

BROADENED INCLUSIVENESS FOR URBAN RENEWAL

A spatial design contributing to ecological justice
for Carnisse Rotterdam

Emy Steenbergen // 4688341 // January 17, 2024
1st mentor: Ir. Leo van den Burg // 2nd mentor: Dr. Ir. Nico Tillie





Earth's sixth mass extinction is underway and "rapidly accelerating," study warns

Ivana Saric

Facebook, Twitter, LinkedIn, Email icons



...uur
2021, 17:32
...weer: natuurbranden
...derland worden
...heersbaar door
...atverandering

...entists say planet in
...st of sixth mass
...inction, Earth's
...dlife running out of
...ces to live

By Scott Pelley
January 1, 2023 / 7:29 PM EST / CBS New



...22, 21:07
...na de overstromingen in Limburg
...nog altijd mensen op hun huis



NOS Nieuws • Zaterdag 29 april, 18:24
Bijen en andere bestuivers ernstig bedreigd, nieuwe telmethode moet helpen

Plant and animal species at risk of extinction

The current rate of species extinction is far higher than the average in the past 10 million years.

VN-top over biodiversiteit: 'Dieren en planten sterven versneld uit'

Aangepast 7 december 2022 10:39



Modern 'Sixth Mass Extinction' Event Will Be Worse Than First Predicted: Report

GrrlScientist

Climate change risks 'extinction domino effect'
Loss of animal or plant species to climate change causes global 'extinction domino effect'



NOS Nieuws • Bijgewerkt: 06 nov. 2023, 08:33

Waterkwaliteit Nederlandse sloten en plassen blijft slecht



NOS Nieuws • Bijgewerkt: 16 jul. 2020, 21:33

Leefgebied zeldzame vlinder in Limburg grotendeels vernietigd



Klimaatop Dubai

NOS Nieuws • 20 nov. 2023, 15:00

VN waarschuwt voor opwarming aarde met 3 graden: 'Kloof tussen woorden en daden'

Earth's sixth mass extinction event way, scientists warn

Researchers talk of 'biological annihilation' as study reveals decline in populations of animals has accelerated in recent decades

Opinion: You don't need to know what's causing the sixth mass extinction



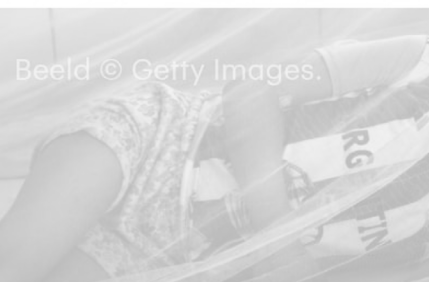
NOS Nieuws • 10 nov. 2023, 17:5

Een op de vijf planten in Europa met uitsterven

Veel planten en dieren in Europa met uitsterven bedreigd. Uit nieuw onderzoek blijkt dat van de circa 100 onderzochte planten en dieren 20 procent dreigt te verdwijnen.

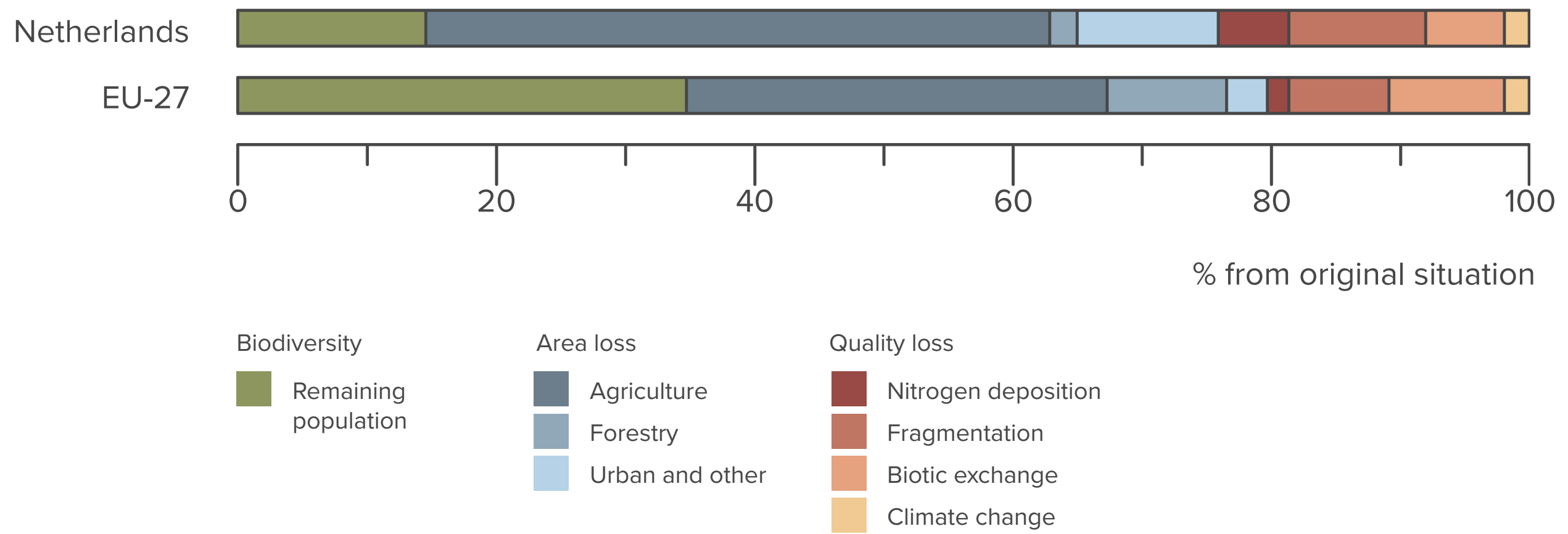
Rapport: klimaatverandering kan tot desastreuze gevolgen en gezondheidseffecten leiden

Door Bart Verheggen
Aangepast 1 juni 2023 22:00



WE ARE AT THE START OF THE SIXTH MASS EXTINCTION...

BIODIVERSITY LOSS



Adapted from PBL, n.d.

WORLD VIEW



Flora is becoming increasingly important. However, it should be neat and well-maintained.



Nature-inclusive building is becoming more common, for example, Living Roof bus shelters. (Adapted Clear Channel UK, 2021)



Animals should not come too close. Bird scraps keep birds out under roof tiles. (Adapted from Traas Building Care, n.d.)

WORLD VIEW



Before the Industrial Revolution, people protected themselves from nature as at the Medieval settlement town of Carcassonne. (Adapted from Musement, n.d.)

