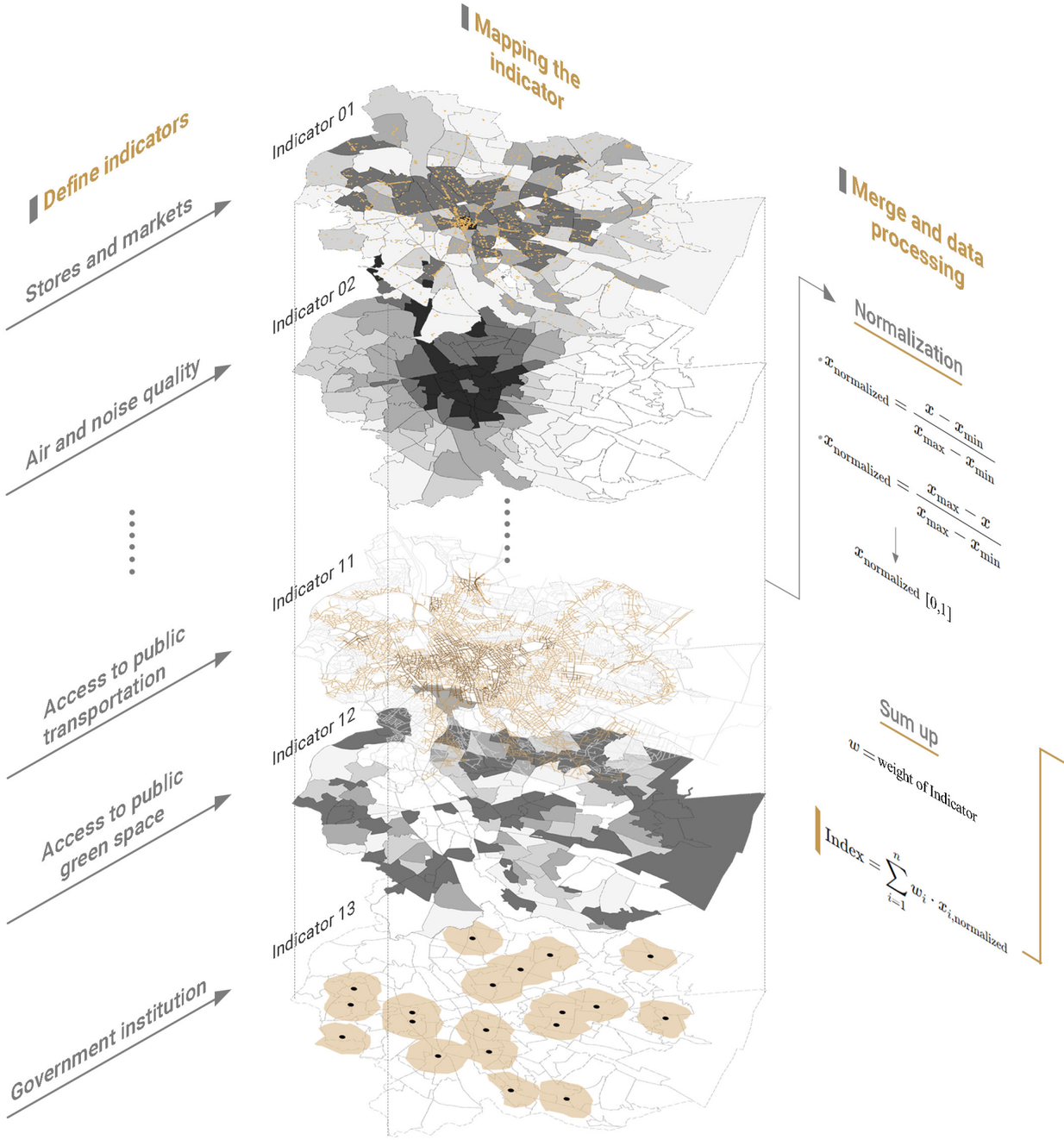
Indicator12(I_{12})
The number of community center by neighborhood



6 Reintegration supportiveness evaluation

6.1 Spatialize variables

Indicator13(I_{13})
20-minutes accessibility by walking: based on road network



6 Reintegration supportiveness evaluation

6.2 Synthetic map of Reintegration Supportiveness

重新融入支持性综合图谱

Value: 1.2701 — 6.4079 — Max 8.32

urbis_id	name_nl	Value
2	Dansaert	6.40785
48	Hallepoort	6.33517
1	Grote markt	5.90364
25	Sint-joost centrum	5.83512
8	Marollen	5.78601
72	Jette centrum	5.45423
24	Haachtse steenweg	5.23273
7	Zavel	5.22866
10	Anneessens	5.13857
35	Europawijk	5.05918
16	Historisch molenbeek	5.04027
67	Sint-agatha berchem centrum	5.03409
63	Karreveld	4.97593
12	Kuregem veeartsenij	4.95382
37	Flagey - malibran	4.91788
32	Sint-pieter	4.88608
41	Berckmans - munthof	4.86577
47	Hoog sint-gillis	4.85769
36	Matonge	4.84155
3	Begijnhof - diksmuide	4.83335
33	Jacht	4.81575
17	Koekelberg	4.76707
9	Stalingrad	4.75621
11	Kuregem bara	4.74258
6	Koningswijk	4.68678
29	Squares	4.67888
26	Dailly	4.67367
90	Roodebeek - sterrebeelden	4.66315
18	Havenwijk	4.65476
69	Ganshoren centrum	4.61251
5	Onze lieve vrouw ter sneeuw	4.56098
22	Brabantwijk	4.54422
34	Jourdan	4.52605
118	Sint-denijs - neerstalle	4.47787
83	Conscience	4.43513
27	Josaphat	4.39516
68	Villa's van ganshoren	4.39297
38	Hospitaal etterbeek - elsene	4.3895
116	Globe	4.37251
21	Noordwijk	4.35545
88	Georges henri	4.31338
50	Laag vorst	4.31169
79	Vrede	4.2979
93	Woluwelaan	4.28781
40	Louiza - langehaag	4.28573
43	Brugmann - lepoutre	4.27068
15	Weststation	4.25281
103	Bosvoorde centrum	4.25154
908	Wolvendaelpark	4.23038
917	Boudewijnpark - dielegembos	4.22469
58	Anderlecht centrum - wayez	4.20171
101	Drie linden	4.18745
107	Universiteitswijk	4.17741
4	Martelaars	4.17424
42	Kastelein	4.17285
804	Zuidstation	4.16737
39	Vijvers van elsene	4.10612
51	Van volxem - van haelen	4.10415
117	Vossegat - roosendaal	4.05676
71	Woeste	4.04579
14	Hertogin	4.02366
70	Basiliek	4.0231
98	Oudergem centrum	4.01324
66	Potaarde	3.99626
49	Bosnie	3.98156
28	Plasky	3.95061
102	Transvaal	3.90508
52	Veeweide - aurore	3.88148
13	Kuregem dauw	3.82077
84	Leopold iii laan	3.80386
45	Moliere - longchamp	3.74321
901	Josaphatpark	3.73248
20	Oud laken oost	3.73071
75	Houba	3.71762
23	Colignon	3.71512
805	Industrie birmingham	3.70355
909	Dudenpark - park van vorst	3.60738
902	Kruidtuin	3.59454
80	Helmet	3.57733
82	Terdelt	3.56918
30	Tervurense poort	3.56344
89	Gribaumont	3.54324
904	Leopoldpark	3.52569
92	Kapelleveld	3.47259
31	Sint-michiel	3.4707
46	Hoogte 100	3.46629
913	Marie-josepark	3.44873
903	Jubelpark	3.44629
905	Park van woluwe	3.44303
104	Watermaal centrum	3.43506
59	Scheut	3.43314
81	Schaarbeek station	3.41372

6 Reintegration Supportiveness evaluation

6.3 Identifying Key Intervention Area

确定关键干预区域

Protection area

Area that is not allowed to intervene

保护区域

Regulation

- NATURA 2000

limited area

Area that has very limited potential to intervene

限制区域

Regulation

- Area designed for industry

Land characteristic

- Area that has very limited potential
  - Single type of land use
  - Less frequently used by the roofless

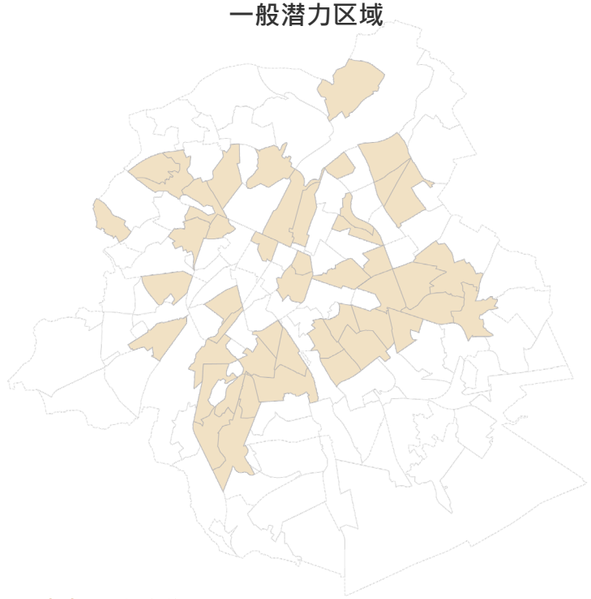
Value

- Area that has the value higher than 5.1(top 20%)

Moderate Potential area

Area that has Moderate potential to intervene

一般潜力区域



Land characteristic

- Area that has moderate potential
  - mixed types of land use
  - Frequently used by the roofless

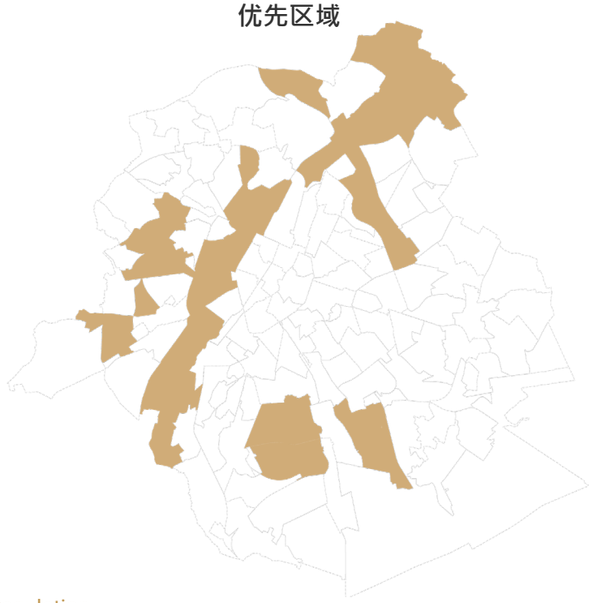
Value

- Area that has the value between 3.7 and 5.1

Priority area

Area that has high potential to intervene

优先区域



Regulation

- ZEUS Zone

Land characteristic

- Area has high potential
  - mixed types of land use
  - More frequently used by the roofless

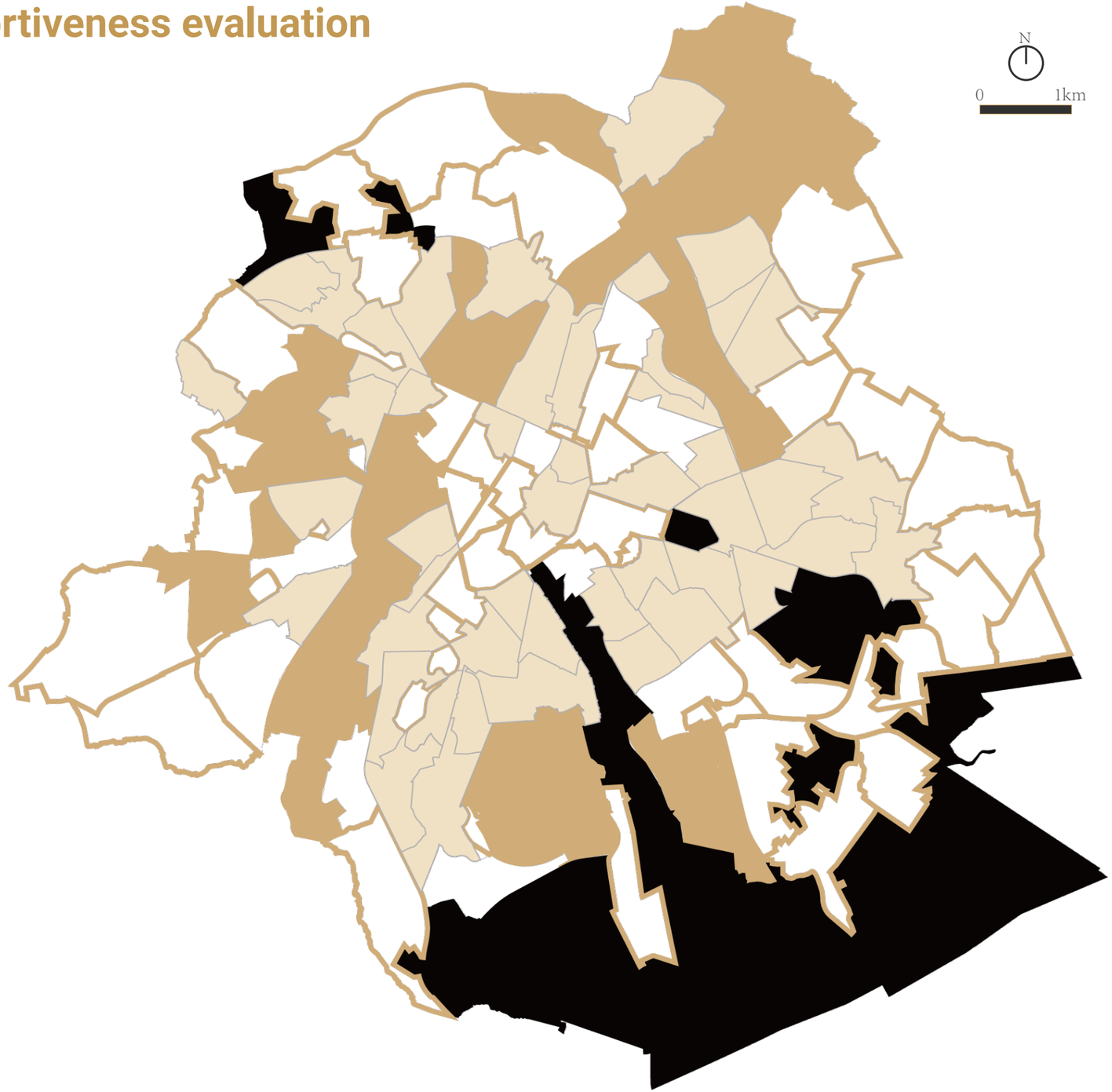
Value

- Area that has the value lower than 3.7(lower than the average value)

6 Reintegration Supportiveness evaluation

6.3 Conditional map

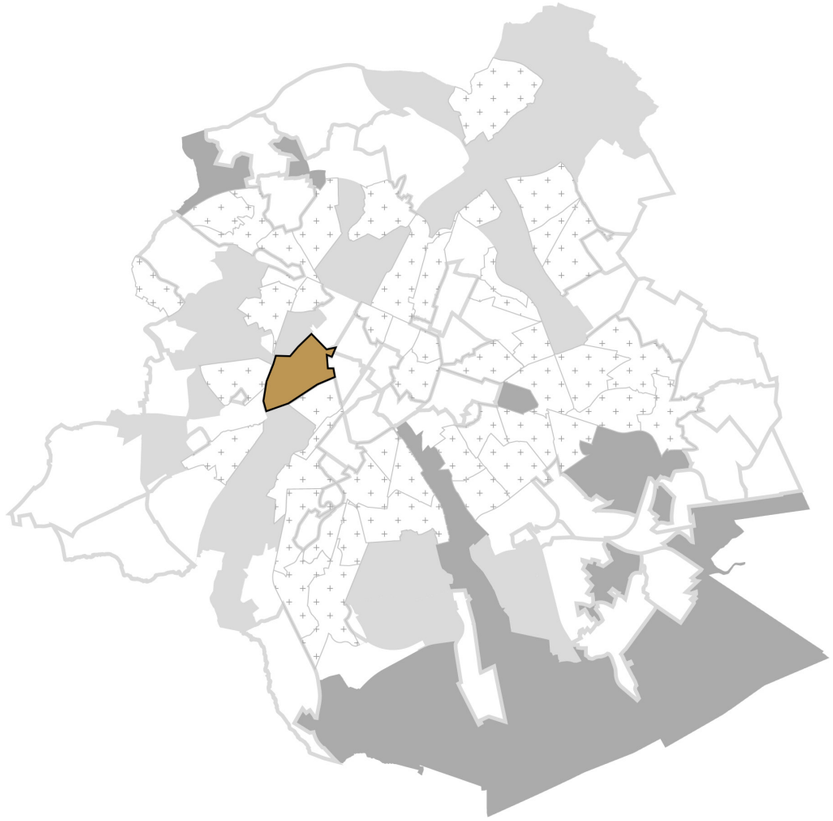
条件地图



6 Reintegration Supportiveness evaluation

6.5 Intervention area

干预区域



7 Strategy of transitional stage

7.1 Echoing The Masterplan

与计划呼应

Pillar 2-reusing vacant properties

Measure 11.8 sets a SMART goal that by 2030, **20% of vacant housing in each municipality should be brought under public housing management.** This opens up opportunities for reusing vacant properties to provide affordable housing for the homeless.

