P5 Graduation Presentation
03.07.2023
Clarissa Bechmann

Metropolitan Ecologies of Places Studio
1st mentor: Remon Rooij ● 2nd mentor: Nico Tillie ● External examiner: Wing Yung

Urban Nature in Daily Doses

Restorative Design Strategies for improved personal and ecological well-being in Berlin

„Hitzestress in Berlin: An besonders heißen Orten droht Lebensgefahr“

If children lose contact with nature they won't fight for it
George Monbiot

Lärm, Anonymität, Dreck
Stress-Forscher: Das Stadtleben macht psychisch krank - doch es gibt einen Ausweg

The metropolis and mental health: are big cities making us sick?
Published: October 20, 2015 5.57pm CEST

How city living could be making you anxious - and how to deal with it

Feb 4, 2020

Urban Loneliness & Isolation: The Dark Side Of Living In A Big City

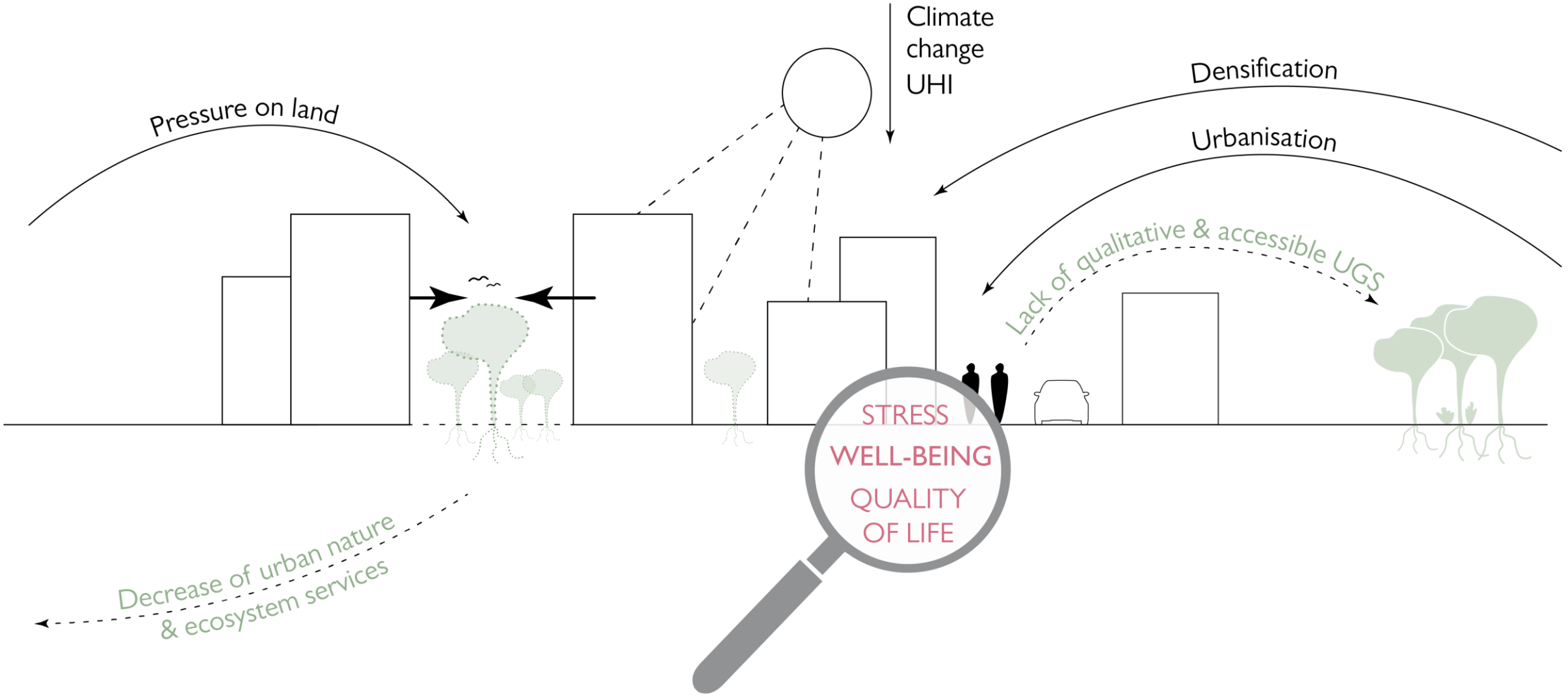
Sick cities: why urban living can be bad for your mental health

Humans Losing Touch with Nature

Fig. 1: Sustainable Development Goal 3 (adapted from UN, 2015)

Fig. 2: Sustainable Development Goal 11 (adapted from UN, 2015)

Problematisation at the case of Berlin



Lack of accessible and qualitative green

"More green is needed but where? Everything is built up."

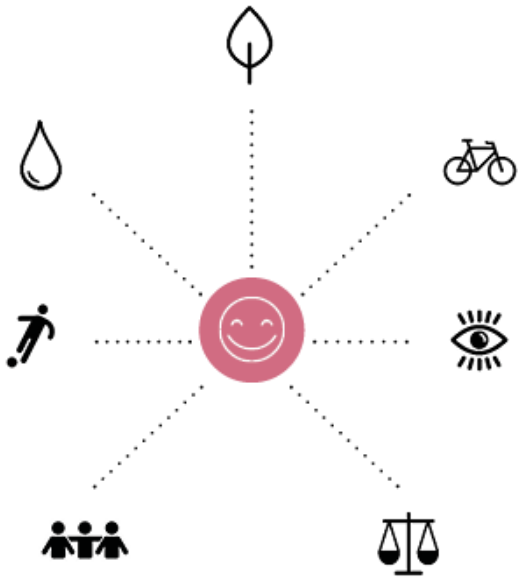
"I am preferably on my balcony. Everywhere else are too many people. When I go for a run in the park, I am more stressed afterwards."

(Quotes from street conversations)*

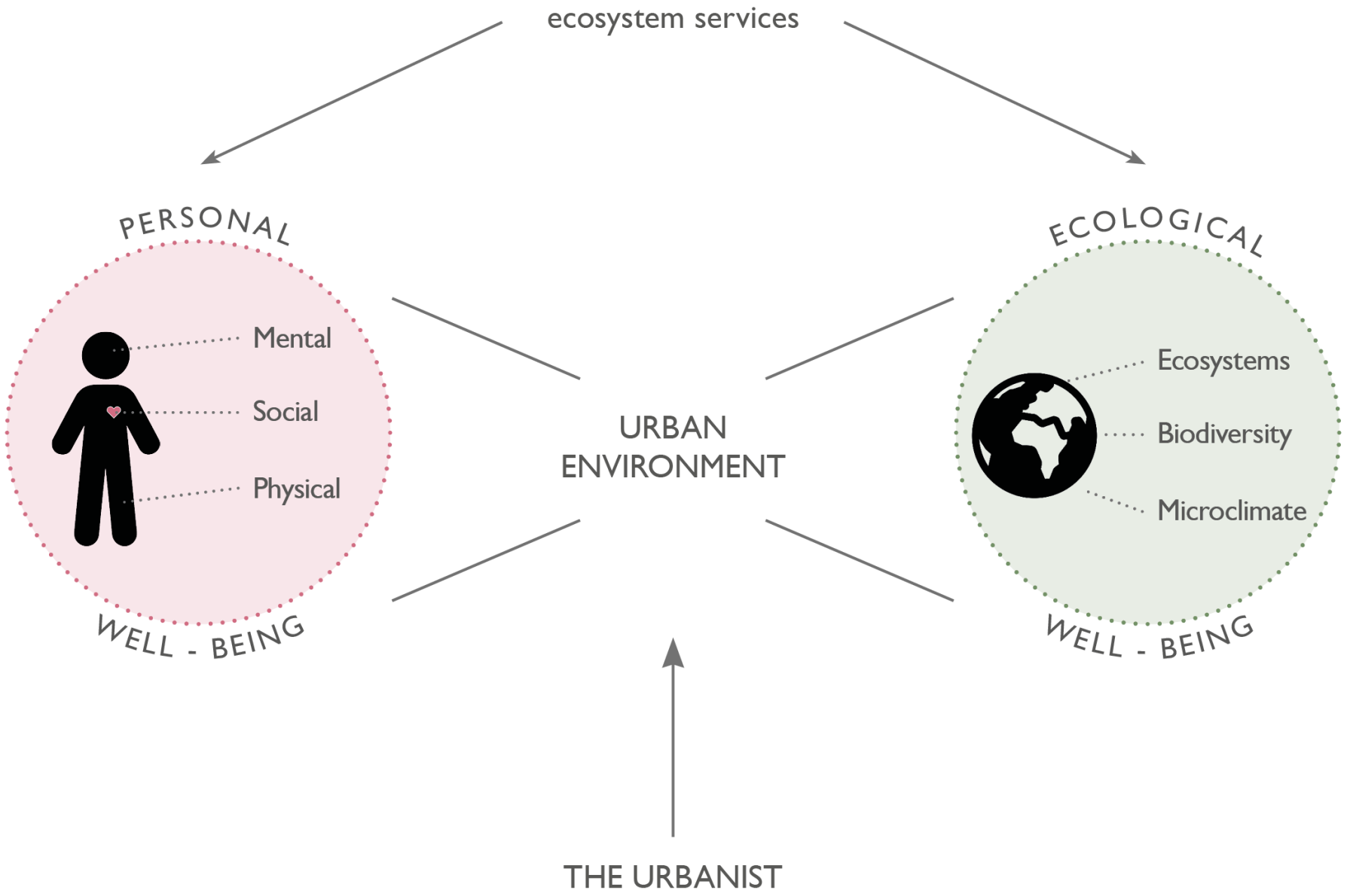
*How can **urban green spaces** in Berlin contribute to creating **restorative environments** that improve the **personal well-being** of residents as well as the quality of **ecosystem services**?*

‘Restorative Environments‘?

- natural settings
- stress recovery
- involuntary attention
- mental space for reflection
- occasional encounters



Roe, J., & McCay, L. (2021). *Restorative Cities. Urban Design for Mental Health and Wellbeing.* Bloomsbury Visual Arts.
Ulrich, R. S., Simons, R. F., Losito, B. D., Fiorito, E., Miles, M. A., & Zelson, M. (1991). Stress recovery during exposure to natural and urban environments. *Journal of Environmental Psychology, 11*(3), 201–230. https://doi.org/10.1016/s0272-4944(05)80184-7



Musek, J., & Polic, M. (2014). Personal Well-Being. In A. C. Michalos (Ed.), Encyclopedia of Quality of Life and Well-Being Research. (pp. 4752–4755). Springer. https://doi.org/10.1007/978-94-007-0753-5_2148
Grouzet, F. M. E., & Lee, E. S. (2014). Ecological Well-Being. In A. C. Michalos (Ed.), Encyclopedia of Quality of Life and Well-Being Research. (pp. 1784-1787). Springer. https://doi.org/10.1007/978-94-007-0753-5_3966