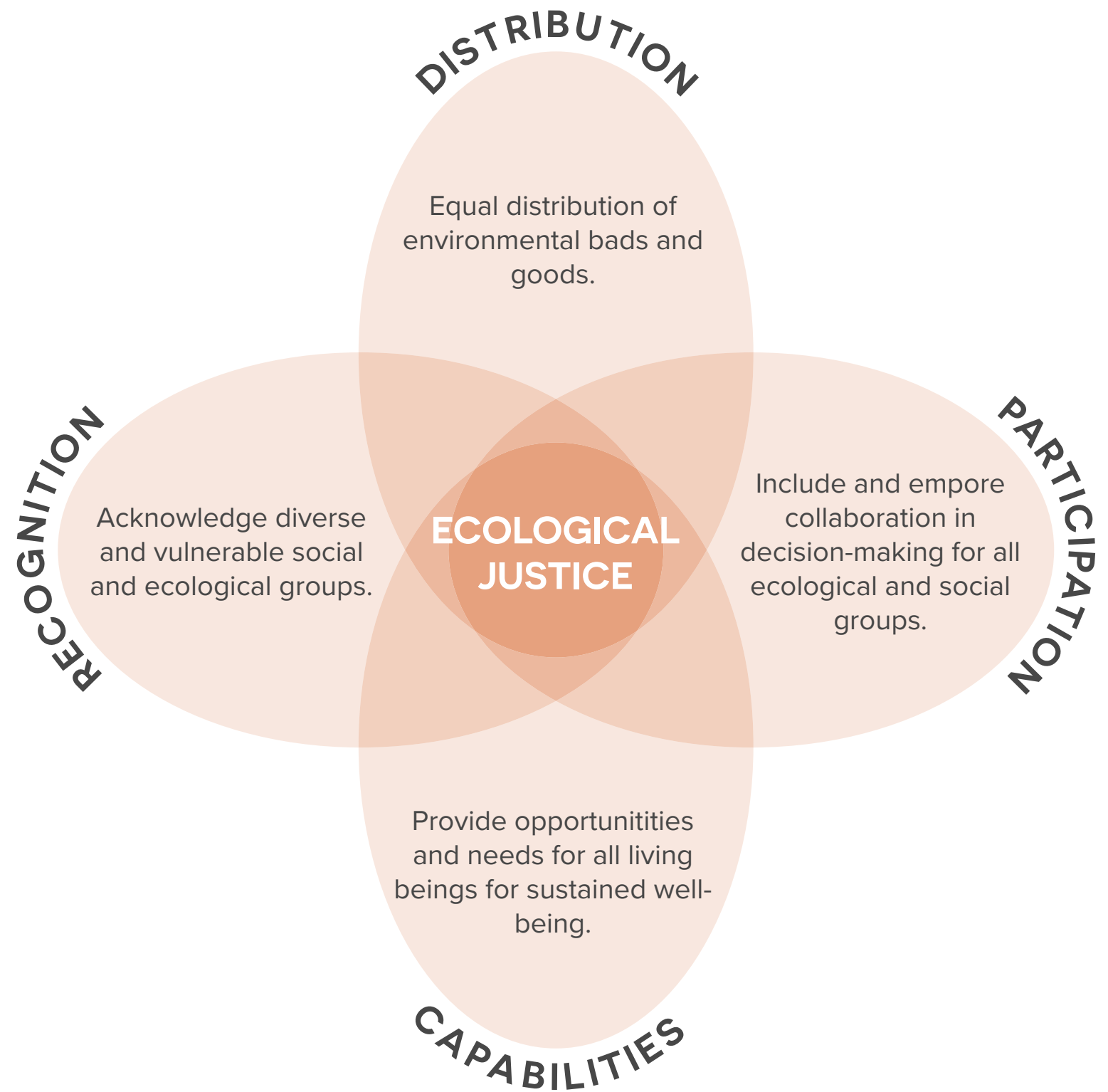


After the Industrial Revolution, people were no longer scared of nature. (Aliunix, 2018)

ECOLOGICAL (IN)JUSTICE

Ecological justice is doing justice to nature. Within this justice, all living beings should have the opportunity to enjoy and flourish in their own lives.

Gleeson and Low, 1998, p. 133

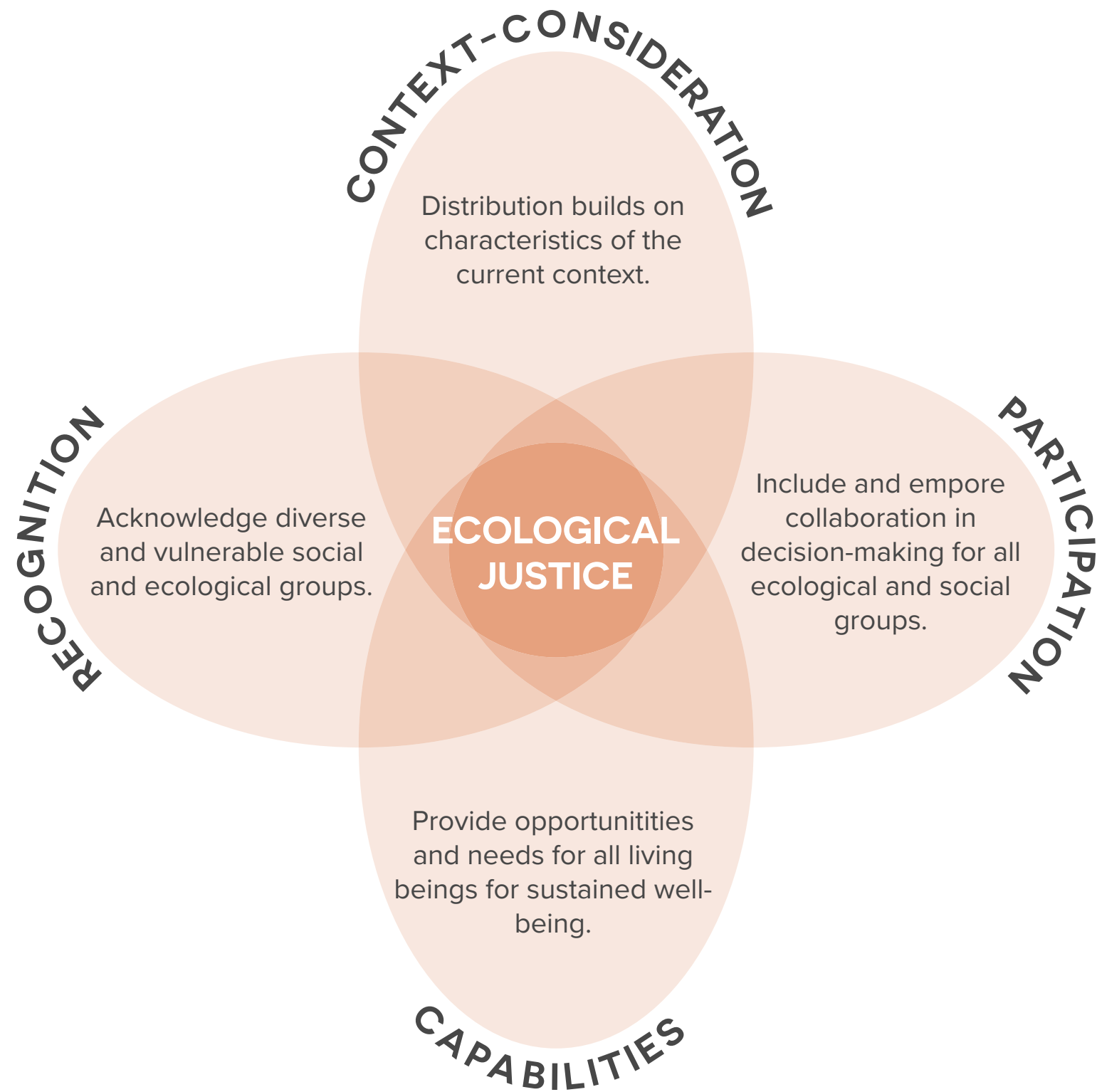


Based on Pineda-Pinto et al., 2022

■ ECOLOGICAL (IN)JUSTICE

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Gleeson and Low, 1998, p. 133



Based on Pineda-Pinto et al., 2022

DUTCH URBAN RENEWAL



Street lighting blinds nocturnal animals such as bats. (Modernista, n.d.)



The connectivity of other species, such as bats and butterflies, is not considered.



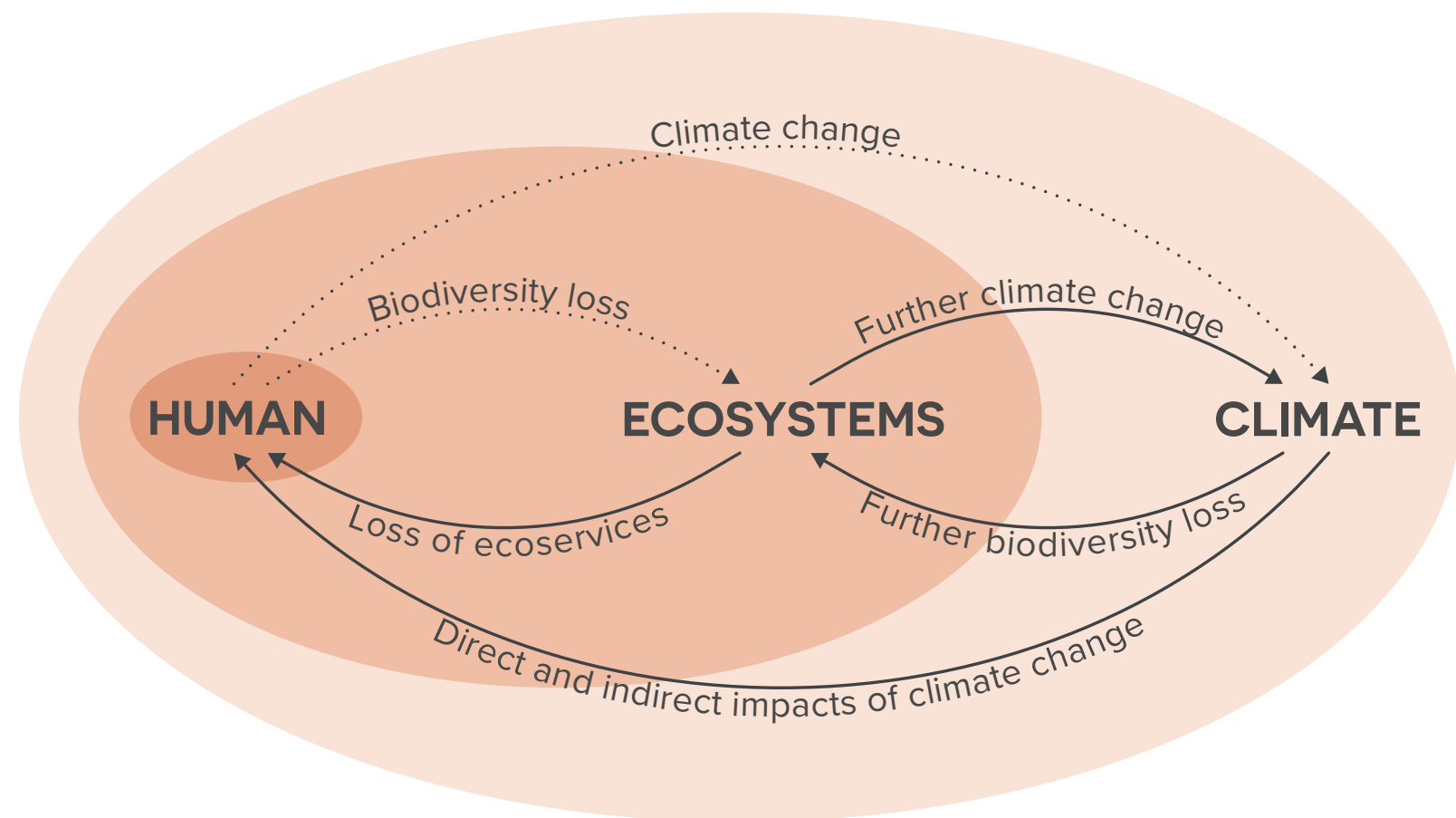
High quays lead to drowning hazards for hedgehogs, frogs and young swans.

