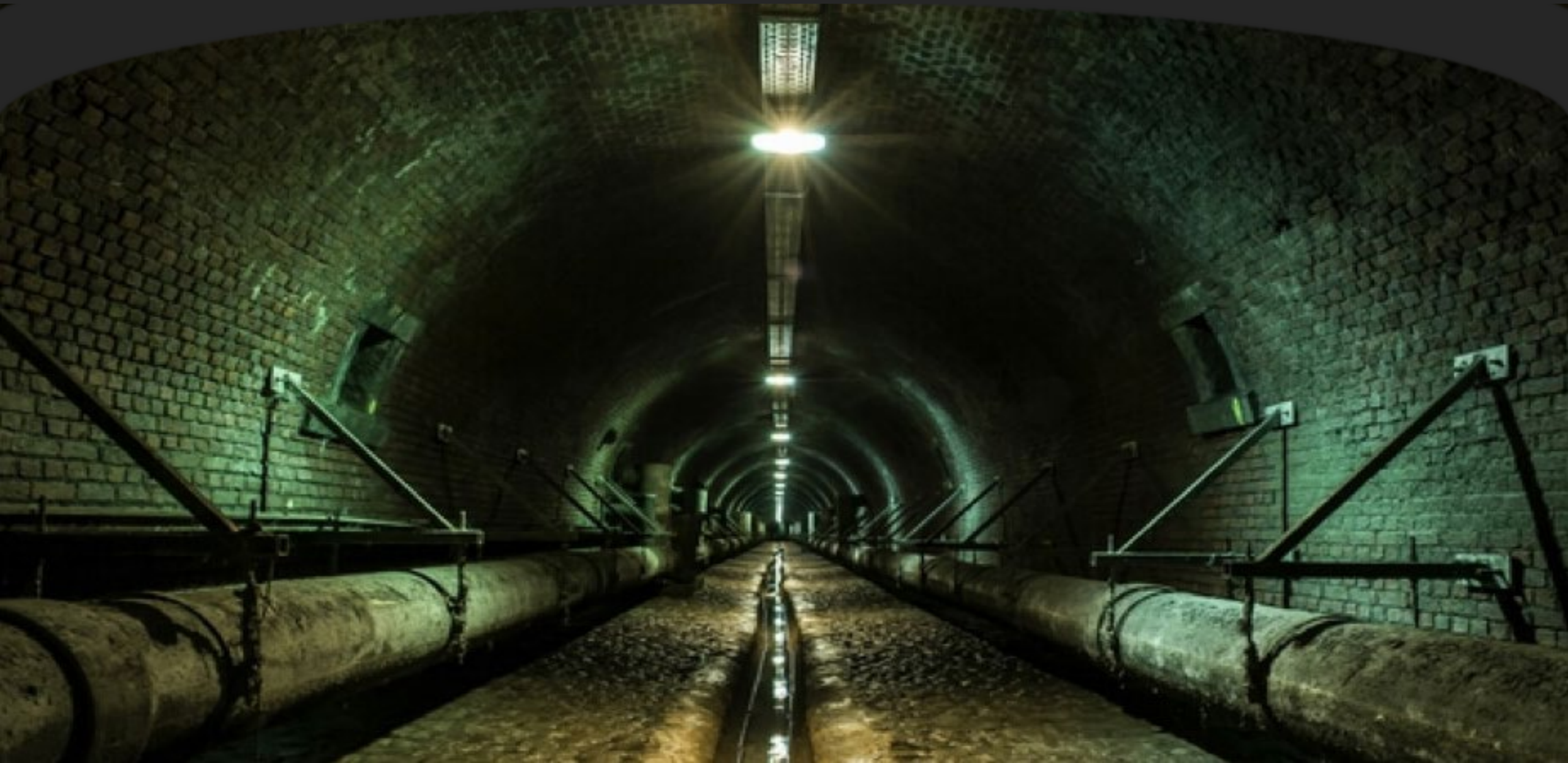
P5 Presentation – July 7, 2023
Jolt Wiersma, 4719379

Antwerp Unearthed

The capacity of Antwerp’s historic underground canal system in facilitating future security for environmental and social infrastructures.



Content

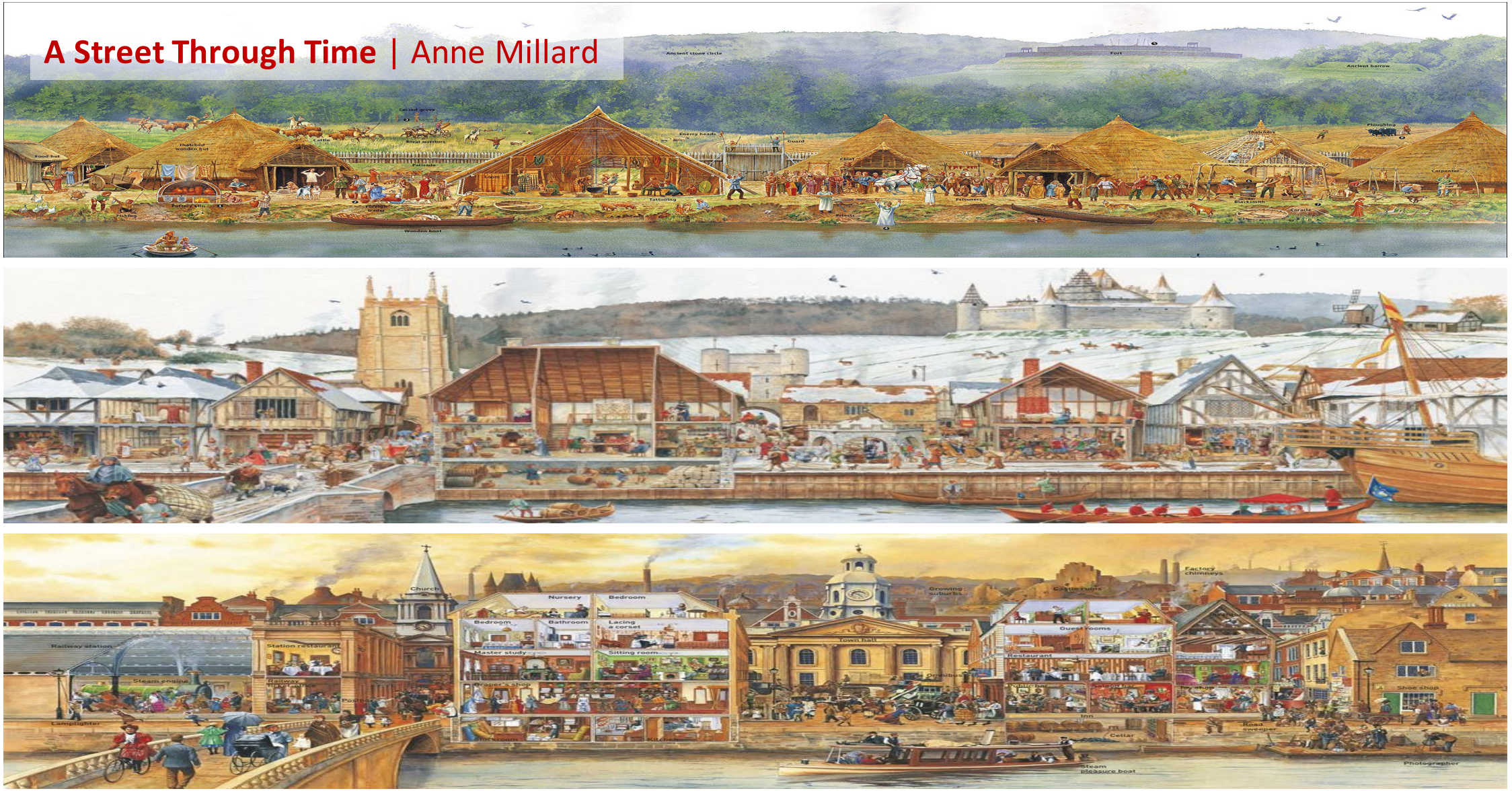
1. Fascination

Source: Disneyland Paris (Good, 2020)

Source: Disney Utilidor (The Walt Disney Company, n.d.)

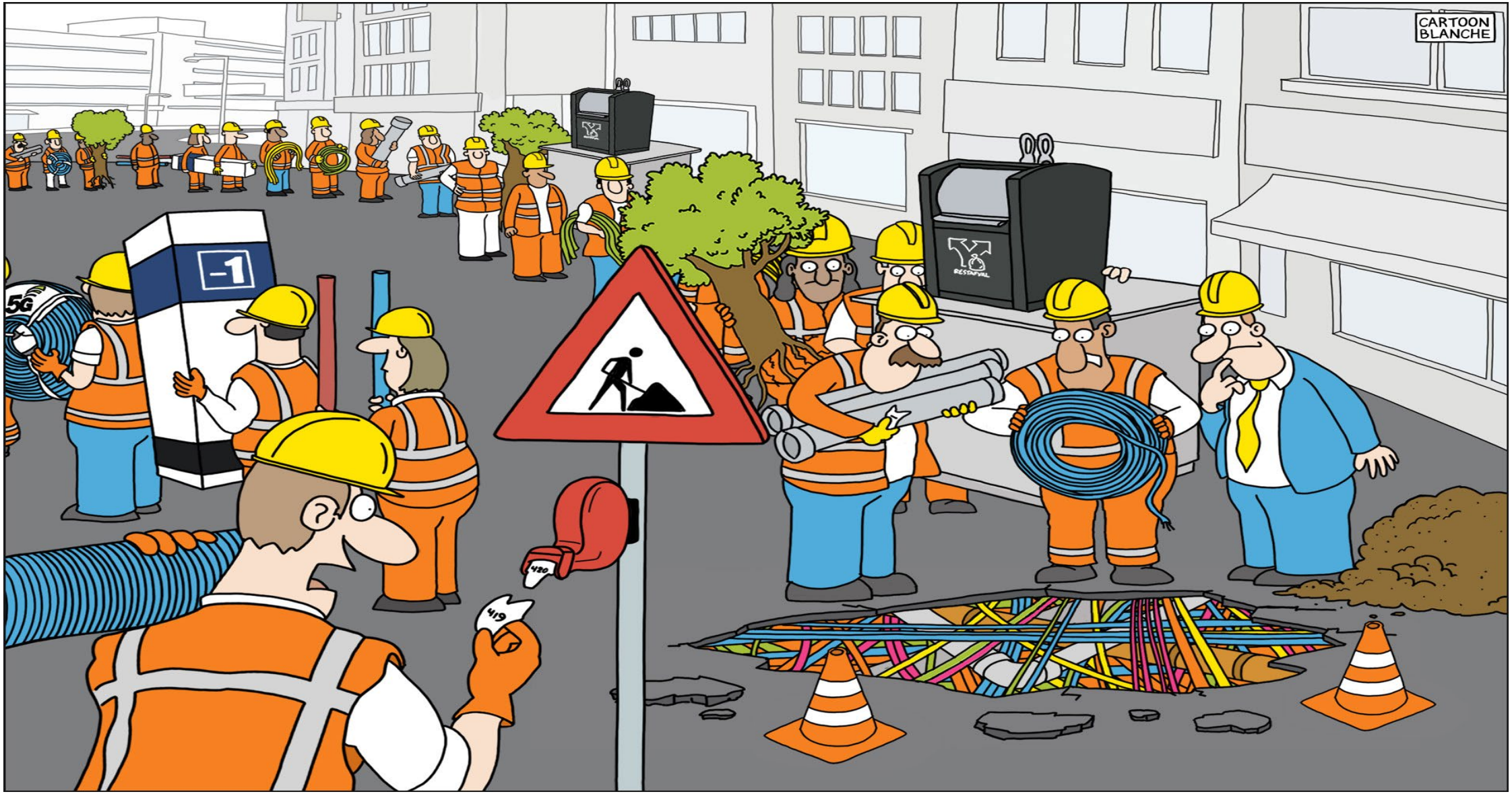
Source: London Transport Museum (Gavin Dunn, 1989)

A Street Through Time | Anne Millard



Source: A Street Through Time (Anne Millard, 1998)

2. Problem



Source: Cartoon Blanche

CLIMATE CHANGE

⇩

harsh summers
harsh winters

⇩

environmental infrastructures

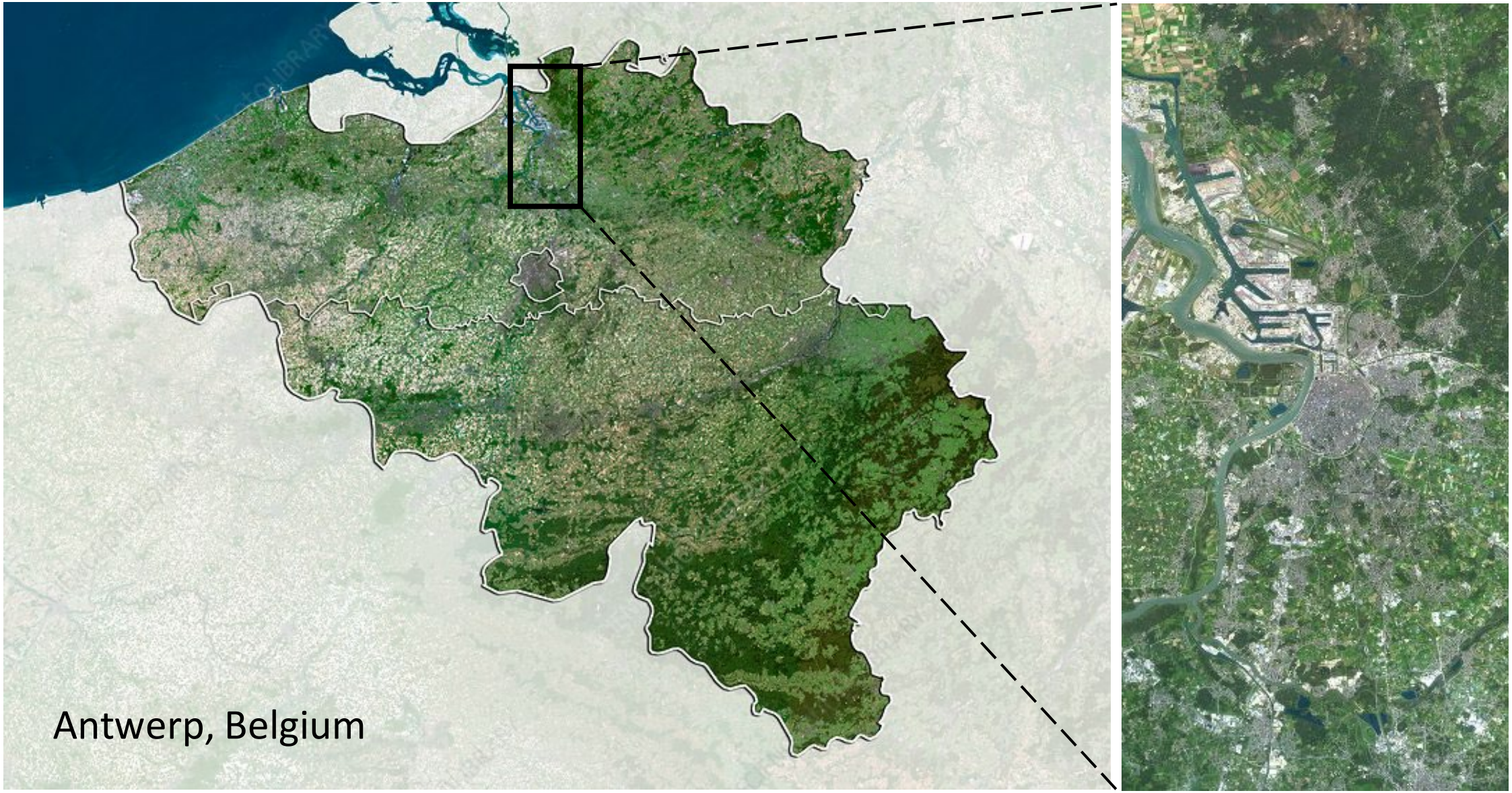
DENSIFICATION

⇩

overcrowding
over renewal

⇩

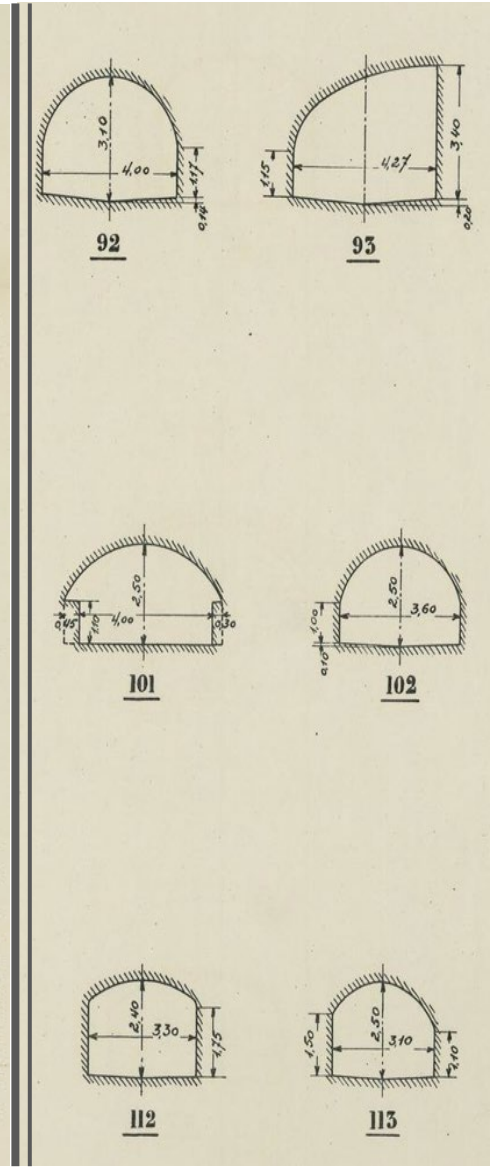
social infrastructures



Source: Google Earth

Source: news articles as indicated


Schelde


3,10
4,00
92
4,27
3,40
93
2,50
4,00
101
2,50
3,60
102
2,40
3,30
112
2,50
3,10
113

Source: Photos by De Ruien Antwerpen (www.ruien.be), FelixArchief Antwerpen

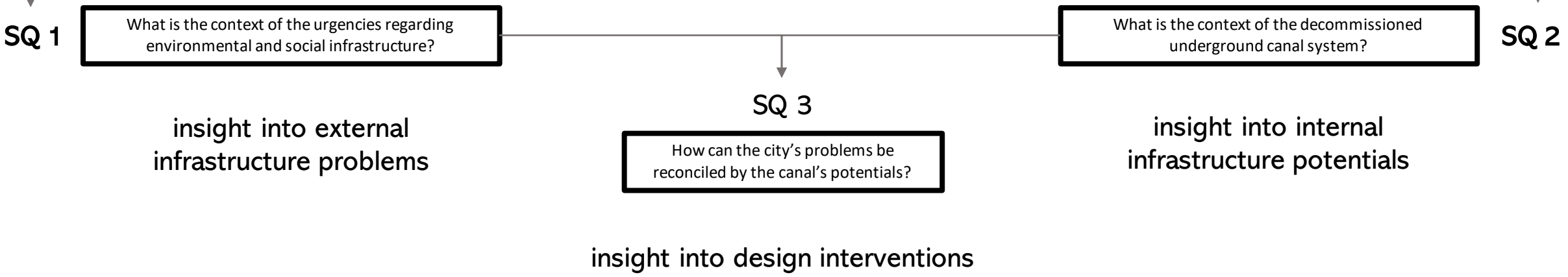

TEXTILE
CEI

3. Question

How can the reappropriation of the decommissioned underground canal system in Antwerp spatially mediate the city's urgencies regarding environmental and social infrastructure?