Restorative Urban Nature

Buildings and streets

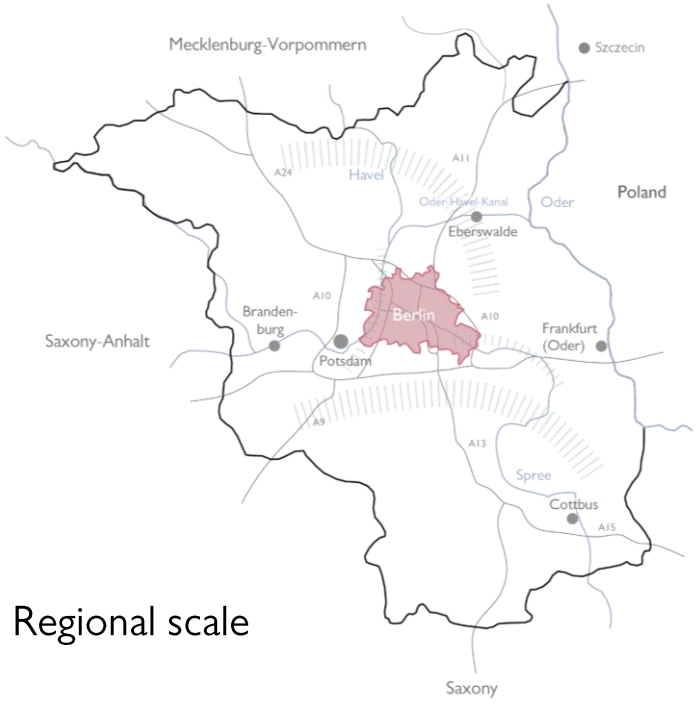
Public squares

Waterfronts

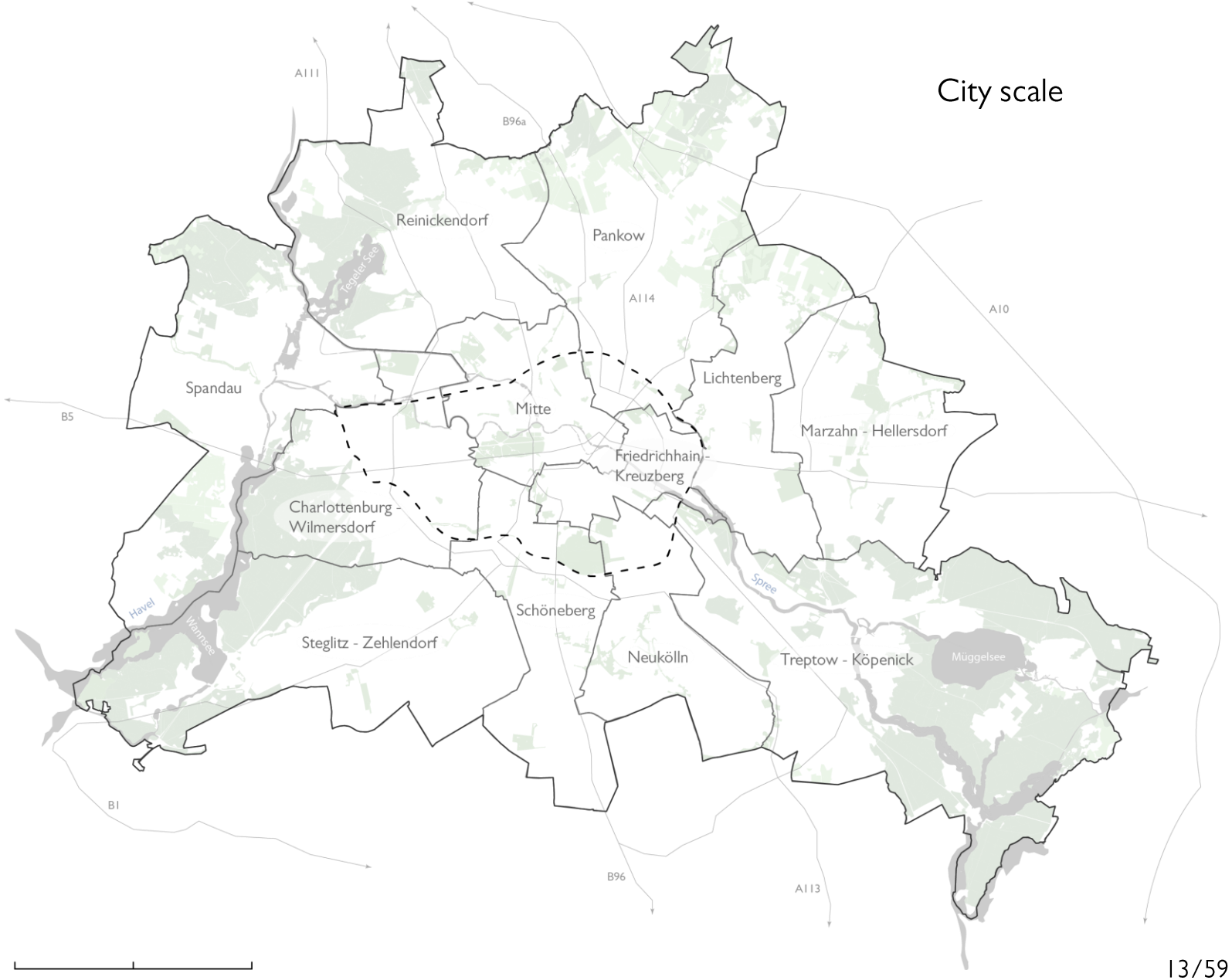
Allotments and community gardens

Case study location Berlin

National scale

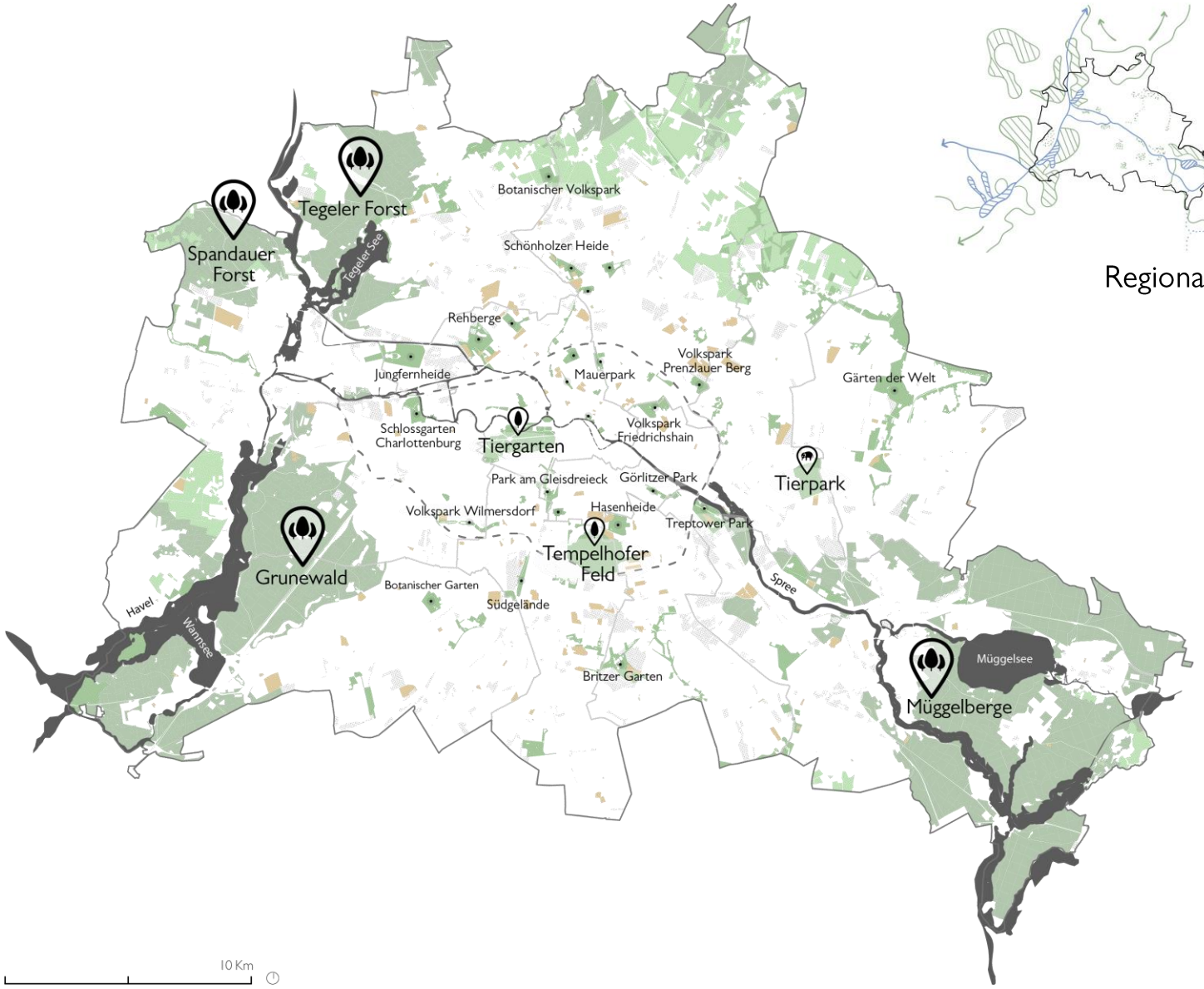


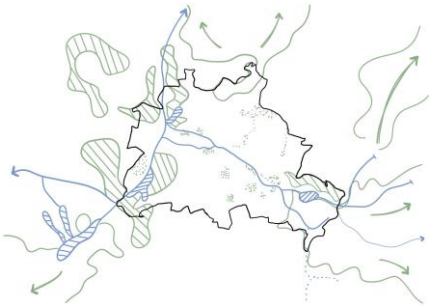
Regional scale



City scale

Status quo of urban green spaces in Berlin





Regional scale

Cemeteries

Allotment gardens

Parks, sport, etc.

Agriculture & grasslands

Forests

Water

Quality and awareness?

Conflict of use

Monotonous & sealed up

Pressured inner city

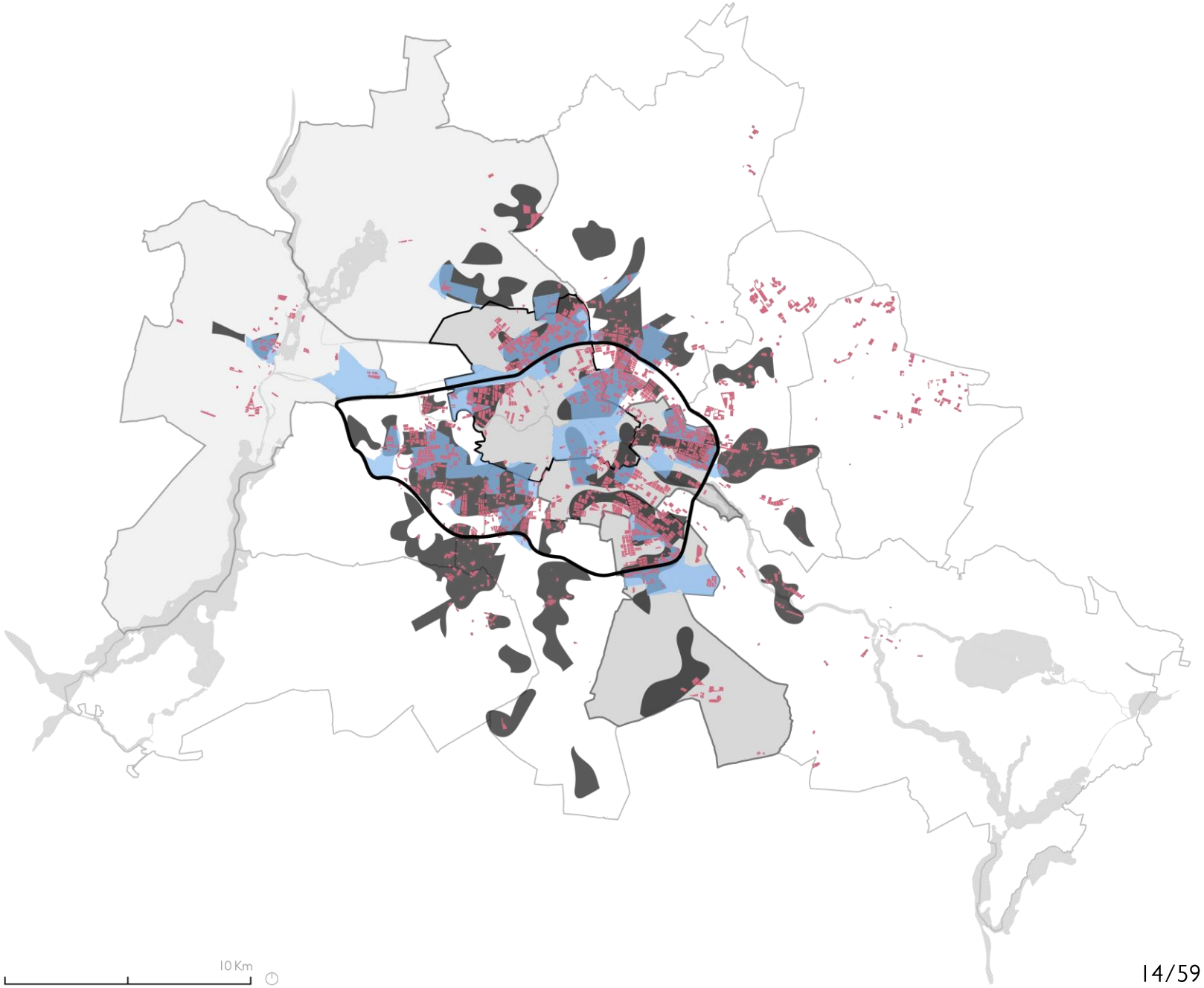
Population density
1 > 550 in/ha

Undersupply of UGS
≤ 0,1 - 6 m²/inh.