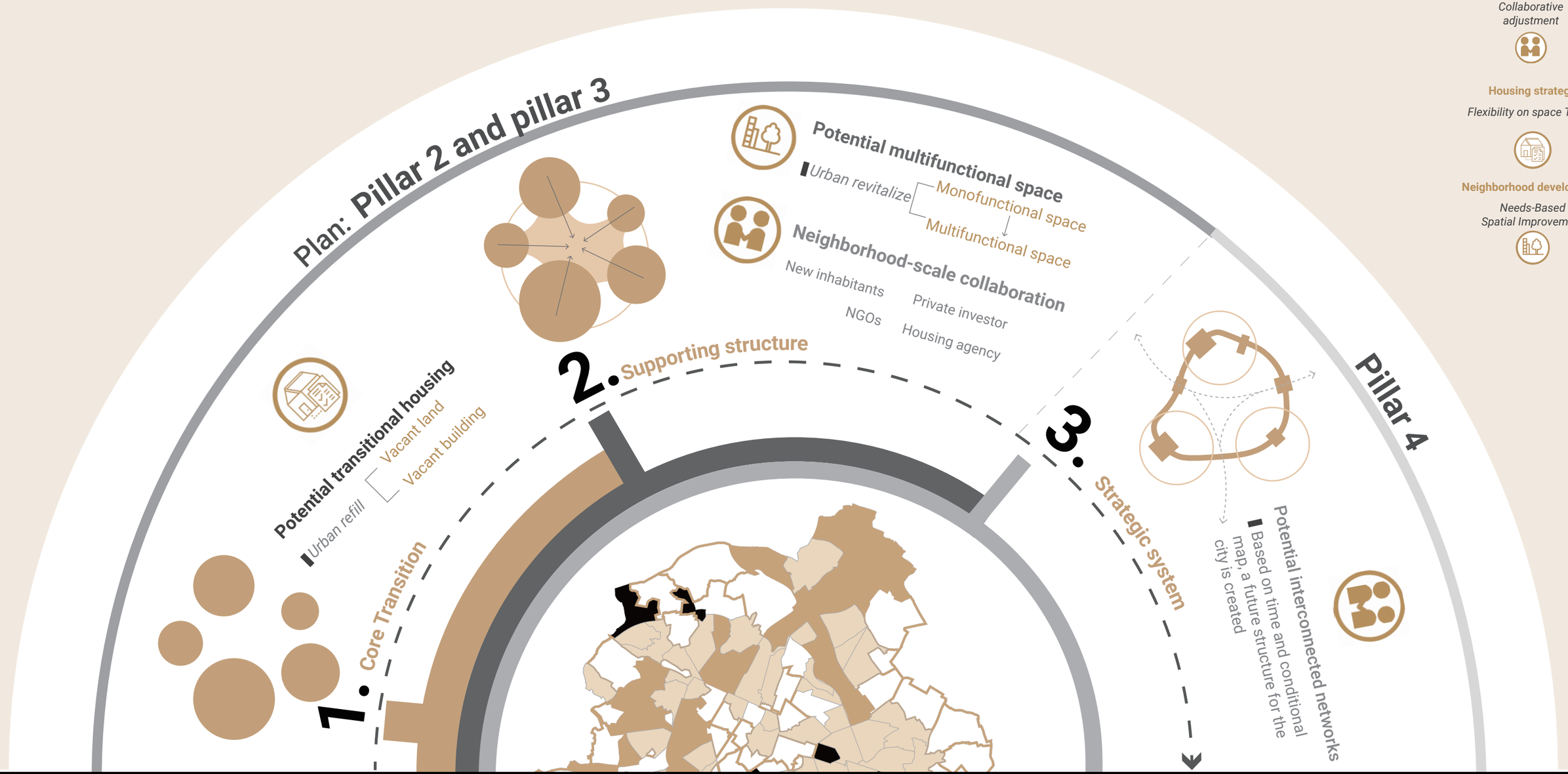
Measure 13.1 sets a target of **allocating 1,200 transitional housing units and flexible rental agreements annually**, providing immediate and adaptable housing solutions.

Pillar 3-integration of employment and housing

Measure 21 introduces a large-scale Housing First 2.0 program, with a SMART goal of **helping 300 homeless individuals per year access decent jobs and sustainable and affordable housing**. The integration of employment and housing aims to enable more personalized, point-to-point assistance.

Pillar 4-future system

Pillar 4 focuses on long-term prevention, particularly on addressing institutional violence and amplifying the voices of rights holders. It stresses **the need for a comprehensive, accountable, and sustainable system as a foundation to prevent future homelessness**.



Conceptual framework key elements

Stakeholder collaboration

Collaborative adjustment

Housing strategy

Flexibility on space Types

Neighborhood development

Needs-Based Spatial Improvement

~~The right to Property~~

The right to Housing

1.

Core Transition

Potential transitional housing

Urban refill

Vacant land

Vacant building

"The Roofless".

街头流浪汉

7 Strategy of transitional stage

7.3 Identifying vacant space

识别空置空间

Vacant building

Rue Heyvaert 15, 1080 Molenbeek-Saint-Jean, Belgium

Vacant building

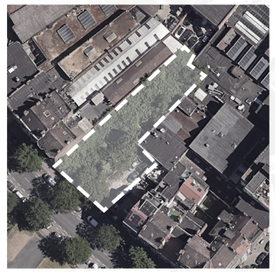
1080 Sint-Jans-Molenbeek, Belgium

Vacant land

Rue du Compas, 1070 Anderlecht, Belgium

Vacant land

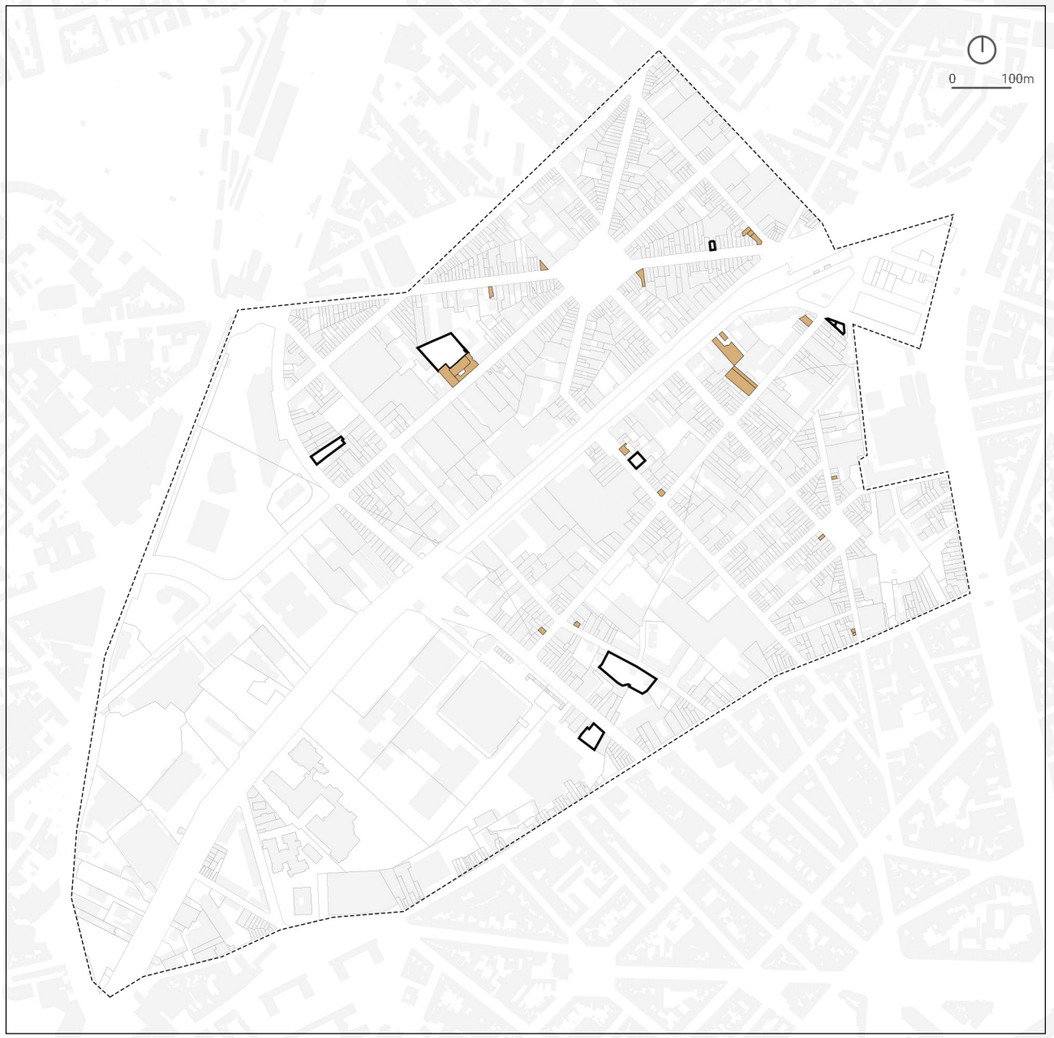
1080 Sint-Jans-Molenbeek, Belgium



7 Strategy of transitional stage

7.3 Identifying vacant space

Vacancy map
空置空间地图



Legend

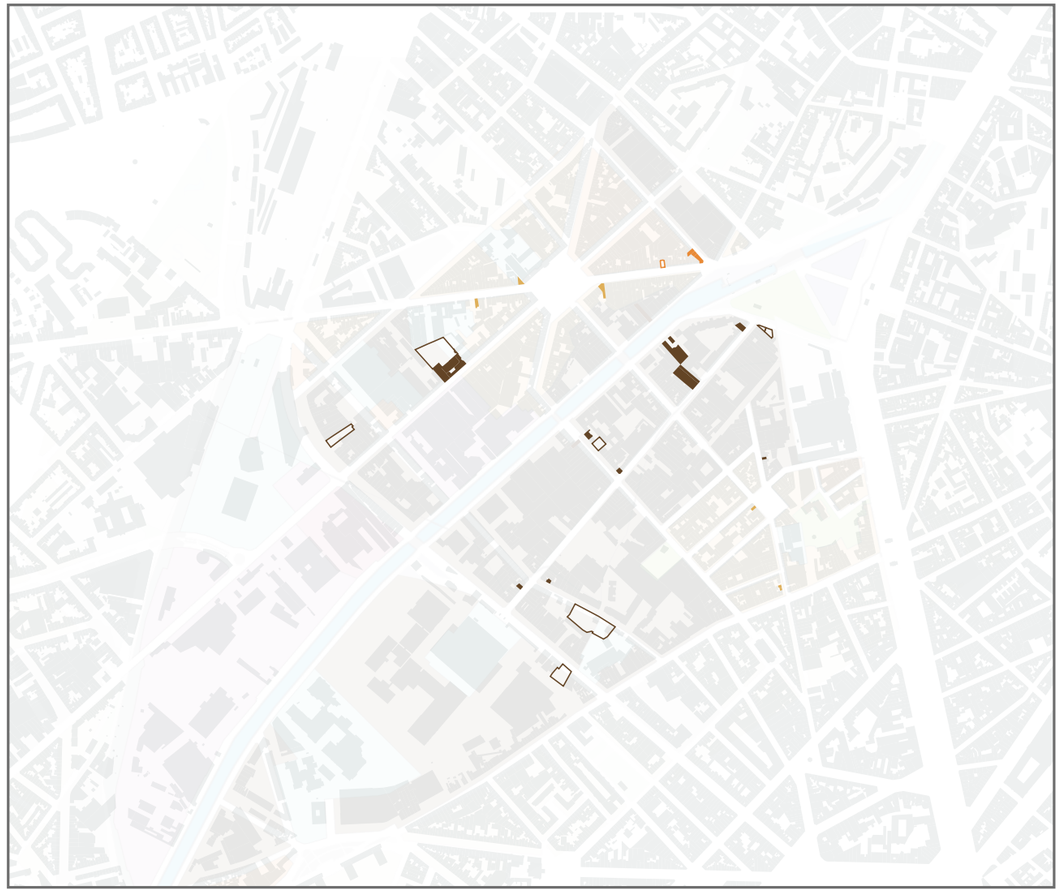
- vacant building
- vacant land
- building
- area boundary
- cadastral line