Urban regeneration in the Netherlands aims to improve the liveability of its human citizens.

Stouten, 2016

DUTCH URBAN RENEWAL

However, urban renewal also delivers benefits when considering the liveability of non-human species.

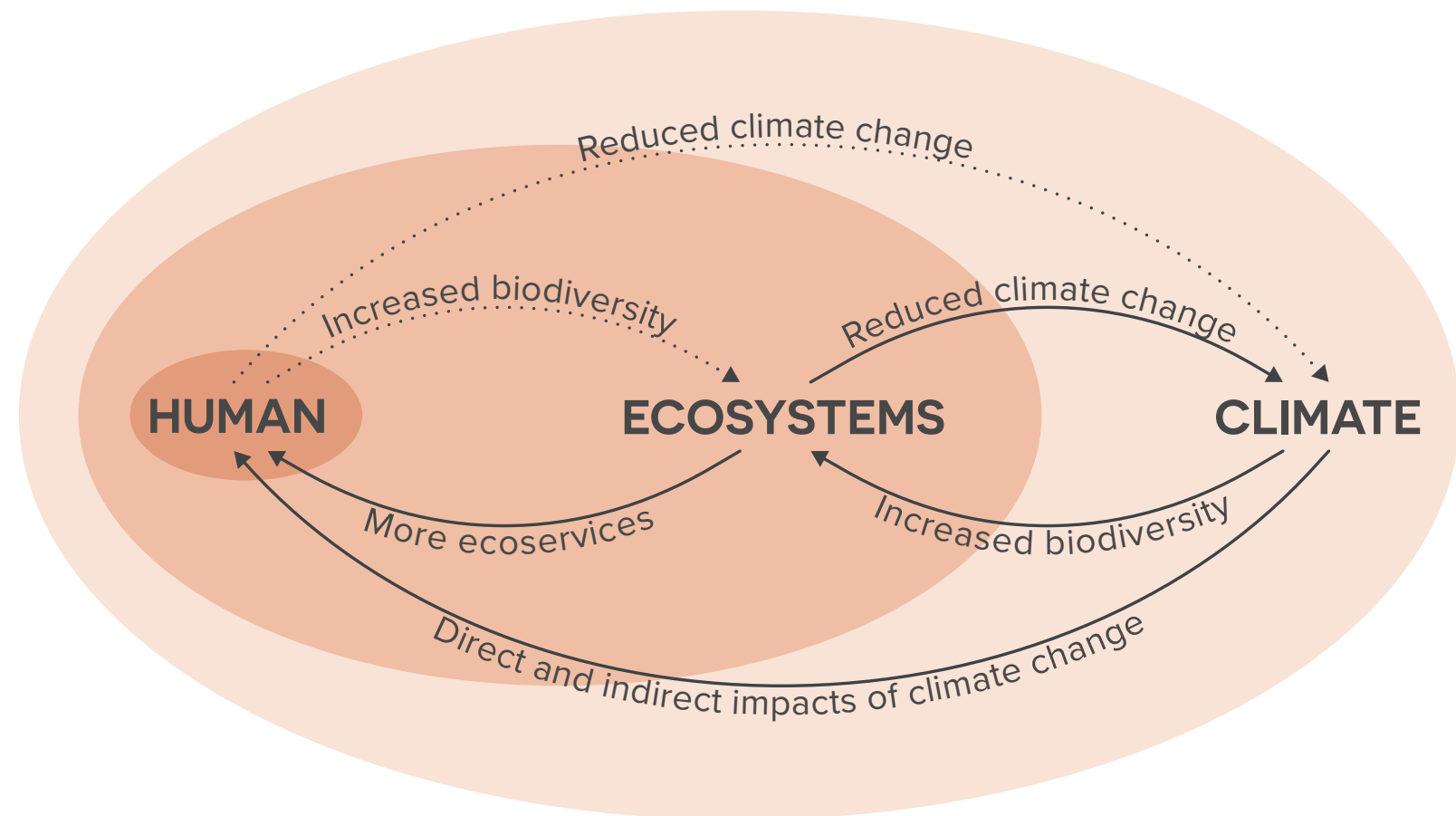


- Negative impact of behaviour / activities
- Result of change

Adapted from Pedersen Zari, 2015

DUTCH URBAN RENEWAL

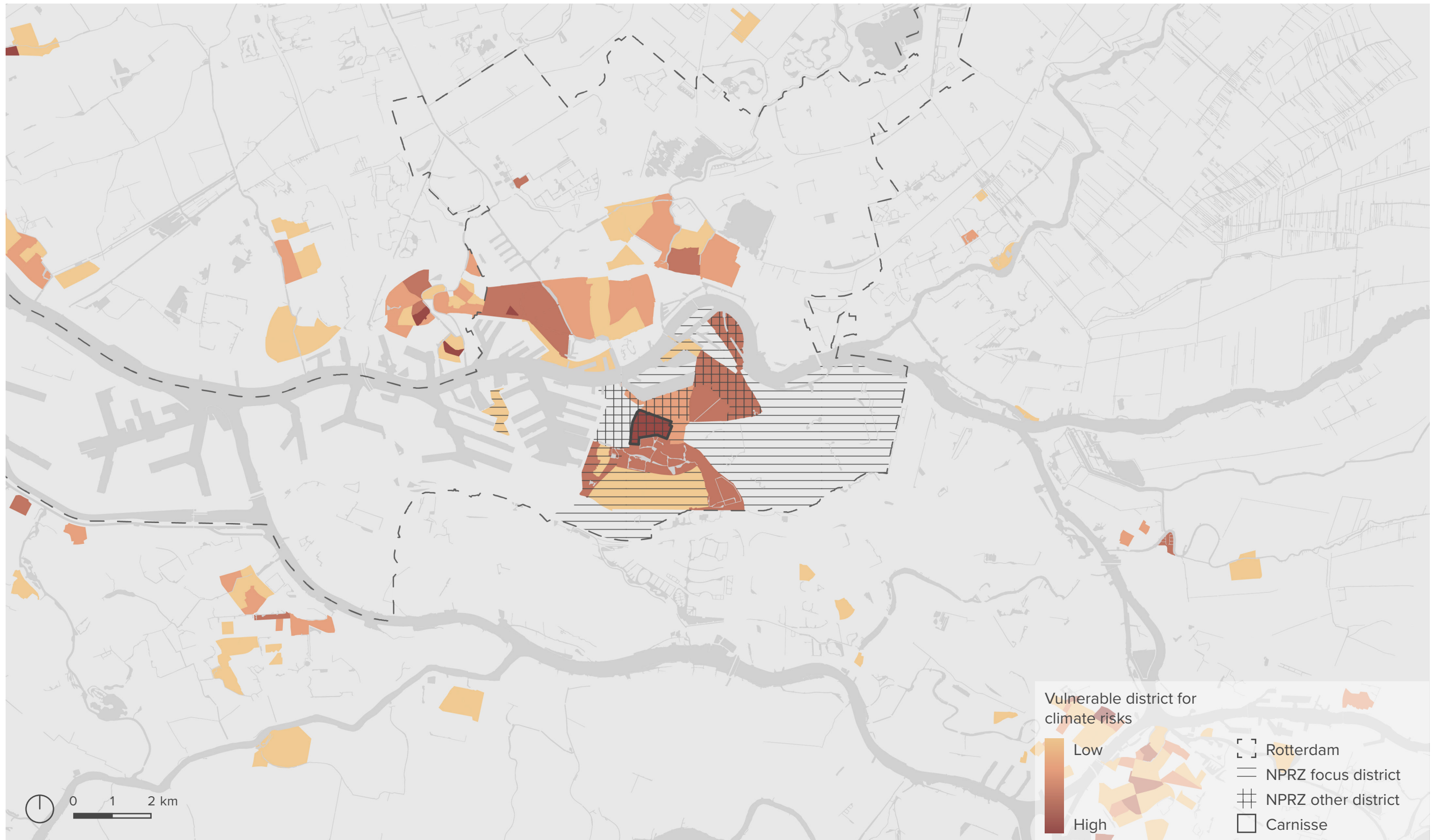
However, urban renewal also delivers benefits when considering the liveability of non-human species.