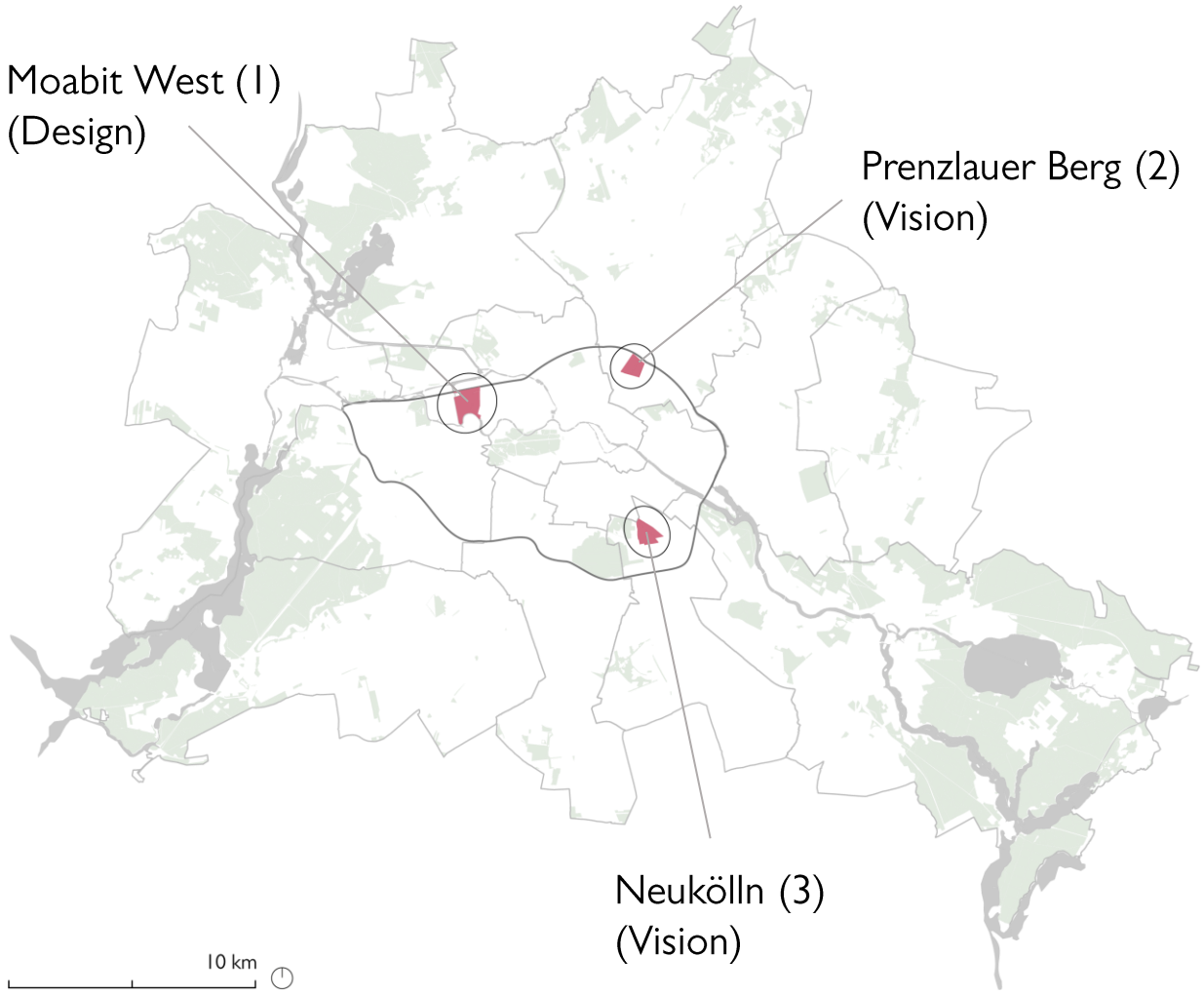
Environmental justice
Pressured areas

Socio-economic factors
Unemployment, life expectancy, cultural background

Inner S-Bahn-Ring
(light railway)



Focus areas



- High density
- Insufficient UGS per capita
- Different socio-economic compositions
- Varying spatial characteristics

Impressions of fieldwork

"If you want green, you don't move to Neukölln."

Moabit West (1)

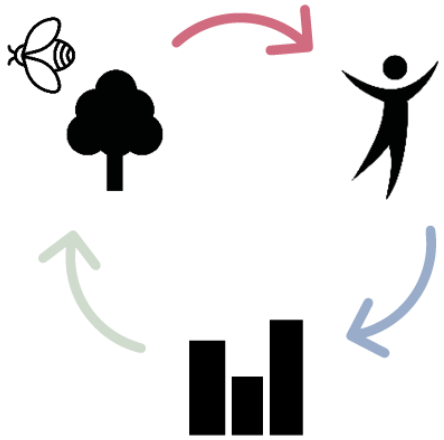
Prenzlauer Berg (2)

Neukölln (3)

"You are looking for green spaces here? Haha, good luck, let me know when you find any."

(Quotes from street conversations)*

Research approach: bridging theory and practice



Relations

Application

Participation

A PATTERN LANGUAGE

“RESTORATION WITH URBAN NATURE”

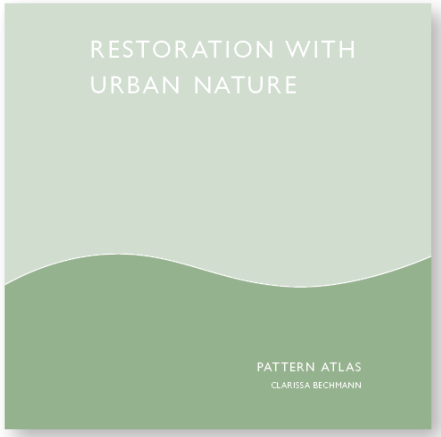
What is a Pattern Language?

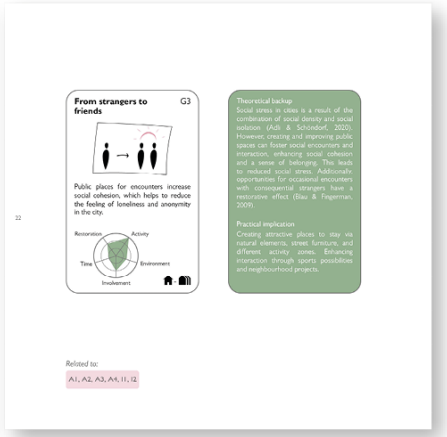
Reoccurring problems in the environment

Collection of design ideas

Applicable to various contexts and combinable

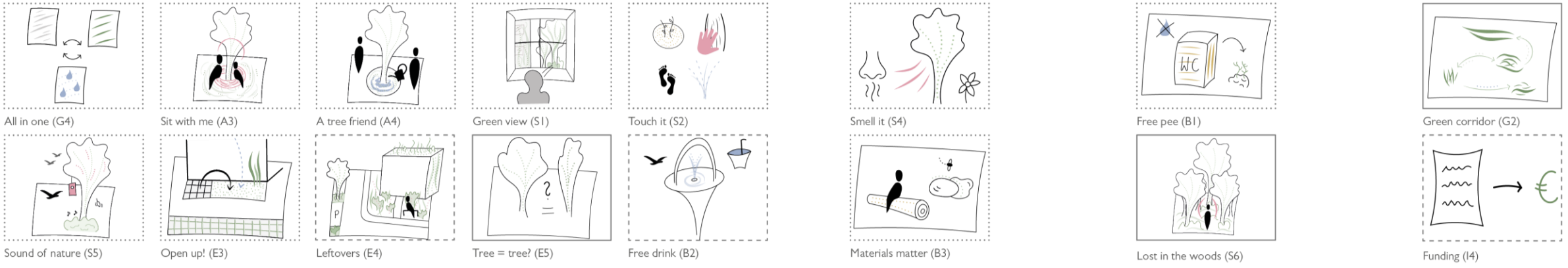
Based on: theory and practice

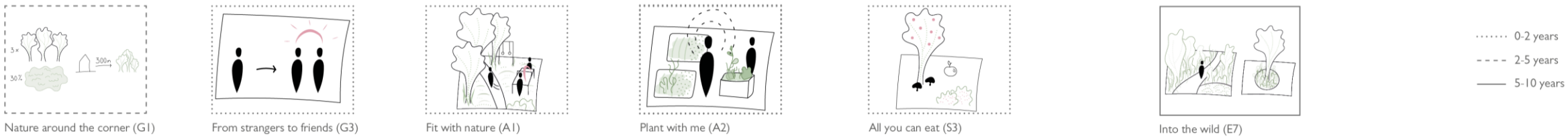




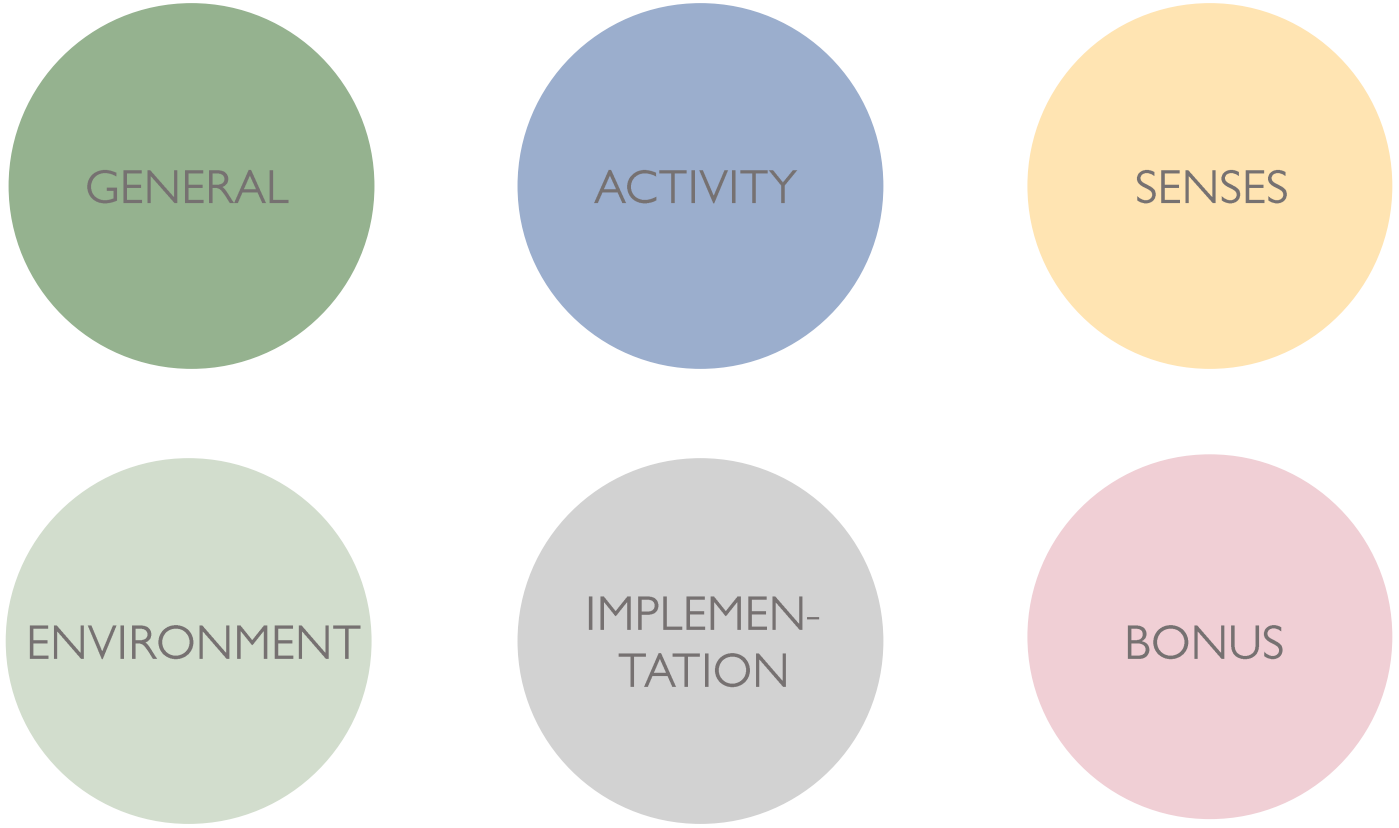
Alexander, C., Ishikawa, S., & Silverstein, M. (1977). A pattern language : towns, buildings, construction. Oxford University Press.

Overview of all patterns





Categories of patterns



Nature around the corner

GI

Possibilities to experience nature in different ways close-to-home improve well-being and environmental justice.

Theoretical backup

A higher dose of weekly nature contact (at least two hours per week) leads already to positive health impacts (Roe & McCay, 2021). By making nature better accessible, a fair distribution of green for healthier living conditions for society can be ensured (SenUVK, 2019).