*How can the reappropriation of **the decommissioned underground canal system in Antwerp***

*spatially mediate **the city's urgencies regarding environmental and social infrastructure**?*



4. Theory

- Use **‘integrated infrastructure masterplans’** to ensure that the long-term land use effects of multiple infrastructural systems are considered jointly.

Delmastro, C., Lavagno, E., & Schranz, L. (2016). Underground urbanism: Master Plans and Sectorial Plans. *Tunnelling and Underground Space Technology*, *55*, 103–111. https://doi.org/10.1016/j.tust.2016.01.001

outline operational criteria

set negotiation conditions

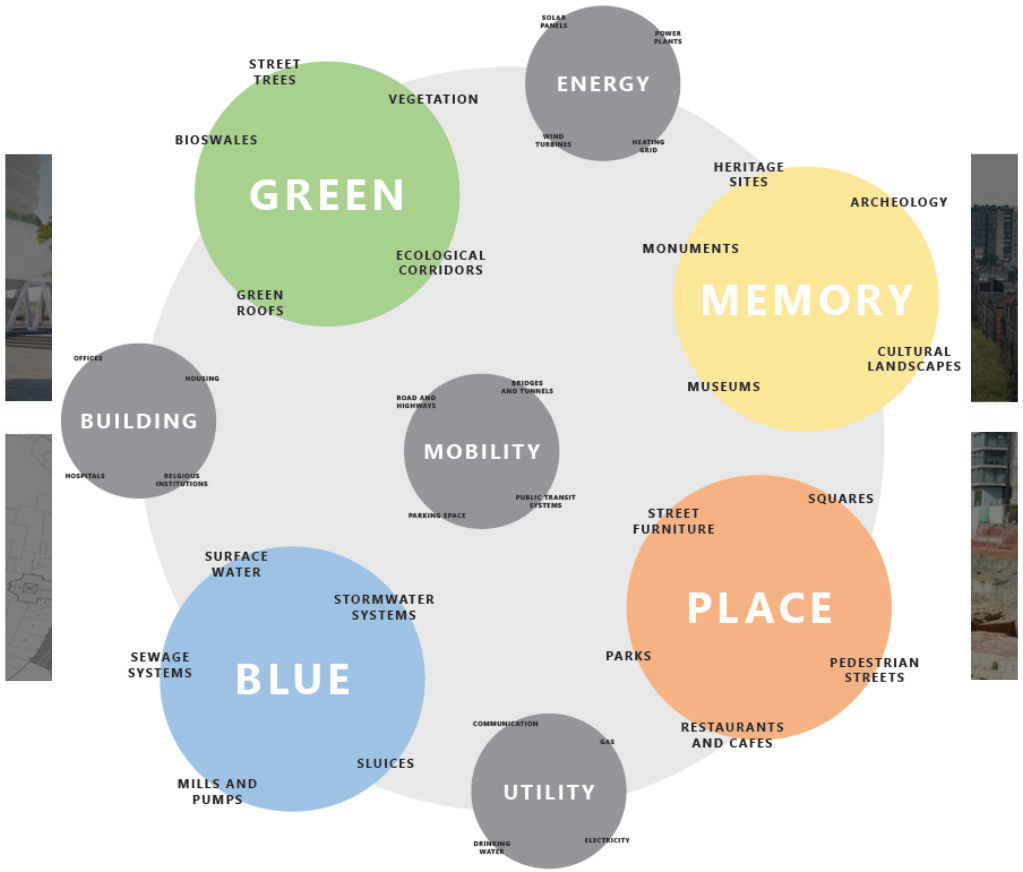
- Use a design mindset based on **systems-thinking frameworks** that outline the specific operational criteria and negotiation conditions for the desired infrastructures.

Von Der Tann, L., Sterling, R. L., Zhou, Y., & Metje, N. (2020). Systems approaches to urban underground space planning and management – A review. *Underground Space*, *5*(2), 144–166. https://doi.org/10.1016/j.undsp.2019.03.003

5. Method

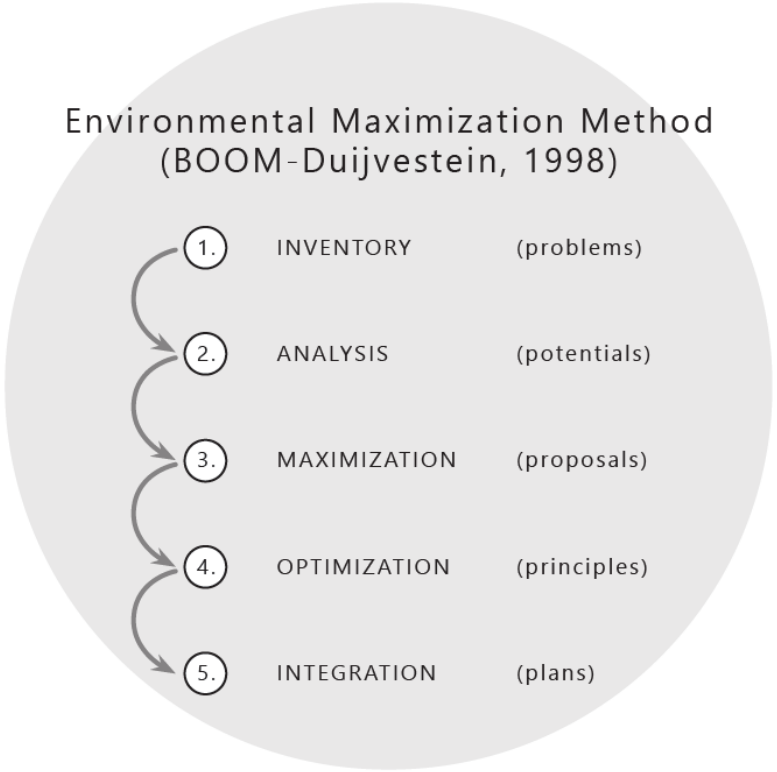
RESEARCH QUESTION

implement various infrastructural themes



THEORETICAL QUESTION

implement a systems-thinking design approach

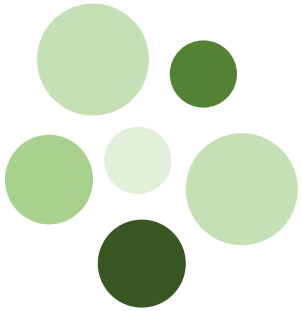


	Theme 1	Theme 2	Theme 3	Theme 4
1. **Inventory** each theme **SQ 1** - *outline problems*				
2. **Analyze** each theme **SQ 2** - *outline potentials*				
3. **Maximize** each theme **SQ 3** - *outline proposals*				
4. **Optimize** each theme **SQ 3** - *outline principles*				
5. **Integrate** each theme **SQ 3** - *outline plans*				

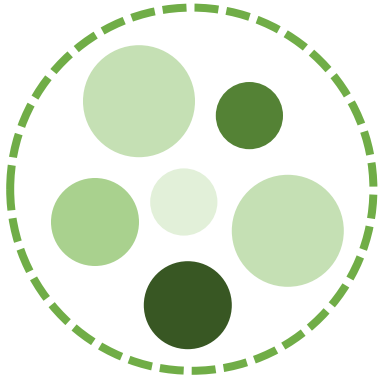
6. Experiment

G R E E N

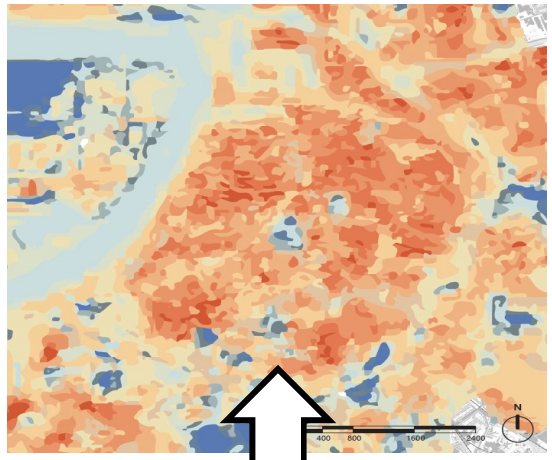
1. Analysis (problems)



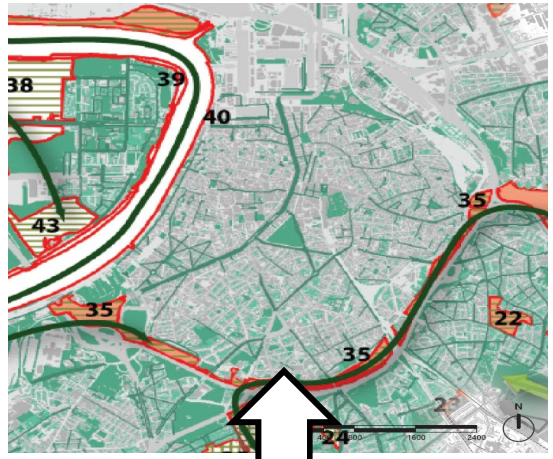
2. Inventory (potentials)

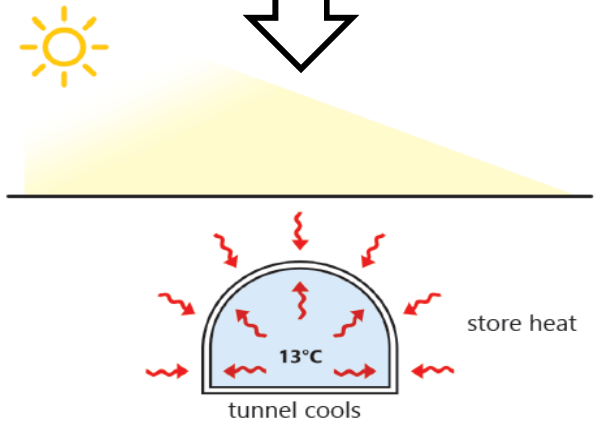


heat stress

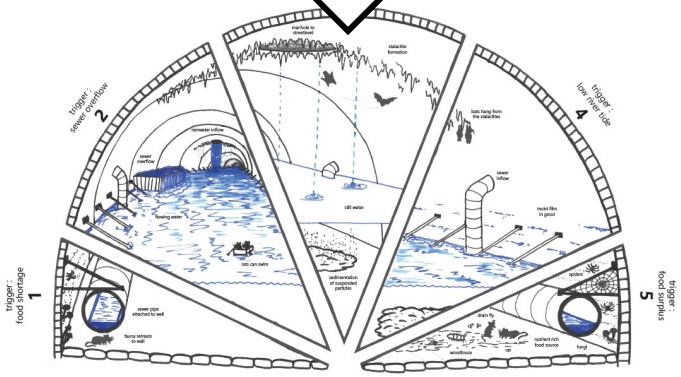


ecological struggle





confined microclimate



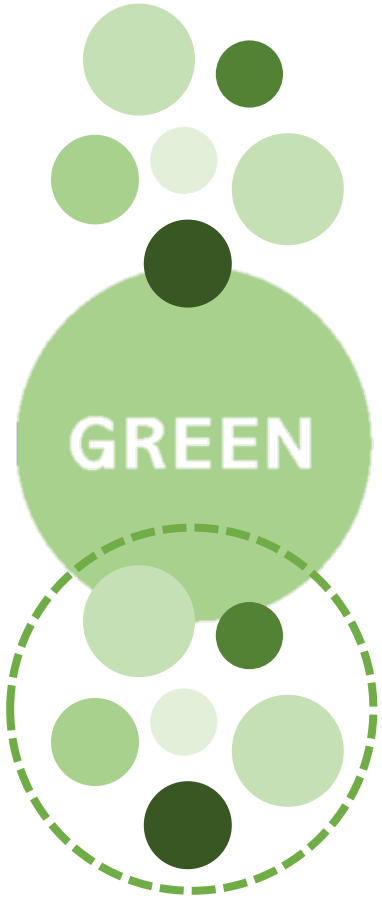
natural biotopes

G R E E N

1. Analysis (problems)

2. Inventory (potentials)

3. Maximization (proposals)

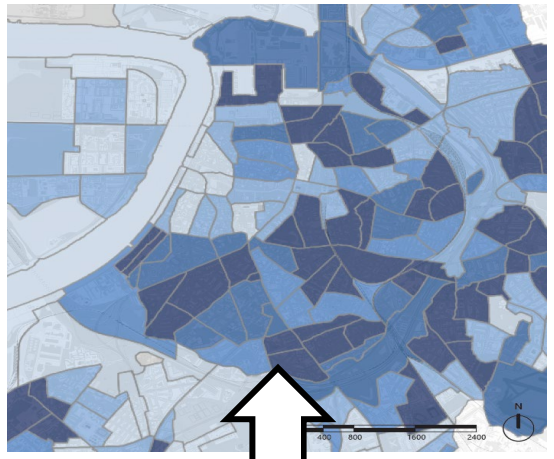


B L U E

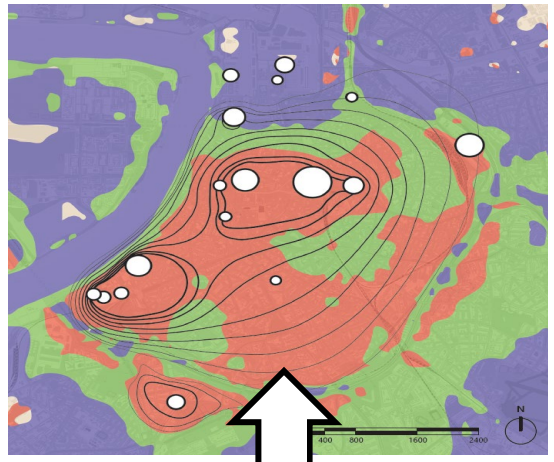
1. Analysis (problems)

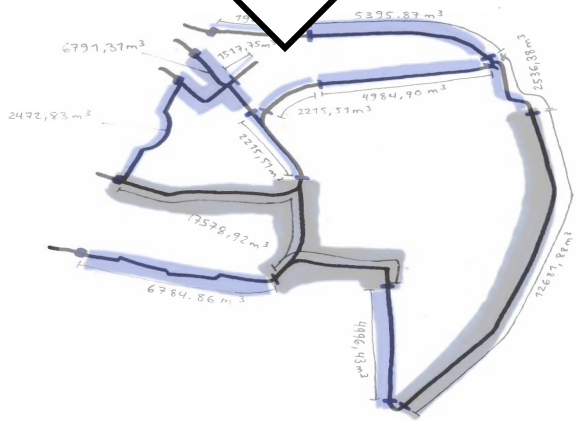
2. Inventory (potentials)

flood risk

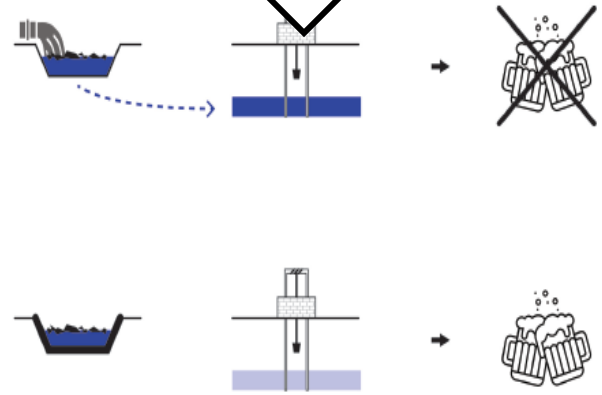


freshwater shortage





sluice compartments



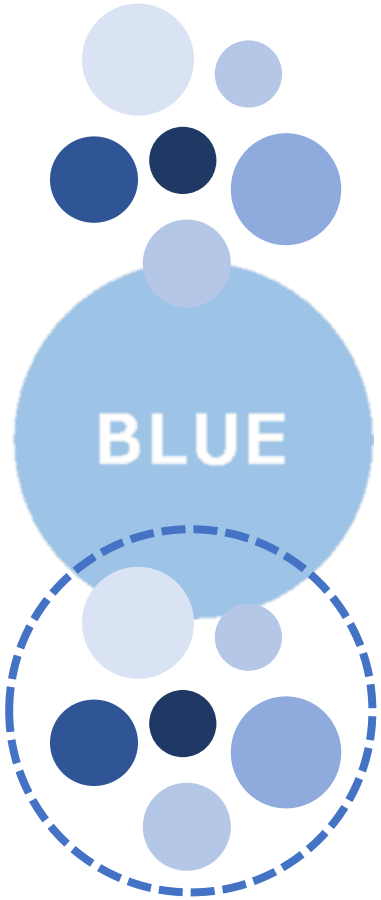
floor construction

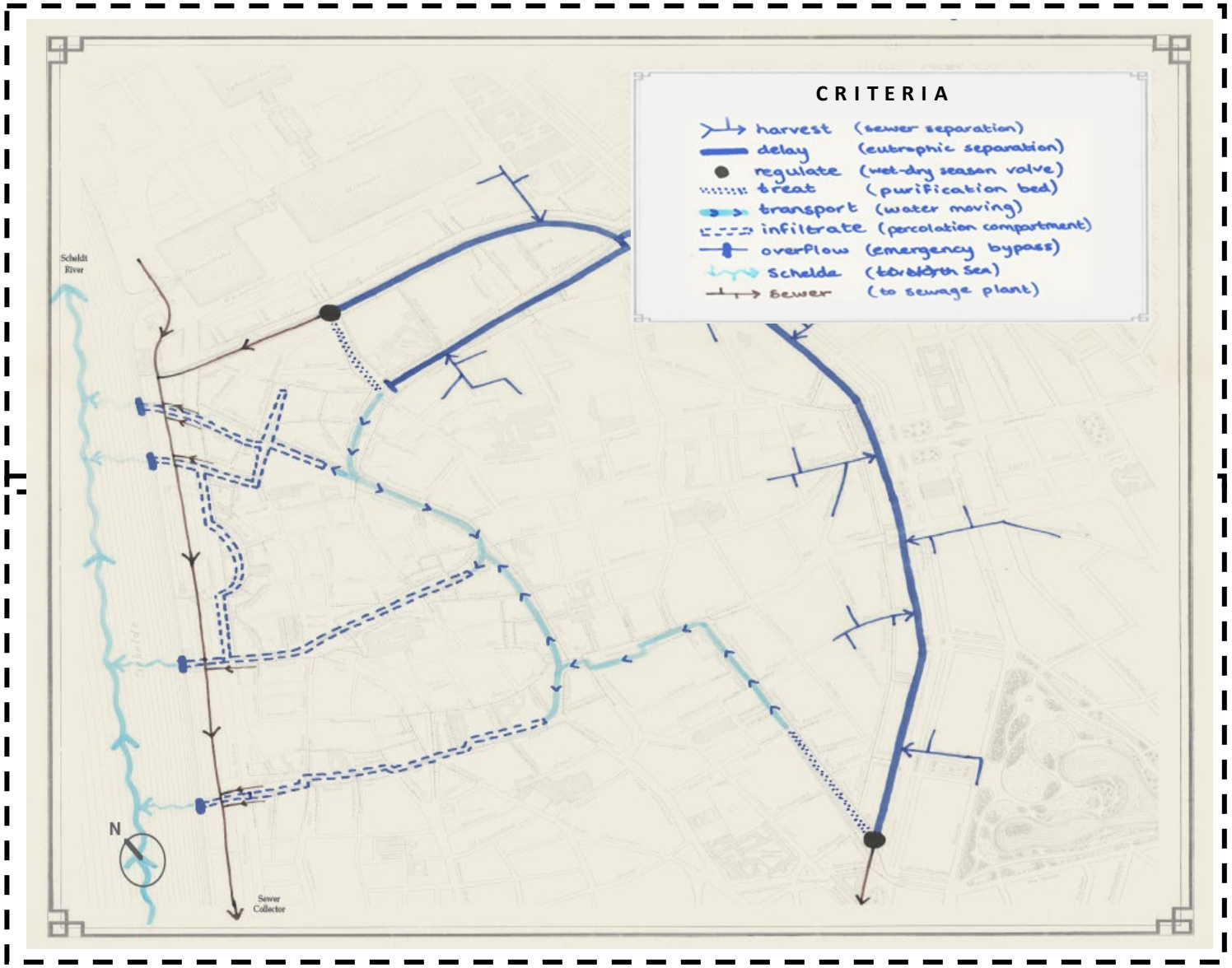
B L U E

1. Analysis (problems)

2. Inventory (potentials)

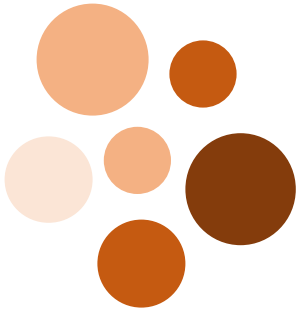
3. Maximization (proposals)