- > Positive impact of behaviour / activities
- Result of change

Adapted from Pedersen Zari, 2015

CONTEXTUALIZATION: ROTTERDAM



IMPRESSION OF CARNISSE



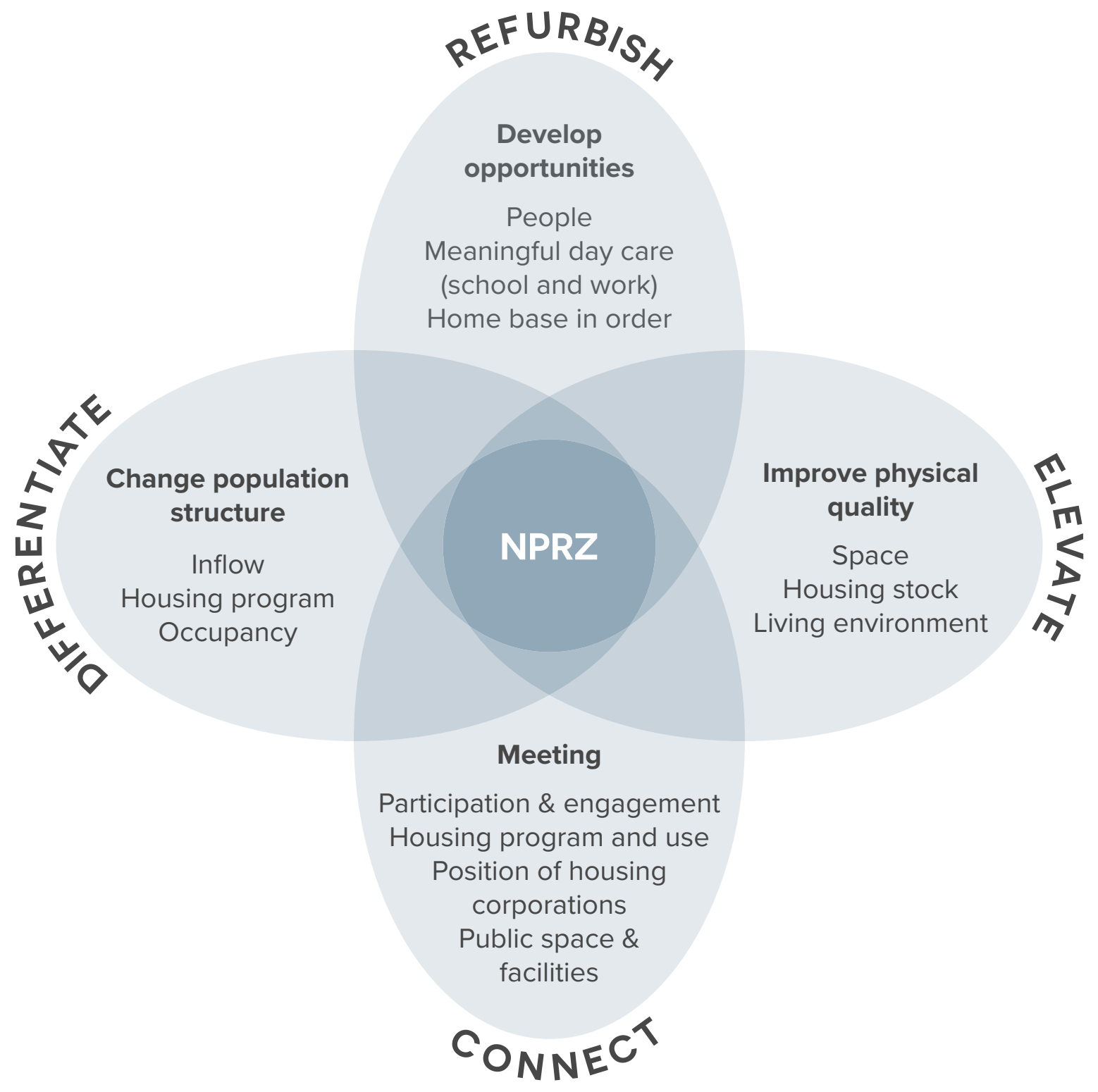
■ MAIN RESEARCH QUESTION

How can values of **ecological justice** contribute to a **spatial design** that improves **urban renewal** in **Carnisse, Rotterdam?**

■ THIS PRESENTATION

1. **Current form** of urban renewal in Carnisse, Rotterdam.
2. **Liveability** of present species.
3. Translation of ecological justice values into a **spatial design**.
4. **Comparison** of the NPRZ plan and the proposed plan.
5. Conclusion.

NARRATIVE NPRZ



Adapted from In.Fact.Research & Circusvis, 2022

MID-TERM PROJECTS NPRZ



1. Future perspective Roerdomplan.



2. Future perspective residential streets.



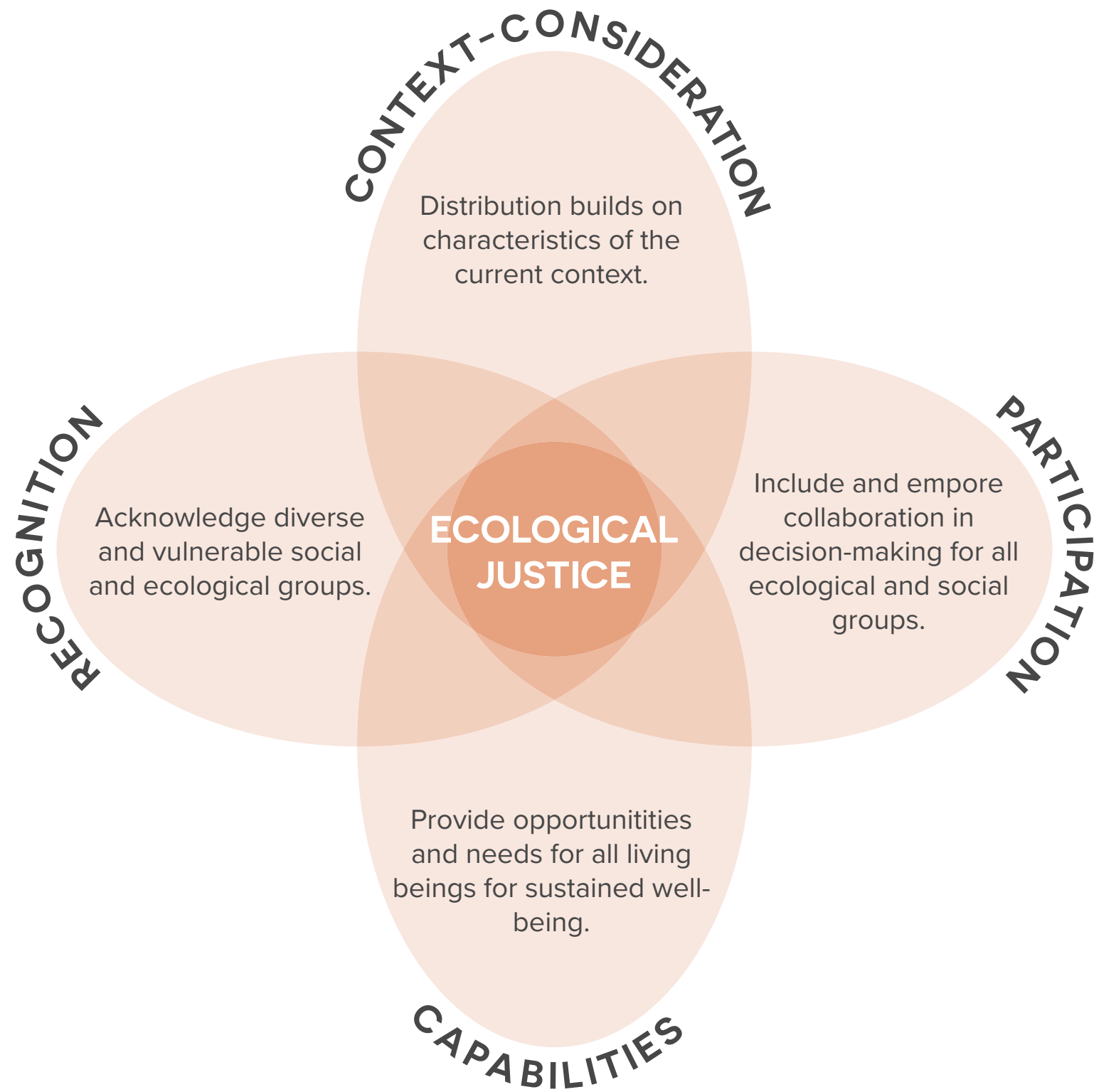
3. Future perspective city streets.