Practical implication

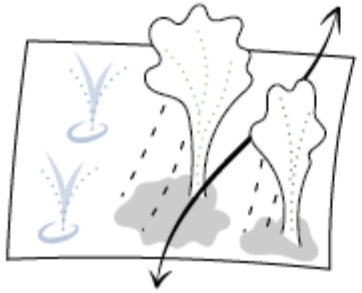
Providing nature contact on various scales, starting with the front yard and street greenery up to parks and urban forests.

3-30-300 rule:

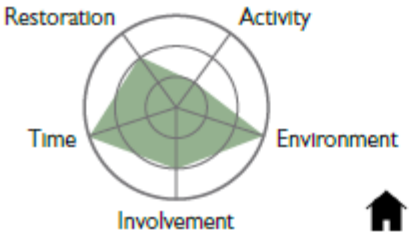
- 3 trees in the view from home
- 30% tree canopy per neighbourhood,
- max. 300 m to the nearest urban green space from every home (Konijnendijk, 2022)

Cool down

E1



Water elements, trees, and other types of vegetation reduce heat in the city when applied correctly.



Theoretical backup

Shading, moisture, and unblocked air flows lower the temperature in cities. When planting temperature-regulating trees, it is important to consider that sufficient root space and moisture are needed (Roozen et al., 2022).

Practical implication

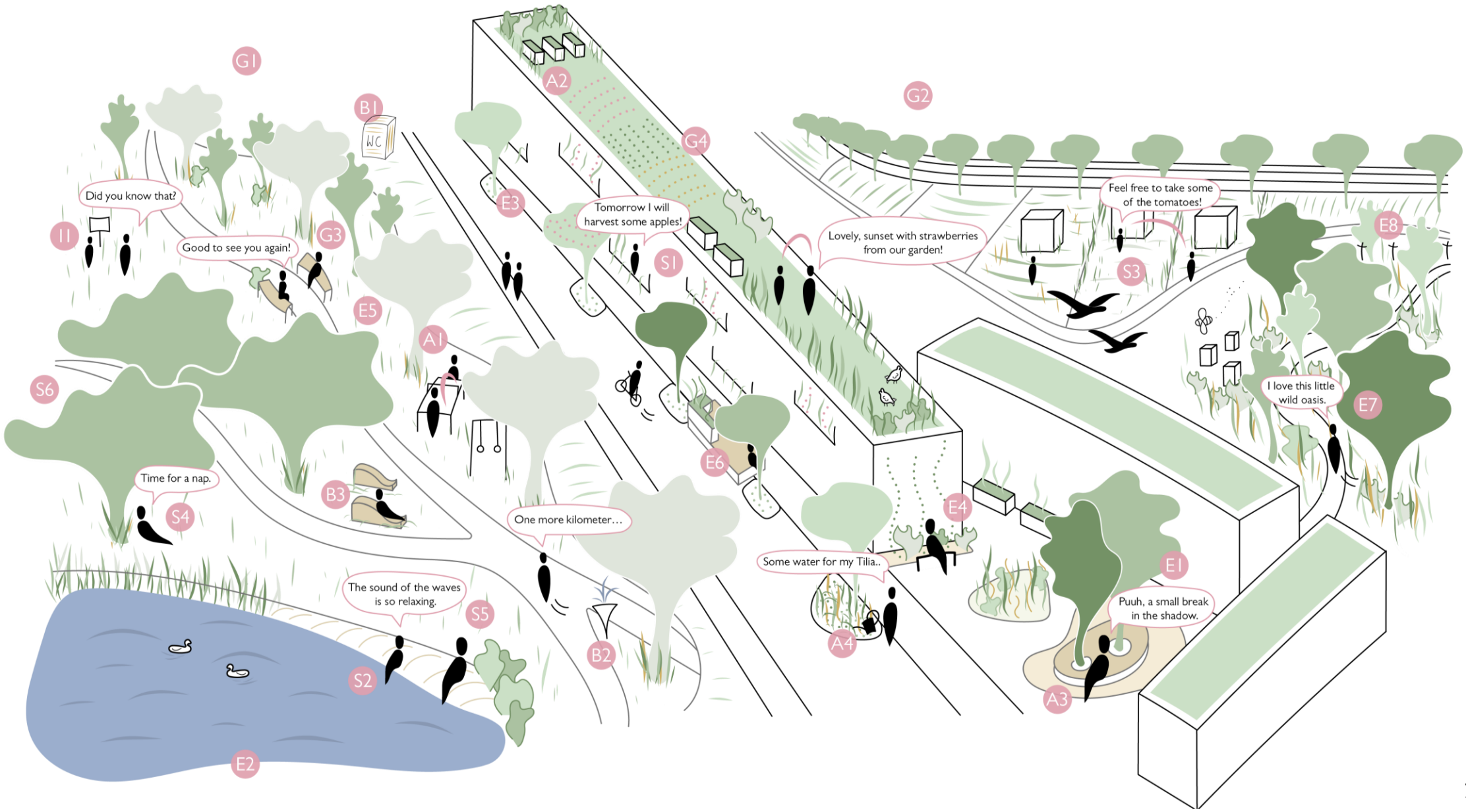
Planting trees not too densely and ensuring a variety of crown shapes and heights to avoid trapping the heat during the night.

Species:

- Acer cappadocium (Cappadocian maple)
- Fagus sylvatica (Common beech)
- Tilia tomentosa (Silver lime)
- Platanus hispanica (London plane)

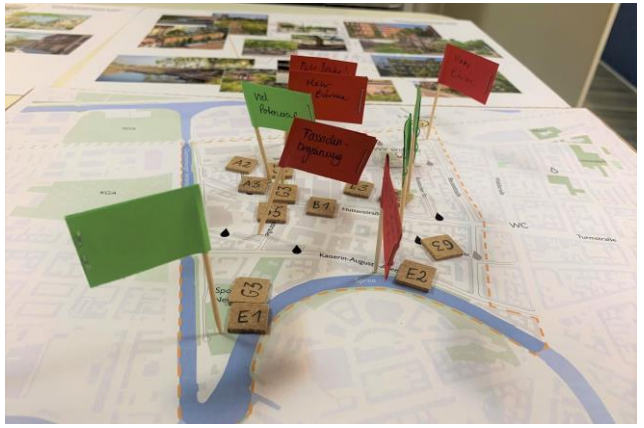
Fig. 3: Blaha Lujza Square by Lépték-Terv, 2023

Applied patterns



Co-creation workshop in Moabit West

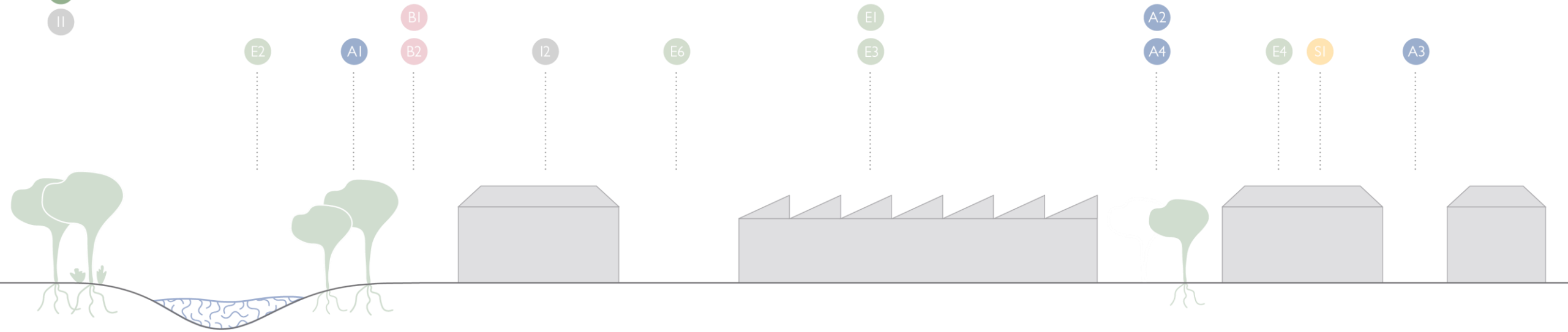
- Testing & application of Pattern Language
- Analysis and ideas for the area
- First design ideas