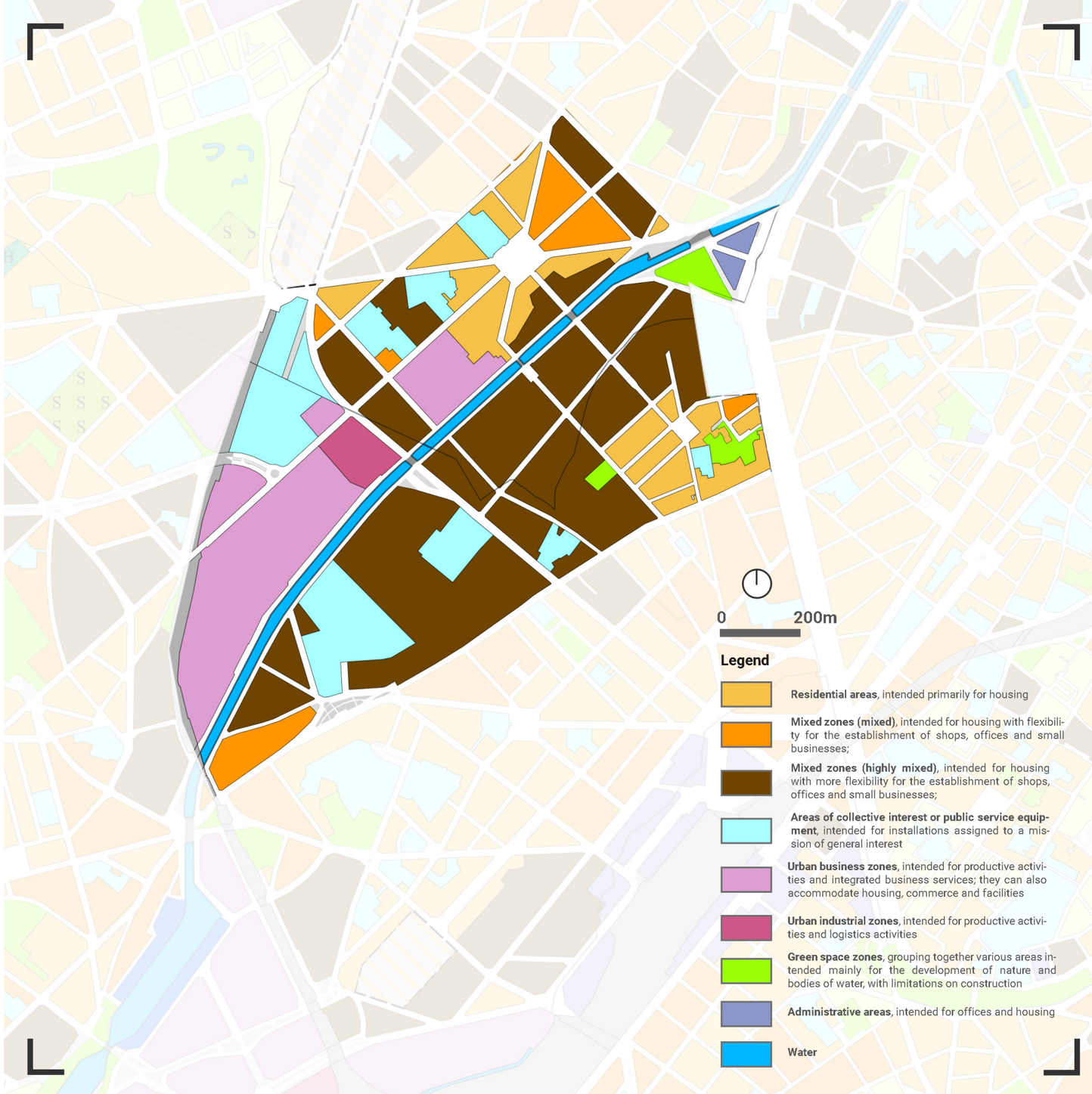
7 Strategy of transitional stage

7.4 the Regional Land Use Plan

土地利用图

Vacant Spaces by Land Use Type



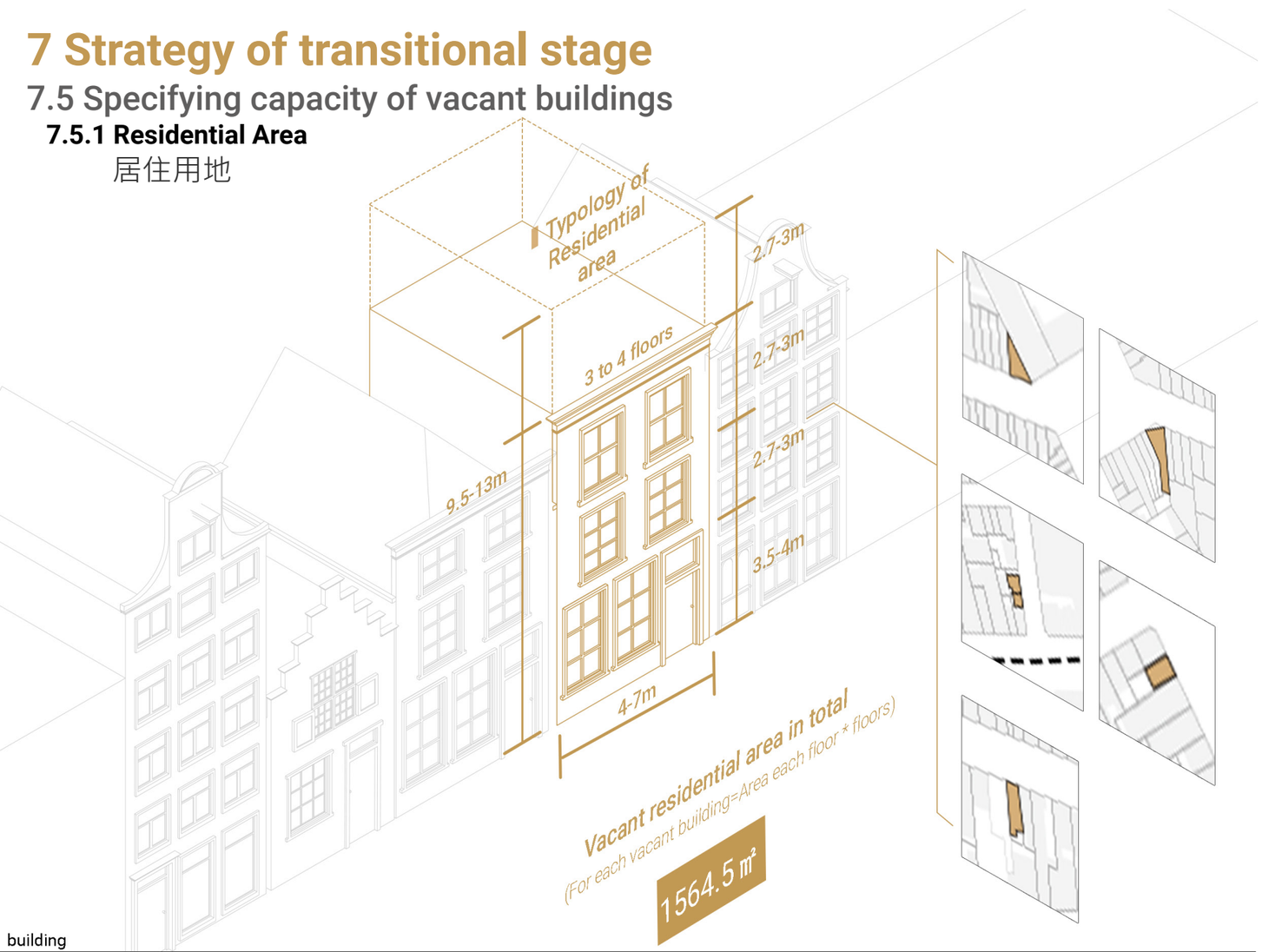


7 Strategy of transitional stage

7.5 Specifying capacity of vacant buildings

7.5.1 Residential Area

居住用地



building

Title iii: interior of buildings

Section 2: Coliving accommodations

Article 17 – Dimensions

Type	number of people	Min(㎡)	efficiency(people/ ㎡)
Studio	1	28	0.0357
two-bedroom	2	70	0.0285 MIN
three-bedroom	3	85	0.0352
four-bedroom	4	100	0.0400
five-bedroom	5	120	0.0416 MAX
six-bedroom	6	160	0.0375
seven-bedroom	7	180	0.0388

If build all five-bedroom*

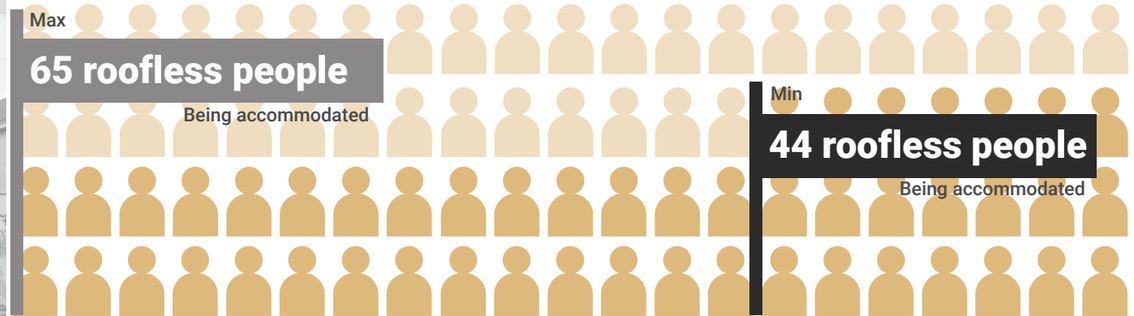
Maximum capacity = 1564.5 ÷ 120 = 13 homes

Maximum roofless people = 13 × 5 =65

If build all two-people bedroom*

Minimum capacity = 1564.5 ÷ 70 = 22 homes

Minimum roofless people = 22 × 2 = 44



7 Strategy of transitional stage

7.5 Specifying capacity of vacant buildings

7.5.2 Mixed Zones(mixed)

混合用地（混合）

If build all five-people bedroom*

Maximum capacity = 539.68 ÷ 120 = 4 homes

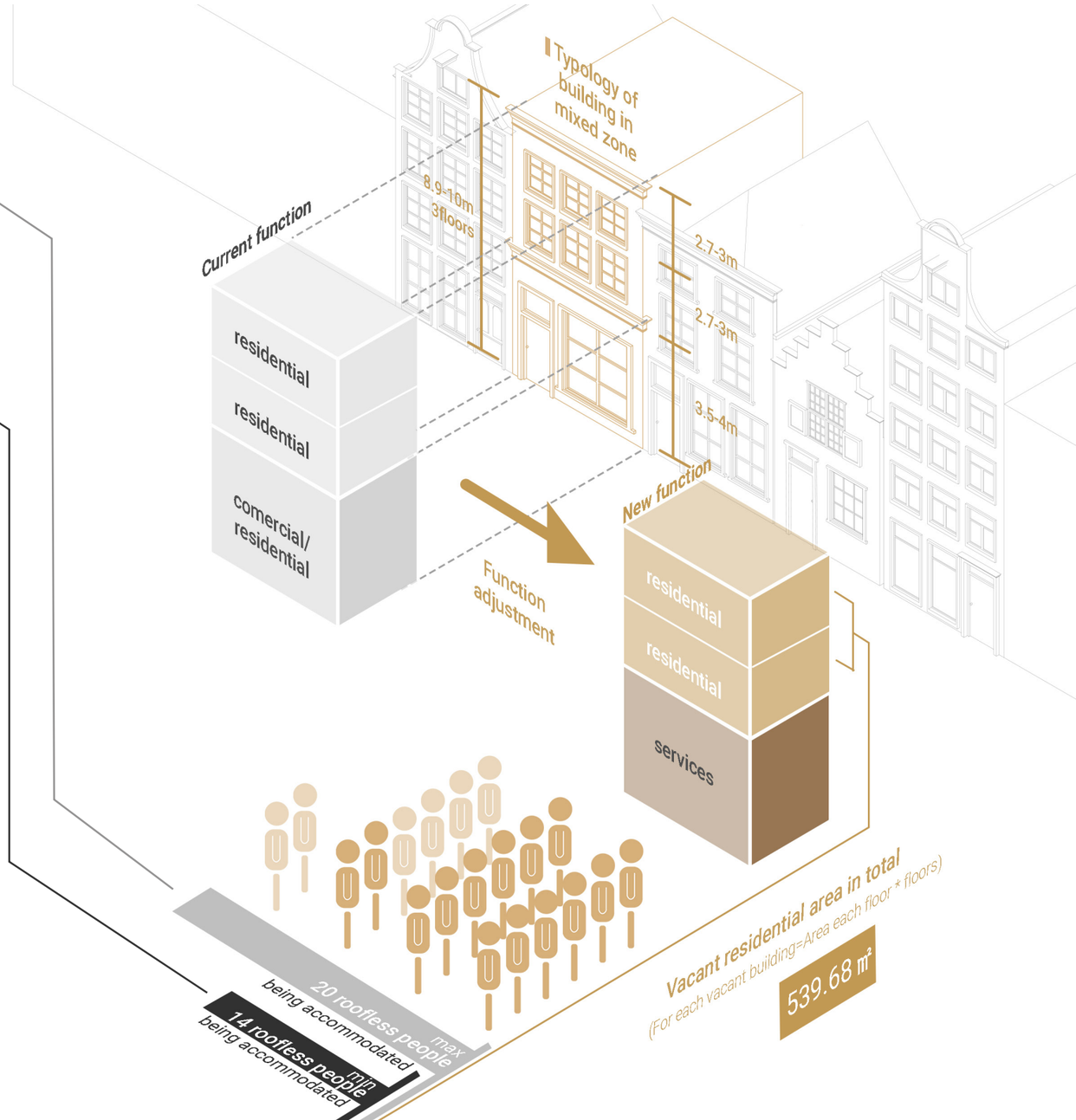
Maximum roofless people = 4 × 5 =20

If build all two-people bedroom*

Minimum capacity = 539.68 ÷ 70 = 7 homes

Minimum roofless people = 7 × 2 =14

building



7 Strategy of transitional stage

7.5 Specifying capacity of vacant buildings

7.5.3 Mixed Zones(highly mixed)

混合用地（高度混合）

If build all five-people bedroom*

Maximum capacity = 3902 ÷ 120 = 32 homes

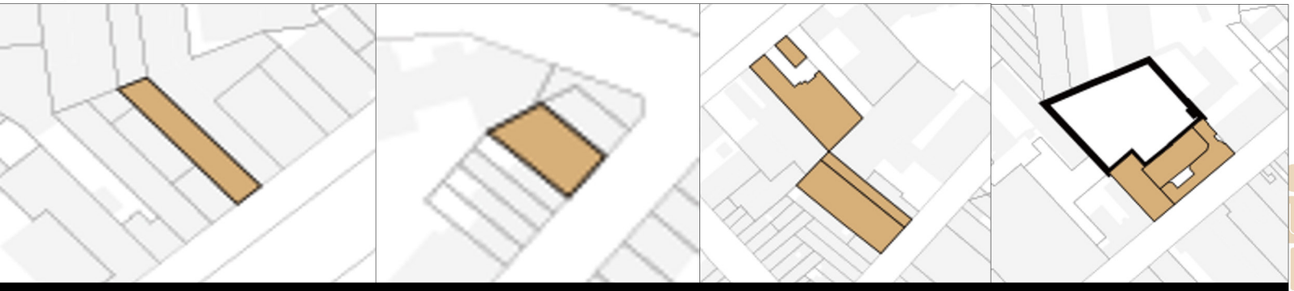
Maximum roofless people = 32 × 5 = 160

If build all two-people bedroom*

Minimum capacity = 3902 ÷ 70 = 55 homes

Minimum roofless people = 55 × 2 = 110

building



A LOUER
ENTREPÔT / COMMERCE
SURFACE +- 2.500 m²
LC
IMMOBILIÈRE
0479/18.90.09
59

7 Strategy of transitional stage

7.6 Specifying capacity of vacant land

7.6.1 Modular transitional housing as the solution

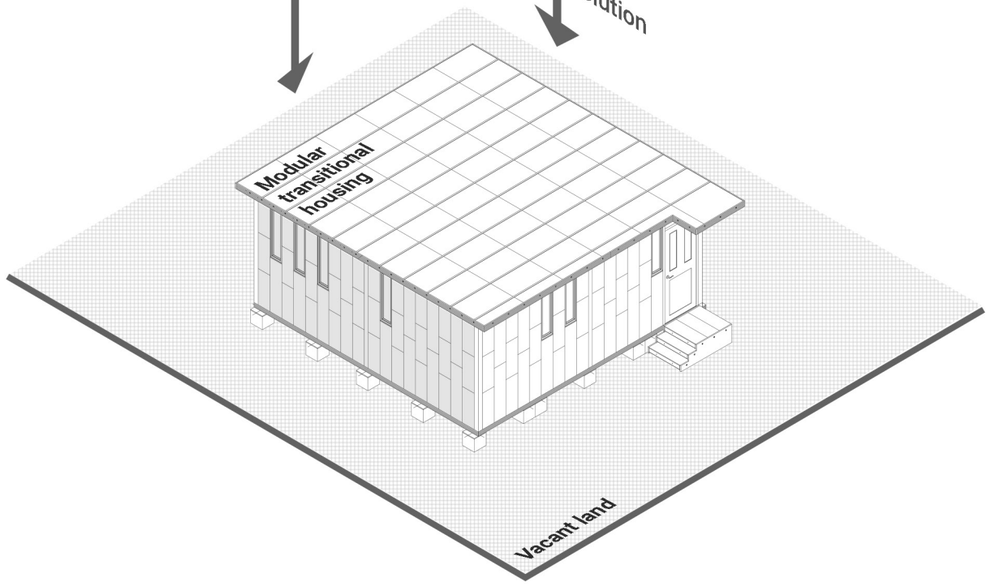
模块建筑作为解决方案

"It is way more acceptable if those modular housing for the roofless can be pluged in in a small scale, than accommodating hundreds of them at one place. Using small leftover spaces may be a nice one".

We started with finding small waiting spaces that can be used to build up modular housing for the homeless in Brussels.

solution

solution

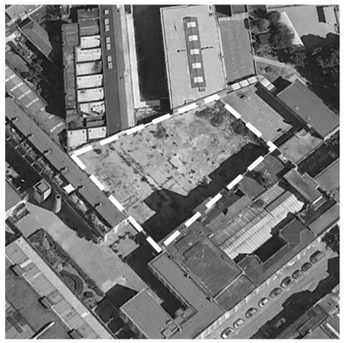


Area: 3060 ㎡

Area: 99 ㎡

Area: 223 ㎡

Area: 825 ㎡



Area: 2227 ㎡

Area: 400 ㎡

Area: 1218 ㎡

7 Strategy of transitional stage

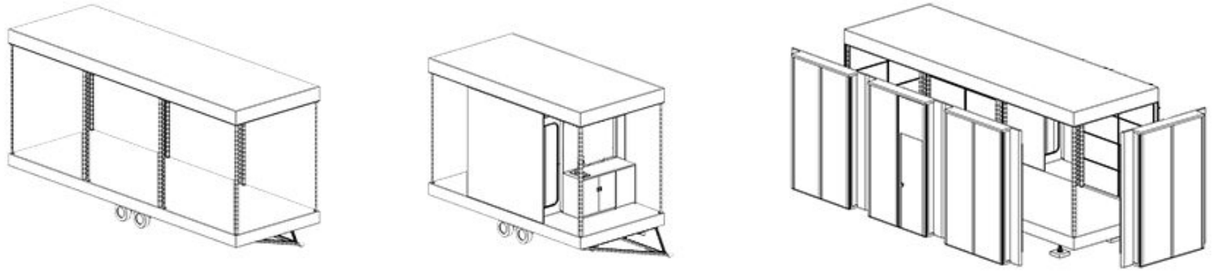
7.6 Specifying capacity of vacant land

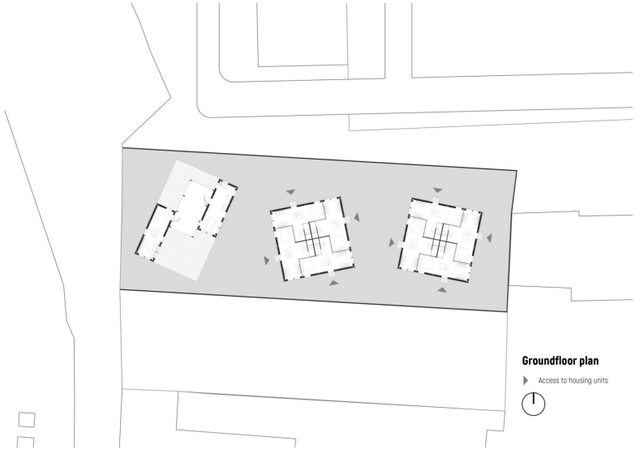
7.6.2 Case study

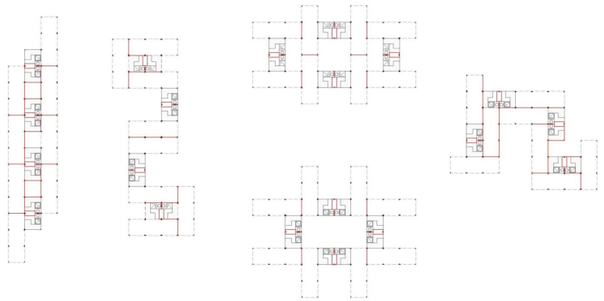
案例研究

Case 1: 400 Daken(400 roofs)