4. Future perspective Lepelaarsingel

Adapted from De Nijl Architecten, 2022

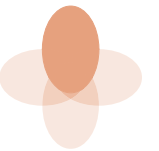
■ ECOLOGICAL (IN)JUSTICE IN CARNISSE



Based on Pineda-Pinto et al., 2022

PRESENT BIOTOPES

context consideration



	Common blue	Common pipistrelle	European hedgehog	House sparrow	Human	Vagrant darter
Rock						
Grassland						
Brushwood						
Forest						
Water						
Desert						
Infrastructure						
Free-riding species	<ul style="list-style-type: none"> • Various butterflies • Various insects • Various mice 	<ul style="list-style-type: none"> • Various bat species • Small birds • Moths 	<ul style="list-style-type: none"> • Various mice • Weasel • Polecat • Stone marten • Amphibians 	<ul style="list-style-type: none"> • Various bird species • Various insects 		<ul style="list-style-type: none"> • Various dragonfly species • Amphibians • Small ground-dwelling mammals • Fishes • Various (water) insects • Water birds

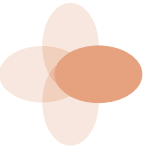


Biotope is a synthetic Greek word combining “**bios**” (meaning life) and “**topos**” (meaning place). **Biotope** is defined as “**the habitat together with its recurring associated community of species, operating together at a particular scale**”.

Panayiotis et al., 2019; Costello et al., 1997

TARGET SPECIES

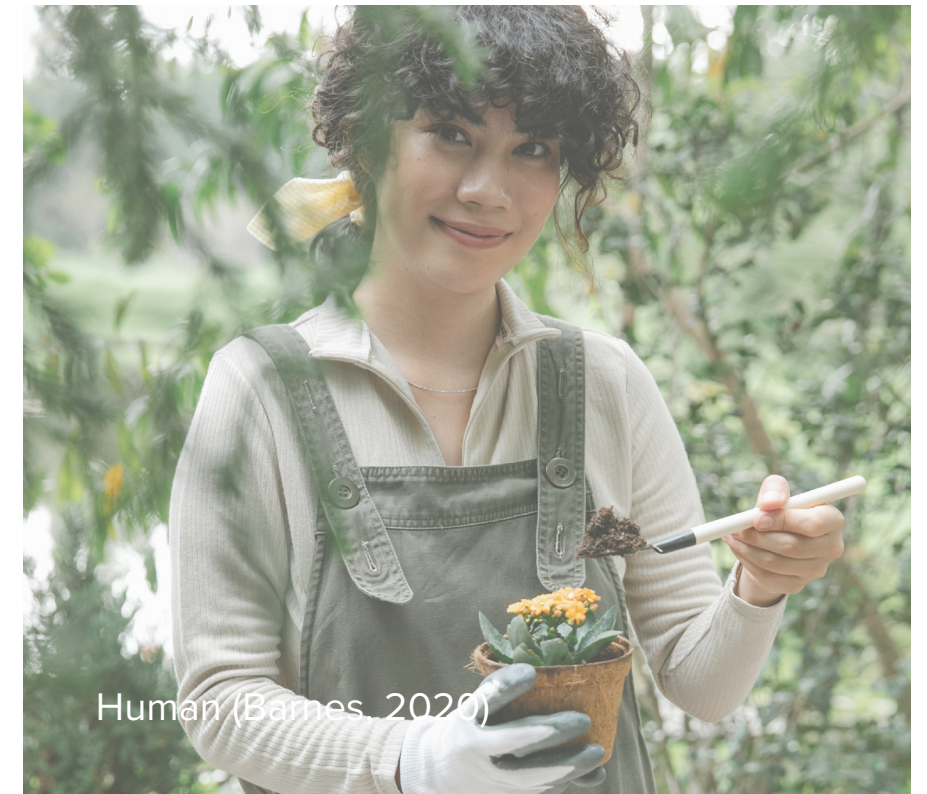
participation



Common blue (Johnson, 2015)



Common pipistrelle (Vishal Mahale Wildlife, n.d.)



Human (Barnes, 2020)



European hedgehog (Terwiel, 2015)

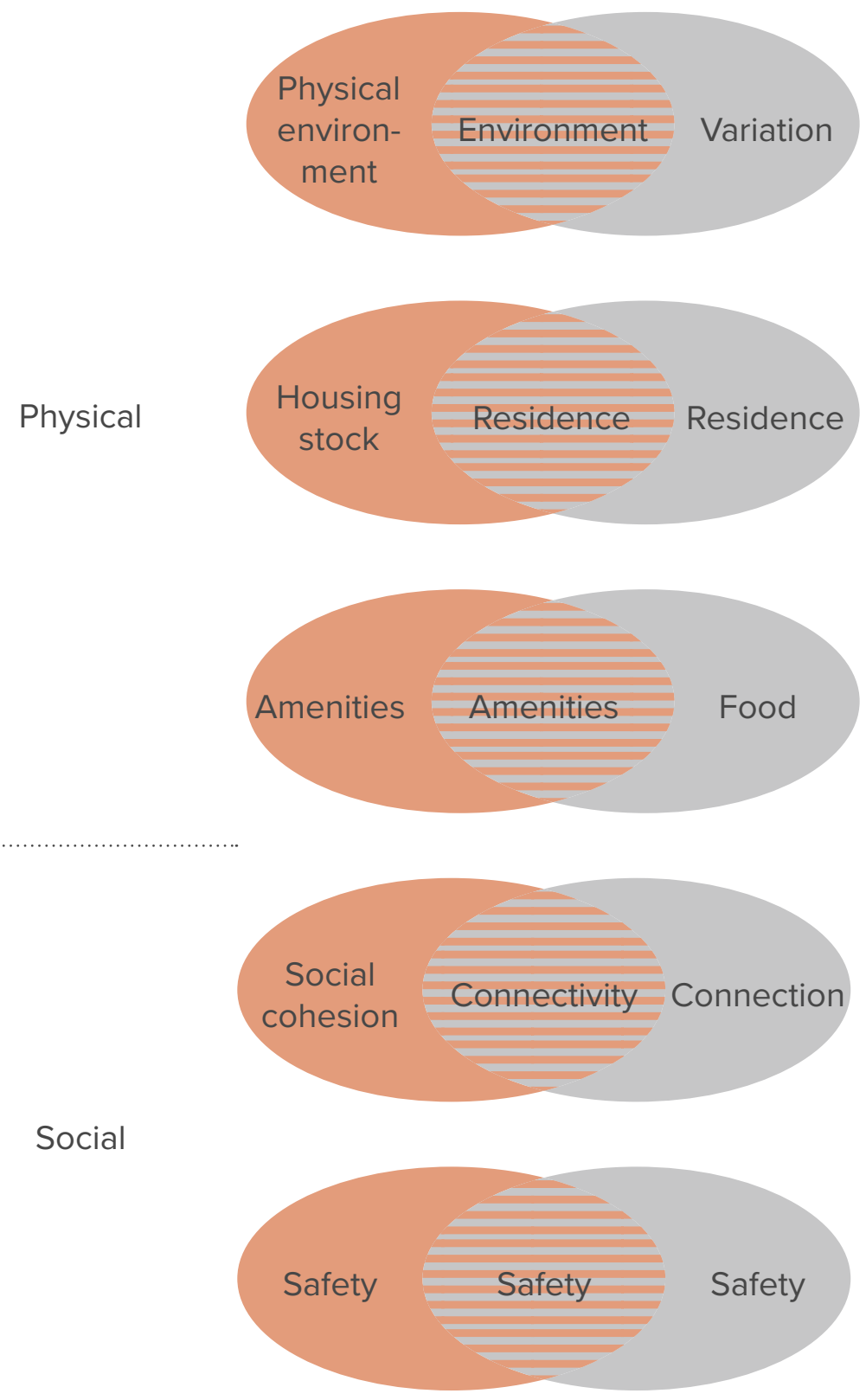





House sparrow (Rhododendrites, 2022)



Vagrant Darter (Andy C. Wildlife, n.d.)