Co-creation workshop - outcomes

G1
G3
I1

For the whole area



Water edge

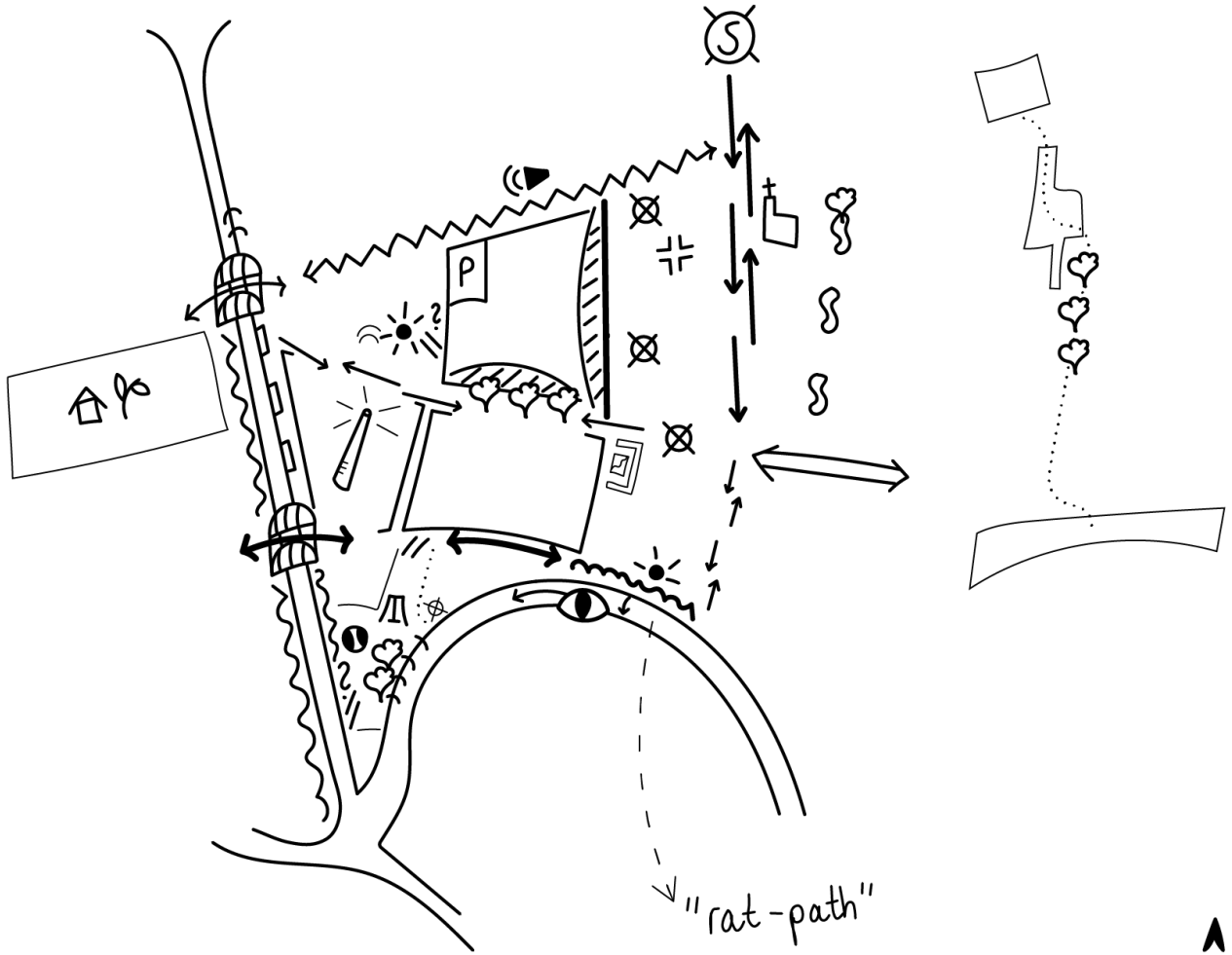
Main streets

Industrial area

Residential streets

Residential area

Moabit West



Place of encounter at neighbourhood center

Lacking visibility and knowledge of existing UGS

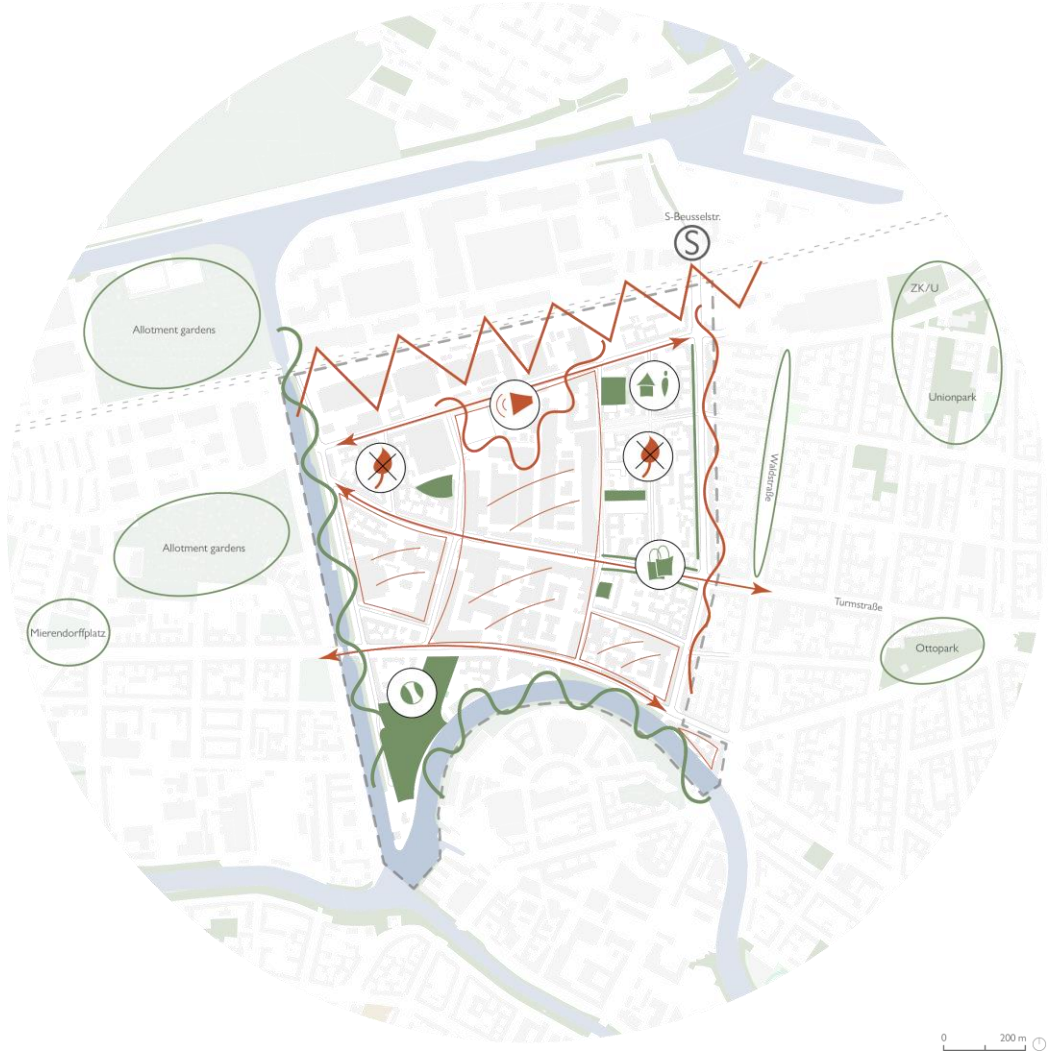
Sport park Neues Ufer - variation of activities

Division between industrial & residential areas

Potential of waterfront

Abundance of traffic area

From analysis…



- Noise pollution
- High traffic
- Undersupply of UGS
- High sealing rates
- Potential of existing UGS
- Potential of waterfronts
- Mixed-use on ground floor
- Social institutions: neighbourhood center

…to goals

ENSURE the supply of **UGS** and daily **nature contacts**

→ new development of UGS
→ green facades and rooftops

INVITE for **participation** and interdisciplinary **collaboration**

→ developing all interventions in a participatory way
→ including several stakeholders

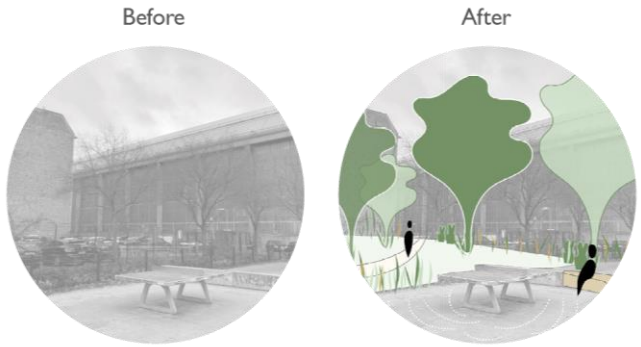
FOSTER a better **exchange** between the areas

→ using the potential of a mixed-use area with various functions

…to goals

STRENGHTEN AND QUALIFY existing **urban green spaces** in connection to adjacent **social institutions**, including the sport park Neues Ufer

→ improved visibility and connections
→ restorative and ecological qualification



Extension of sport fields to park instead of parking

TRANSFORM the **streets** and **reduce traffic**

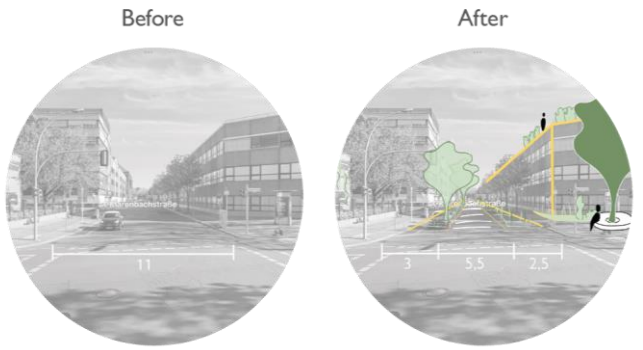
→ restructuring of existing space
→ reduced noise and air pollution

Transformation street profile Wiebestraße

…to goals

CREATE places of encounter within the area

→ strengthened social cohesion and identification

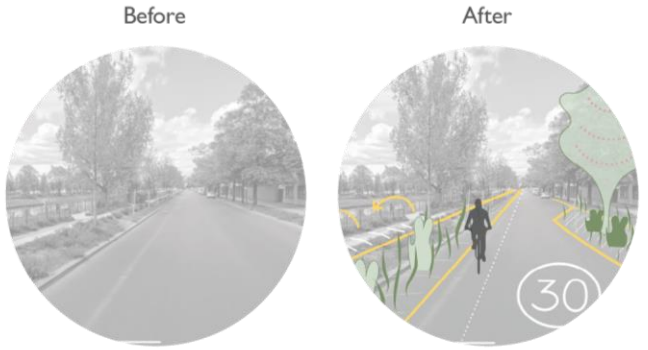


Street corner and parking on roof top to rooftop garden

DEVELOP the **waterfronts**

→ improved accessibility and quality of stay

→ enhanced ecological quality

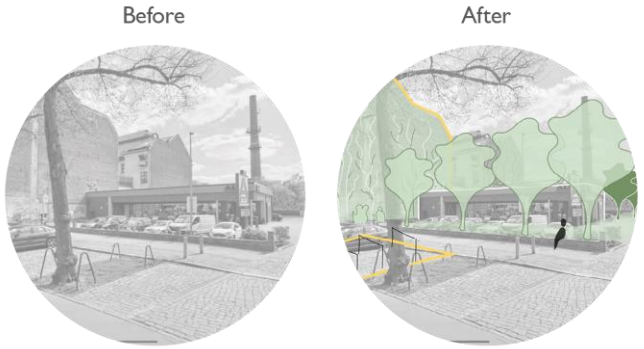


Neues Ufer along the canal

…to goas

FACILITATE a **climate adaptive development**

- applying measures to reduce heat stress
- rainwater infiltration and retention



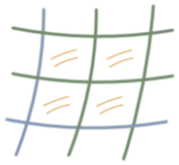
Huttenstraße - facades and supermarket

ADAPT the **industrial sites** in the long term

- unsealing and greening
- futureproof functions

Urban wilderness park instead of parking area

…to vision & design



A green-blue net for restoration and encounter

Local scale

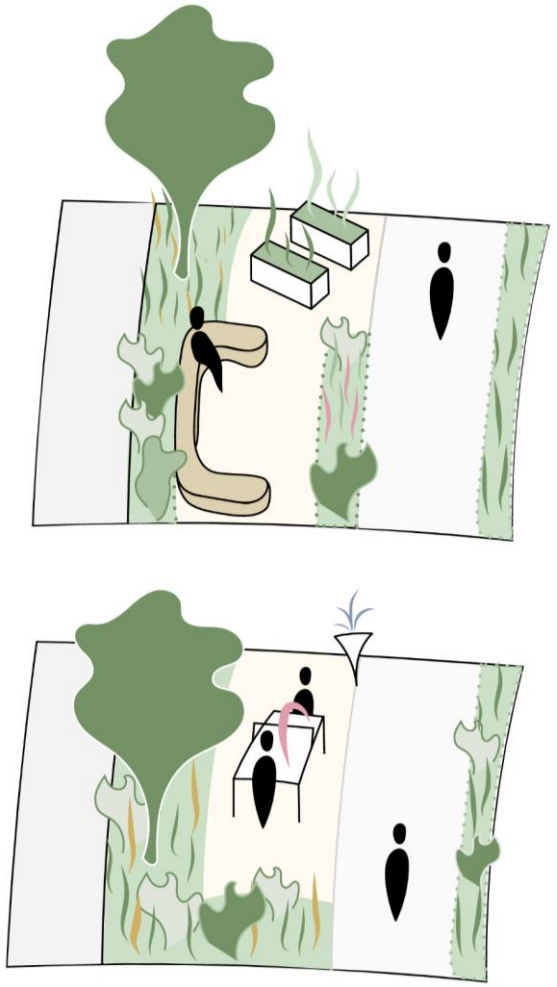
Green-blue network through scales

City scale

District scale

Local scale

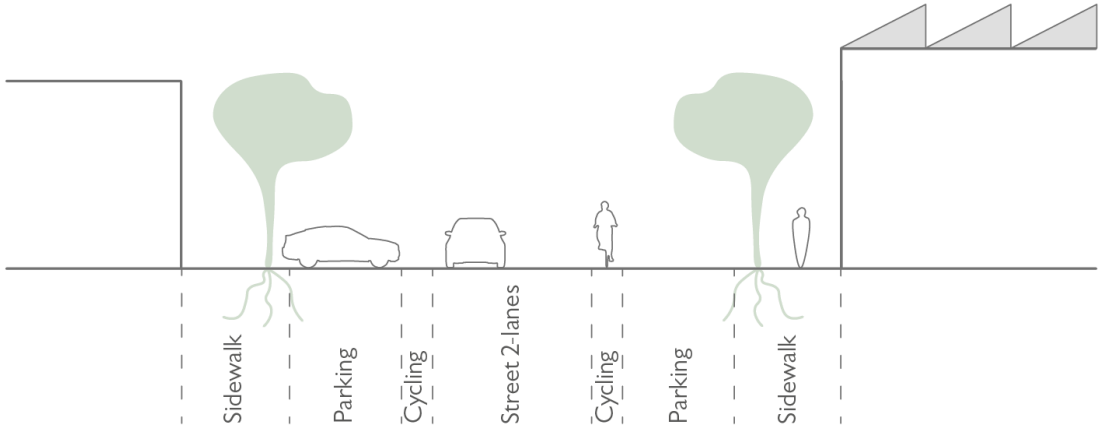
Design phase 1: Preparation & Formation of the frame (0-2 years)