Case 2: SMH Pilot Project







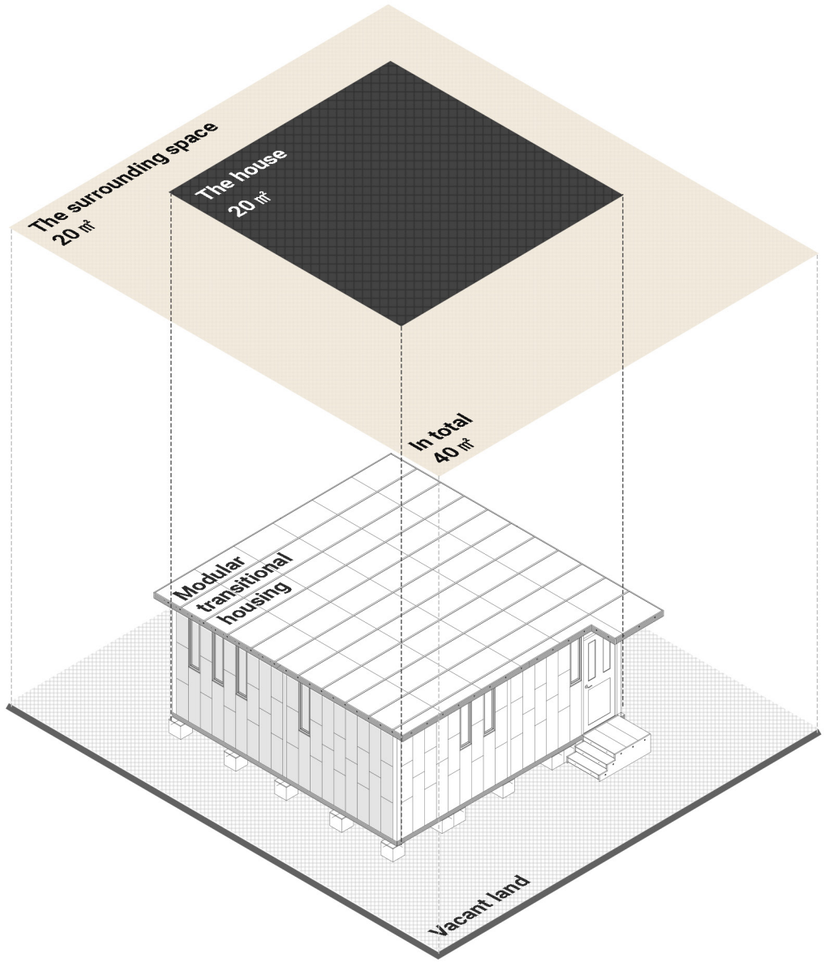
7 Strategy of transitional stage

7.6 Specifying capacity of vacant land

7.6.3 Approximate capacity of people living in modular transitional housing

模块化过渡性住房中居住的人口数量估算

Assuming that **each modular housing unit has an area of 20 m² and requires a total of 40 m² including surrounding space**, we can estimate how many roofless individuals could be accommodated if all of the following seven vacant land were used to construct temporary transitional housing.

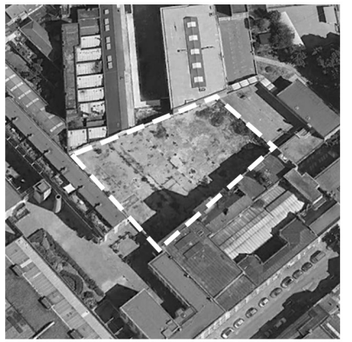


Area: 3060㎡
modular house(max): 76

Area: 99㎡
modular house(max): 2

Area: 223㎡
modular house(max): 5

Area: 825㎡
modular house(max): 20



Area: 2227㎡
modular house(max): 55

Area: 400㎡
modular house(max): 10

Area: 1218㎡
modular house(max): 30

198

roofless people are accommodated

Maximum

如果这个区域所有空置空间能被合理用作过渡住房

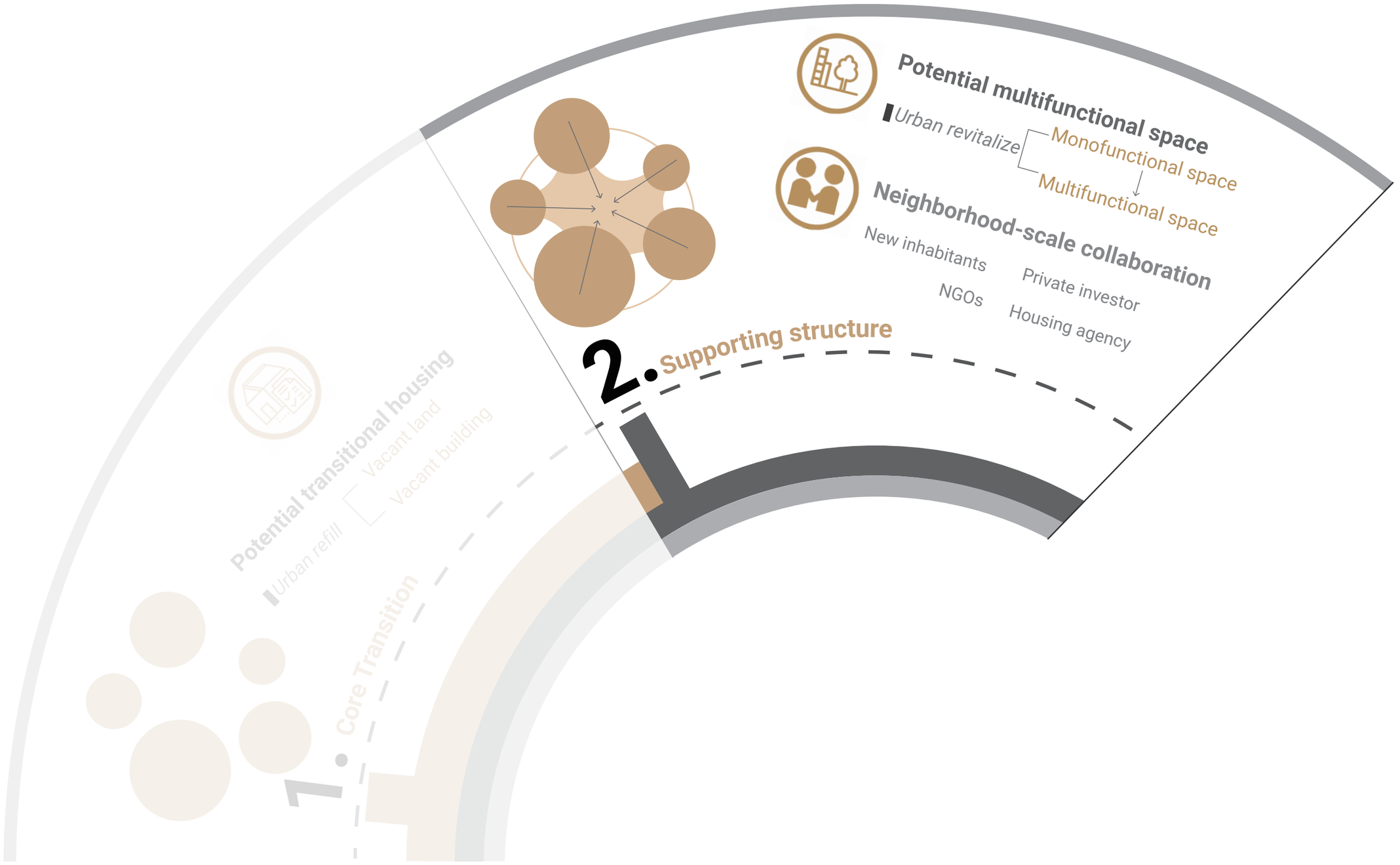
If all vacant space can be used properly as transitional hosuing in this neighborhood

最多 443 个

at most 443

无家可归的人可以摆脱流浪的恶性循环

Roofless people can get out of the Homeless Vicious Cycle


Potential multifunctional space
Urban revitalize
Monofunctional space
Multifunctional space
Neighborhood-scale collaboration
New inhabitants
Private investor
NGOs
Housing agency
2. Supporting structure
Potential transitional housing
Urban refill
Vacant land
Vacant building
1. Core Transition

"New Inhabitant"