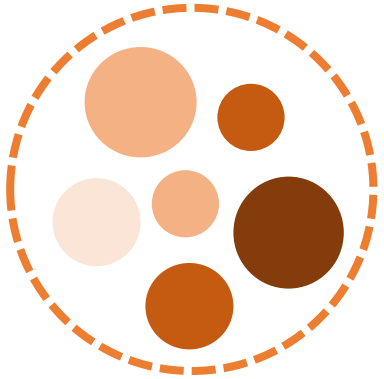


P L A C E

1. Analysis (problems)

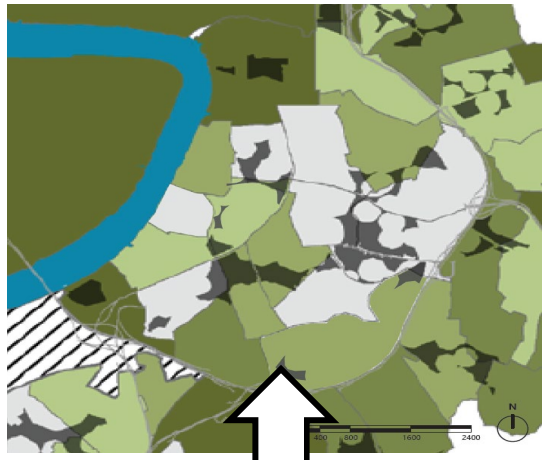


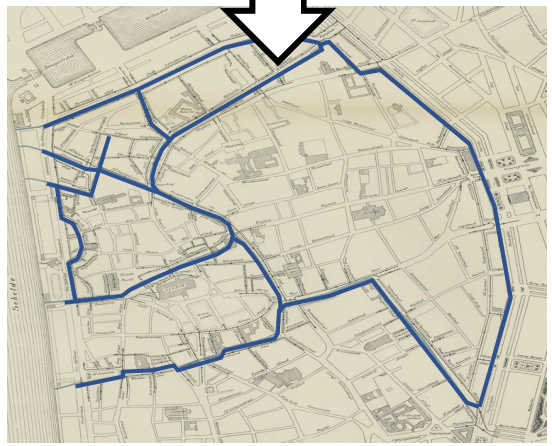
2. Inventory (potentials)



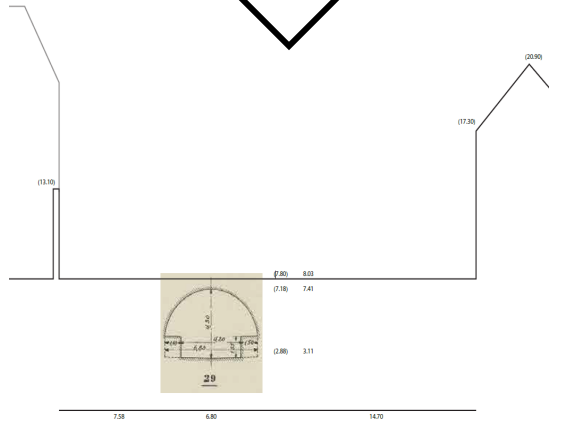
congestion strain

leisure deficiency





unimpeded layout



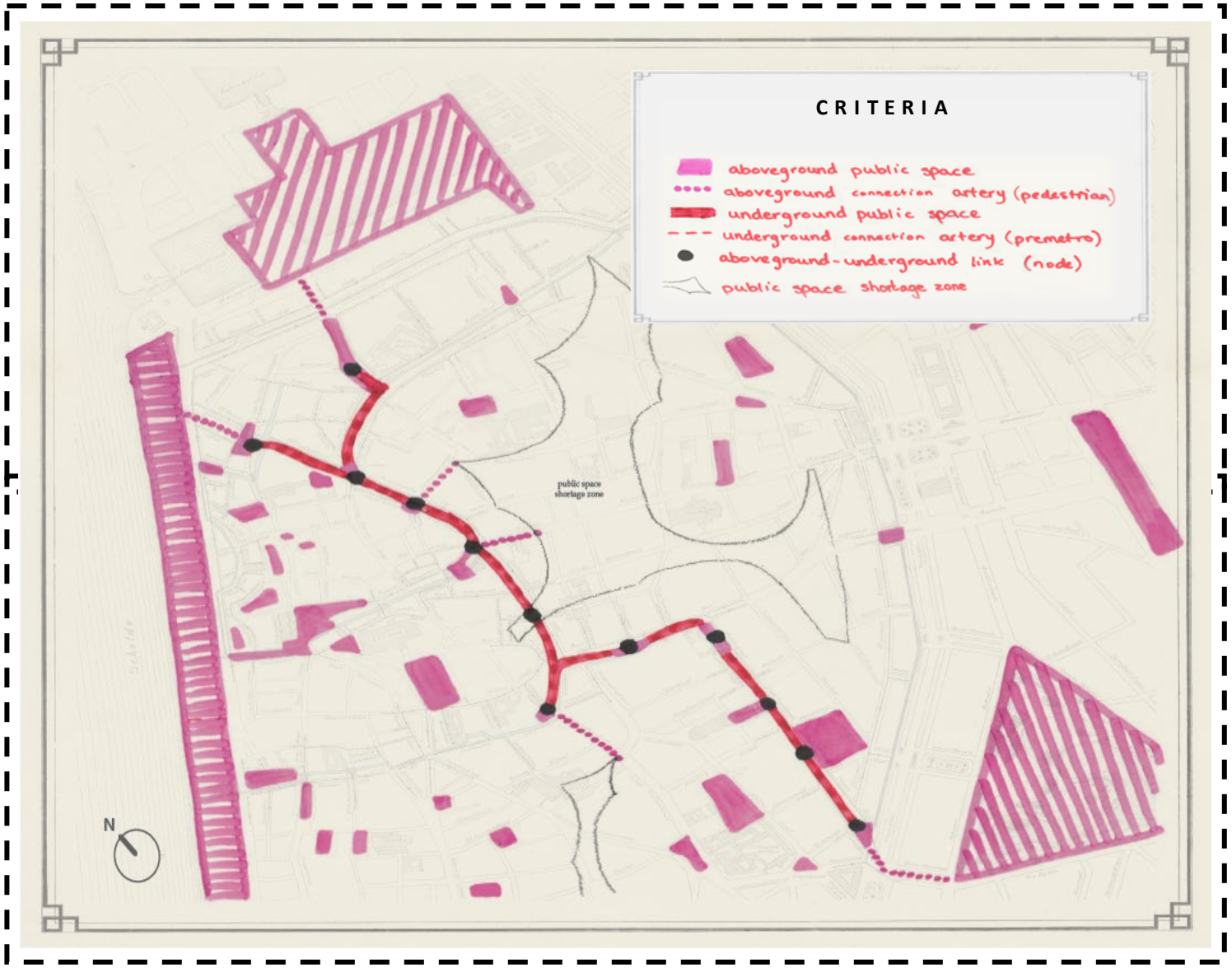
vacant floor-area

P L A C E

1. Analysis (problems)

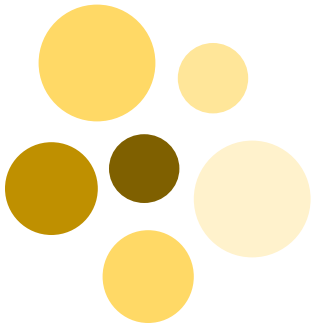
2. Inventory (potentials)

3. Maximization (proposals)

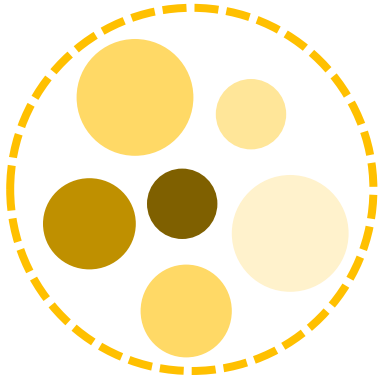


M E M O R Y

1. Analysis (problems)

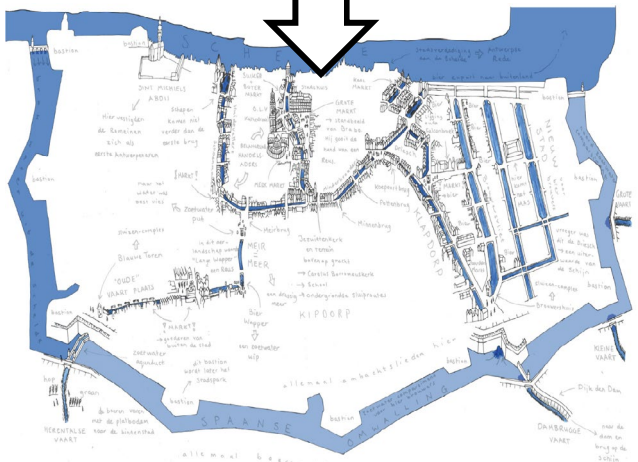


2. Inventory (potentials)

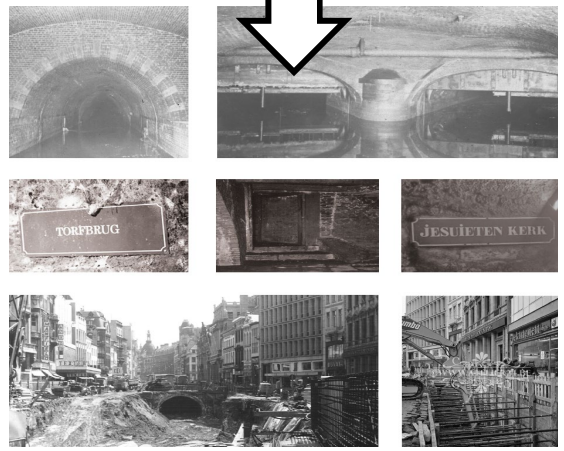


identity depreciation

heritage decline



lingering narratives



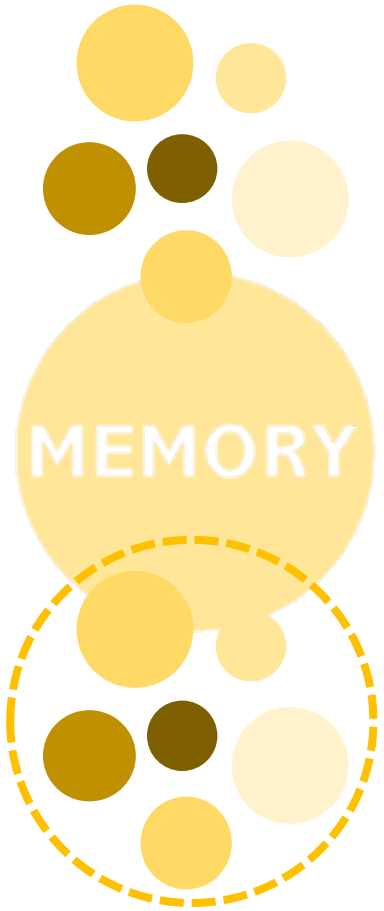
physical relics

M E M O R Y

1. Analysis (problems)

2. Inventory (potentials)

3. Maximization (proposals)



4. **Optimize** each theme (outline the principles)

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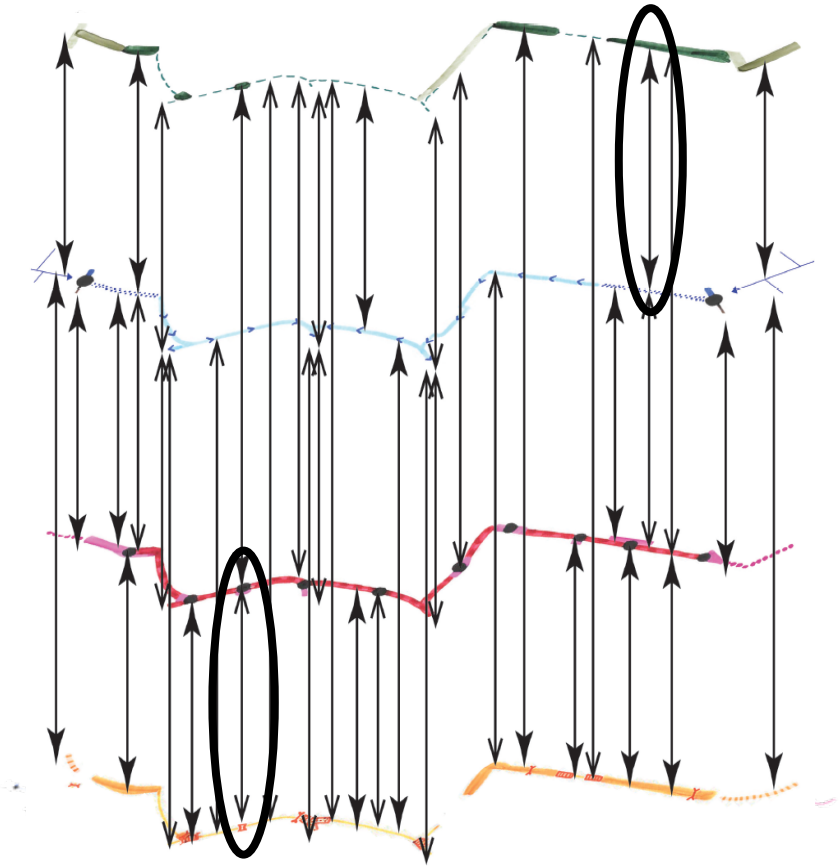
harmonies between criteria

conflicts between criteria

+



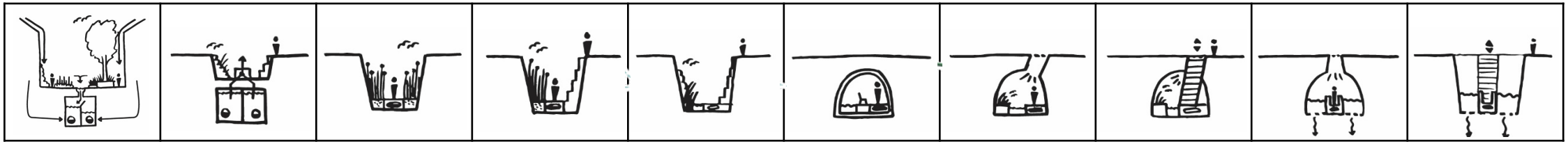
+

priority

Real life: based on stakeholder negotiations
Project: based on systematic importance

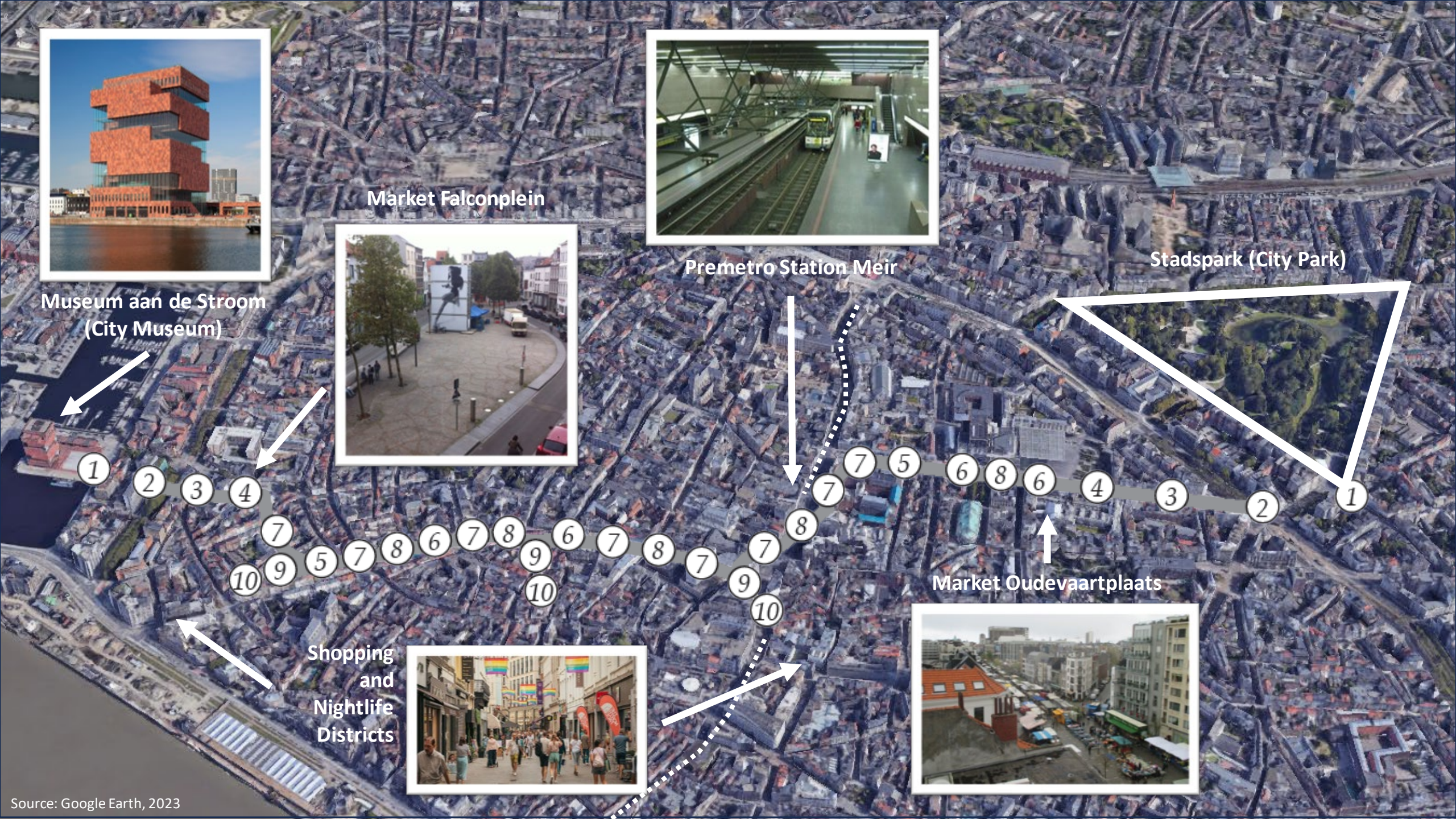
“which criteria acts most as part of a system?”