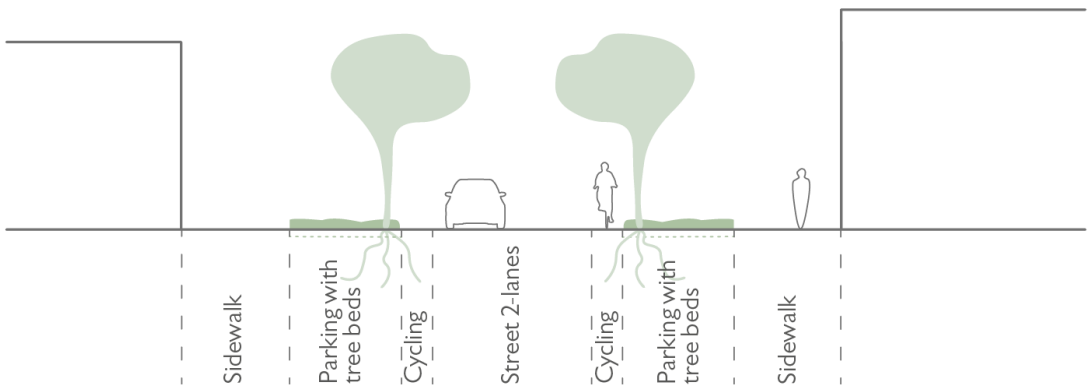


Transformation of main street with green encounter zones

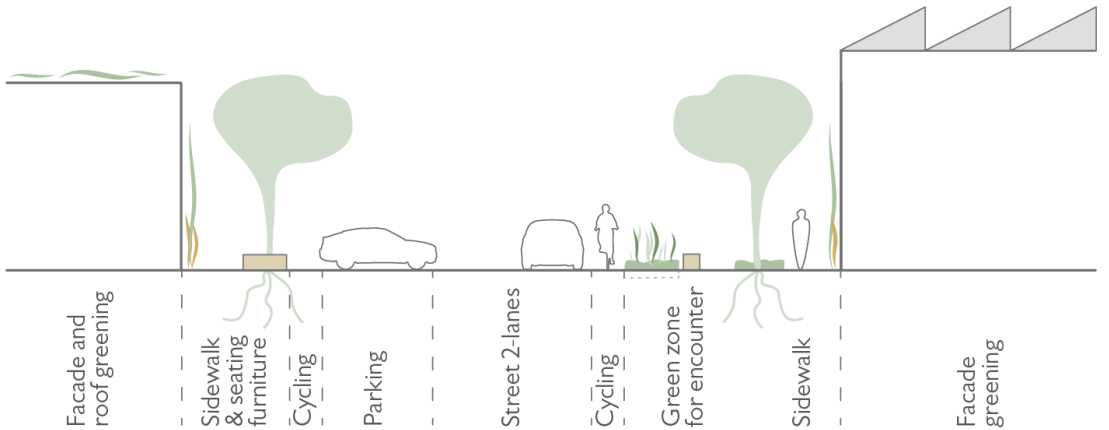
Systemic sections

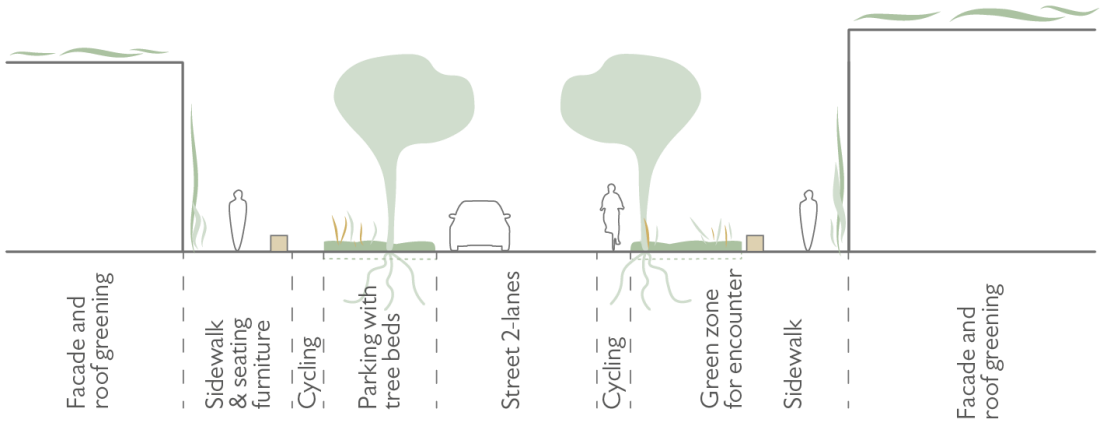
Before





After





Transformation of Huttenstraße to reduced parking with green encounter zones

Value for personal & ecological well-being

Facade greening

Clean air
Noise reduction

Food

Pattern examples

G3: From strangers to friends
S5: Sound of nature
E6: Less cars, less stress

Networks

Activity
Encounter
& Play

Cooling
Shadow
Biodiversity
Infiltration

Resting
Senses &
Fascination
Being away

Green encounter zones – species selection

Trees for cooling/ withstanding drought

Food for humans

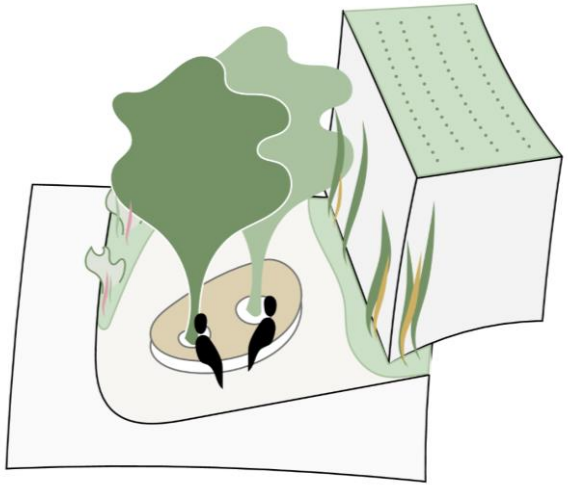
Food for animals

Pollinator friendly

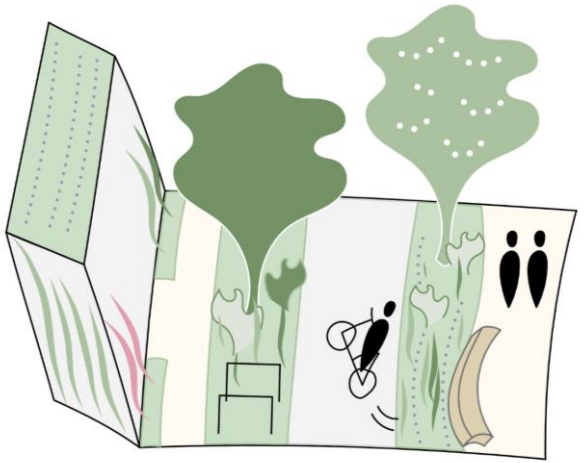
Roozen, N., van der Kloet, J., Smit, J., & Berends, S. (2022). *The Green City Guidelines - the foundation for a healthy city.* Blunt Communicatiadvies and authors.

Design phase 1: Preparation & Formation of the frame

Qualification of playground Wiebestraße

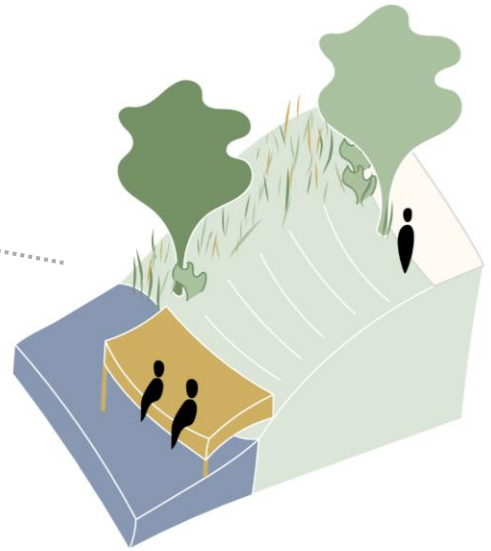


Adaptation of street corners



Transformation of residential streets to bike streets with green encounter zones

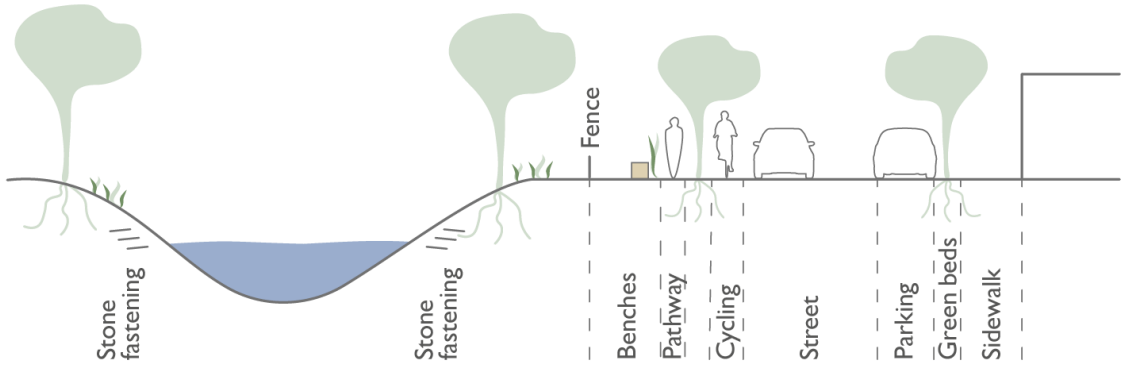
Design phase 2: Elaboration of the net (2-5 years)