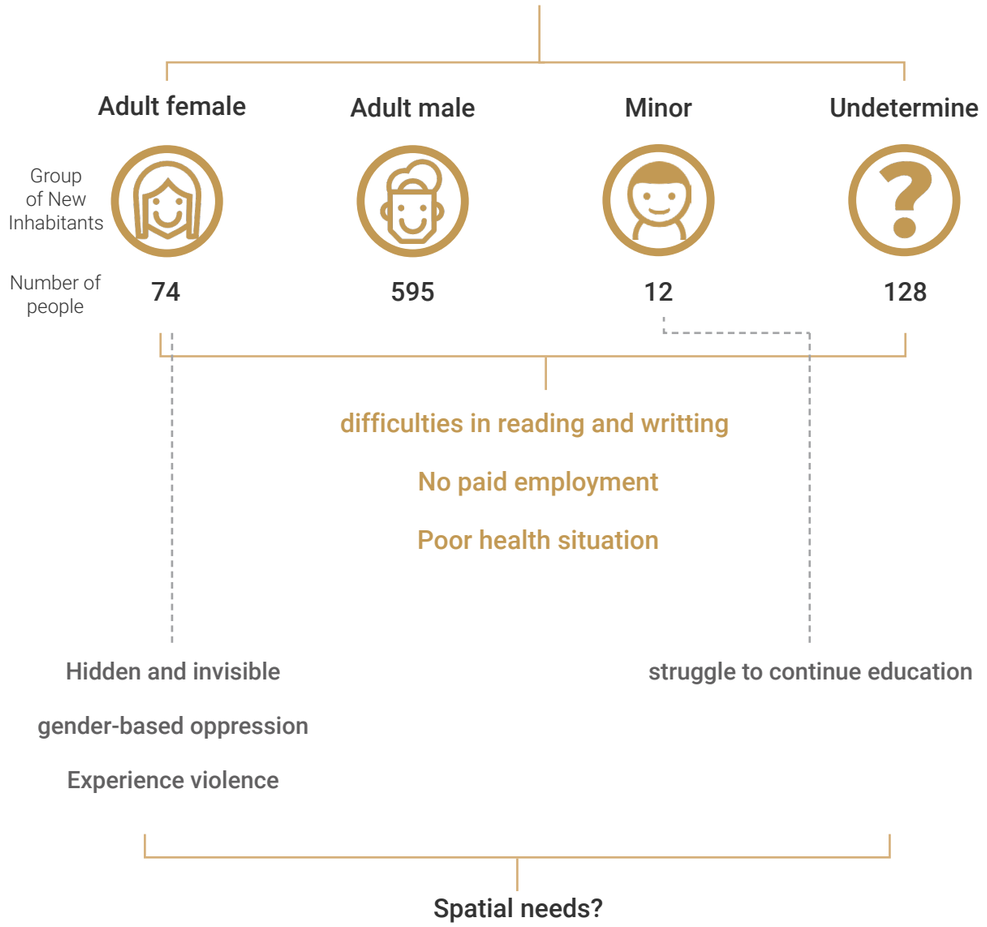
新居民

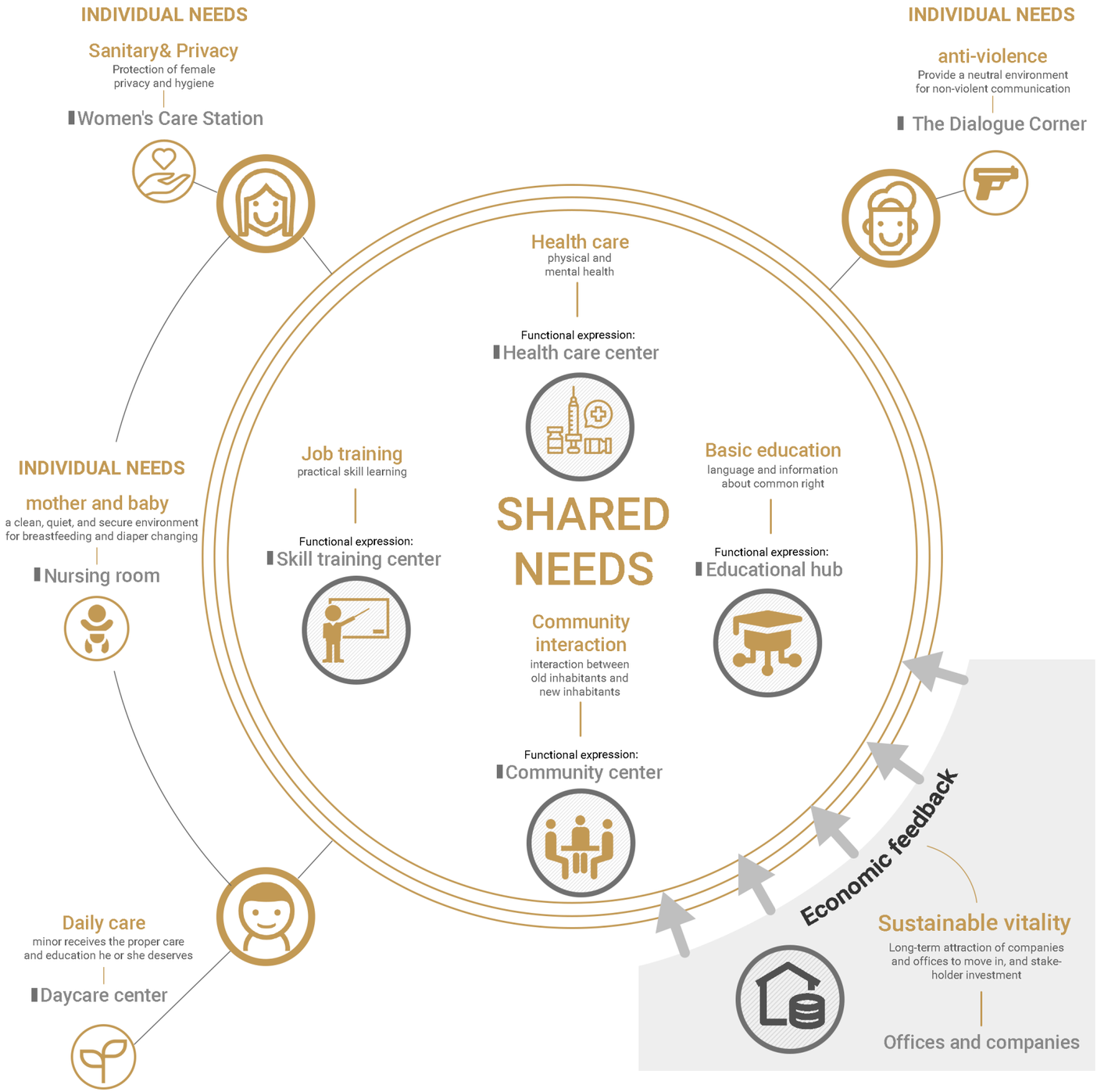
7 Strategy of transitional stage

7.7 Revitalizing Building Functions

7.7.1 Shared and individual needs

共同和个人的需求





7 Strategy of transitional stage

7.7 Revitalizing Building Functions

7.7.2 function implementation kit

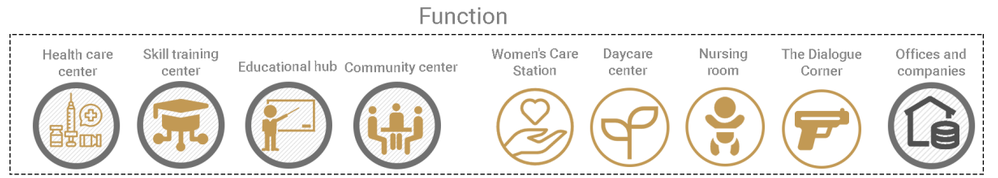
功能植入工具包

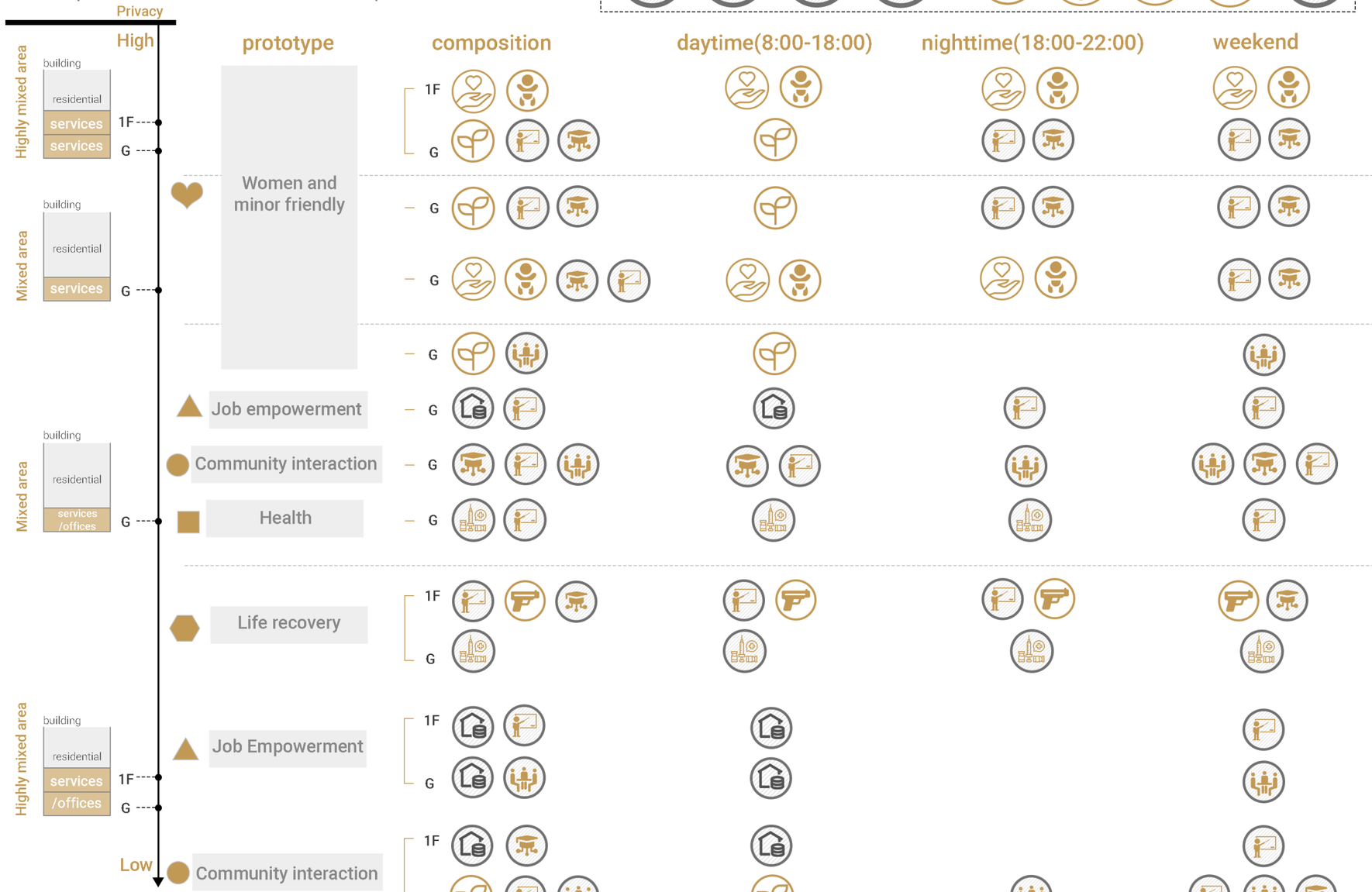
By building
Building based

By floor
Floor specified

By time
Time phased

By building
By floor
By time



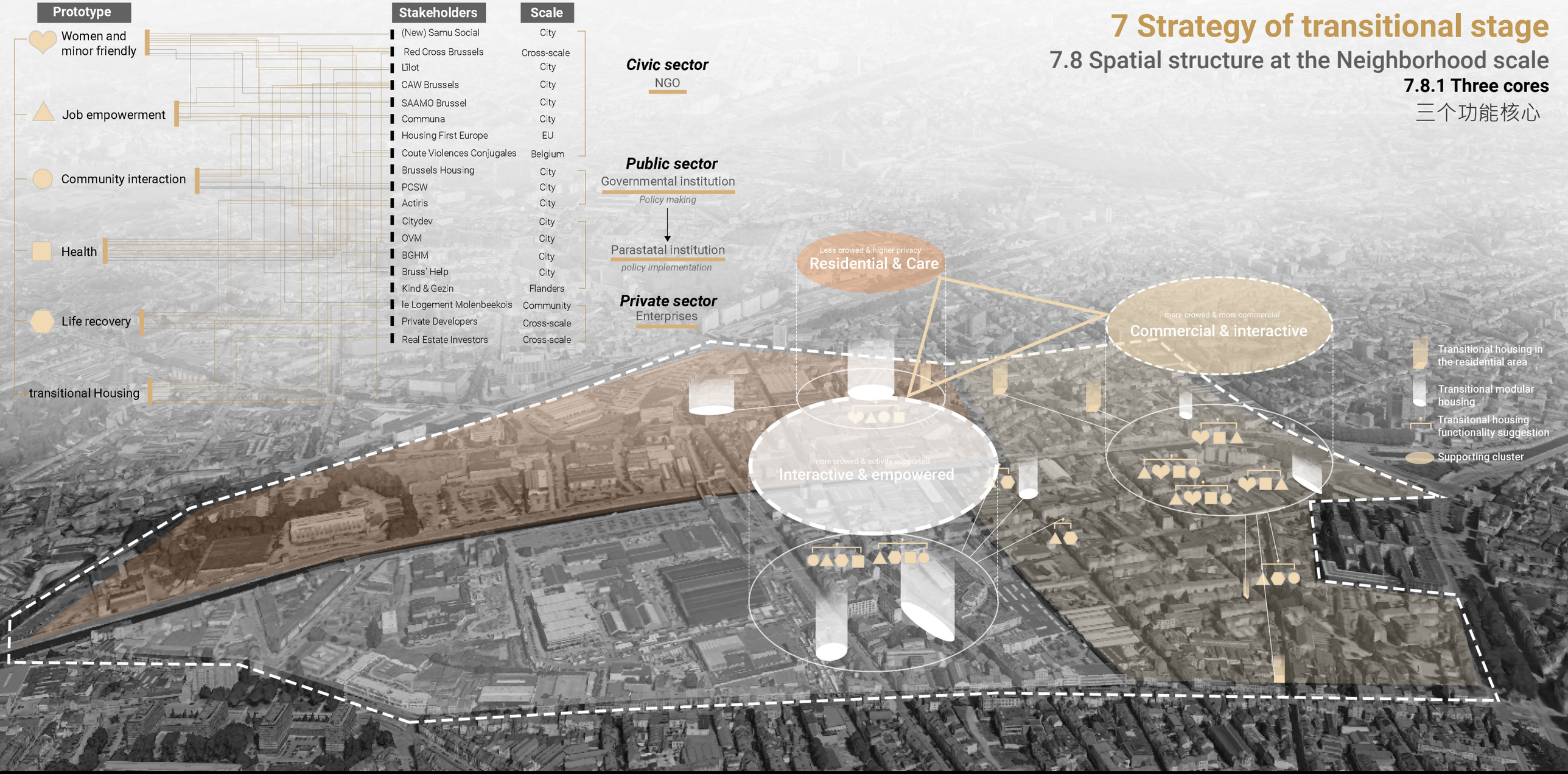


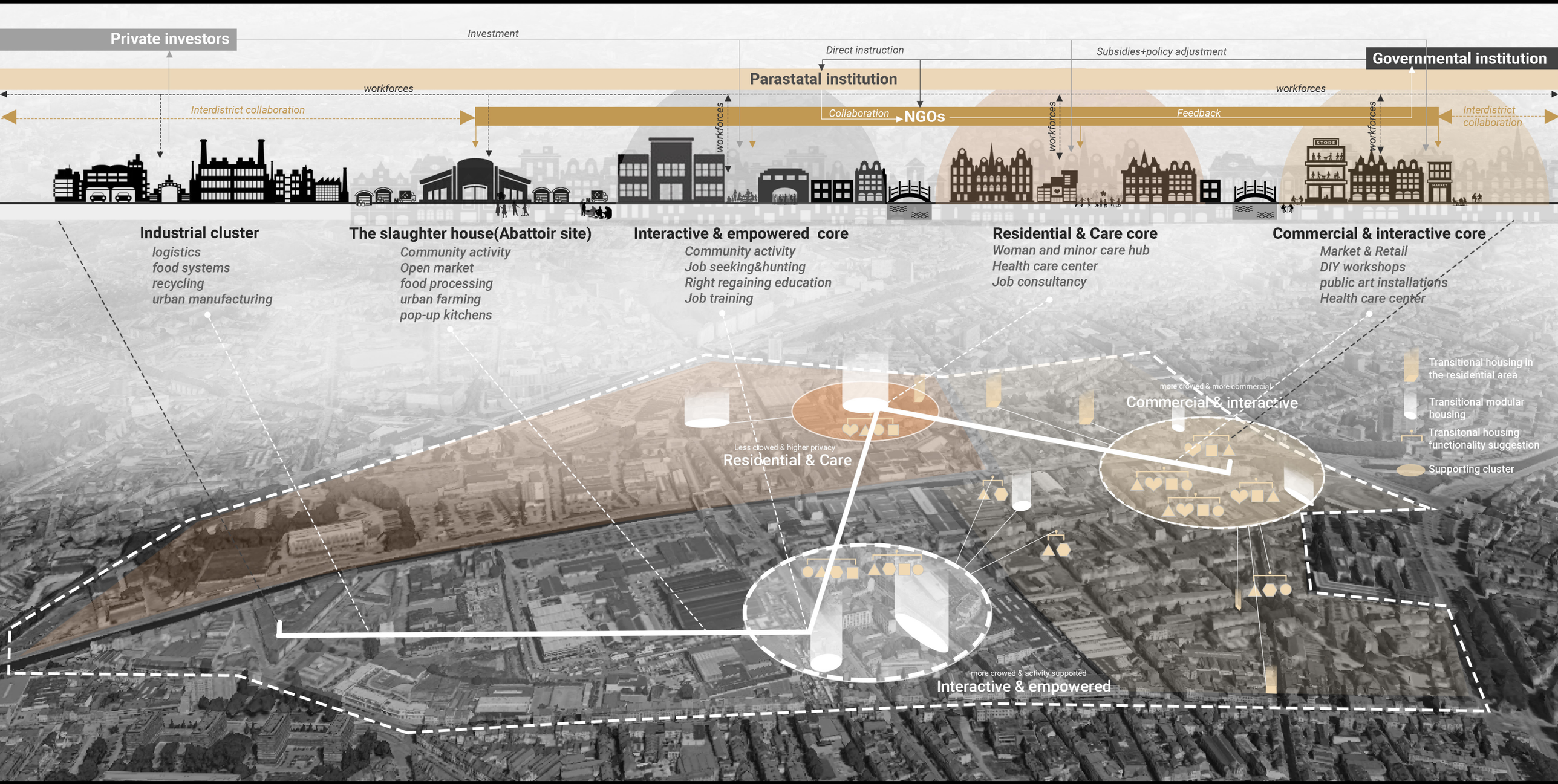
7 Strategy of transitional stage

7.8 Spatial structure at the Neighborhood scale

7.8.1 Three cores

三个功能核心



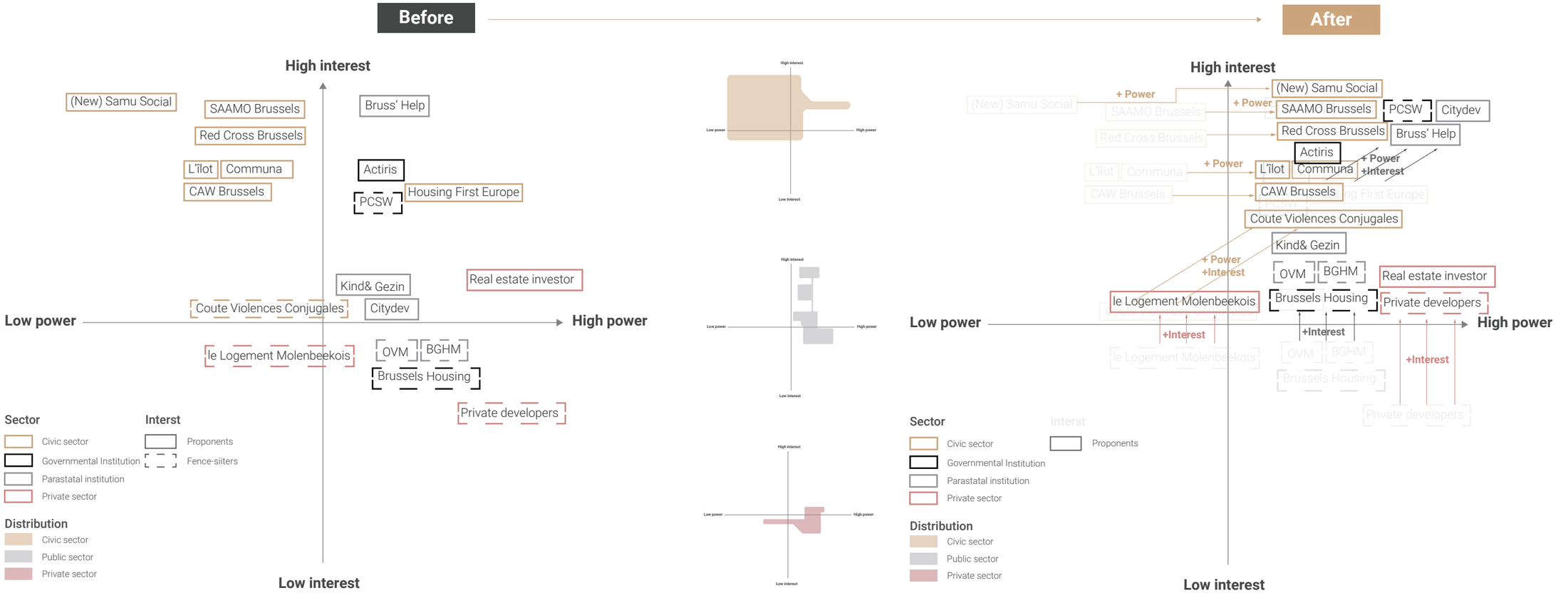

Private investors
Investment
Direct instruction
Subsidies+policy adjustment
Governmental institution
Parastatal institution
workforces
workforces
Interdistrict collaboration
workforces
Collaboration
NGOs
Feedback
workforces
workforces
Interdistrict collaboration
Industrial cluster
logistics
food systems
recycling
urban manufacturing
The slaughter house(Abattoir site)
Community activity
Open market
food processing
urban farming
pop-up kitchens
Interactive & empowered core
Community activity
Job seeking&hunting
Right regaining education
Job training
Residential & Care core
Woman and minor care hub
Health care center
Job consultancy
Commercial & interactive core
Market & Retail
DIY workshops
public art installations
Health care center
Less crowed & higher privacy
Residential & Care
more crowed & more commercial
Commercial & interactive
more crowed & activity supported
Interactive & empowered
Transitional housing in the residential area
Transitional modular housing
Transitonal housing functionality suggestion
Supporting cluster