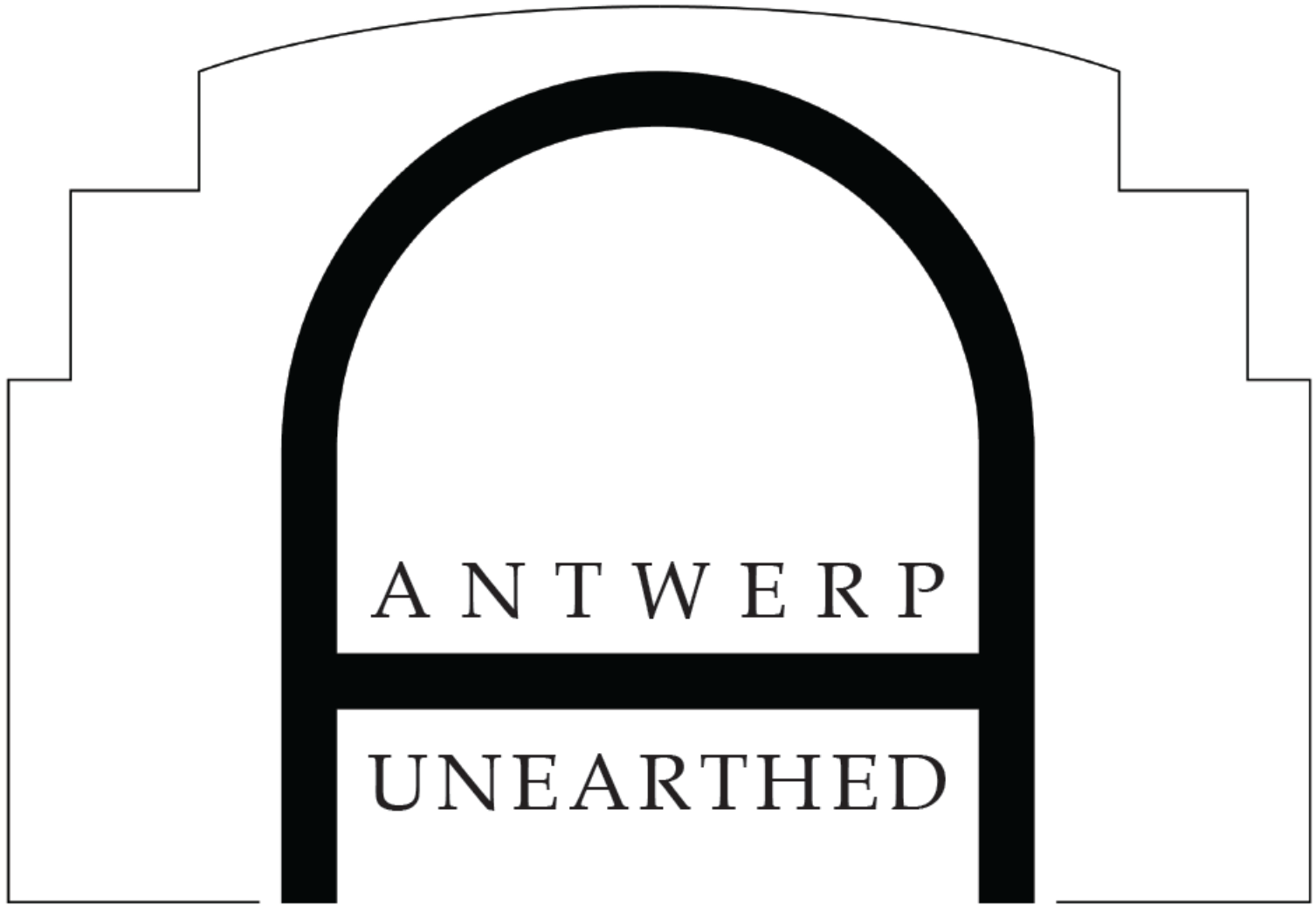
4. **Optimize** each theme (outline the principles)



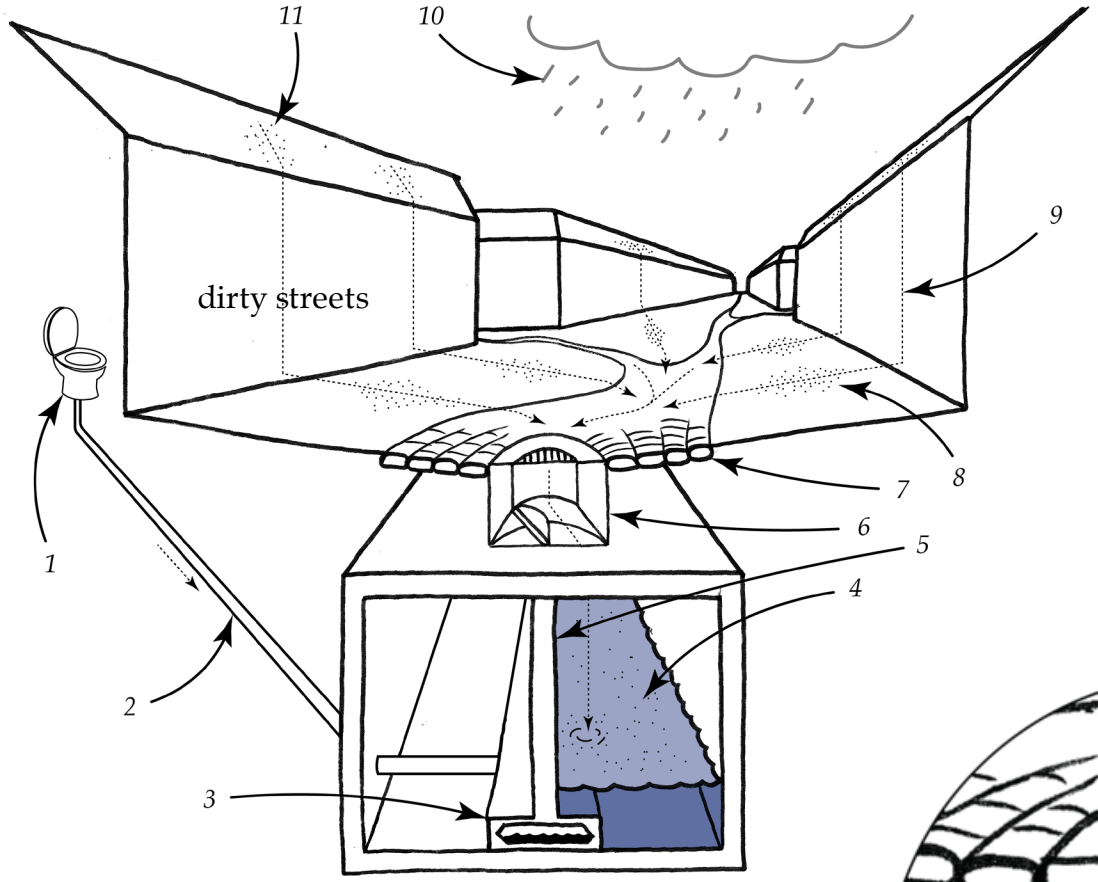
1 **2** **3** **4** **5** **6** **7** **8** **9** **10**

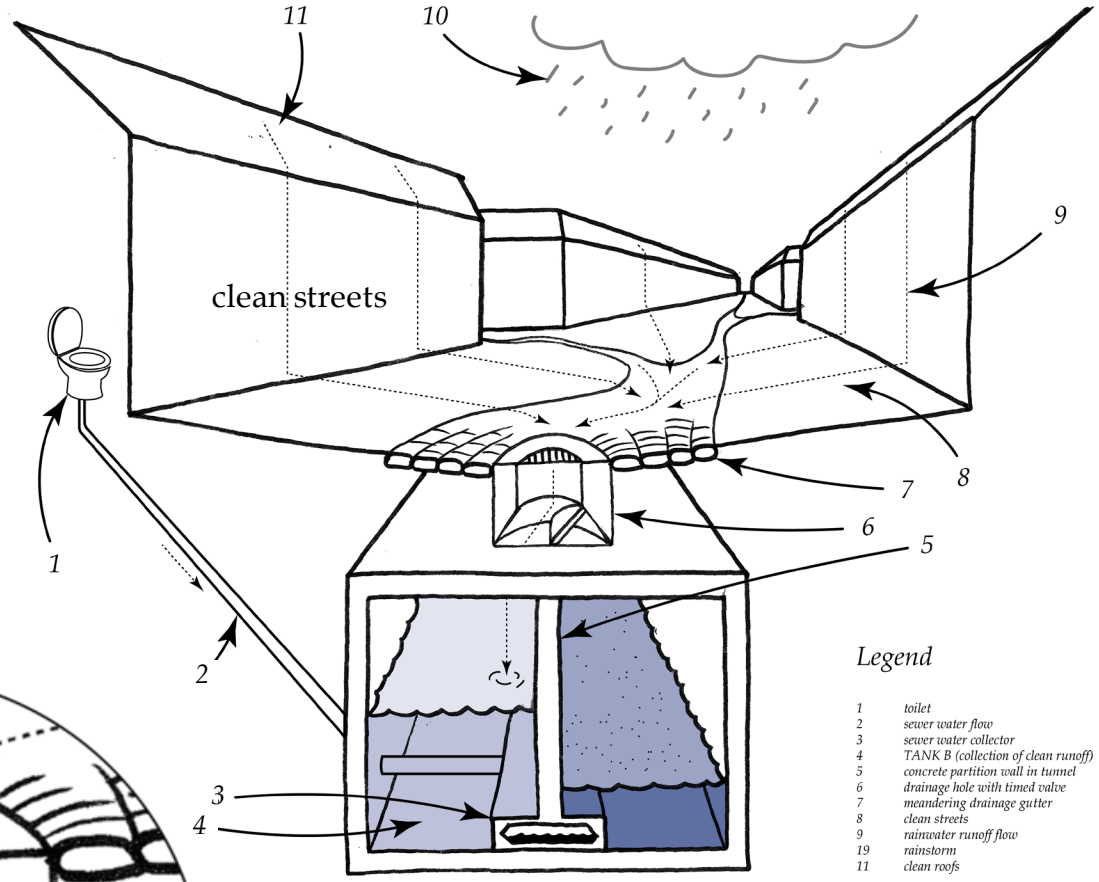
optimization phase = functional quality


Museum aan de Stroom
(City Museum)
Market Falconplein
Premetro Station Meir
Stadspark (City Park)
Market Oudevaartplaats
Shopping
and
Nightlife
Districts
Source: Google Earth, 2023


ANTWERP
UNEARTHED

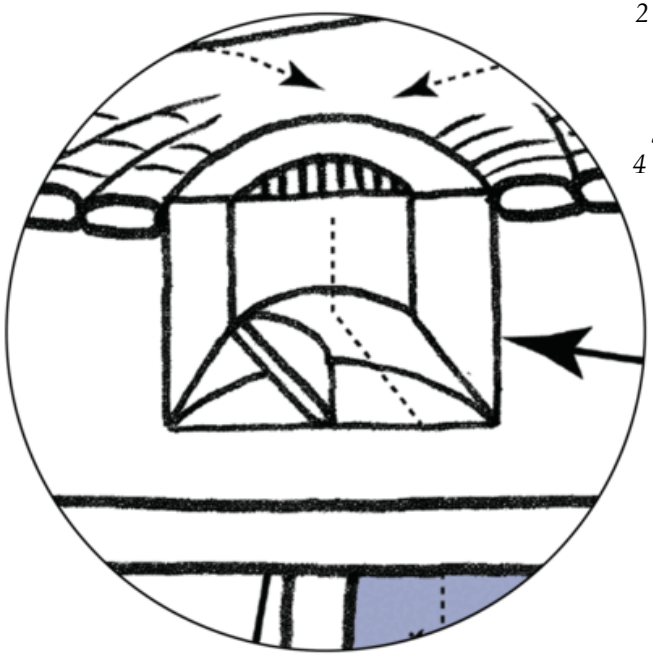

Tuinstraat





Legend

1	*toilet*
2	*sewer water flow*
3	*sewer water collector*
4	*TANK B (collection of clean runoff)*
5	*concrete partition wall in tunnel*
6	*drainage hole with timed valve*
7	*meandering drainage gutter*
8	*clean streets*
9	*rainwater runoff flow*
19	*rainstorm*
11	*clean roofs*