ALIGNED LIVEABILITY



-  Human liveability
-  Non-human liveability
-  Aligned liveability

TOOLBOX

Common blue

Common pipistrelle

European hedgehog

House sparrow

Human

Vagrant darter

WATER BIOTOPE

Riparian vegetation

Gentle slope

Riparian vegetation Puddles

Water storage

Riparian vegetation Continuous water elements Aquatic plants

WATER BIOTOPE

GRASSLAND/FOREST BIOTOPE

Herb-rich grassland Continuous grasslands Host plants Dense grass pollen Phased mowing Litter layer Pesticide ban

Low and high vegetation Open spaces between trees Hollow and old trees

Herb-rich grassland Continuous grasslands Low dense vegetation Bushes with fruit and berries Twigs Branch rills Darkness

Herb-rich grassland Evergreen Bushes with fruit and berries Dense vegetation Group of bushes and trees Sand bath

Aesthetic vegetation Overview

Herb-rich grassland Continuous grasslands Groves

GRASSLAND/FOREST BIOTOPE

TOOLBOX

Common blue

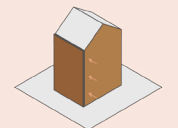
Common pipistrelle

European hedgehog

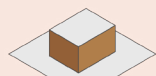
House sparrow

Human

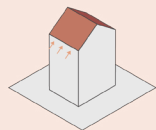
Vagrant darter



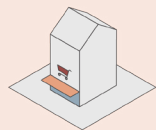
Open cavity walls



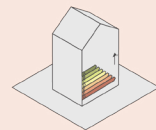
Shed



Open roofing tiles

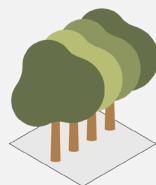


Stores

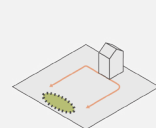


Increase energy label

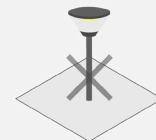
ROCK BIOTOPE - PRIVATE



Linear elements



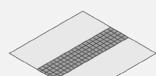
Two routes



Maximum lightning of 1 lux



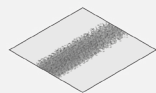
Hop-over by crossing



Paved structure

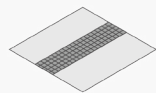


No motorized vehicles



Grit and pebbles

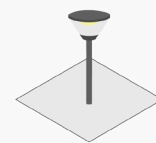
ROCK BIOTOPE - PUBLIC



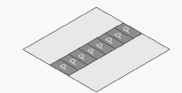
Paved structure



Continuous paved elements



Street lightning



Parking lot



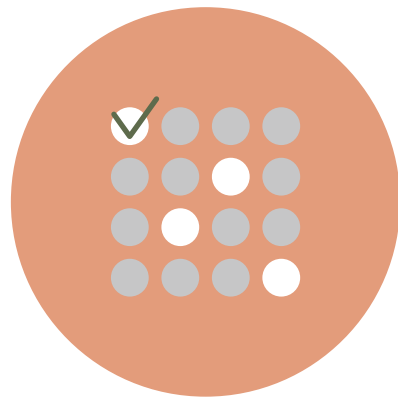
Public transport

CURRENT INTERACTIONS



-  House sparrow
-  Human
-  European hedgehog
-  Common blue
-  Common pipistrelle
-  Vagrant darter

DESIGN STARTING POINTS



Implement the toolbox



Preserve current private buildings and back yards

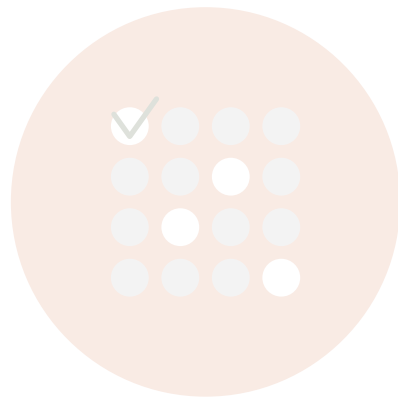


Take context-consideration into account



Use zoning in case of conflicts

DESIGN STARTING POINTS



Implement the toolbox



Preserve current private buildings and back yards

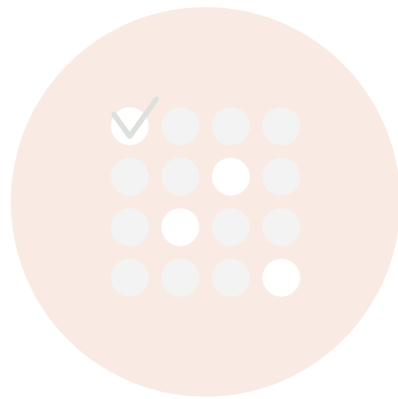


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■ DESIGN STARTING POINTS



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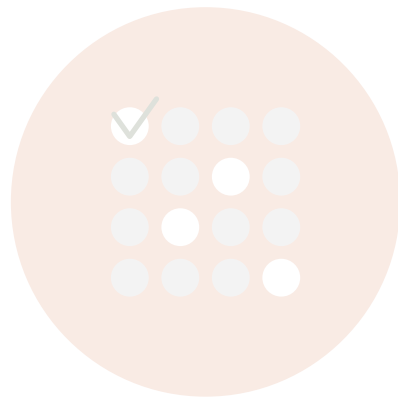


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DESIGN STARTING POINTS



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Preserve current private buildings and back yards