7 Strategy of transitional stage

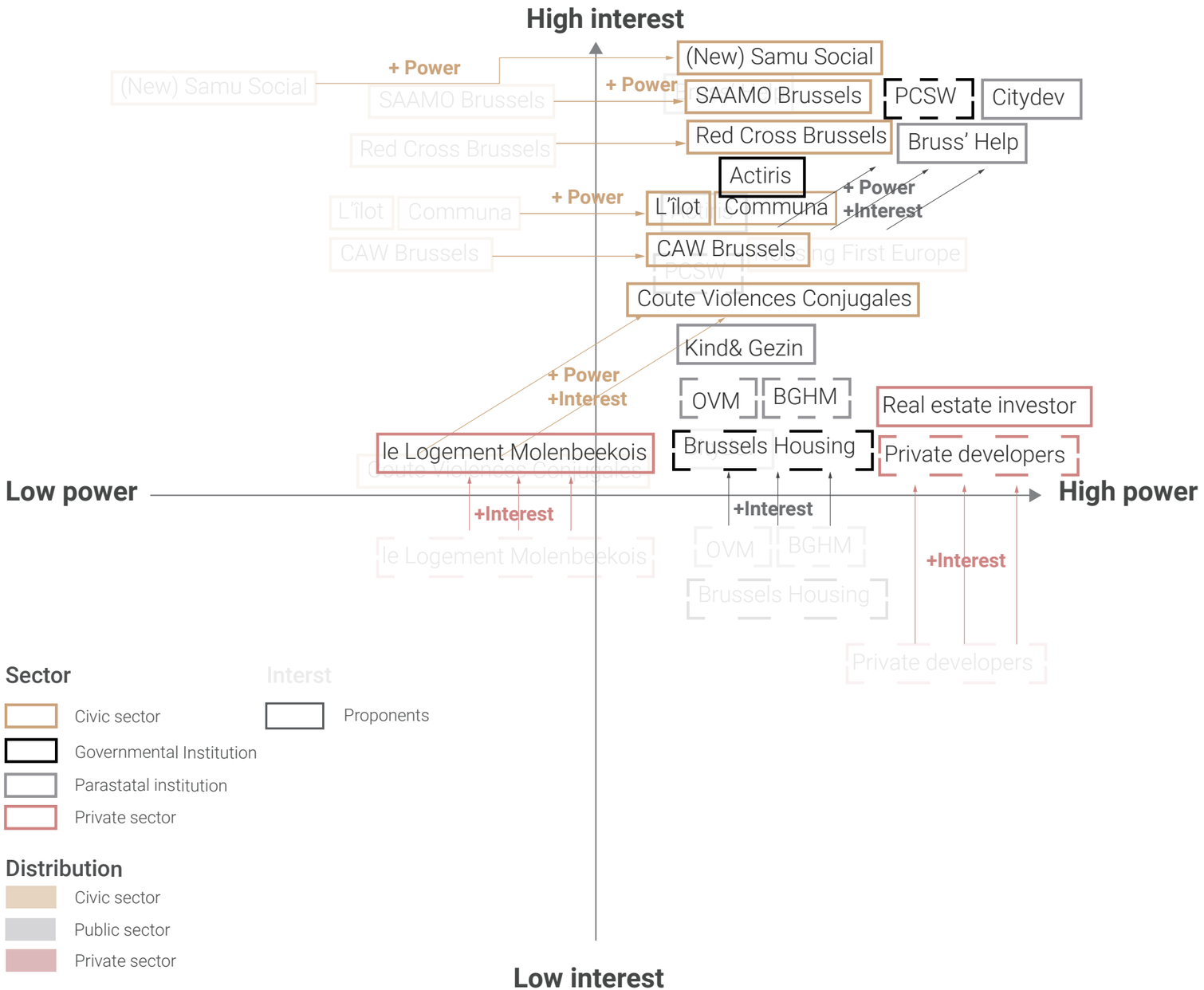
7.8 Spatial structure at the Neighborhood scale

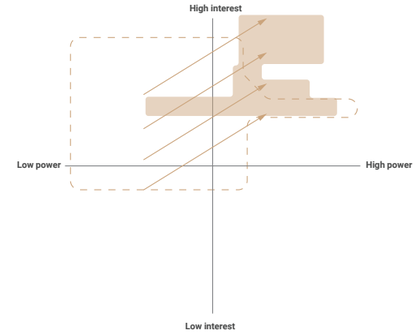
7.8.2 Overarching institutional collaboration

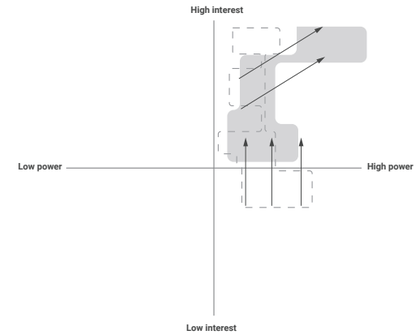
整体性机构合作

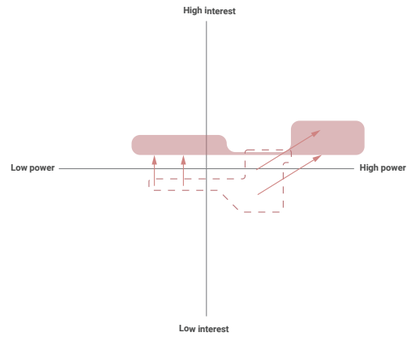


After









Sector

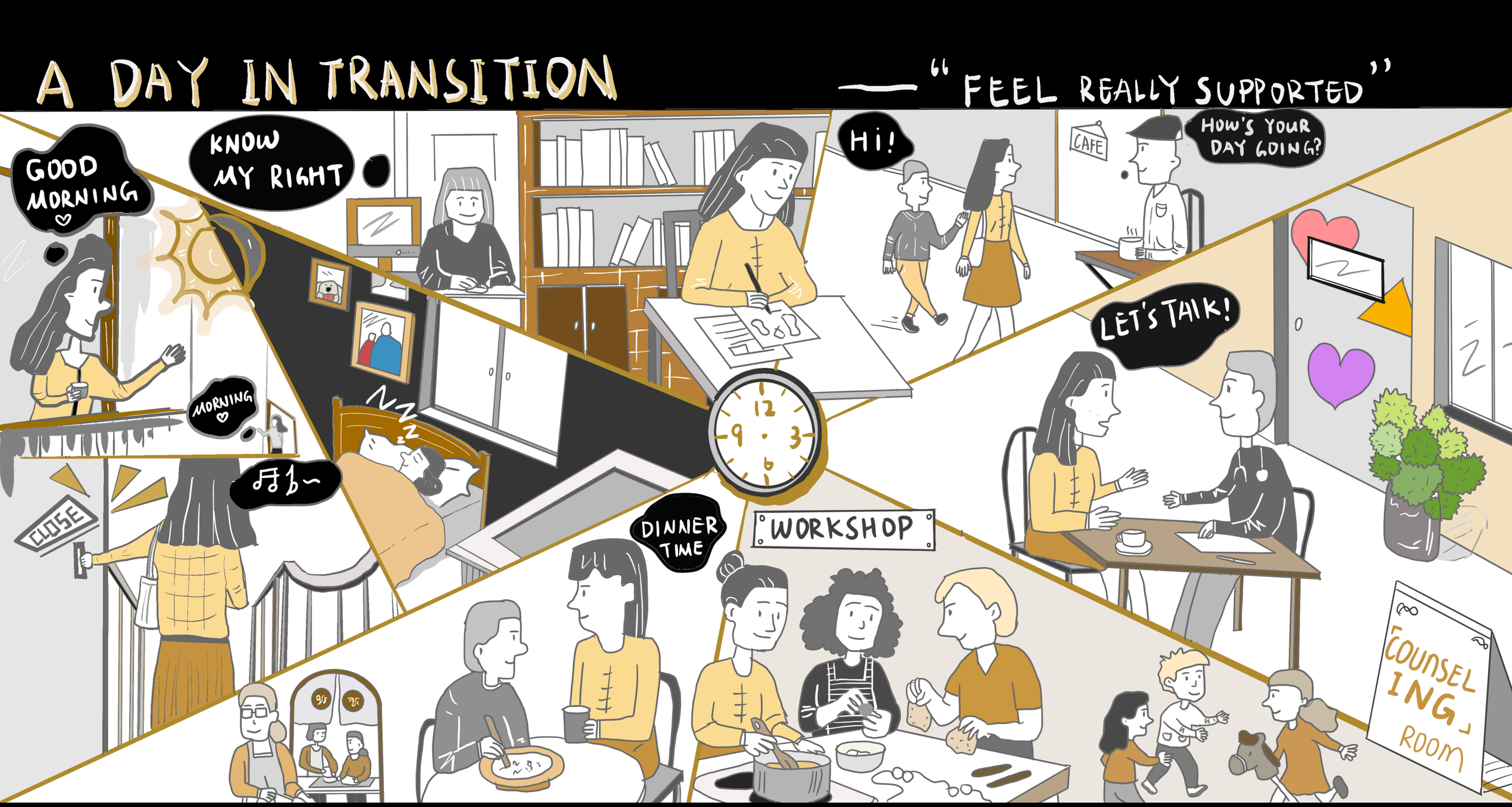
- Civic sector
- Governmental Institution
- Parastatal institution
- Private sector

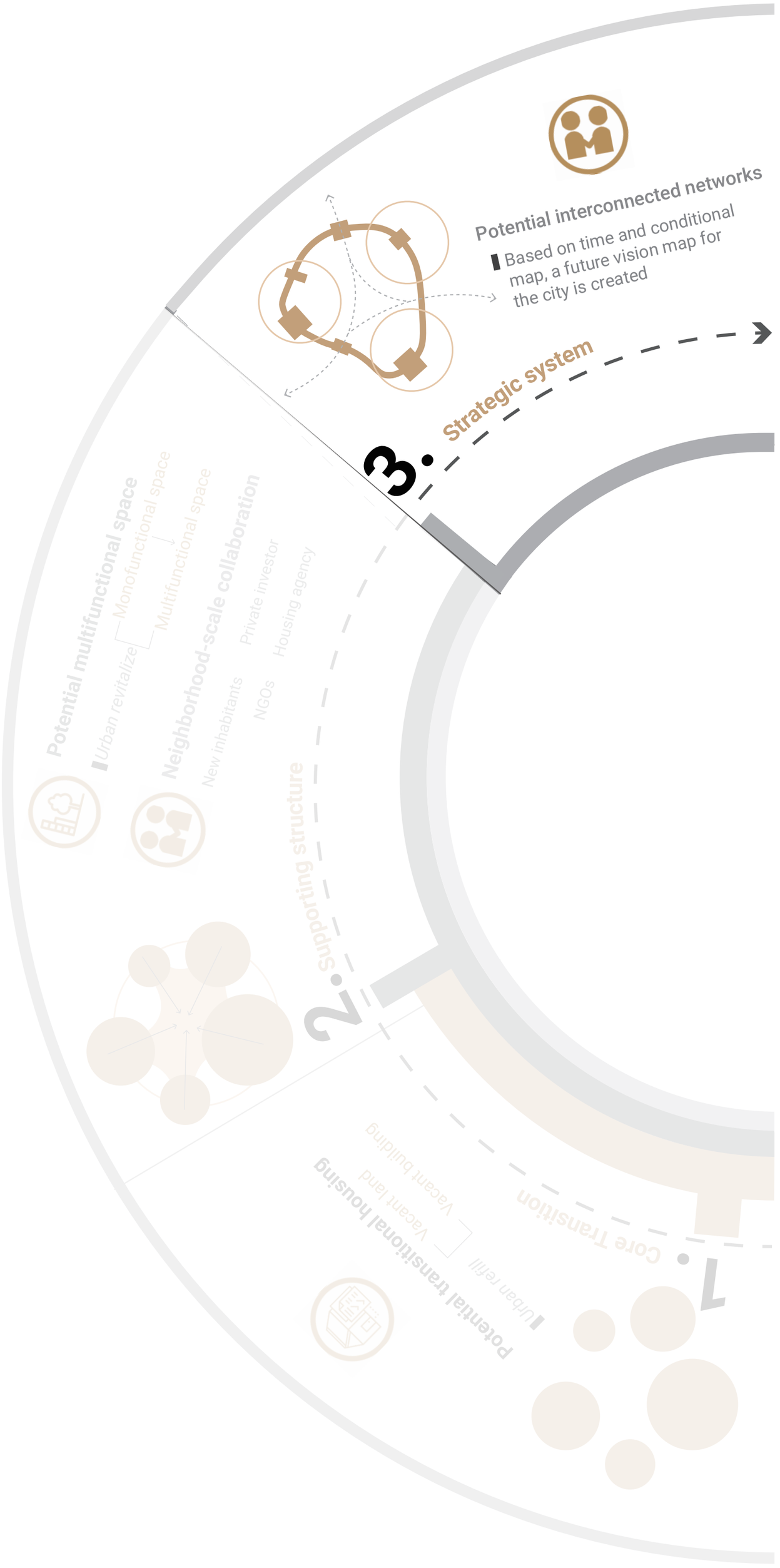
Interst

- Proponents

Distribution

- Civic sector
- Public sector
- Private sector


A DAY IN TRANSITION
—— "FEEL REALLY SUPPORTED"
GOOD MORNING
KNOW MY RIGHT
MORNING
CLOSE
Hi!
CAFE
HOW'S YOUR DAY GOING?
LET'S TAIK!
DINNER TIME
WORKSHOP
COUNSELING ROOM

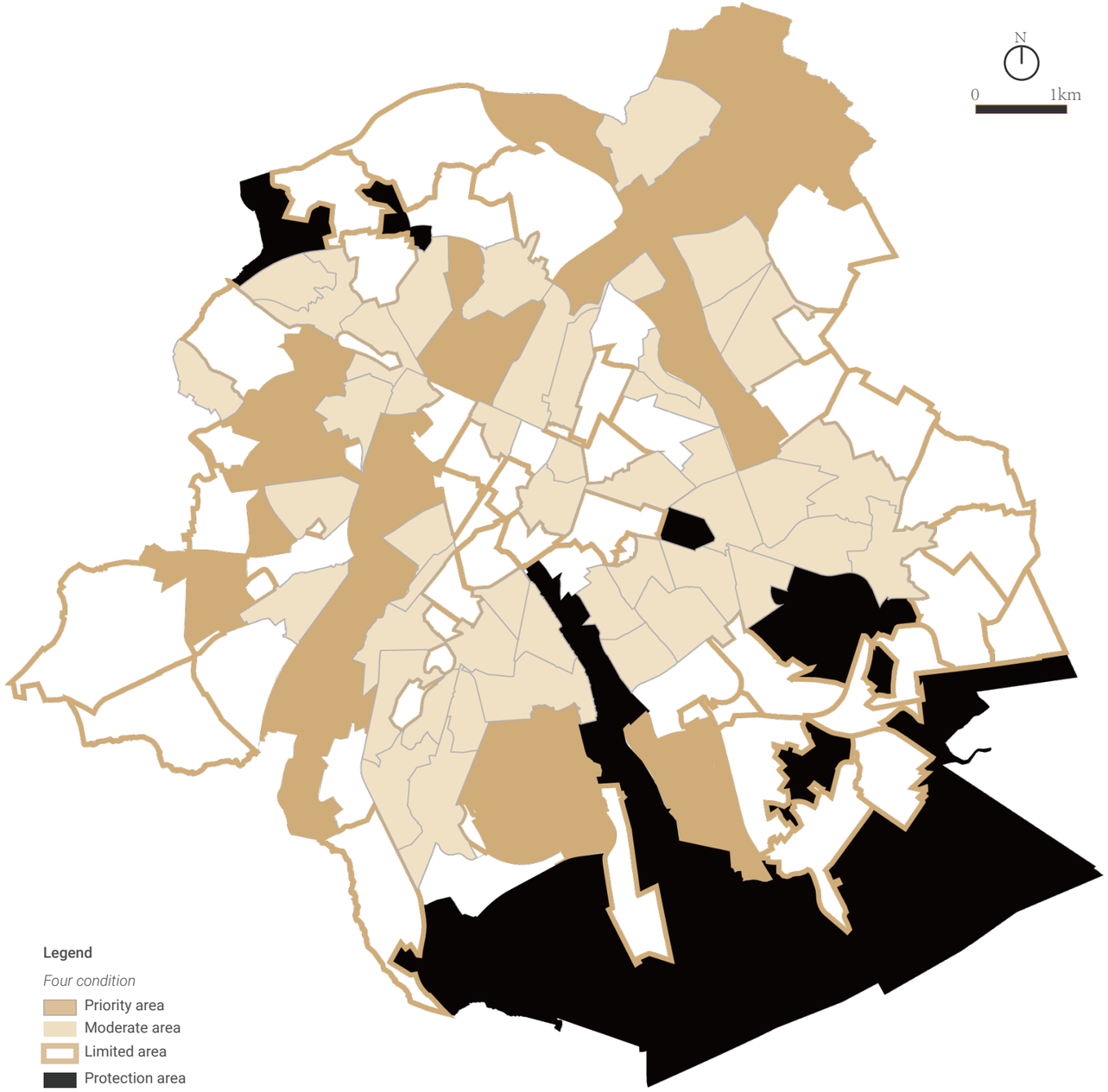

Potential interconnected networks
Based on time and conditional map, a future vision map for the city is created
Strategic system
3
Potential multifunctional space
Urban revitalize
Monofunctional space
Multifunctional space
Neighborhood-scale collaboration
New inhabitants
NGOs
Private investor
Housing agency
Supporting structure
2
Potential transitional housing
Urban refill
Vacant land
Vacant building
Core Transition
1