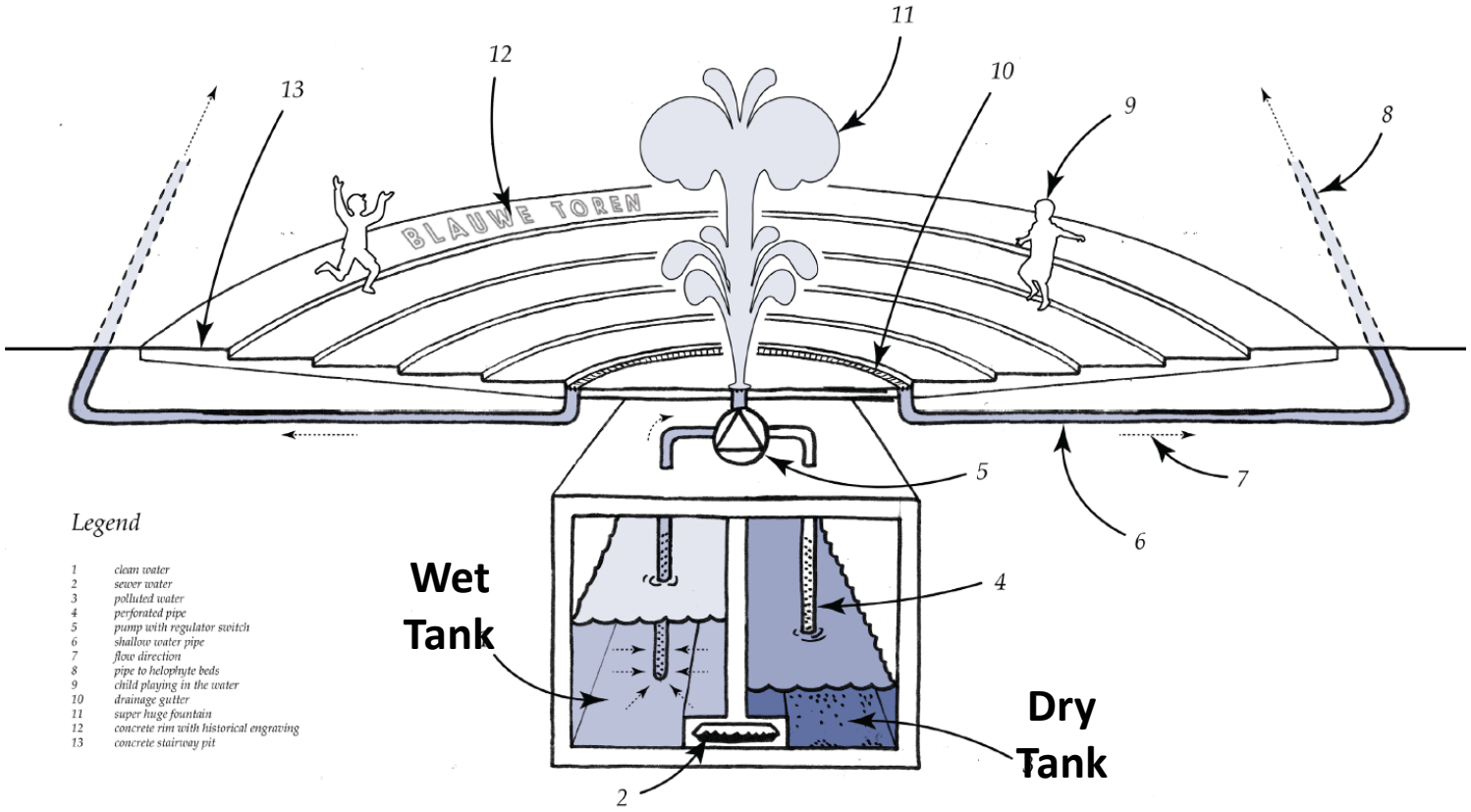
< 15 min

separate polluted runoff from the first 15 minutes …

… from clean runoff during the remaining rainstorm

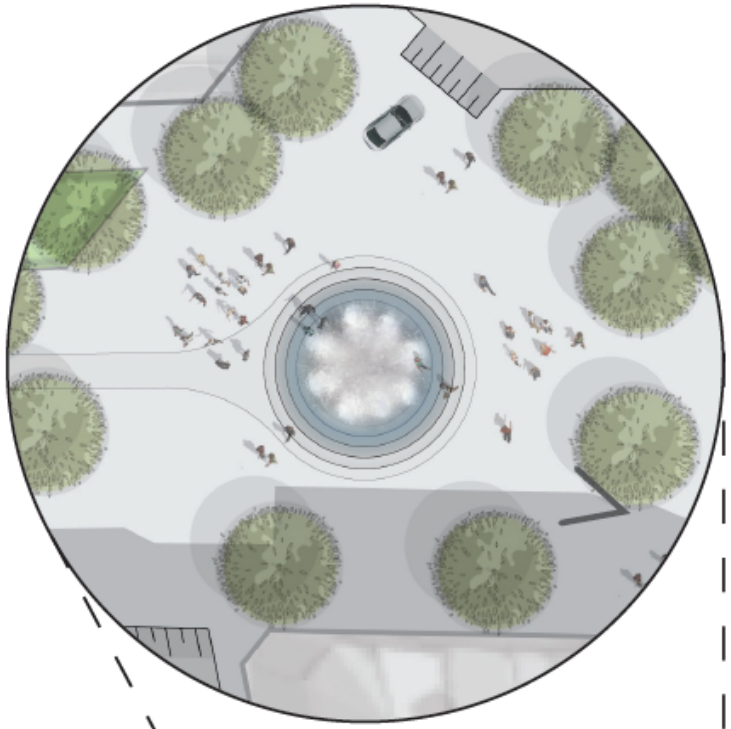
> 15 min


Blauwtorenplein

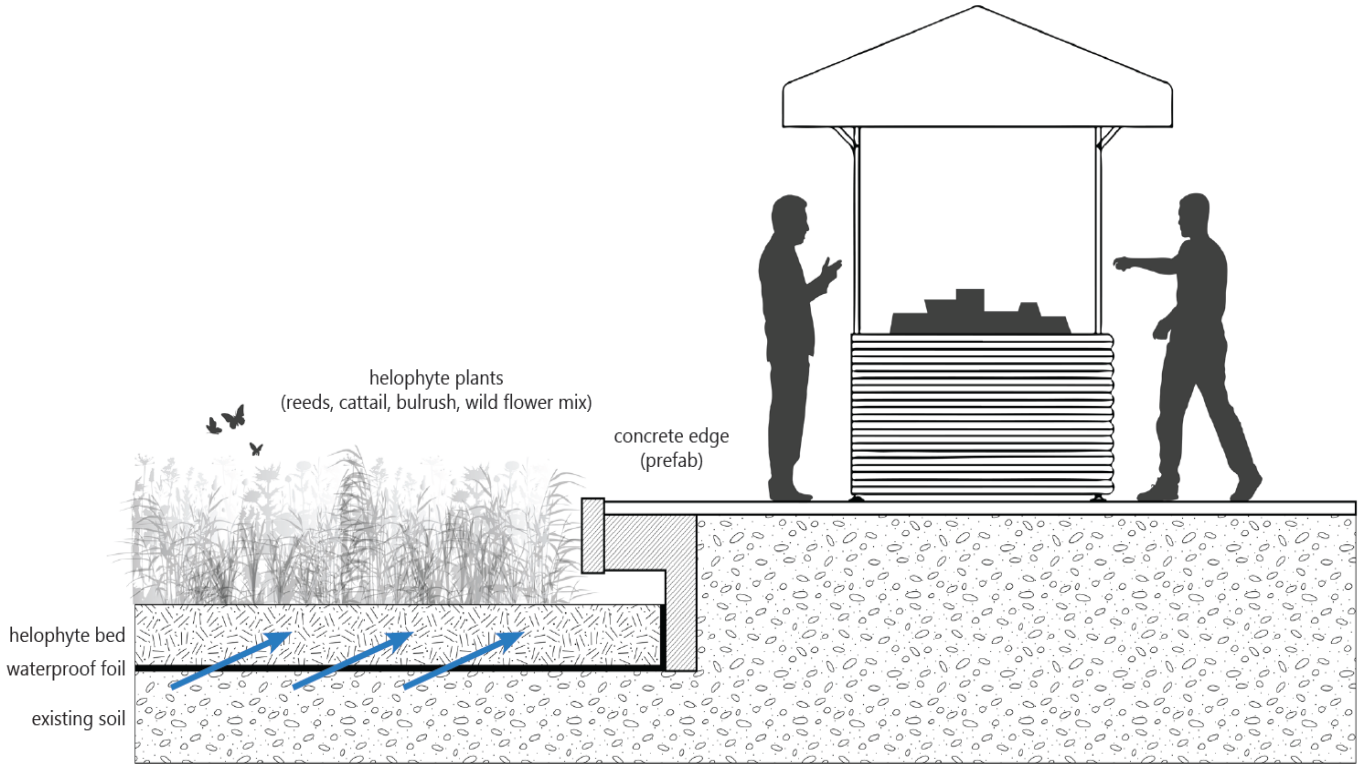


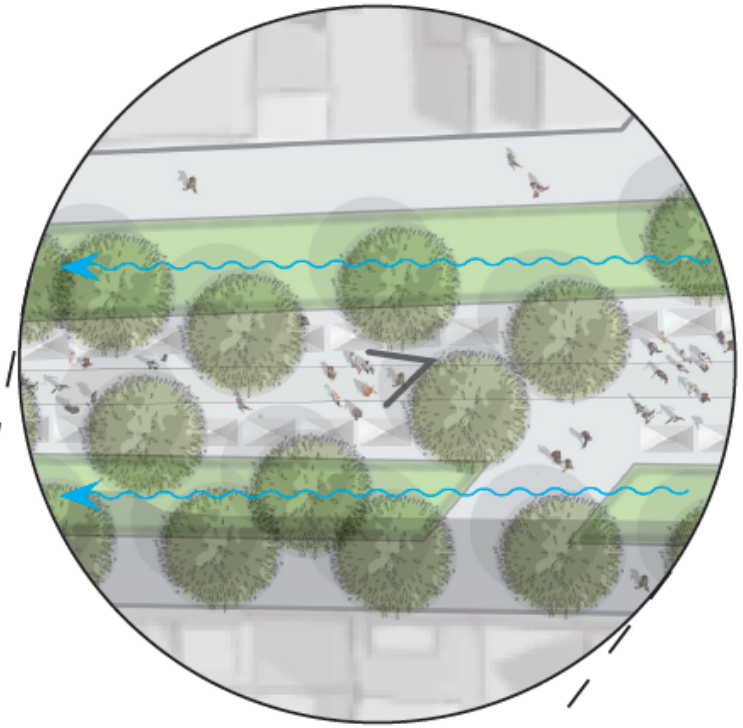
Legend

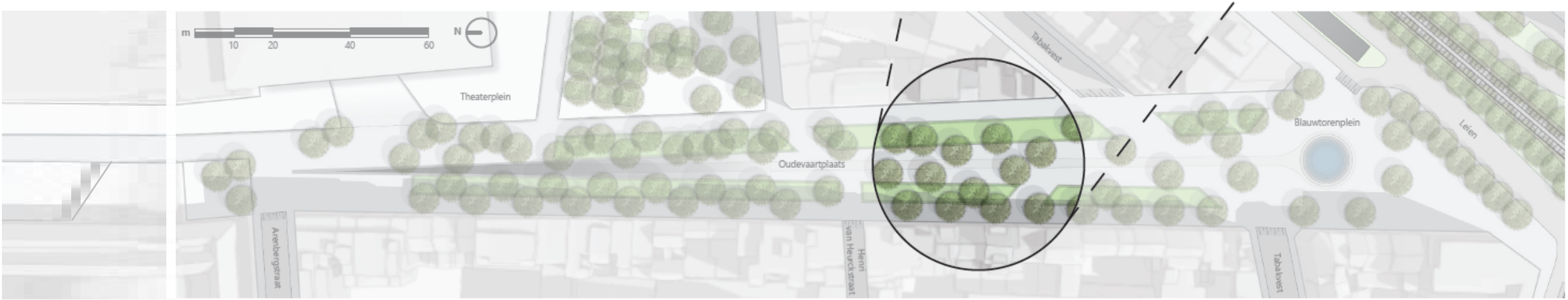
1	clean water
2	sewer water
3	polluted water
4	perforated pipe
5	pump with regulator switch
6	shallow water pipe
7	flow direction
8	pipe to helophyte beds
9	child playing in the water
10	drainage gutter
11	super huge fountain
12	concrete rim with historical engraving
13	concrete stairway pit



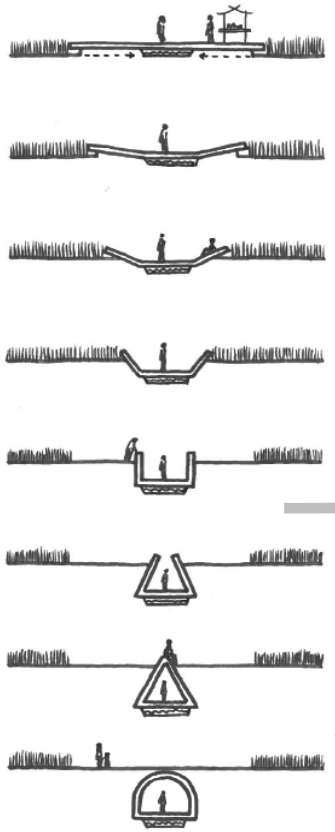

Oudevaartplaats

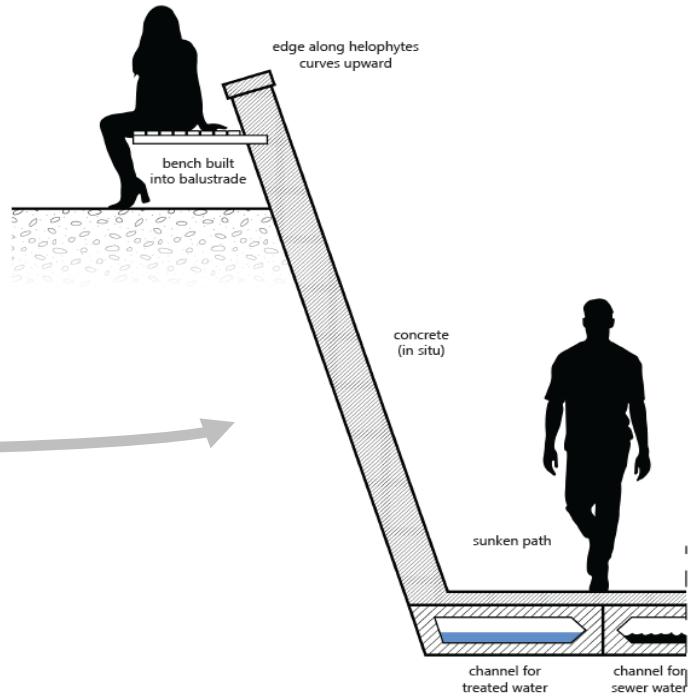

helophyte plants
(reeds, cattail, bulrush, wild flower mix)
concrete edge
(prefab)
helophyte bed
waterproof foil
existing soil

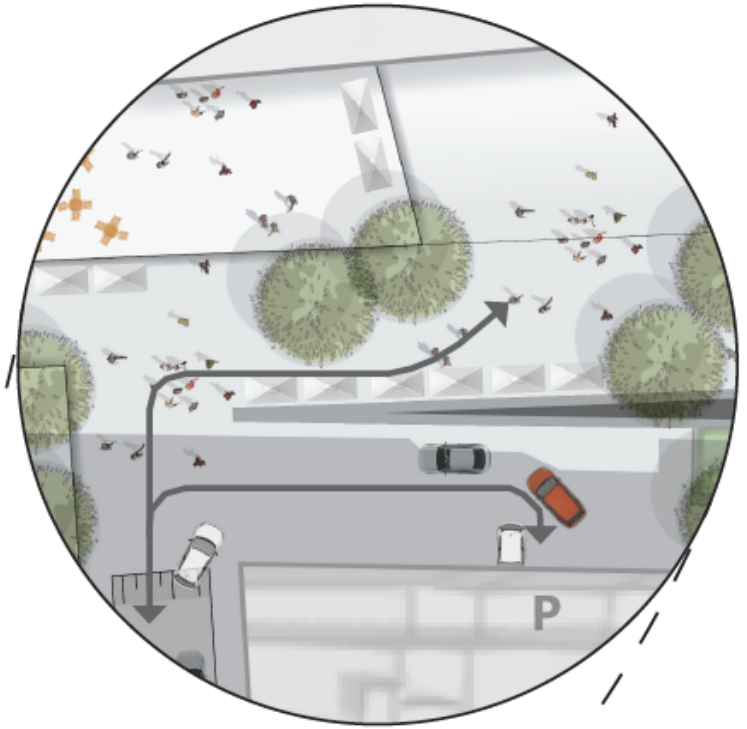



m
10
20
40
60
N
Theaterplein
Oudevaartplaats
Arenbergstraat
Henri van Heurckstraat
Tabakvest
Blauwtorenplein
Leien
Tabakvest


Theaterplein




edge along helophytes
curves upward
bench built
into balustrade
concrete
(in situ)
sunken path
channel for
treated water
channel for
sewer water


P


m
10
20
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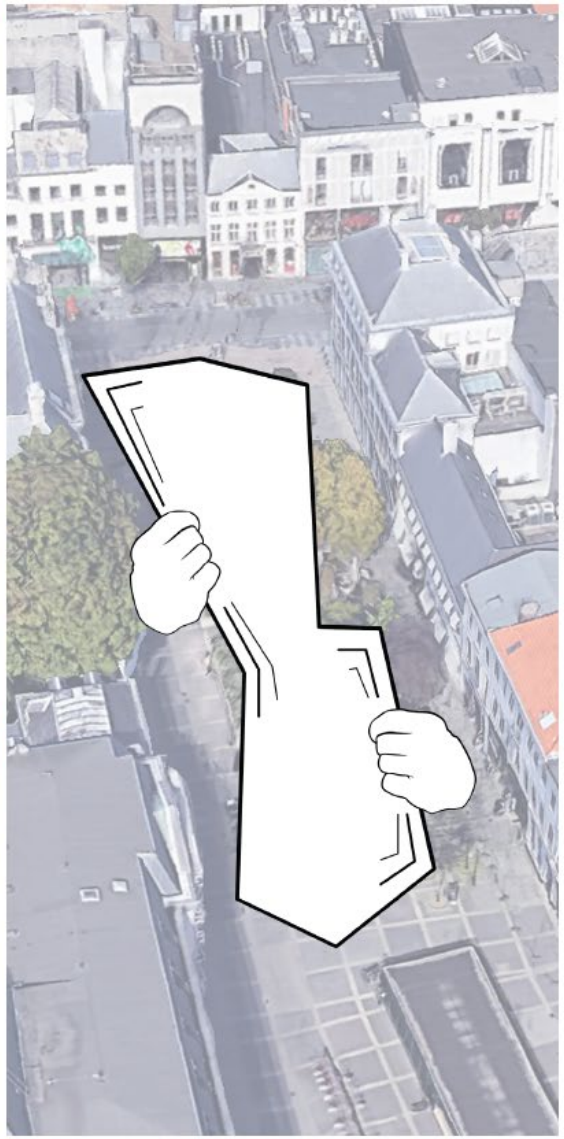
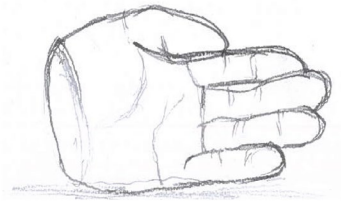
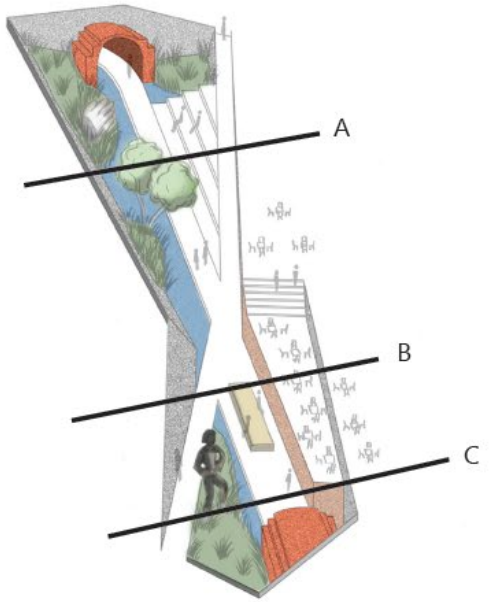
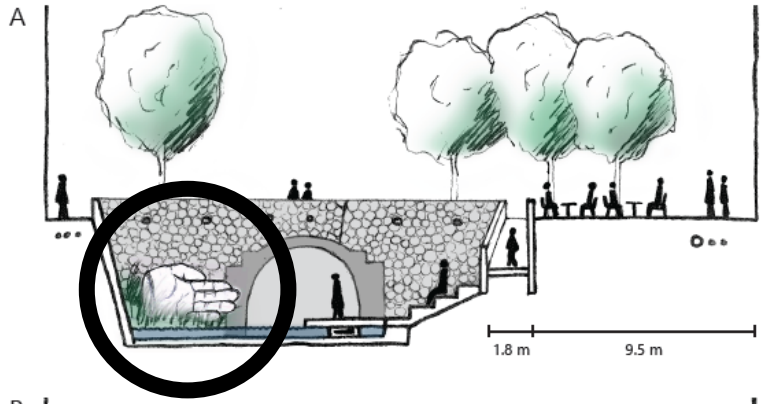
N
Theaterplein
Oudevaartplaats
Tabakvest
Blauwtorenplein
Leien
Tabakvest