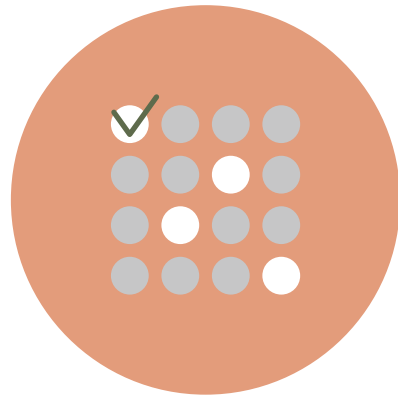


Take context-consideration into account



Use zoning in case of conflicts

DESIGN STARTING POINTS



Implement the toolbox



Preserve current private buildings and back yards



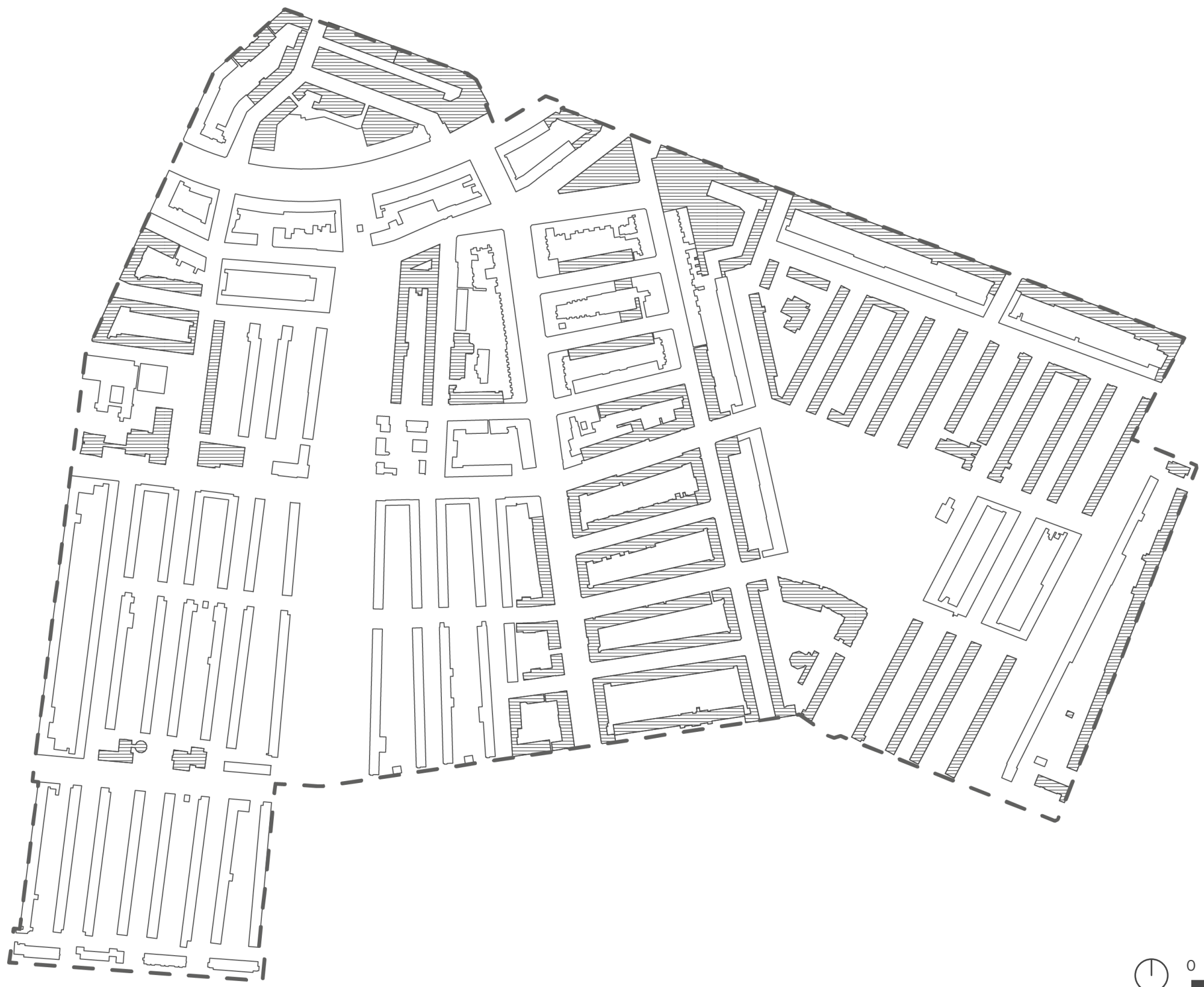
Take context-consideration into account



Use zoning in case of conflicts

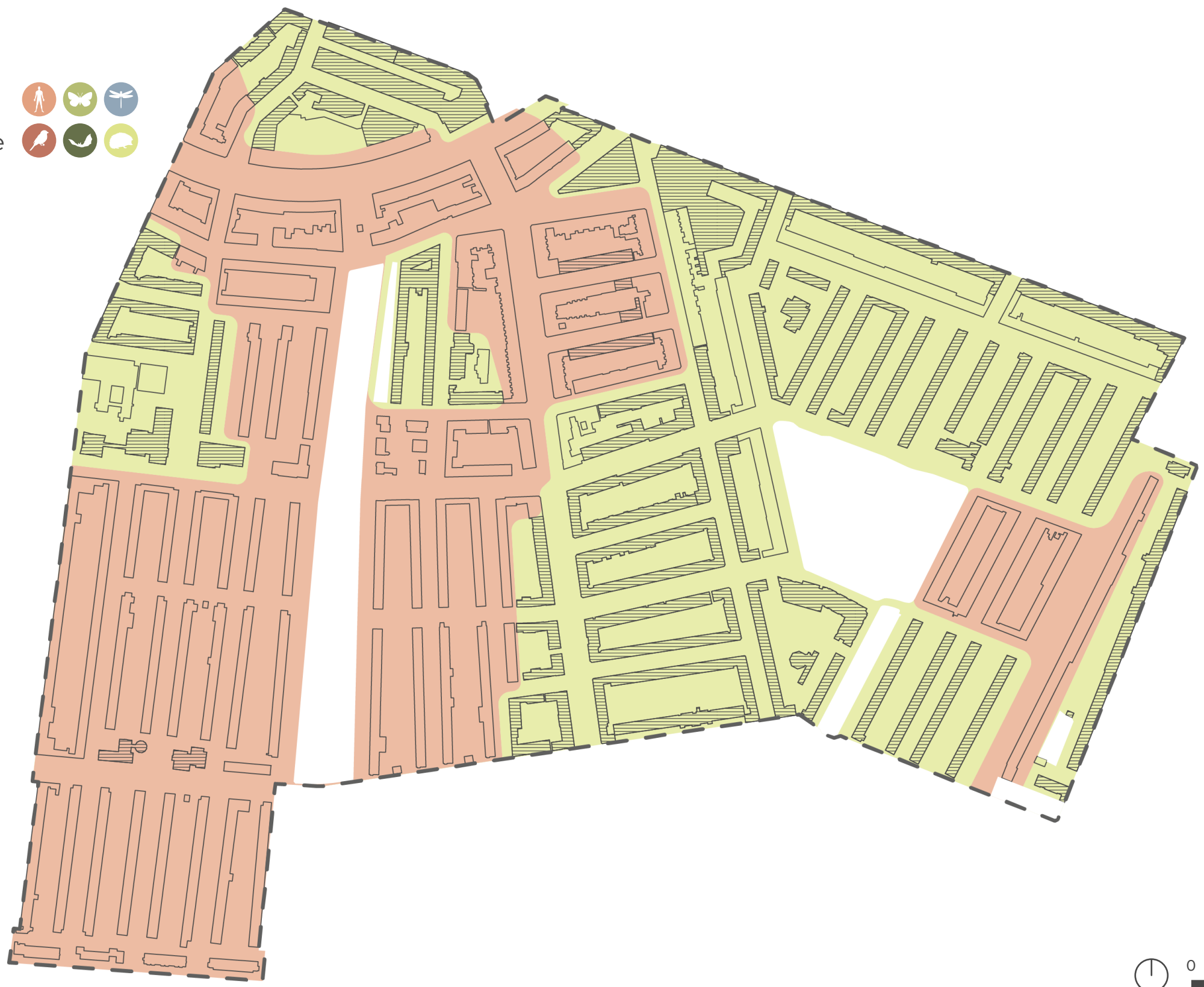
ZONING

- Flat roof
- Pitched roof



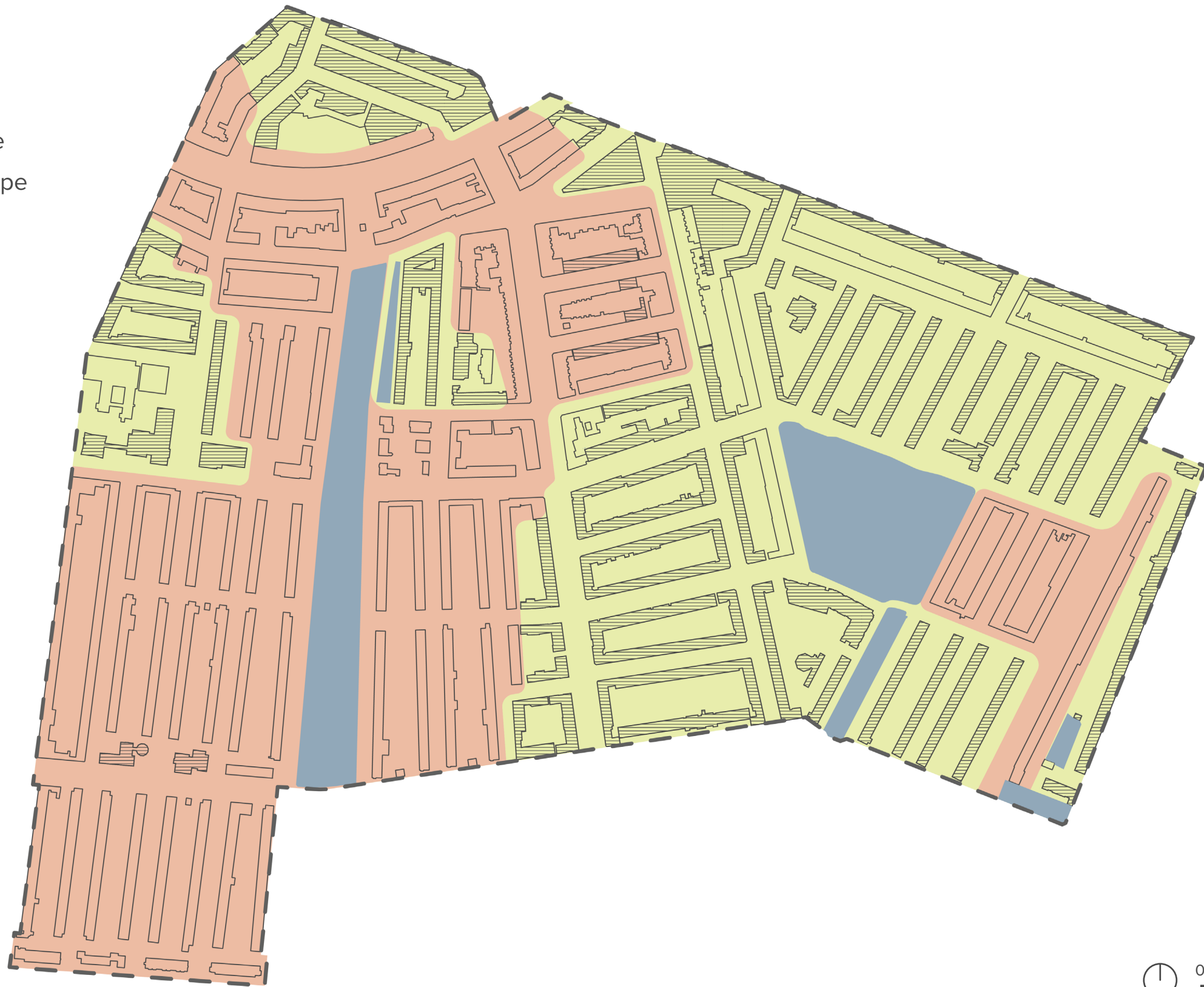
ZONING

- Flat roof
- Pitched roof
- Open biotope
- Sheltered biotope



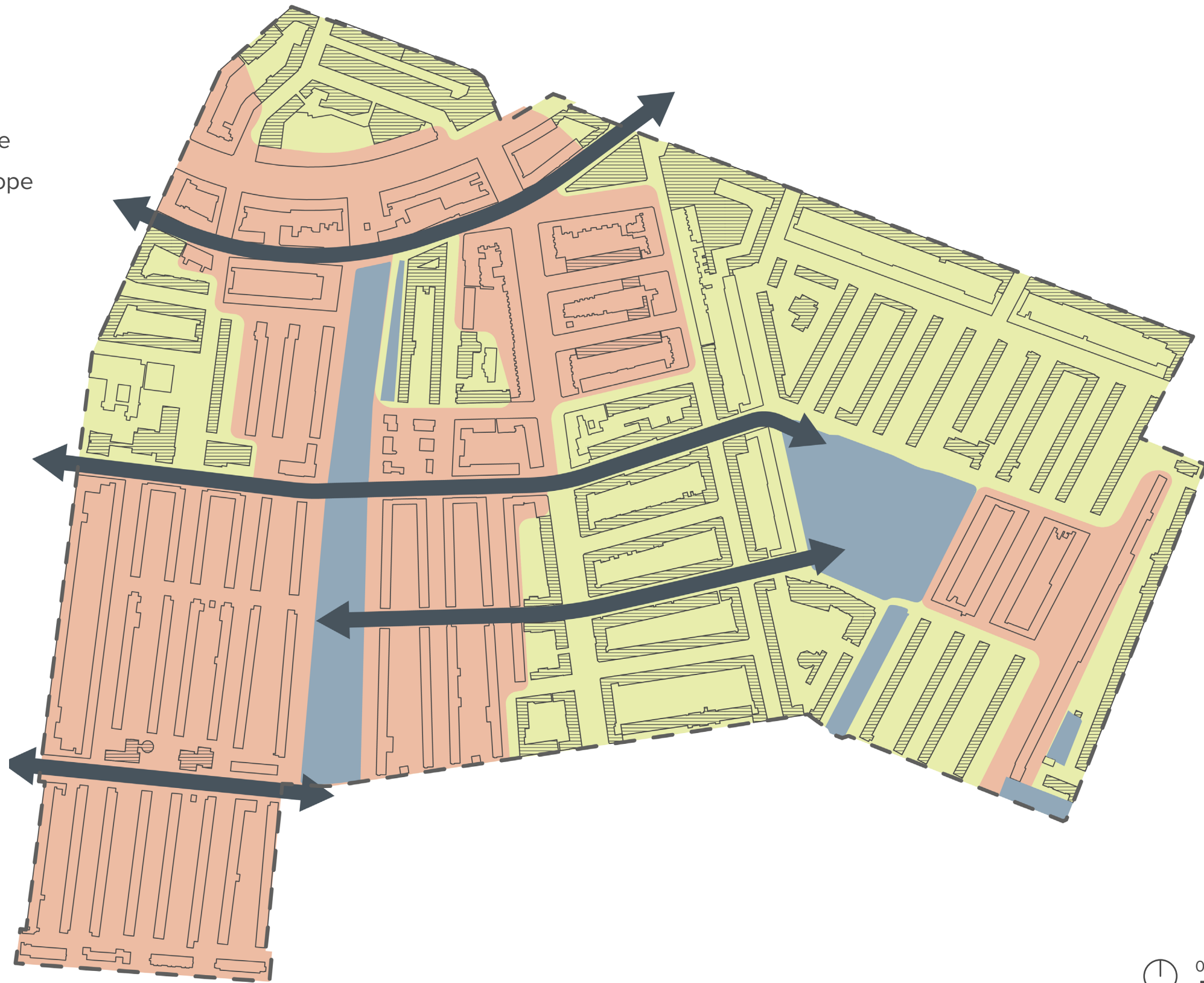
ZONING

- Flat roof
- Pitched roof
- Open biotope
- Sheltered biotope