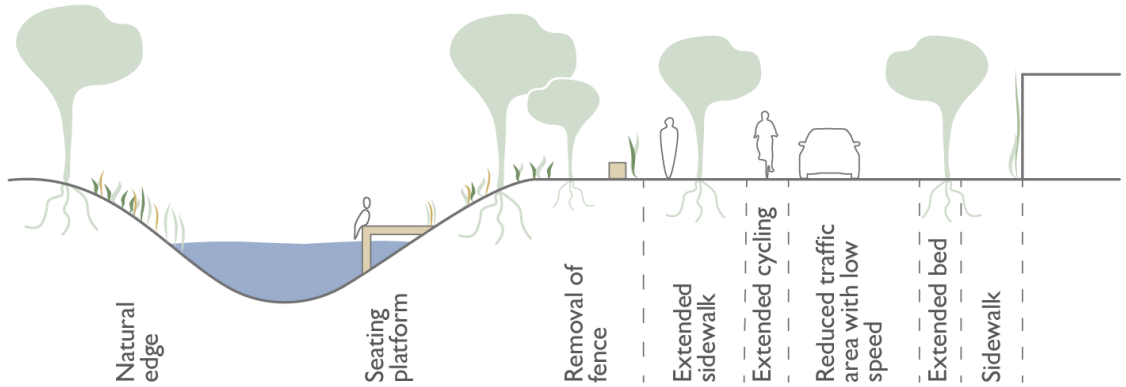
Development of western waterfront

Systemic sections

Before



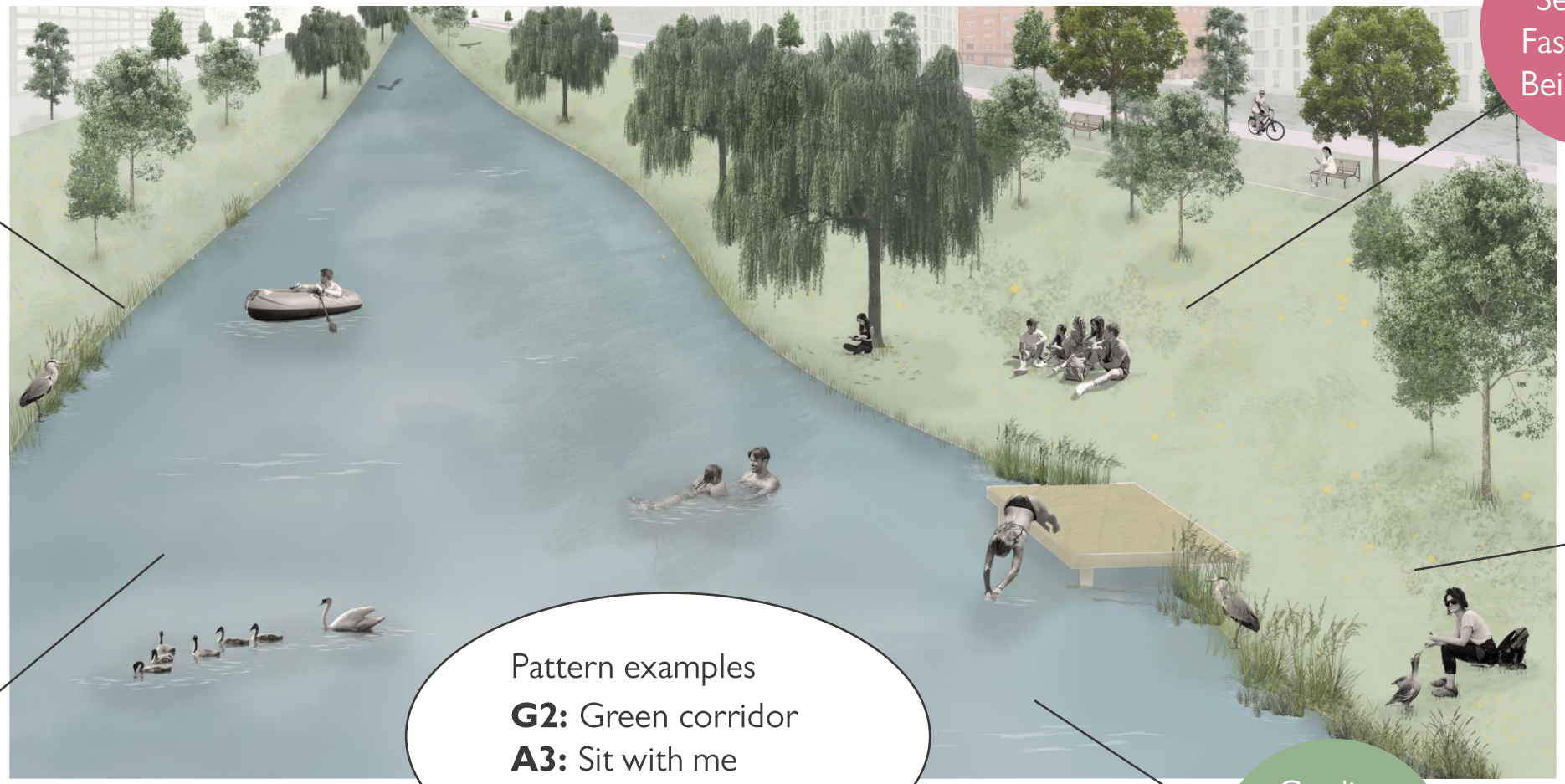
After



Status quo canal banks

Development of waterfront with water access and natural zones

Value for personal & ecological well-being



Natural waterfront Habitats

Resting Senses & Fascination Being away

Encounter Activity

Extent Coherence Networks

Cooling Clean air Water retention

Pattern examples

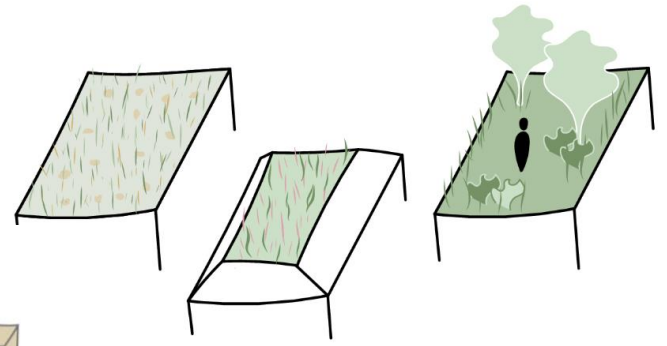
G2: Green corridor

A3: Sit with me

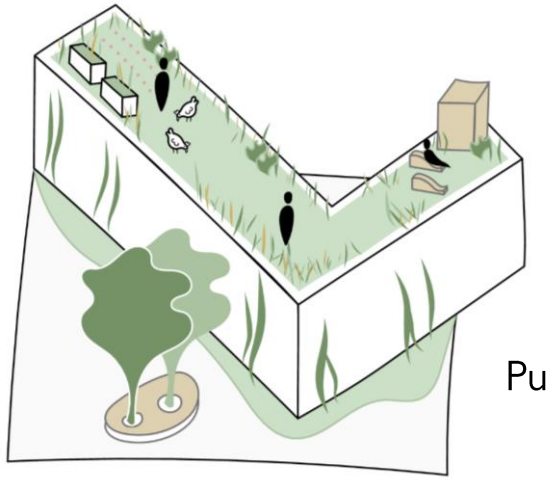
E2: Water inside/out

Design phase 2: Elaboration of the net

Extension of sport fields to park instead of parking

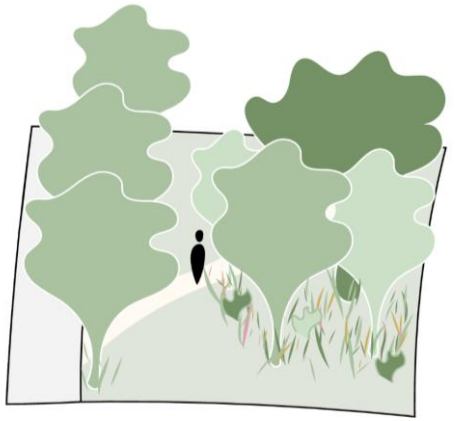


Green roofs at suitable locations



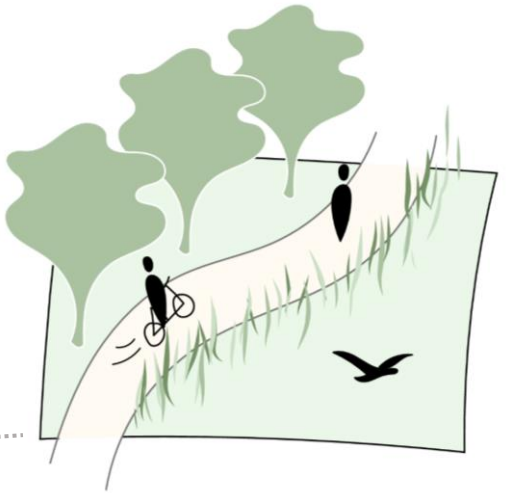
Public rooftop garden

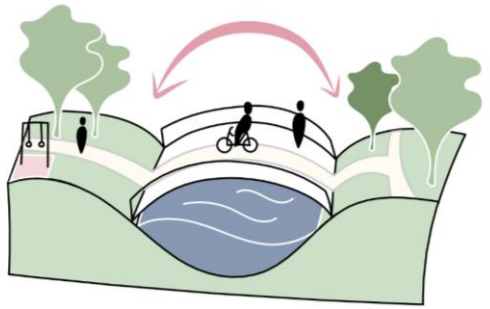
Design phase 3: Expansion from net to network (5-15 years)



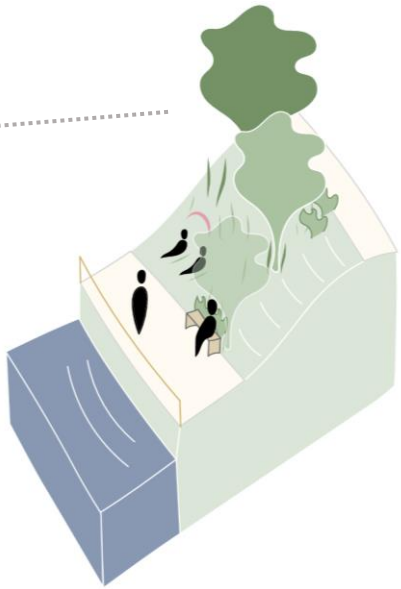
Urban wilderness park instead of parking