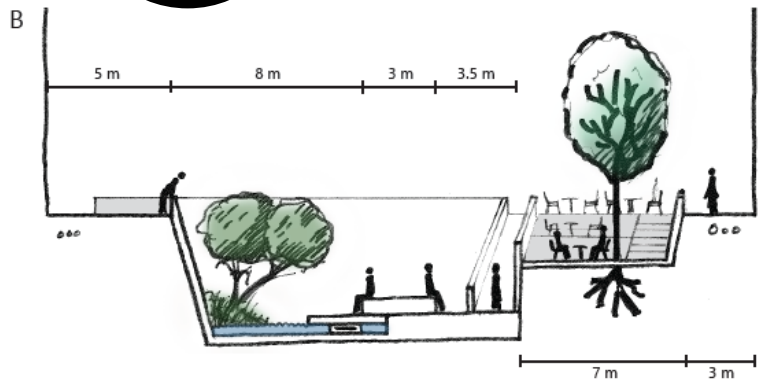

Wapperplein

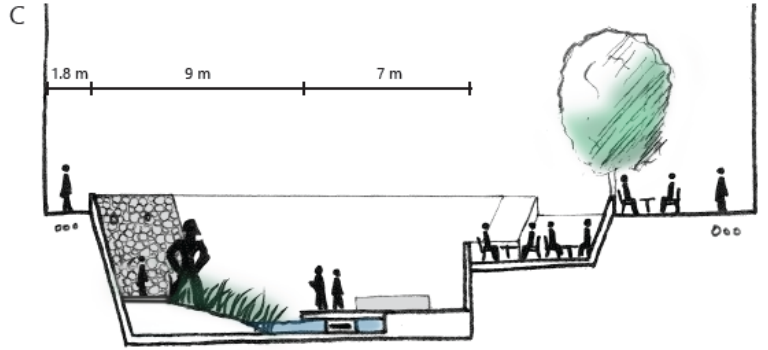




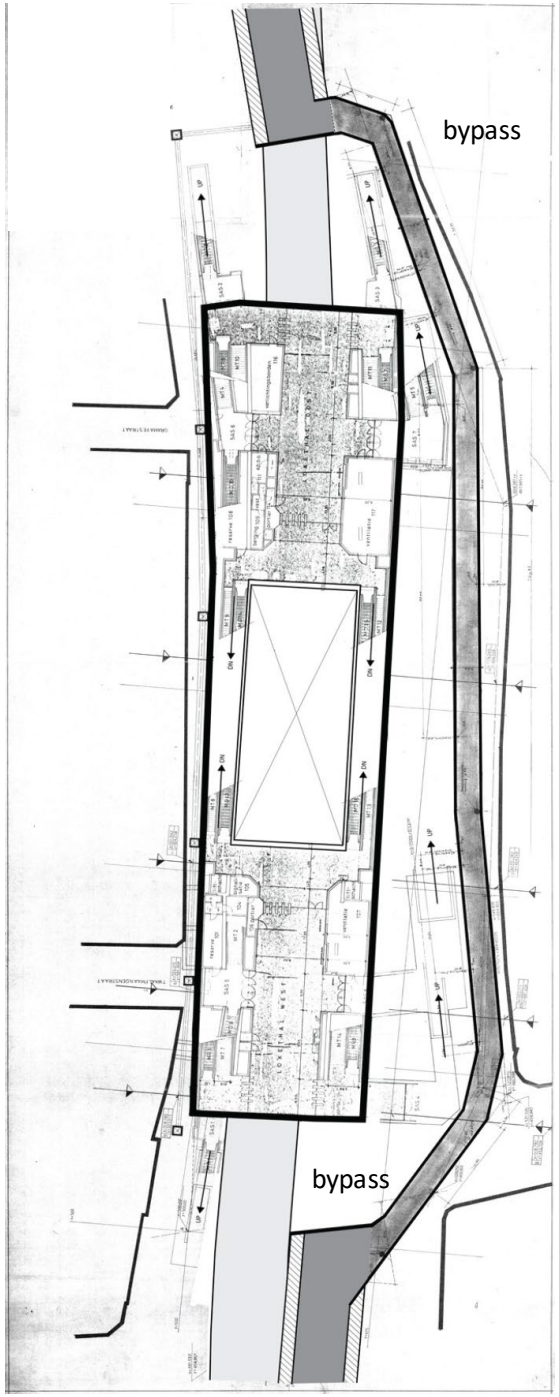

A
B
C

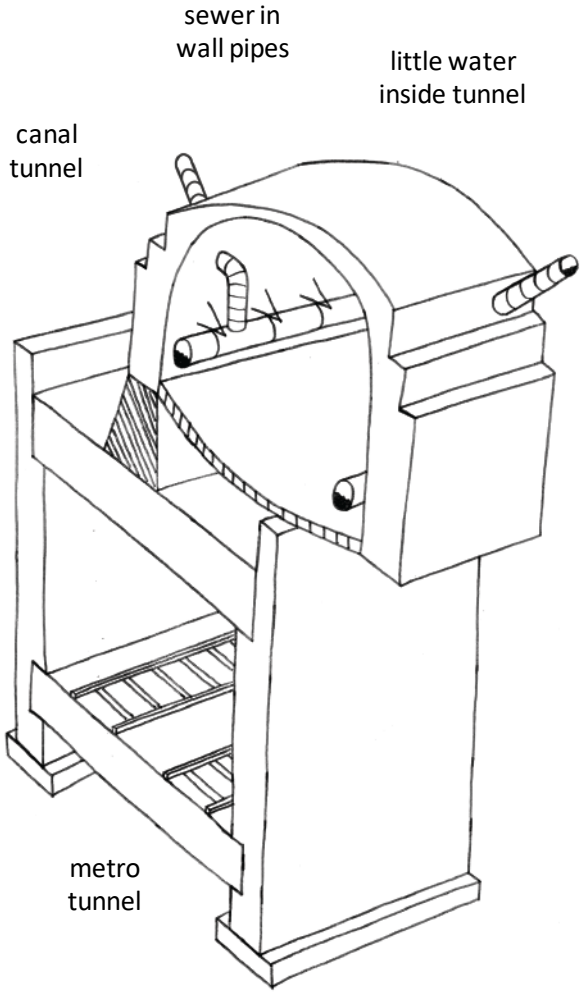

A
1.8 m
9.5 m


B
5 m
8 m
3 m
3.5 m
7 m
3 m

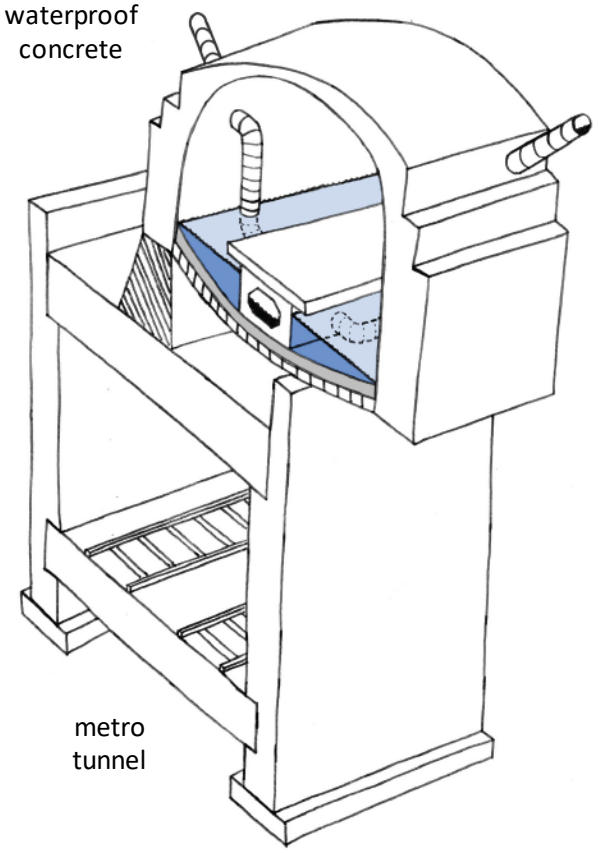

C
1.8 m
9 m
7 m


M
Station Meir
↑ WAPPER

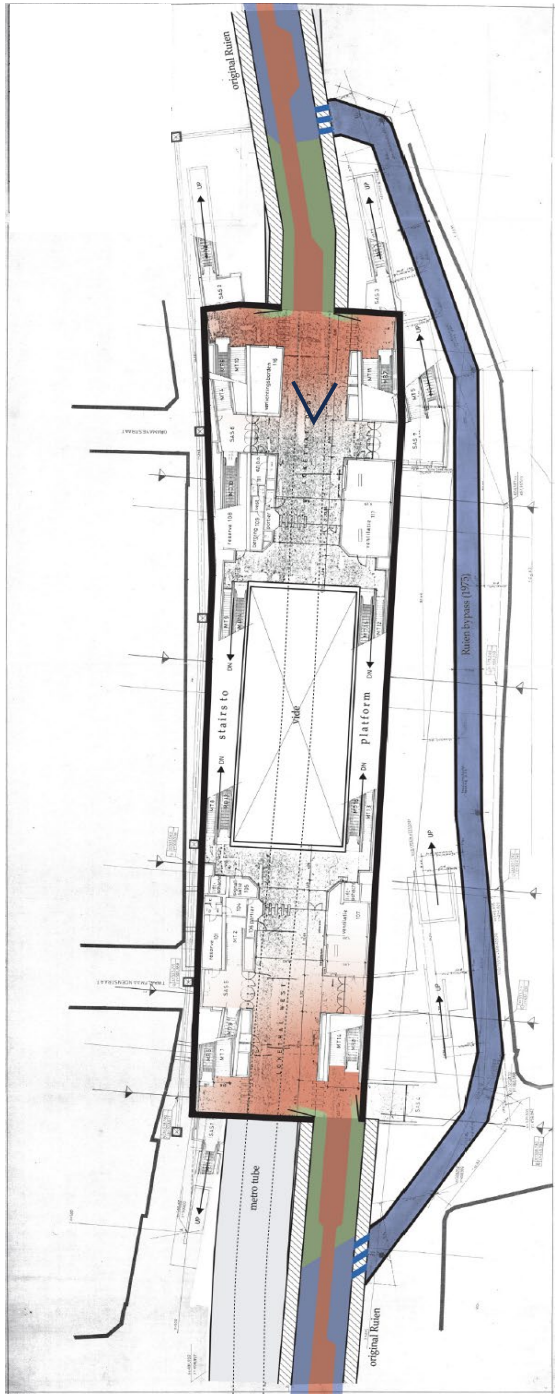




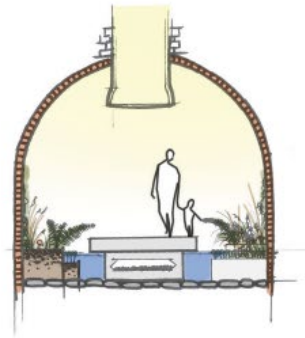
3D section
before



3D section
after




Sint Katelijnevest



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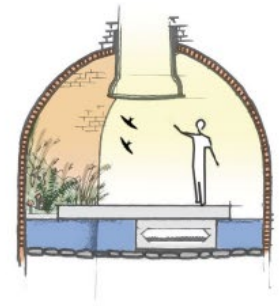

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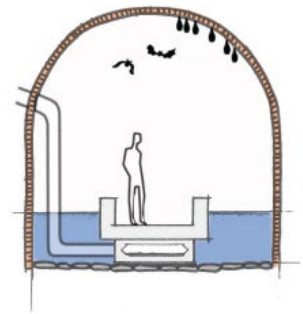

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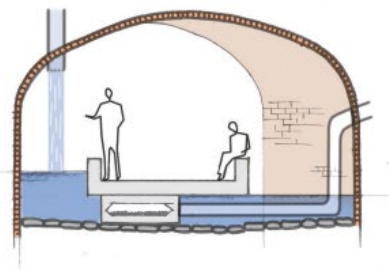

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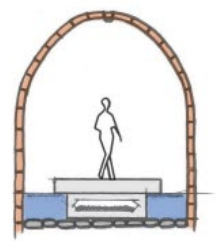

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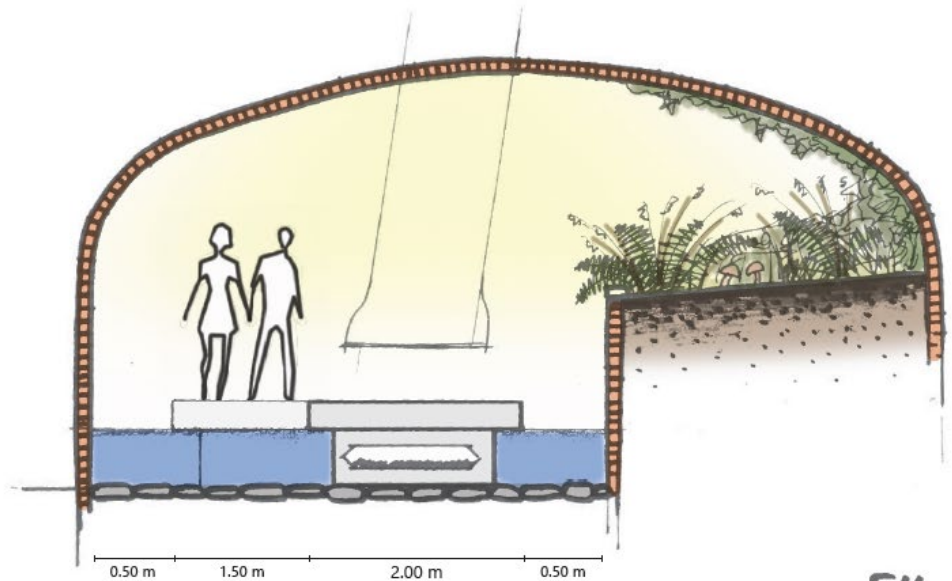
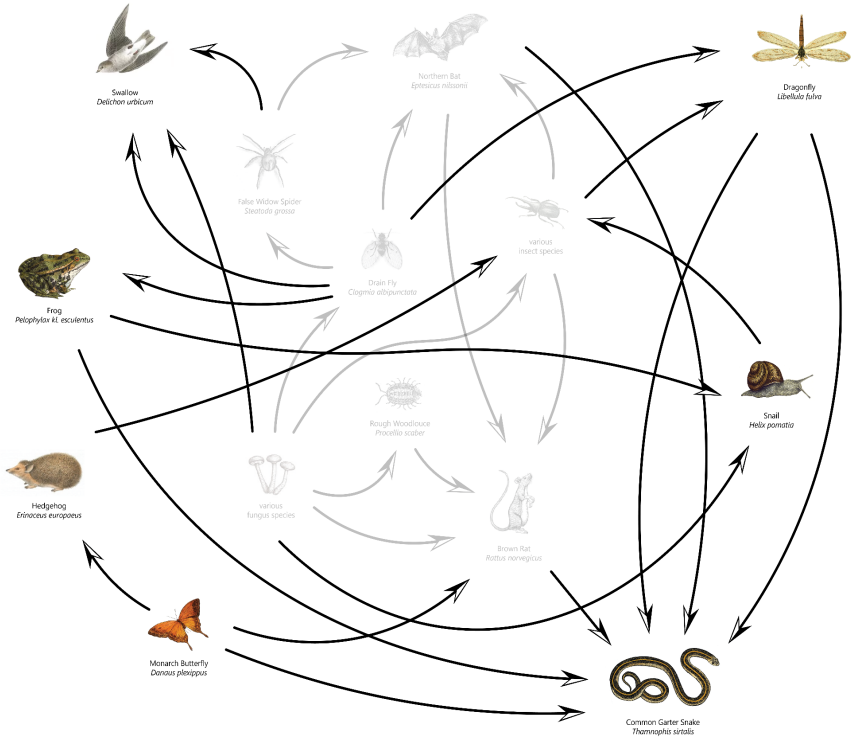
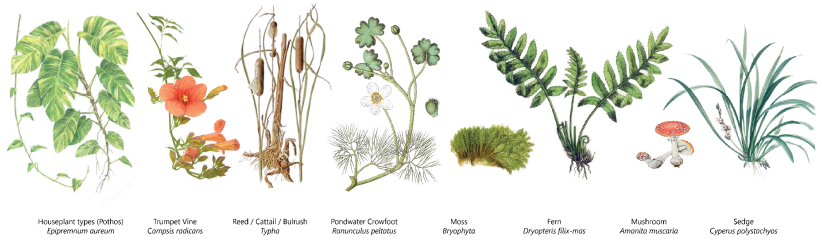


54


SINT KATHELIJNEVEST
Sint Katelijnevest



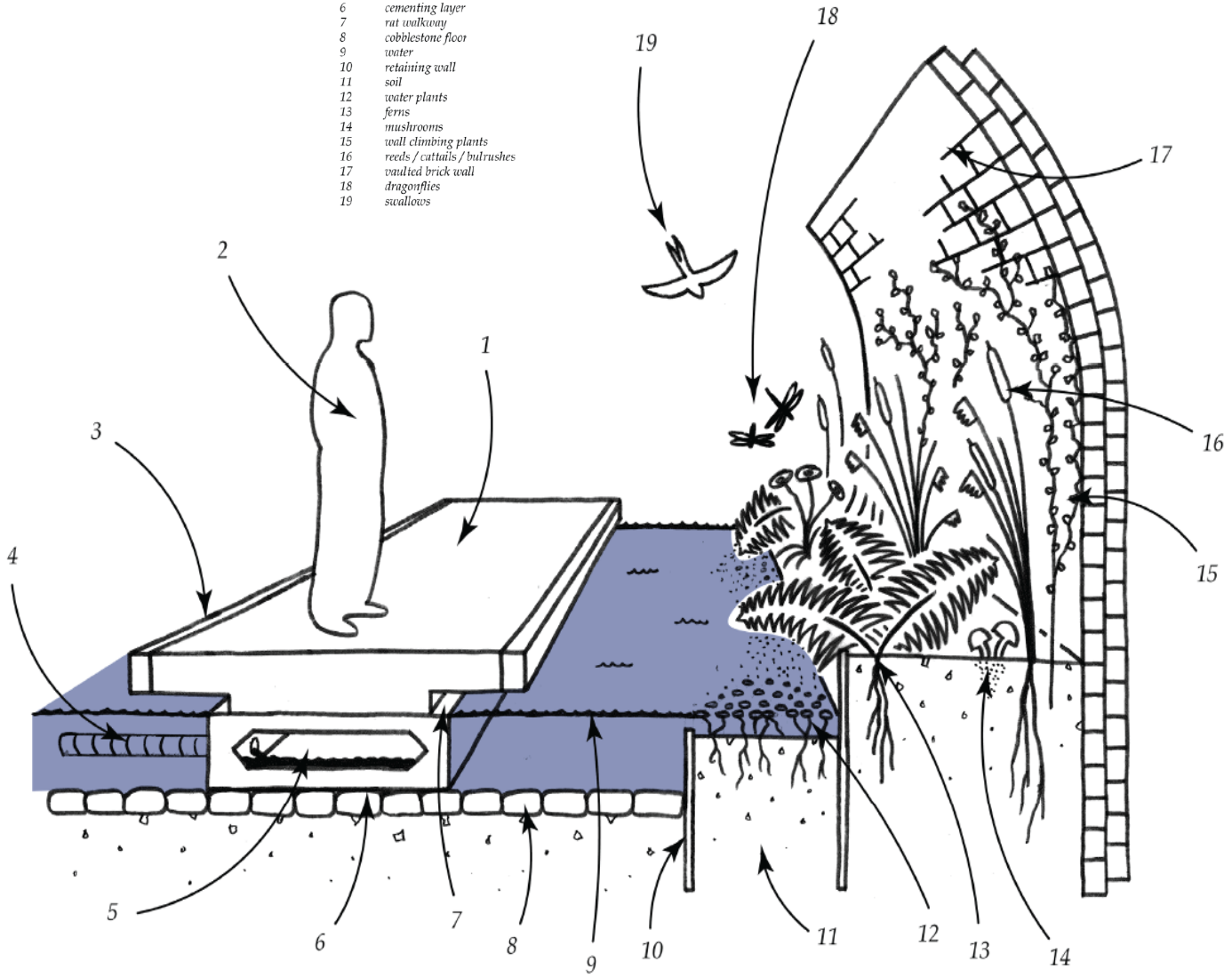


Ecosystem web

light grey = original (existing) ecosystem
colored = new to the ecosystem

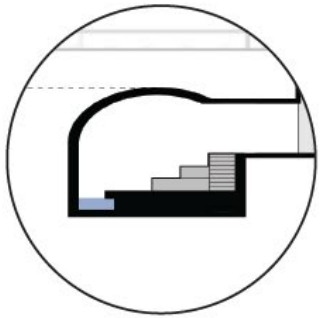
Legend

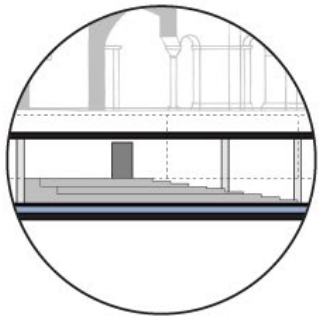
1 *walkway*
2 *pedestrian*
3 *walkway edging*
4 *sewer inflow*
5 *sewer collector*
6 *cementing layer*
7 *rat walkway*
8 *cobblestone floor*
9 *water*
10 *retaining wall*
11 *soil*
12 *water plants*
13 *ferns*
14 *mushrooms*
15 *wall climbing plants*
16 *reeds / cattails / bulrushes*
17 *vaulted brick wall*
18 *dragonflies*
19 *swallows*