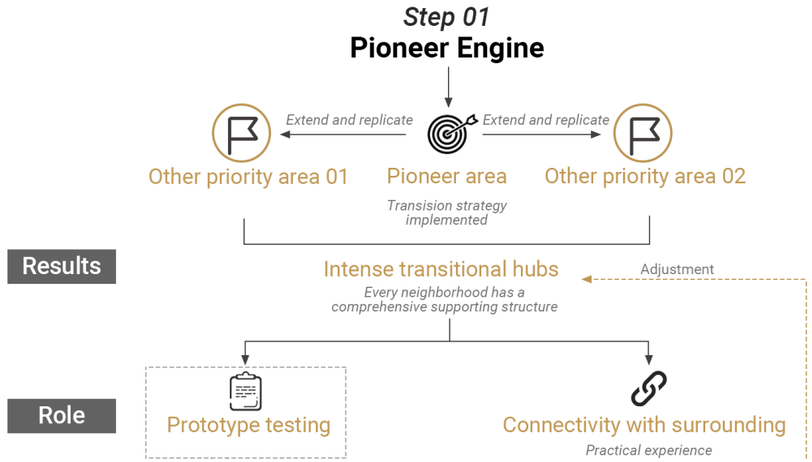
"Citizen"

公民

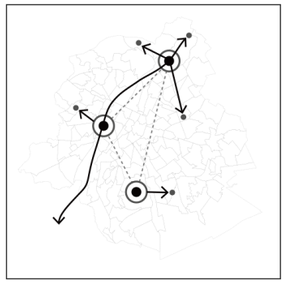
Back to the conditional map

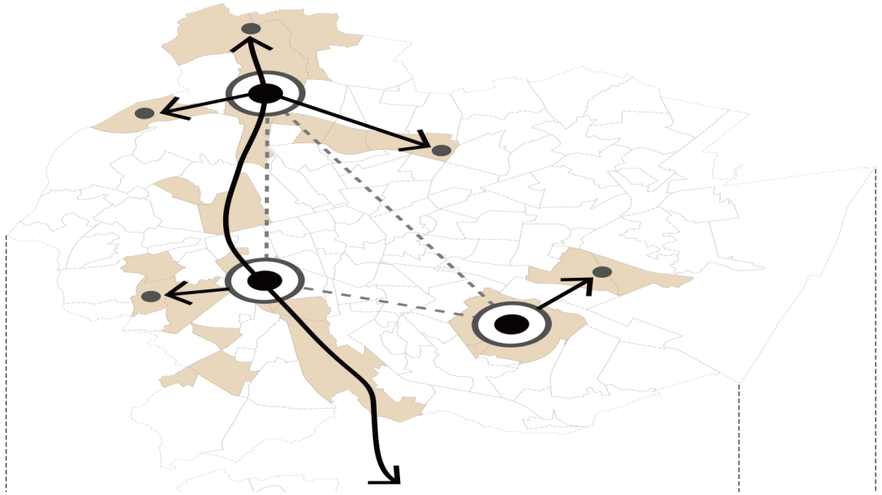
回到条件地图



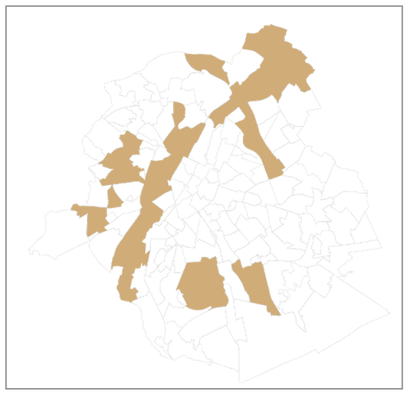


Pioneer Engine



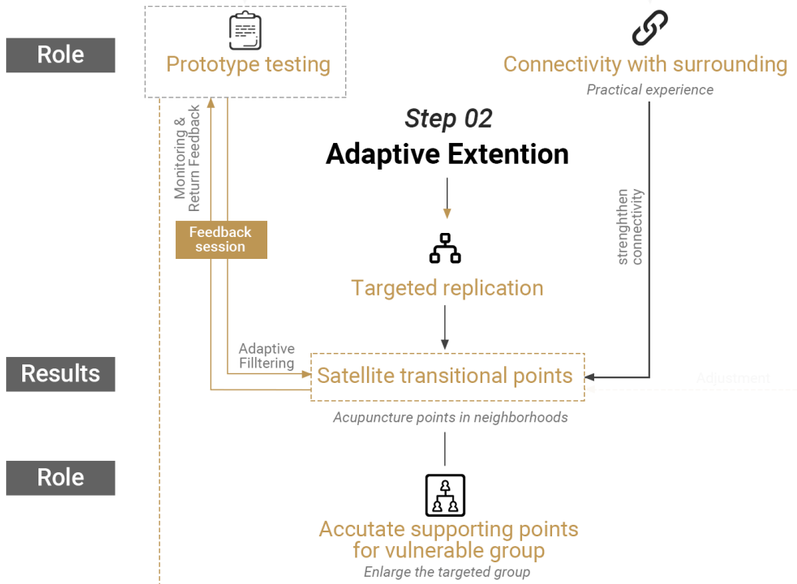


"In uncertain times, a few brave pioneers step out..."



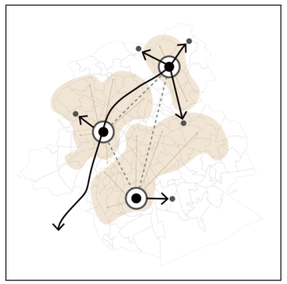
8 Future vision of City

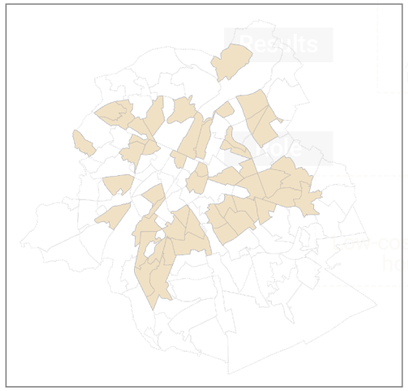
8.1 Future vision the city



"Change spreads — organically, responsively, adaptively."

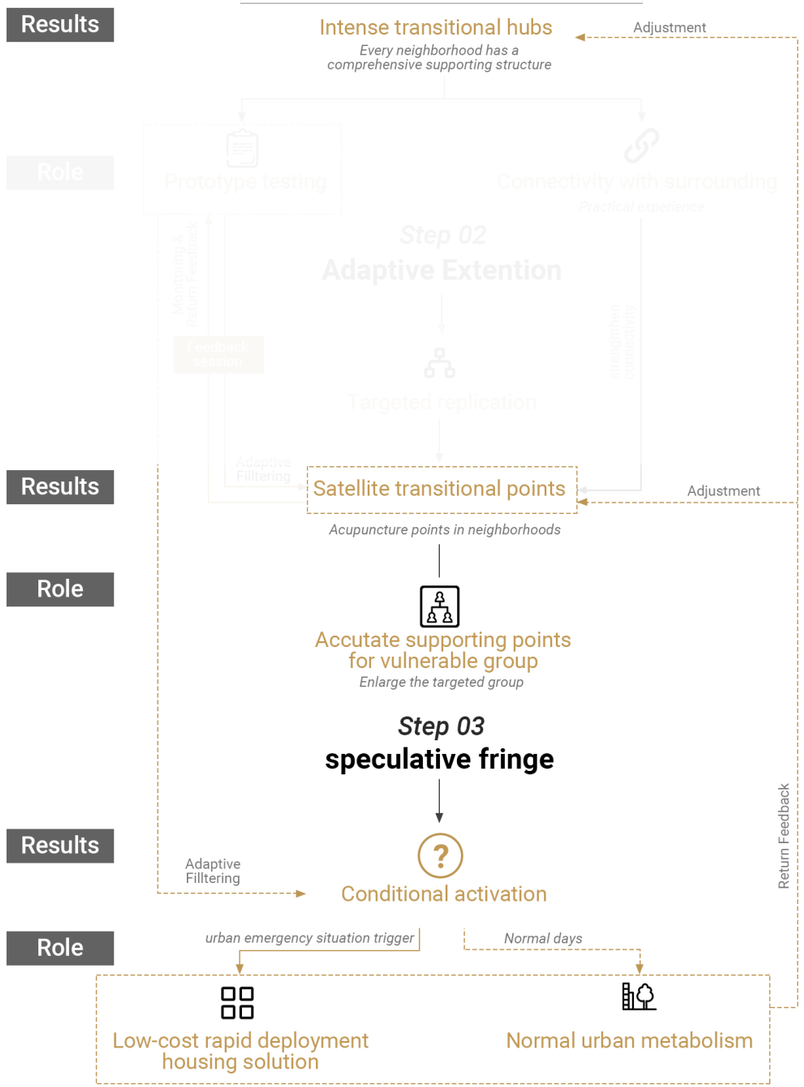
Adaptive Extention



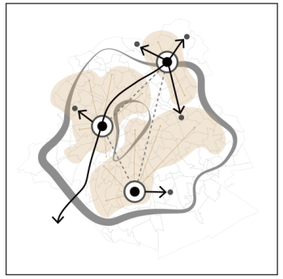


8 Future vision of City

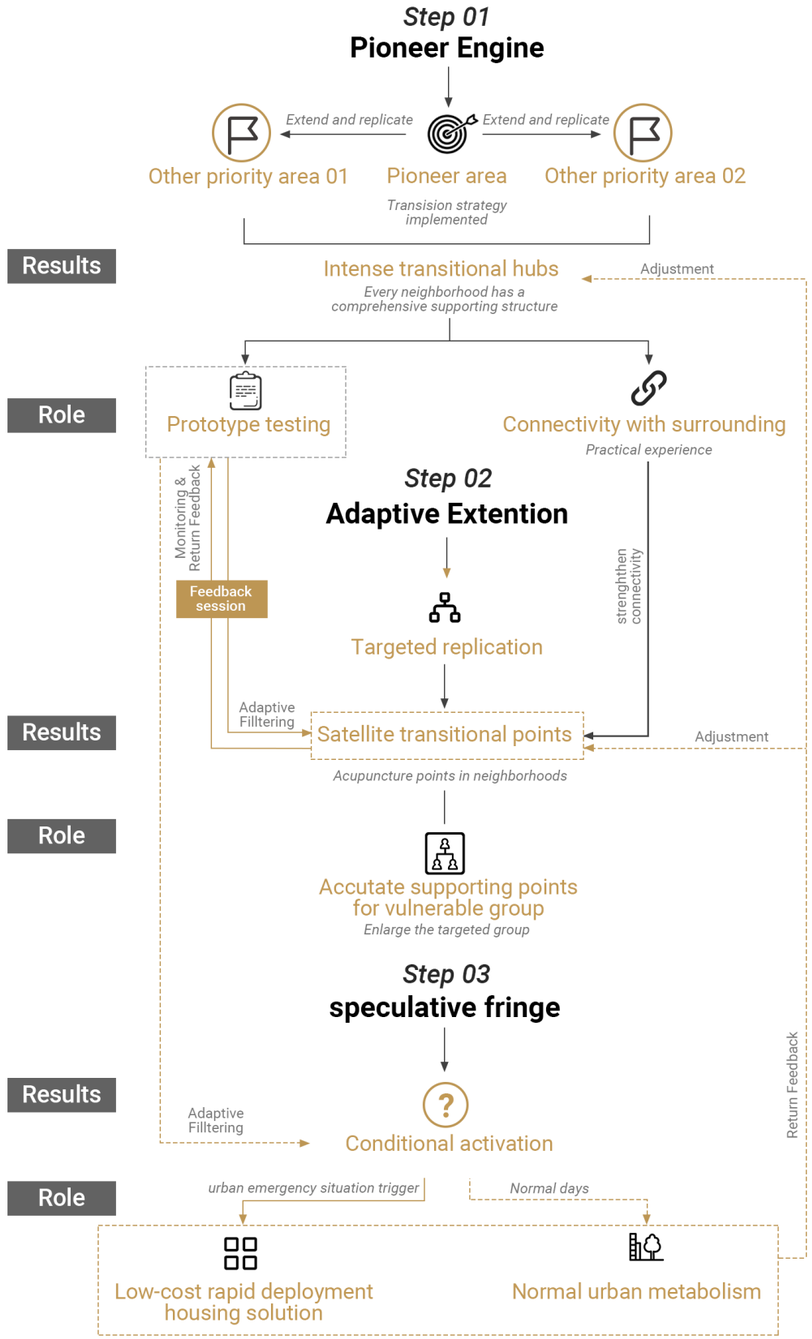
8.1 Future vision the city



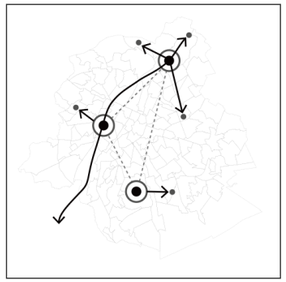
speculative fringe



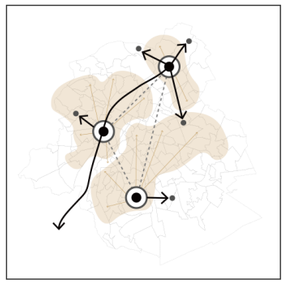
"When the edge becomes the front line..."