Connections to adjacent UGS





Pedestrian and bike bridge connecting waterfronts

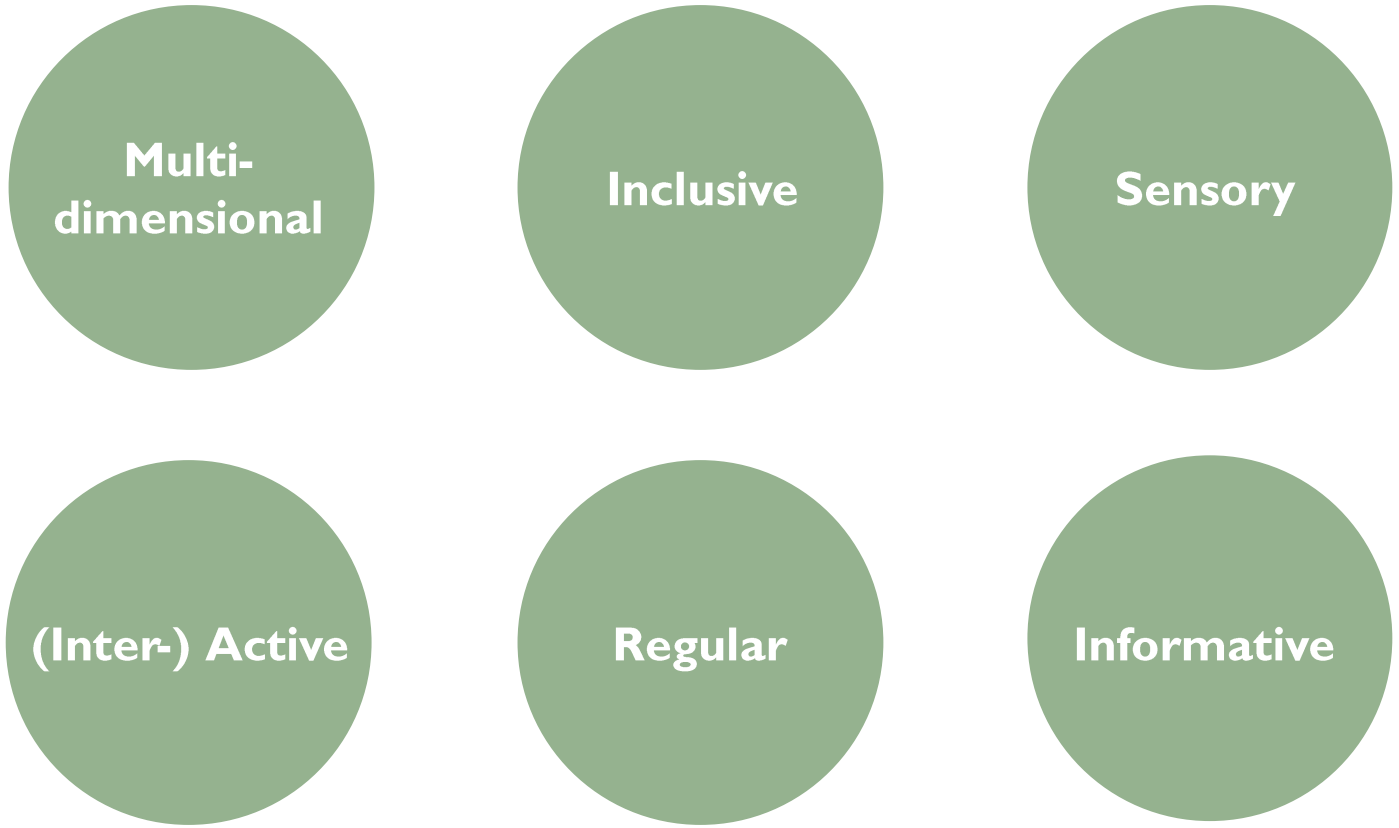


Development of southern waterfront

Application at the other two focus areas

Guidelines

Restorative Urban Nature should be…



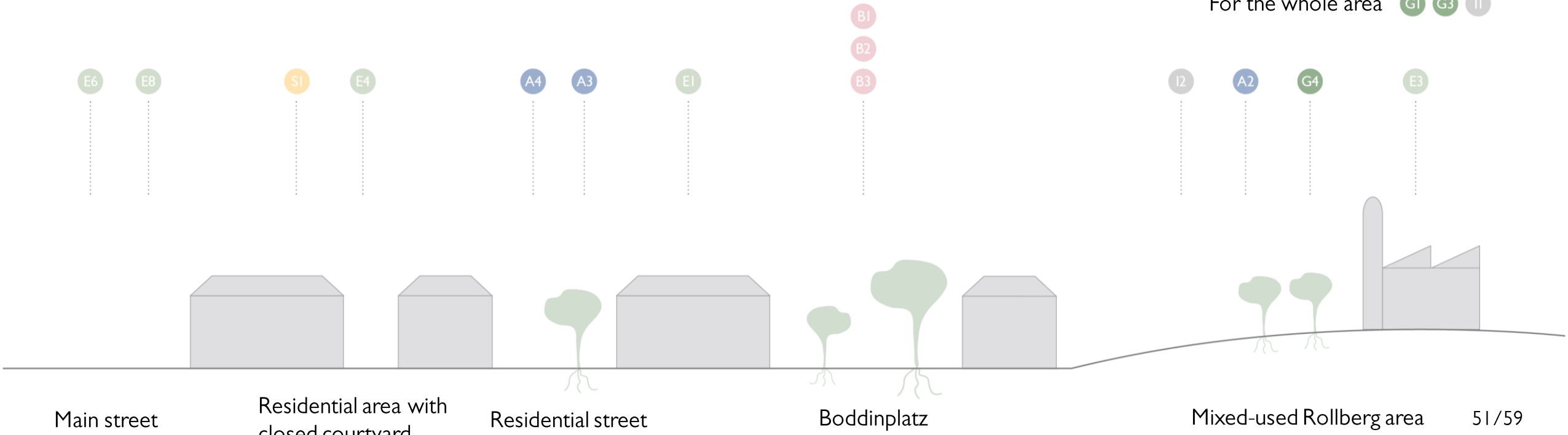
Flughafenkiez Neukölln

SWOT

Hasenheide park

Tempelhofer Feld

For the whole area G1 G3 I1



Main street

Residential area with closed courtyard

Residential street

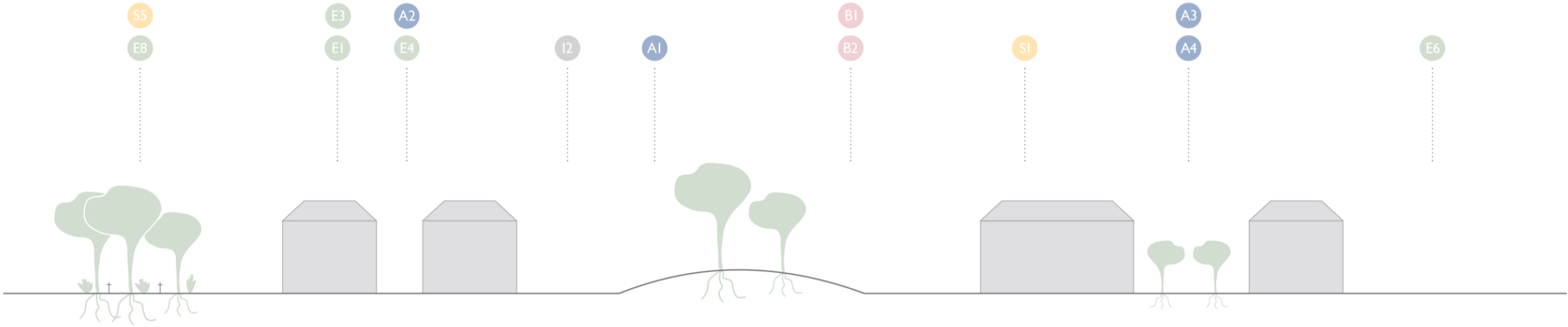
Boddinplatz

Mixed-used Rollberg area

Helmholtzkiez Prenzlauer Berg

SWOT

For the whole area G1 G3 I1



Cemetery park

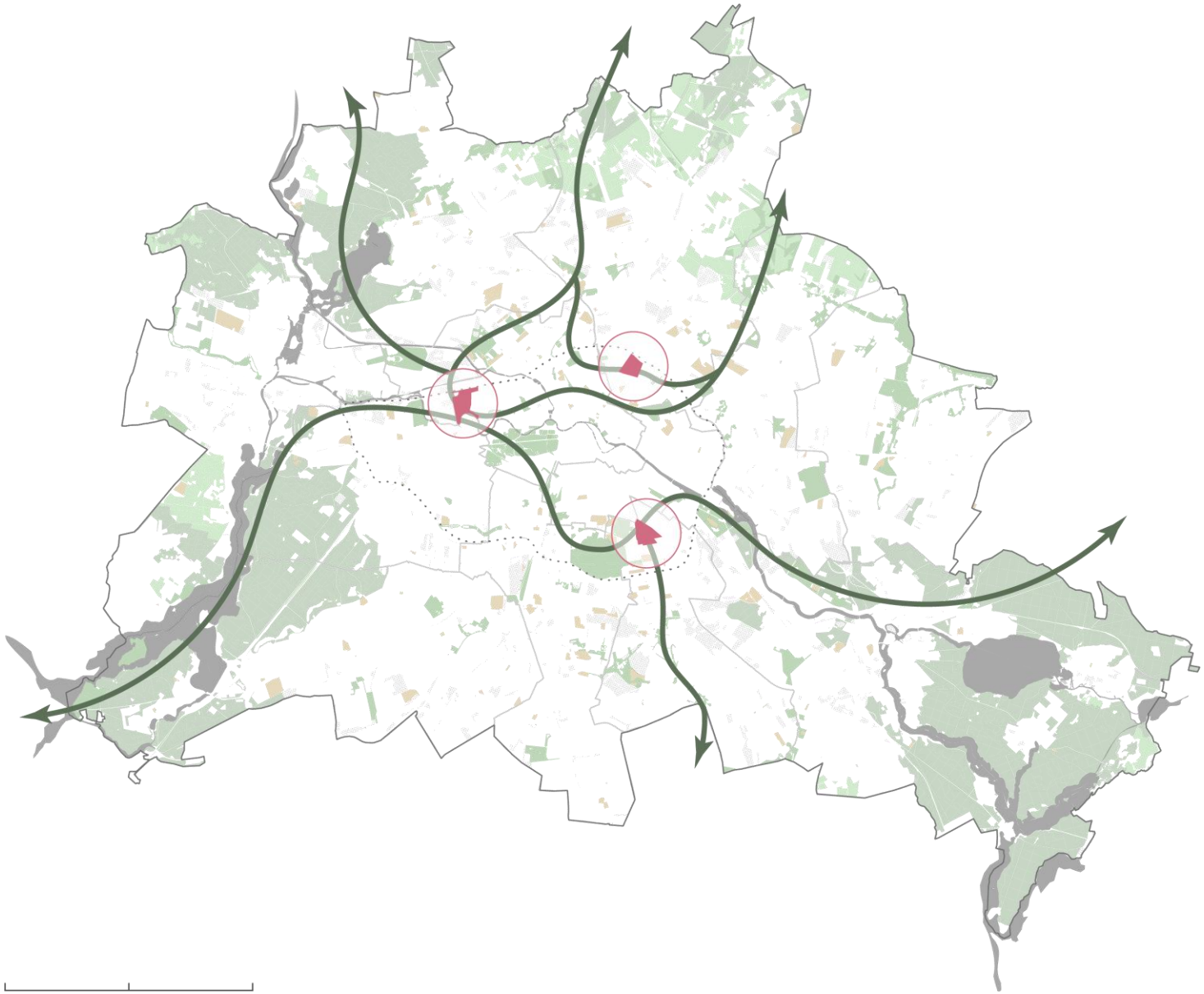
Residential area with closed courtyard

Helmholtzplatz

Residential street

Main street

Growing a green-blue network



*How can **urban green spaces** in Berlin contribute to creating **restorative environments** that improve the **personal well-being** of residents as well as the quality of **ecosystem services**?*

Conclusion

- The dose is important
- Social encounters, nature contact & activity
- Restorative environments at all scales possible

Recommendations

- Awareness
- Education from early on
- Using & preserving existing potentials integrated
- Interdisciplinary collaboration among different stakeholders and interest groups

“Green space in cities shouldn’t be considered an optional luxury. [...] it is a crucial part of a healthy human habitat. Daily exposure is essential.”

(Montgomery, 2015, p.122)


Thank you!

References

- Alexander, C., Ishikawa, S., & Silverstein, M. (1977). A pattern language : towns, buildings, construction. Oxford University Press.
- Grouzet, F. M. E., & Lee, E. S. (2014). Ecological Well-Being. In A. C. Michalos (Ed.), Encyclopedia of Quality of Life and Well-Being Research. (pp. 1784-1787). Springer. https://doi.org/10.1007/978-94-007-0753-5_3966
- Millennium Ecosystem Assessment. (2005). *Ecosystems and Human Well-being: Synthesis*. Island Press. researchgate.net/publication/297563785_Millennium_Ecosystem_Assessment_Ecosystems_and_human_well-being_synthesis
- Montgomery, C. (2015). *Happy city: transforming our lives through urban design*. Penguin Books.
- Musek, J., & Polic, M. (2014). Personal Well-Being. In A. C. Michalos (Ed.), Encyclopedia of Quality of Life and Well-Being Research. (pp. 4752–4755). Springer. https://doi.org/10.1007/978-94-007-0753-5_2148
- Roe, J., & McCay, L. (2021). *Restorative Cities. Urban Design for Mental Health and Wellbeing*. Bloomsbury Visual Arts.
- Roozen, N., van der Kloet, J., Smit, J., & Berends, S. (2022). *The Green City Guidelines - the foundation for a healthy city*. Blunt Communicatiadvies and authors.
- Ulrich, R. S., Simons, R. F., Losito, B. D., Fiorito, E., Miles, M. A., & Zelson, M. (1991). Stress recovery during exposure to natural and urban environments. *Journal of Environmental Psychology, 11*(3), 201–230. https://doi.org/10.1016/s0272-4944(05)80184-7

List of figures

- Fig. 1: Sustainable Development Goal 3 (UN, 2015)

United Nations. (2015). Transforming our world: the 2030 agenda for sustainable development (A/RES/70/1). United Nations. https://sdgs.un.org/sites/default/files/publications/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf

- Fig. 2: Sustainable Development Goal 11 (UN, 2015)

United Nations. (2015). Transforming our world: the 2030 agenda for sustainable development (A/RES/70/1). United Nations. https://sdgs.un.org/sites/default/files/publications/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf

- Fig. 3: Blaha Lujza Square by Lépték-Terv, 2023

Landezine (2023). "Blaha Lujza Square". https://landezine.com/blaha-lujza-square-by-leptek-terv/

Newspaper quotes slide 2:

- https://theconversation.com/the-metropolis-and-mental-health-are-big-cities-making-us-sick-49264
- https://www.theguardian.com/cities/2014/feb/25/city-stress-mental-health-rural-kind
- https://www.weforum.org/agenda/2020/02/cities-urban-life-mental-health/
- https://www.rootsofloneliness.com/urban-loneliness-isolation
- https://www.livescience.com/5389-humans-losing-touch-nature.html
- https://www.theguardian.com/commentisfree/2012/nov/19/children-lose-contact-with-nature
- https://berliner-schloss.de/blog/pressespiegel/hitzestress-in-berlin-an-besonders-heissen-orten-droht-lebensgefahr/
- https://www.focus.de/gesundheit/ratgeber/gesundheit-stressforscher-stadtleben-macht-psychisch-krank-doch-sie-koennen-gegensteuern_id_10764505.html
- https://www.berlin.de/ba-pankow/politik-und-verwaltung/aemter/strassen-und-gruenflaechenamt/gruenflaechen/marchenland_1.jpg

List of figures

Images of species slide 42:

- Agastache: Retrieved May 13, 2023 from https://calendrier-agenda.fr/wp-content/uploads/2016/07/vertus-agastache.jpg
- Allium: Retrieved May 13, 2023 from https://cdn.shopify.com/s/files/1/1419/7120/products/sqAllium_Giganteum.DV_3.jpg?v=1551807600
- Amelanchierlamarckii: Baumkunde.de (n.d.). Retrieved May 13, 2023 from https://www.baumkunde.de/Amelanchier_lamarckii/
- Acer cappadocium: Van den Berk (n.d.). Retrieved May 13, 2023 from https://www.vdberk.nl/media/2080/acer_cappadocicum.jpg
- Castanea sativa: Baumkunde.de (n.d.). Retrieved May 13, 2023 from https://www.baumkunde.de/pics/gr/0073pic_fruechte_gr.jpg
- Colchium autumnale: Retrieved May 13, 2023 from https://order.eurobulb.nl/2276-large_default/colchicum-autumnale-pleniflorum-8013.jpg
- Cornus mas: Baumkunde.de (n.d.) Retrieved May 13, 2023 from https://www.baumkunde.de/pics/gr/0155pic_fruechte_gr.jpg
- Crataegus monogyna: Apatita (n.d.). Retrieved May 13, 2023 from http://www.apatita.com/herbario/familias/Rosaceae/Crataegus_monogyna/Crataegus_monogyna_8.jpg
- Eranthis: Retrieved May 13, 2023 from https://i0.wp.com/plantnu.nl/wp-content/uploads/2011/04/Winteraconiet-scaled.jpg?resize=768%2C579&ssl=1
- Fagus sylvatica: Van den Berk (n.d.). Retrieved May 13, 2023 from https://www.vdberk.nl/media/41170/fagus_sylvatica_6.jpg
- Malus sylvestris: Greenlab (n.d.). Retrieved May 13, 2023 from http://greenlab.org/tastynatives/wp-content/uploads/2018/04/crabapple.jpg
- Origanum: Retrieved May 13, 2023 from http://leszarpentsverts.fr/wp-content/uploads/2013/05/oregano-4743918_1920.jpg
- Platanus hispanica: Baumschule Horstmann (n.d.). Retrieved May 13, 2023 from https://www.baumschule-horstmann.de/bilder/popup/platane-m008060_w_8.jpg
- Prunus maacki: Van den Berk (n.d.). Retrieved May 13, 2023 from https://www.vdberk.nl/media/73320/prunus_maackii_amber_beauty_1.jpg
- Ribes rubrum: Baumkunde.de (n.d.). Retrieved May 13, 2023 from https://www.baumkunde.de/pics/gr/0649pic_fruechte_gr.jpg
- Sambucus nigra: Baumkunde.de (n.d.) Retrieved May 13, 2023 from https://www.baumkunde.de/pics/gr/0159pic_more1_gr.jpg
- Tilia tormentosa: Straßenbaumliste (n.d.). Retrieved May 13, 2023 from https://strassenbaumliste.galk.de/fotos/145/T_tome_Brab_belaubt_2011.jpg