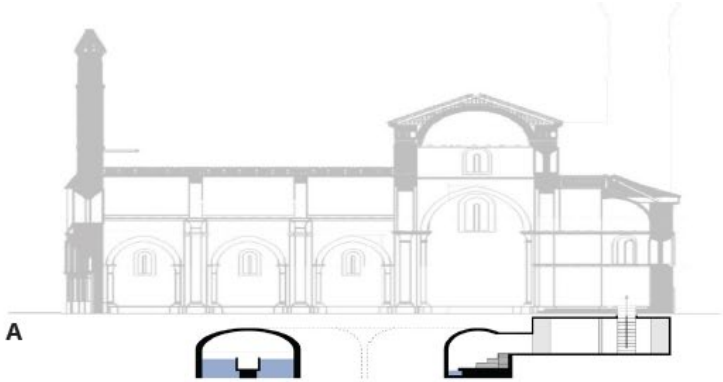

JESUITEN KERK
1600
Sint Carolus Borromeuskerk

amphitheatre niche
(zoom-in section A)

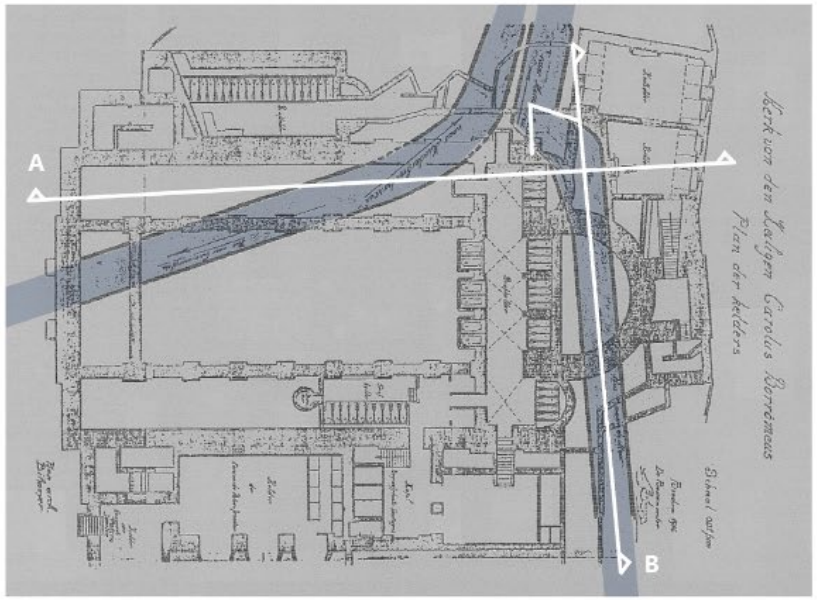


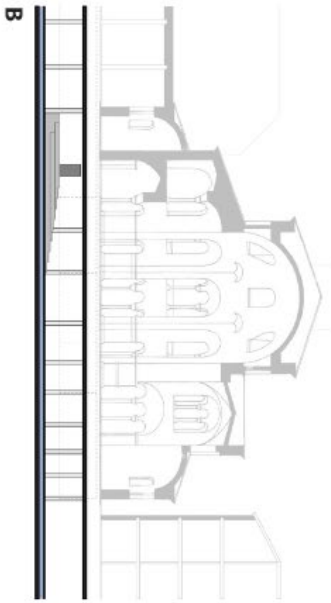


amphitheatre niche
(zoom-in section B)



A not-so-secret escape passage from the overhead church

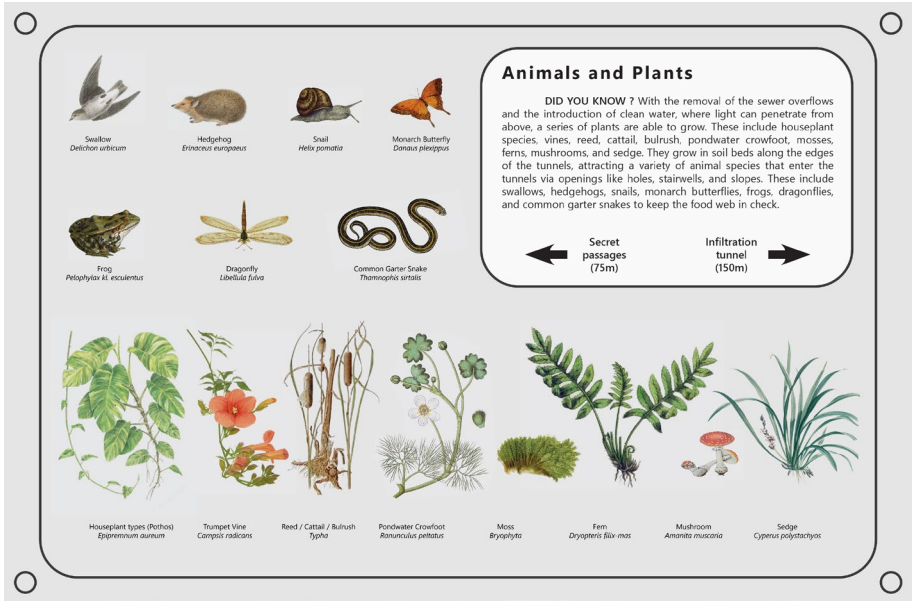




Minderbroedersrui

An overgrown entryway enhances the surface level street space

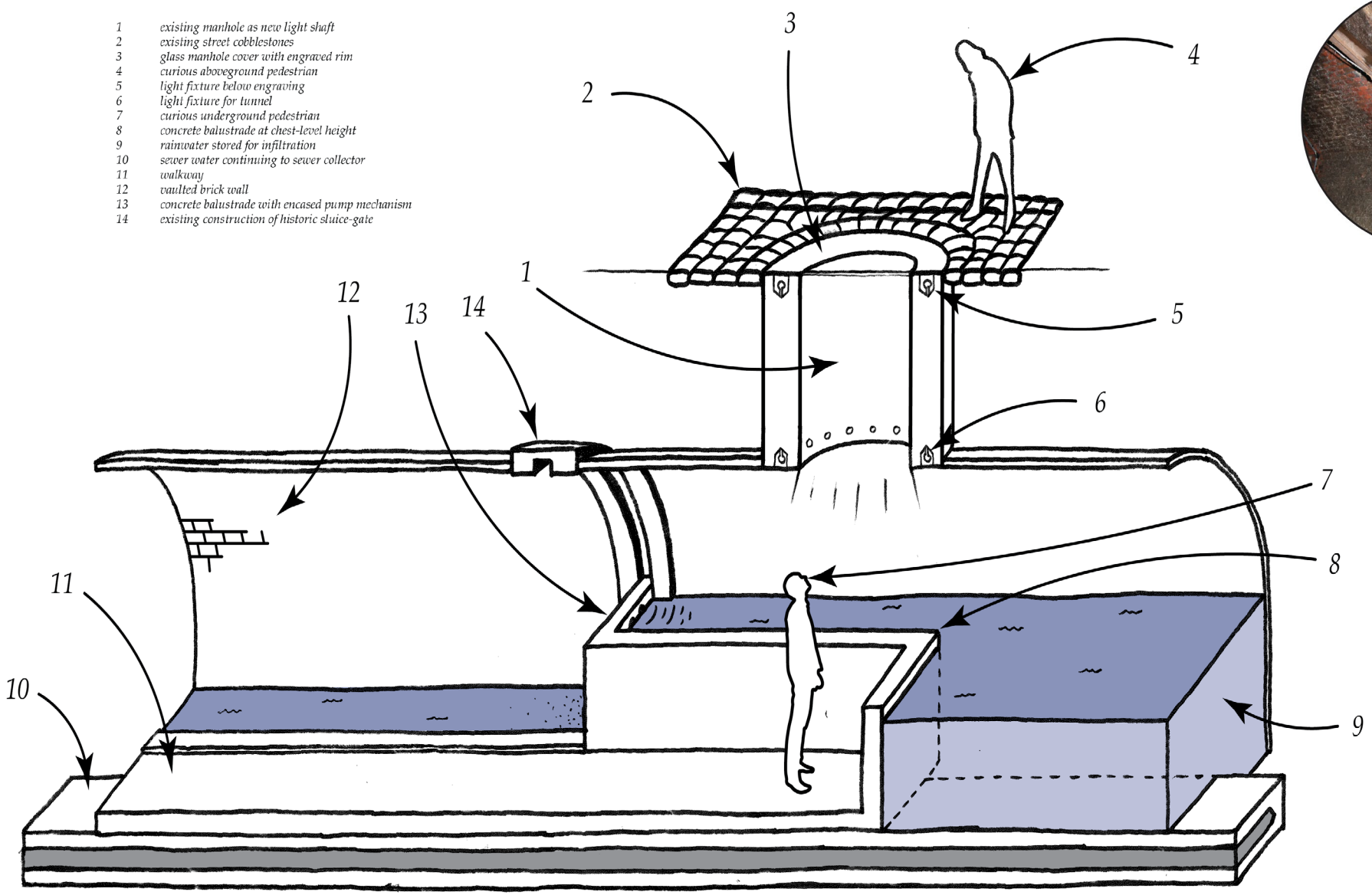
Interpretive signs offer wayfinding information for pedestrians



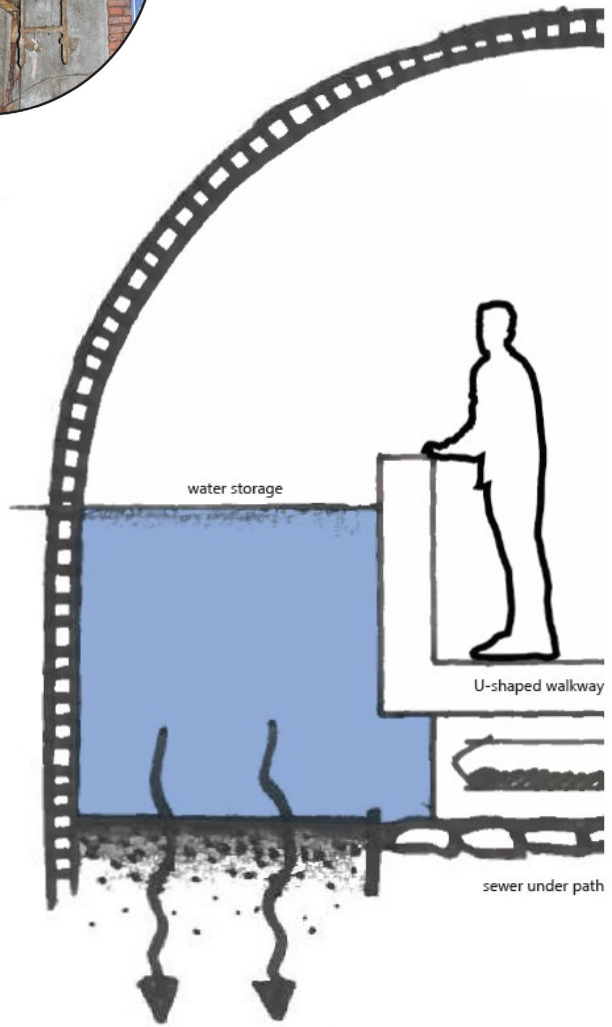

Wijngaardestraat

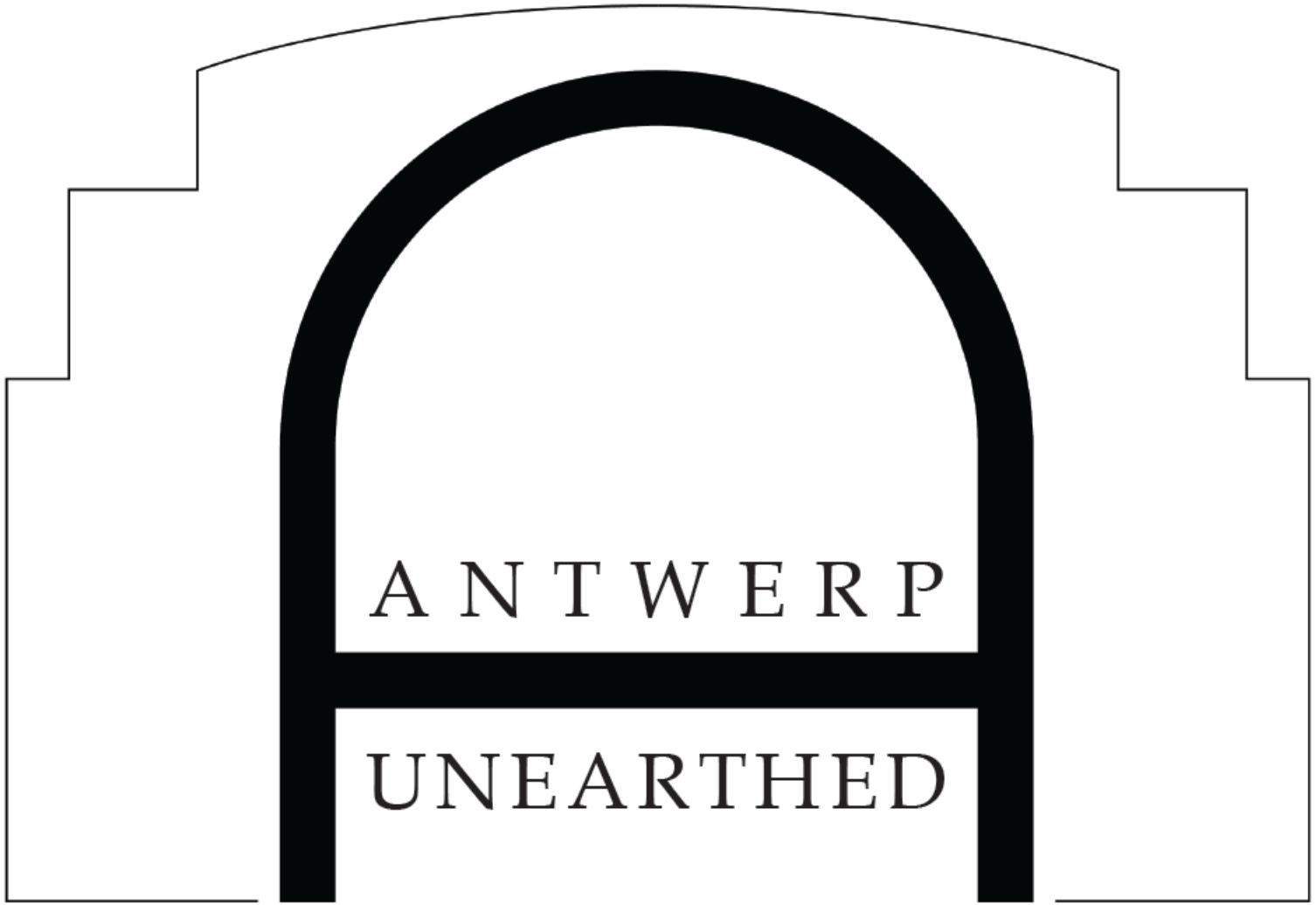
Legend

1 *existing manhole as new light shaft*
2 *existing street cobblestones*
3 *glass manhole cover with engraved rim*
4 *curious aboveground pedestrian*
5 *light fixture below engraving*
6 *light fixture for tunnel*
7 *curious underground pedestrian*
8 *concrete balustrade at chest-level height*
9 *rainwater stored for infiltration*
10 *sewer water continuing to sewer collector*
11 *walkway*
12 *vaulted brick wall*
13 *concrete balustrade with encased pump mechanism*
14 *existing construction of historic sluice-gate*



14
old sluice-gate in its construction groove

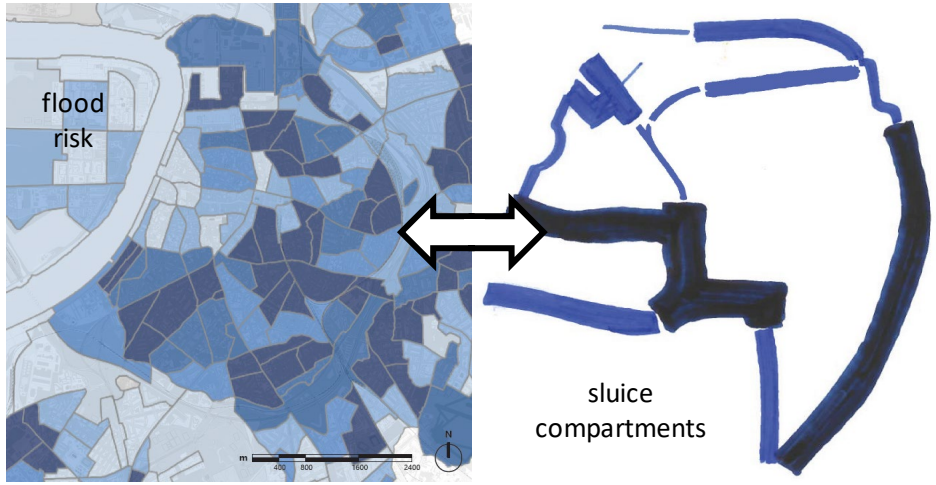



ANTWERP
UNEARTHED

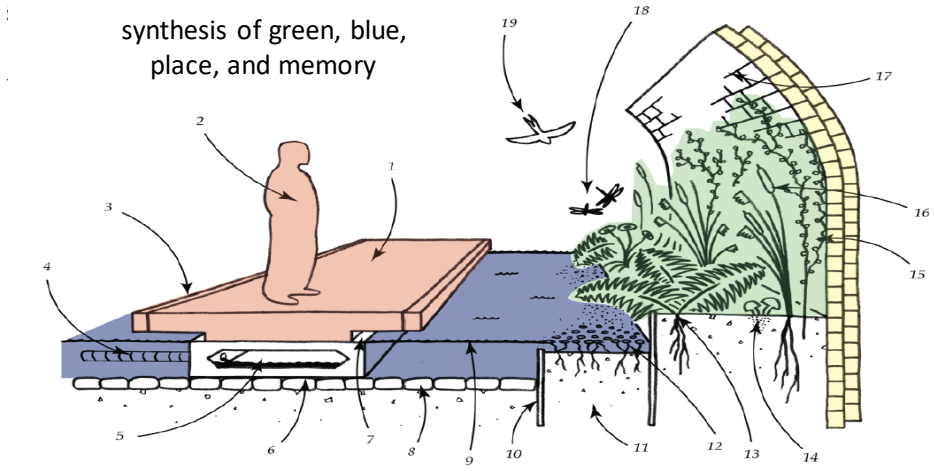
7. Results

How can the reappropriation of the decommissioned underground canal system in Antwerp spatially mediate the city's urgencies regarding environmental and social infrastructure?