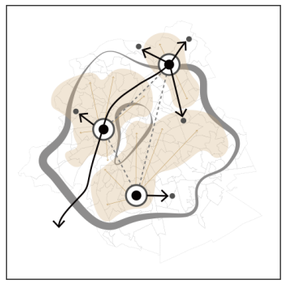
Pioneer Engine

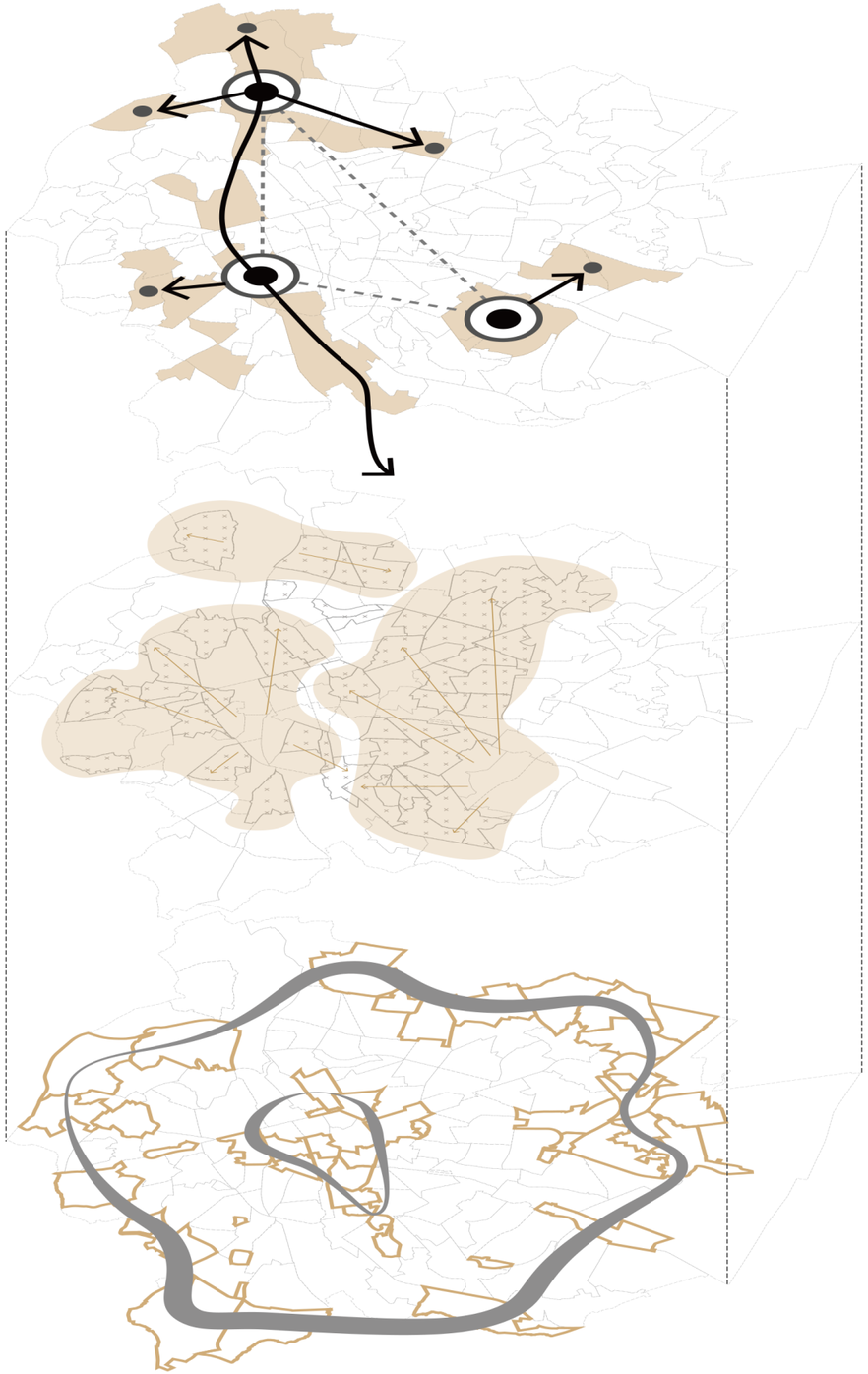


Adaptive Extention



speculative fringe

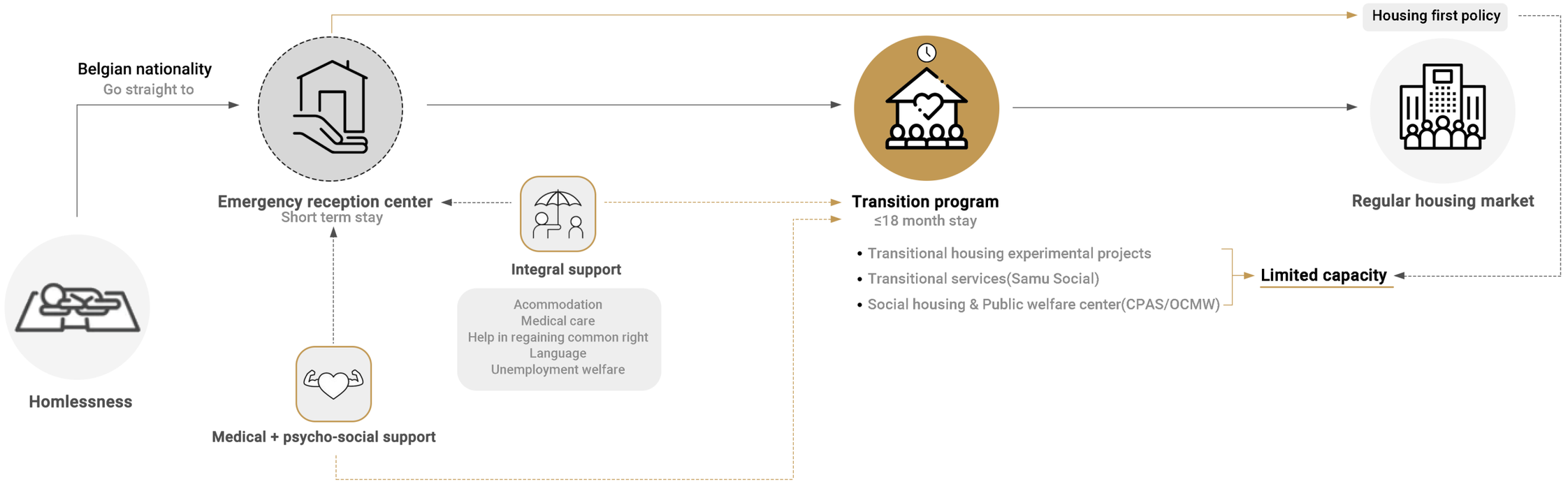




8 Future vision of City

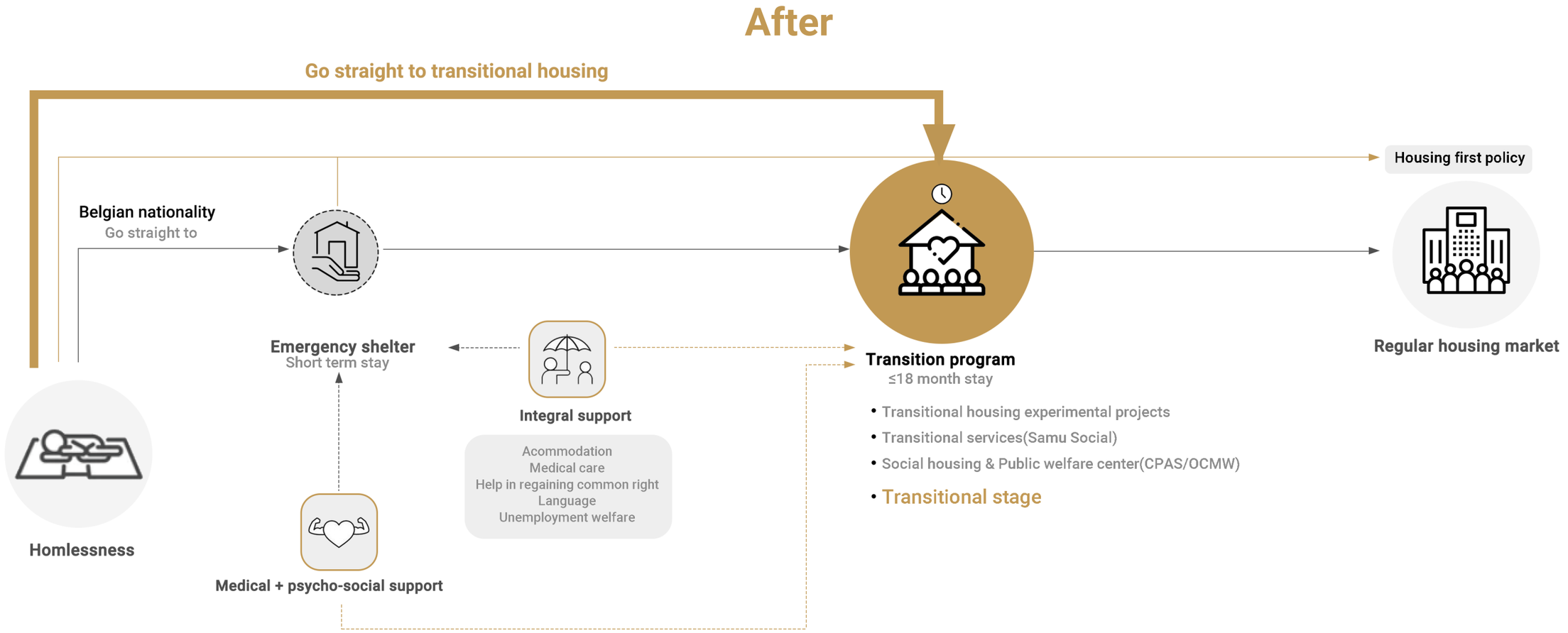
8.2 Back to the trajectory

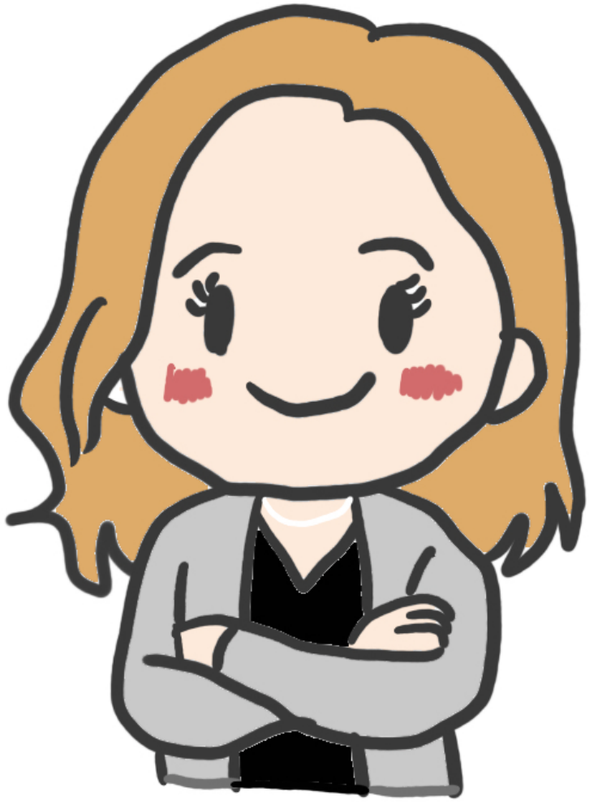
Current



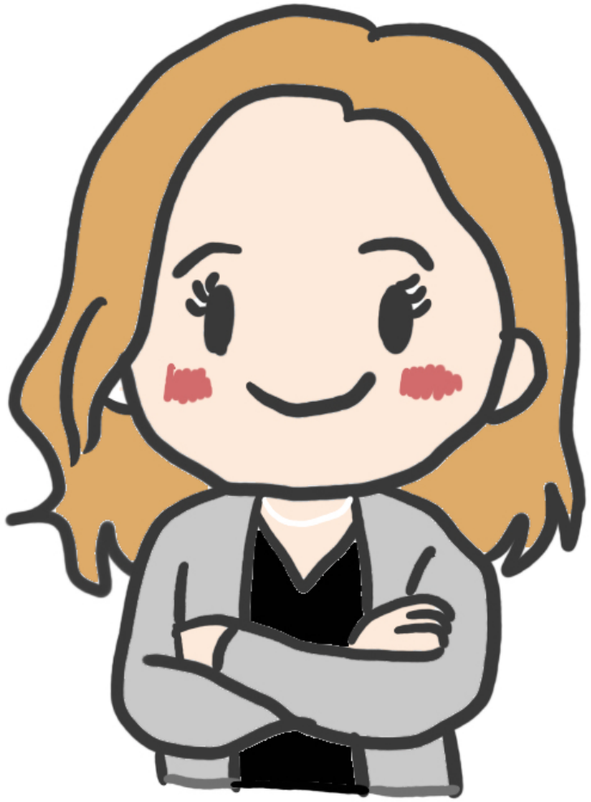
8 Future vision of City

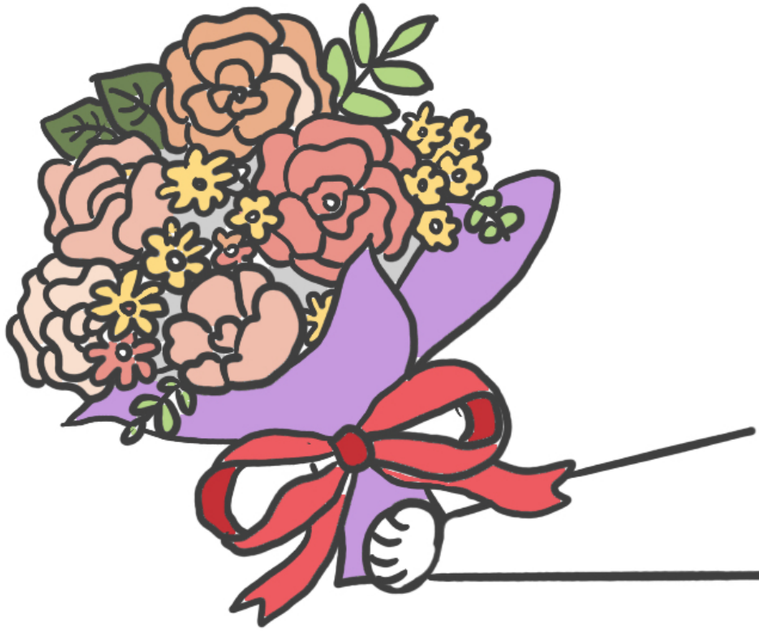
8.2 Back to the trajectory



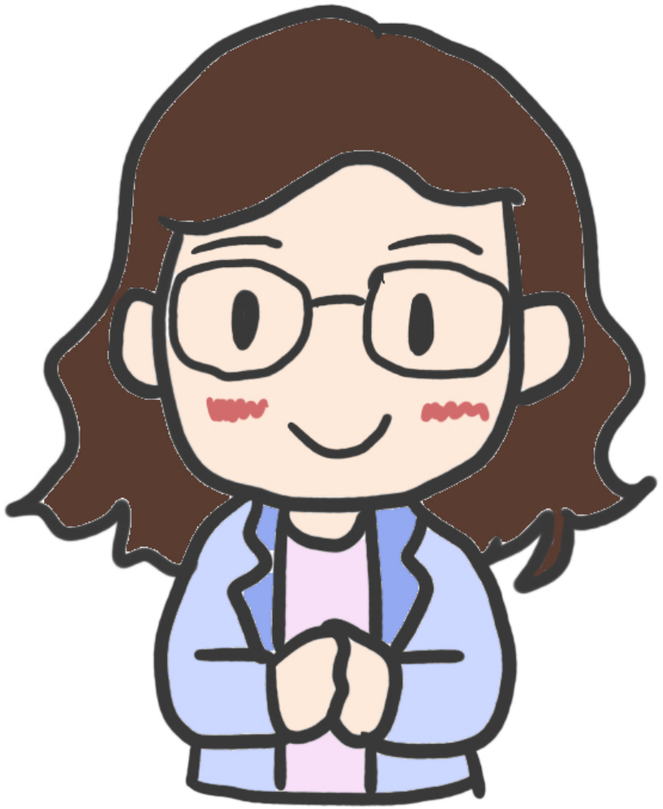


Caroline Newton

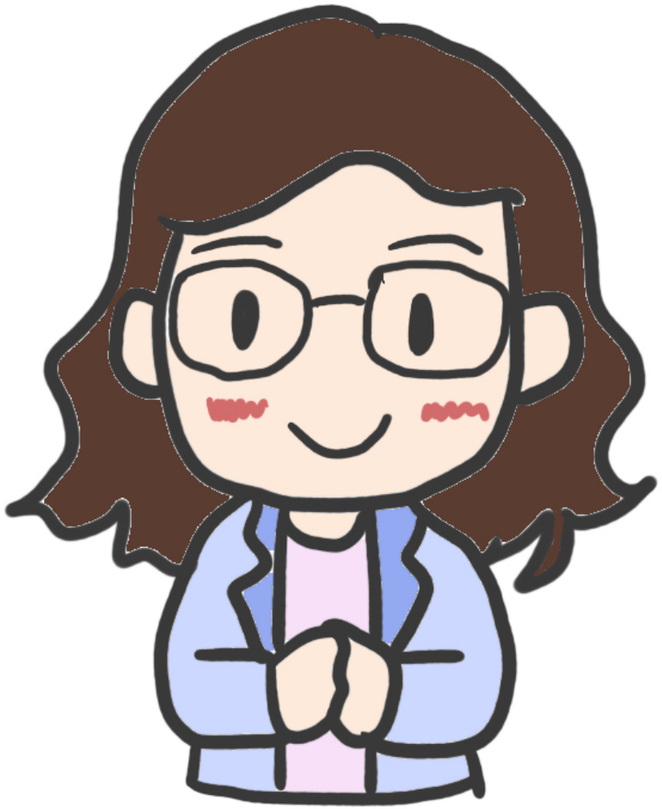




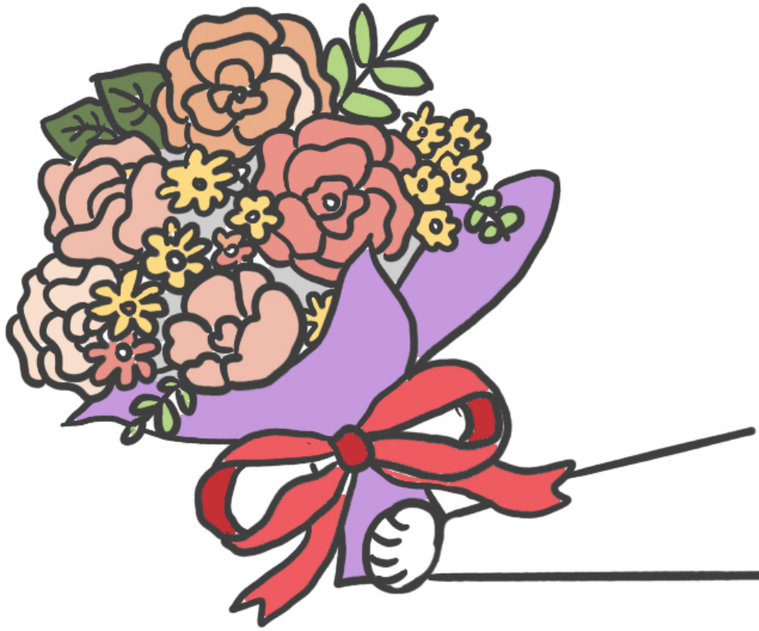
Caroline Newton

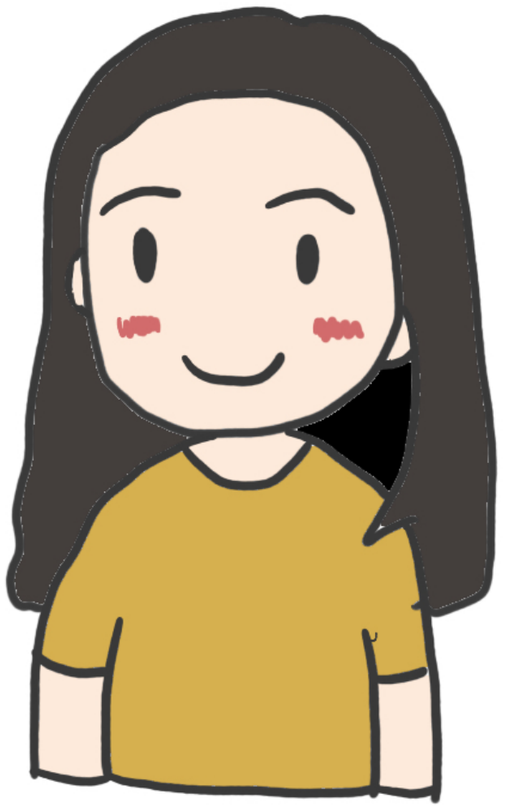


Ana Petrović



Ana Petrović





Me

Thank you!