By pairing external problems with internal potentials



By forming a singly functioning infrastructure system



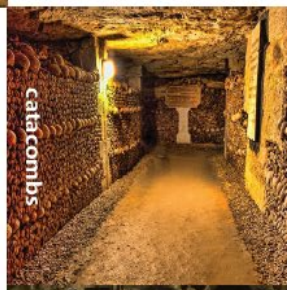
8. Relevance

SOCIETAL RELEVANCE

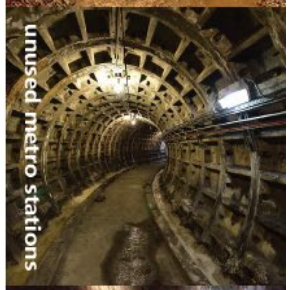
Apply to other cities facing space shortages for environmental and social infrastructures

BEIJING, CH | BERGEN OP ZOOM, NL | SYDNEY, AU | VANCOUVER, CA | NAPLES, IT

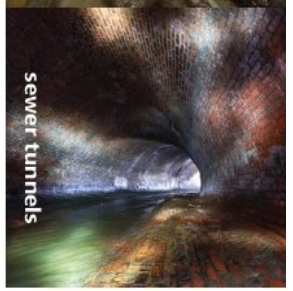
PARIS, FR



LONDON, UK



MOSCOW, RS



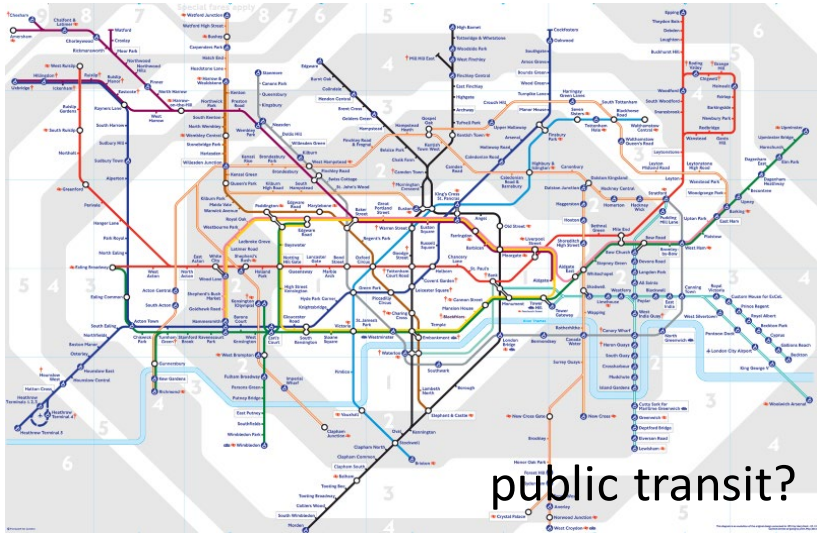
SCIENTIFIC RELEVANCE

Develop a method for implementing multiple infrastructures without conflicts

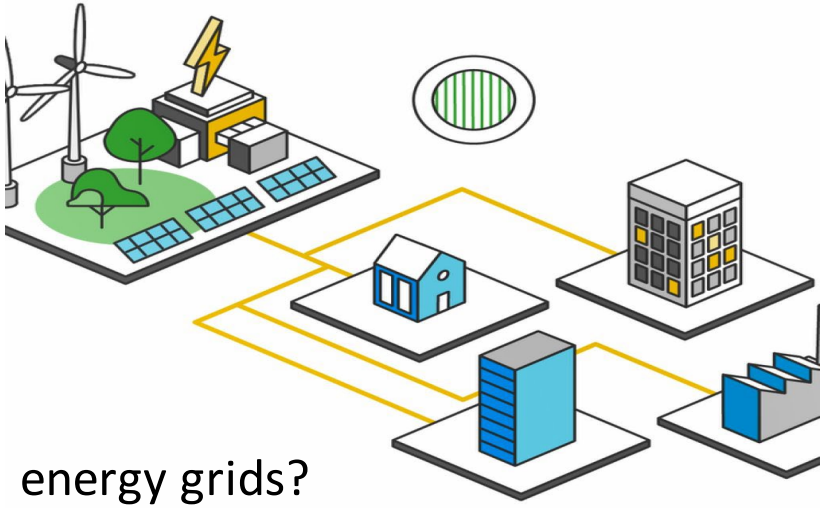
	Theme 1	Theme 2	Theme 3	Theme 4
1. **Inventory** each theme *- outline problems*				
2. **Analyze** each theme *- outline potentials*				
3. **Maximize** each theme *- outline proposals*	GREEN	BLUE	PLACE	MEMORY
4. **Optimize** each theme *- outline principles*	GREEN +	BLUE +	PLACE +	MEMORY
5. **Integrate** each theme *- outline plans*				

PROFESSIONAL RELEVANCE

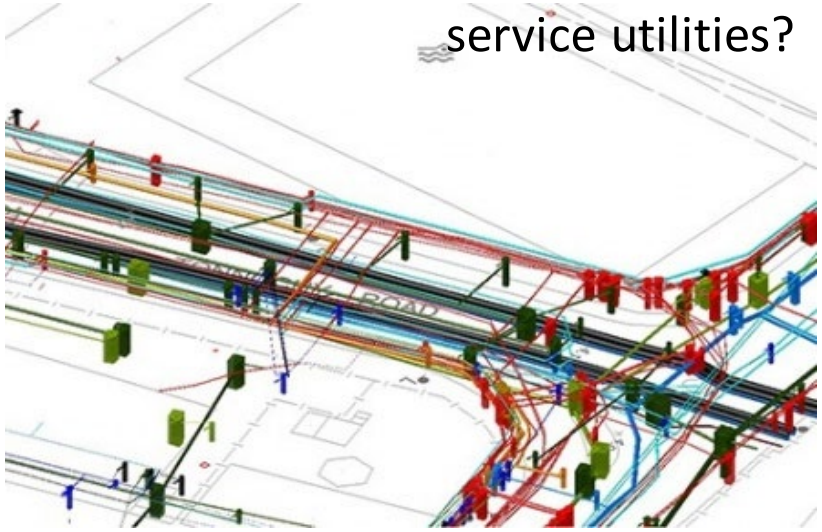
Expand the interdisciplinary knowledge on infrastructure implementation



public transit?

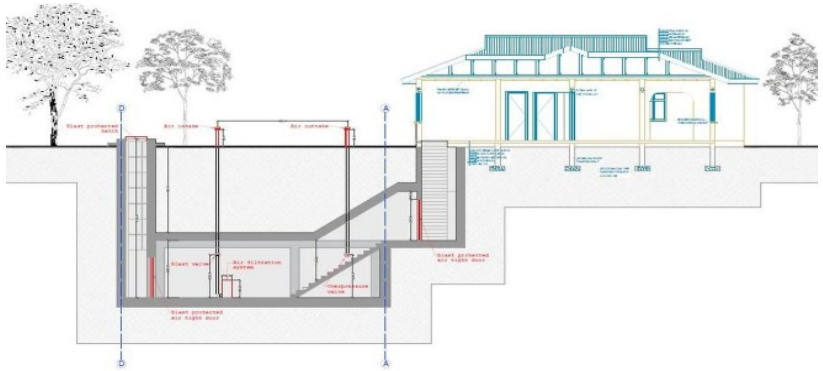


energy grids?

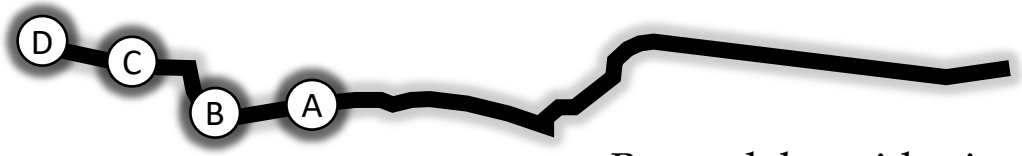


service utilities?

housing?

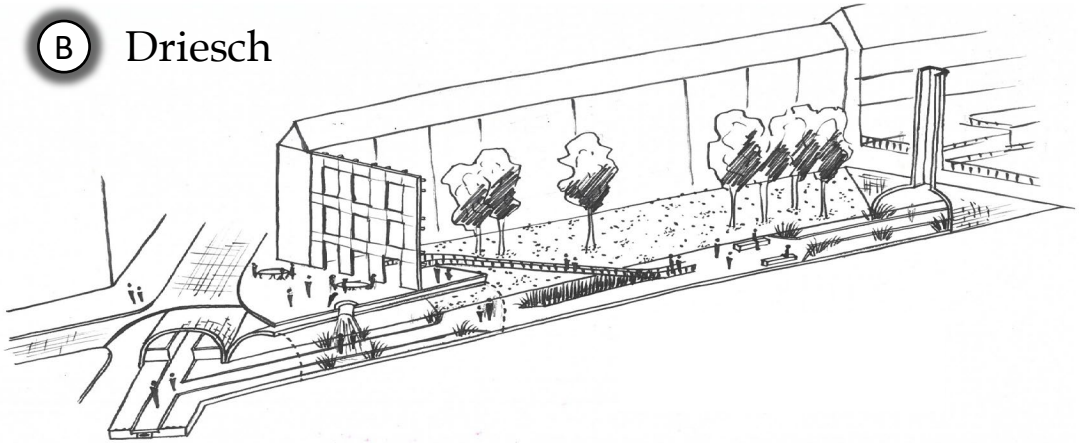


THANK YOU !

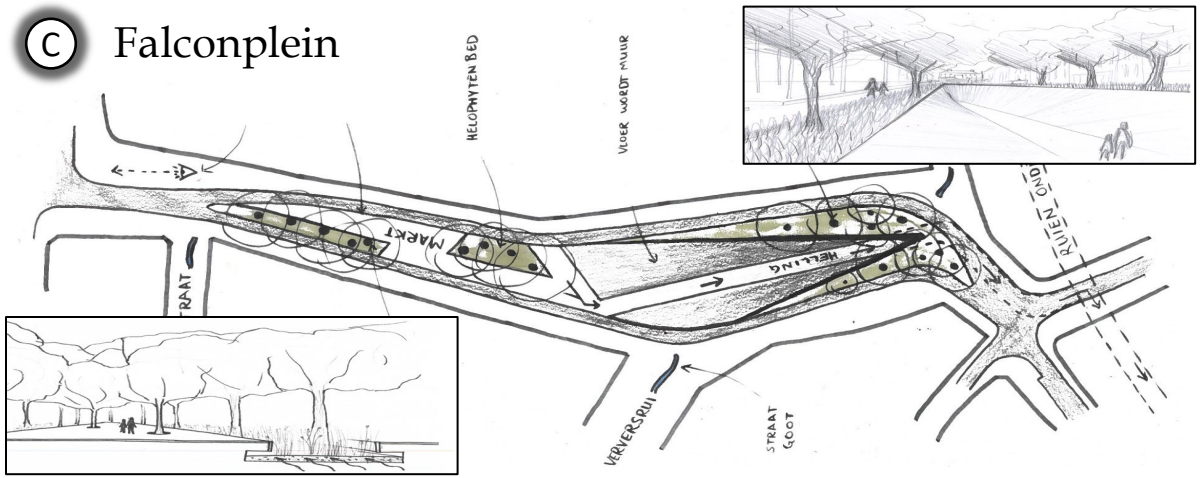


Beyond the midpoint

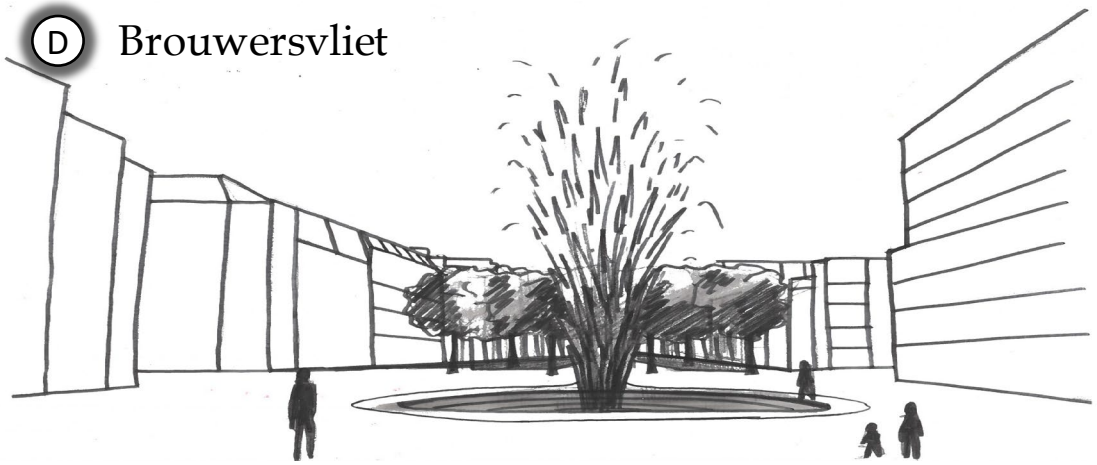
B Driesch

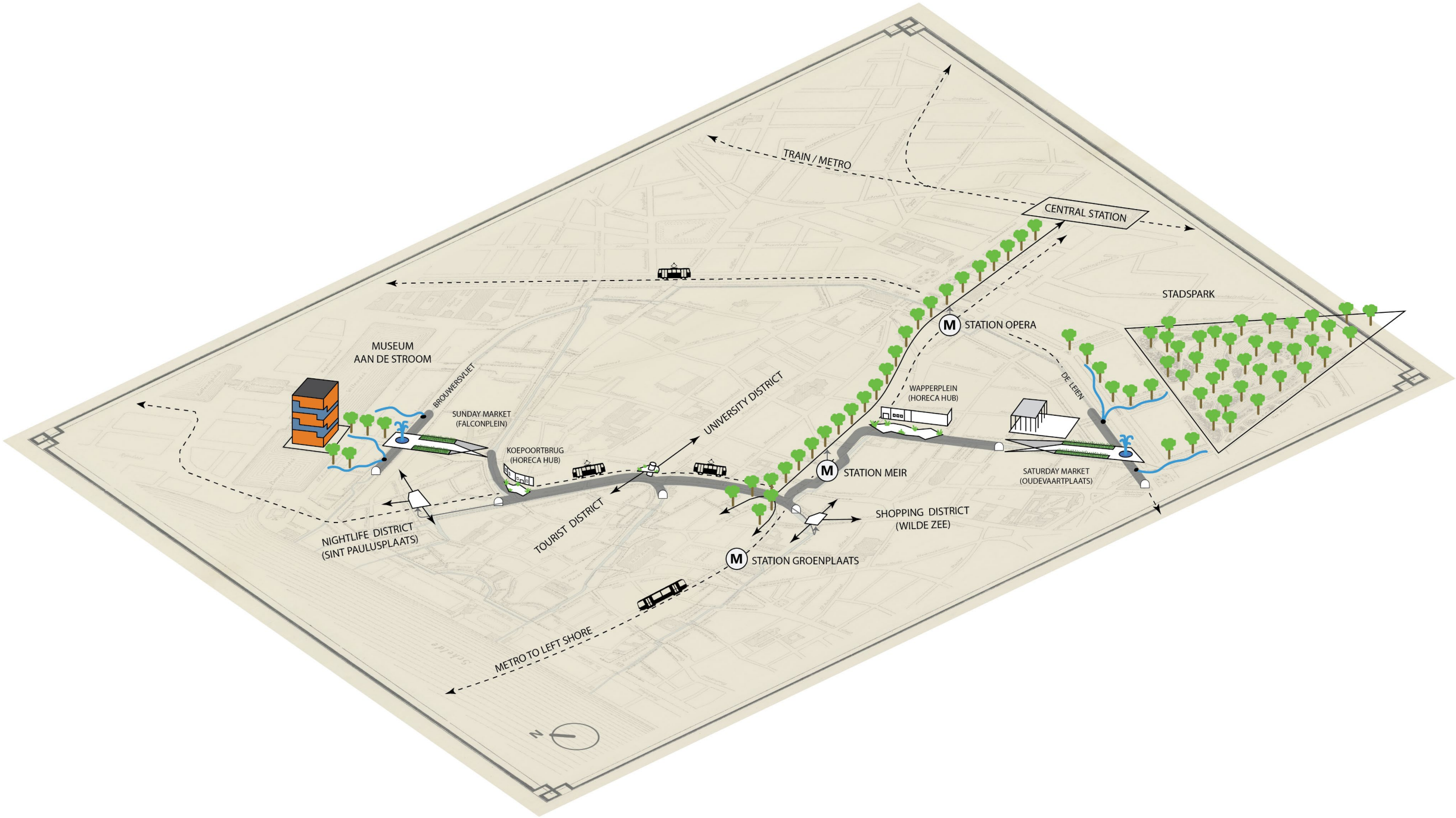


C Falconplein



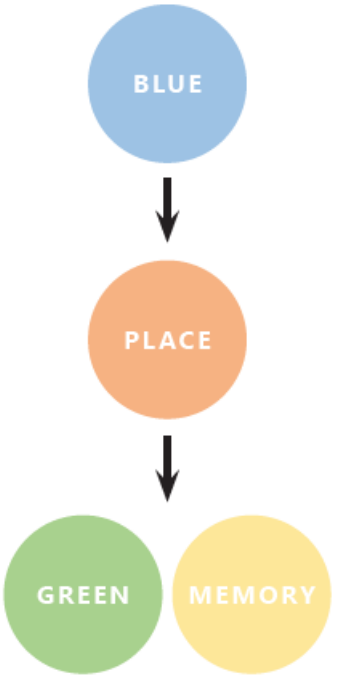
D Brouwersvliet




TRAIN / METRO
CENTRAL STATION
STADSPARK
STATION OPERA
MUSEUM
AAN DE STROOM
BROUWERSVLIET
SUNDAY MARKET
(FALCONPLEIN)
KOEPOORTBRUG
(HORECA HUB)
UNIVERSITY DISTRICT
WAPPERPLEIN
(HORECA HUB)
DE LEIEN
STATION MEIR
SATURDAY MARKET
(OUDEVAARTPLAATS)
NIGHTLIFE DISTRICT
(SINT PAULUSPLAATS)
TOURIST DISTRICT
SHOPPING DISTRICT
(WILDE ZEE)
STATION GROENPLAATS
METRO TO LEFT SHORE
N

Phasing Strategy: phasing by theme

1. BLUE > acts most as a system
2. PLACE > determines success of green or memory
3. GREEN + MEMORY > scattered throughout, based on human presence



Phasing Strategy: phasing by location

Blauwtorenplein – Oudevaartplaats – Theaterplaats

Green:

- heat stress reduction (fountain) and ecological value (helophytes)

Blue:

- water regulating (fountain) and treating (helophytes) > infiltrating can be added at the bottom of the descending path

Place

- create new public space on an unnecessary parking lot and enhance the existing market space

Memory

- Sluice-tower (fountain) and canal (paving) is accentuated, while the tunnel itself becomes accessible