- All-inclusive biotope





ZONING

- Flat roof
- Pitched roof
- Open biotope
- Sheltered biotope
- All-inclusive biotope
- All-inclusive connection



INFRASTRUCTURE MOTORIZED VEHICLES

-  Parking garage
-  Parking block



INFRASTRUCTURE MOTORIZED VEHICLES









INFRASTRUCTURE PUBLIC TRANSPORT



INFRASTRUCTURE BIKE









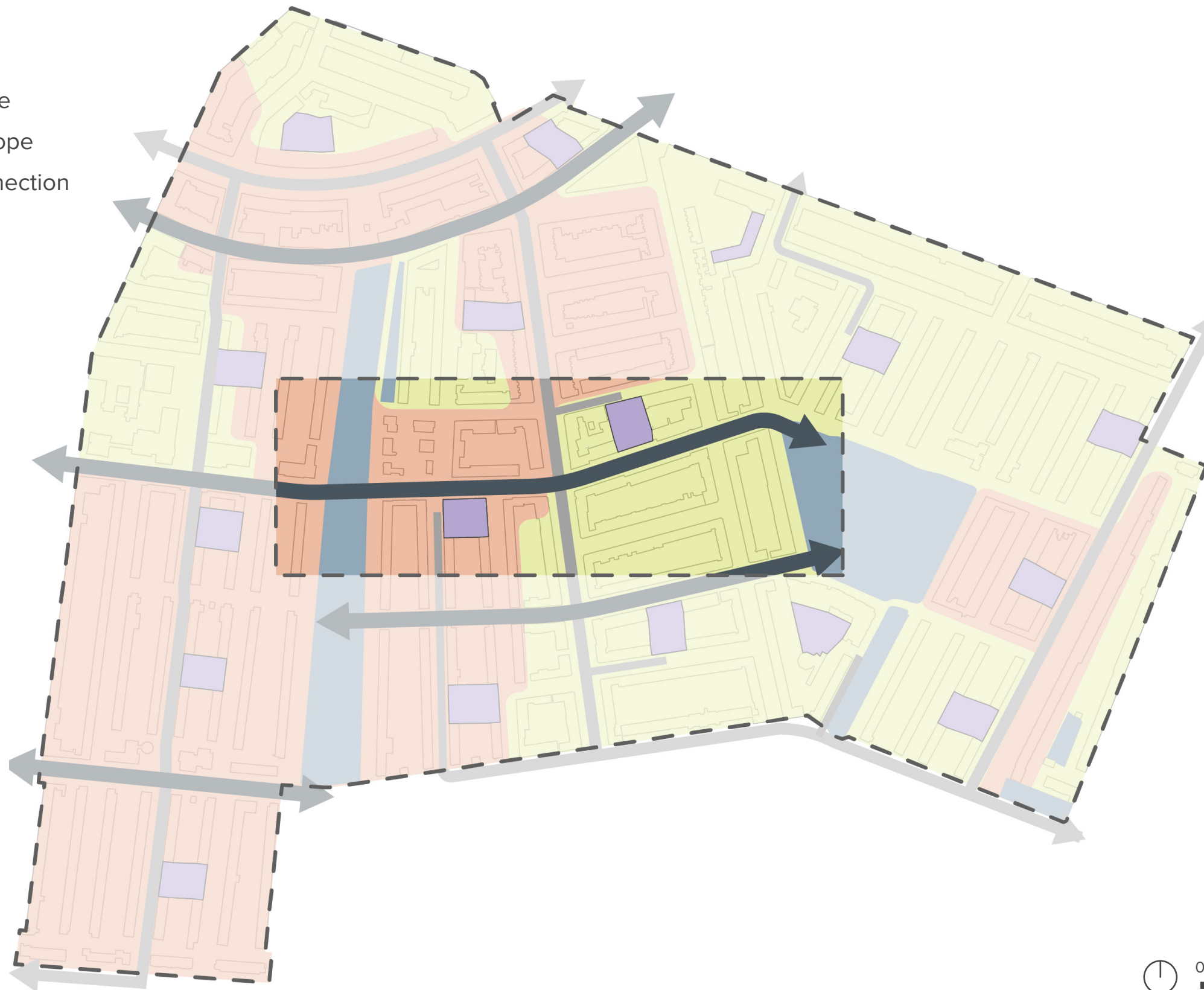
FRAMEWORK

-  Parking garage
-  Open biotope
-  Sheltered biotope
-  All-inclusive biotope
-  All-inclusive connection
-  Car road









FRAMEWORK

-  Parking garage
-  Open biotope
-  Sheltered biotope
-  All-inclusive biotope
-  All-inclusive connection
-  Car road

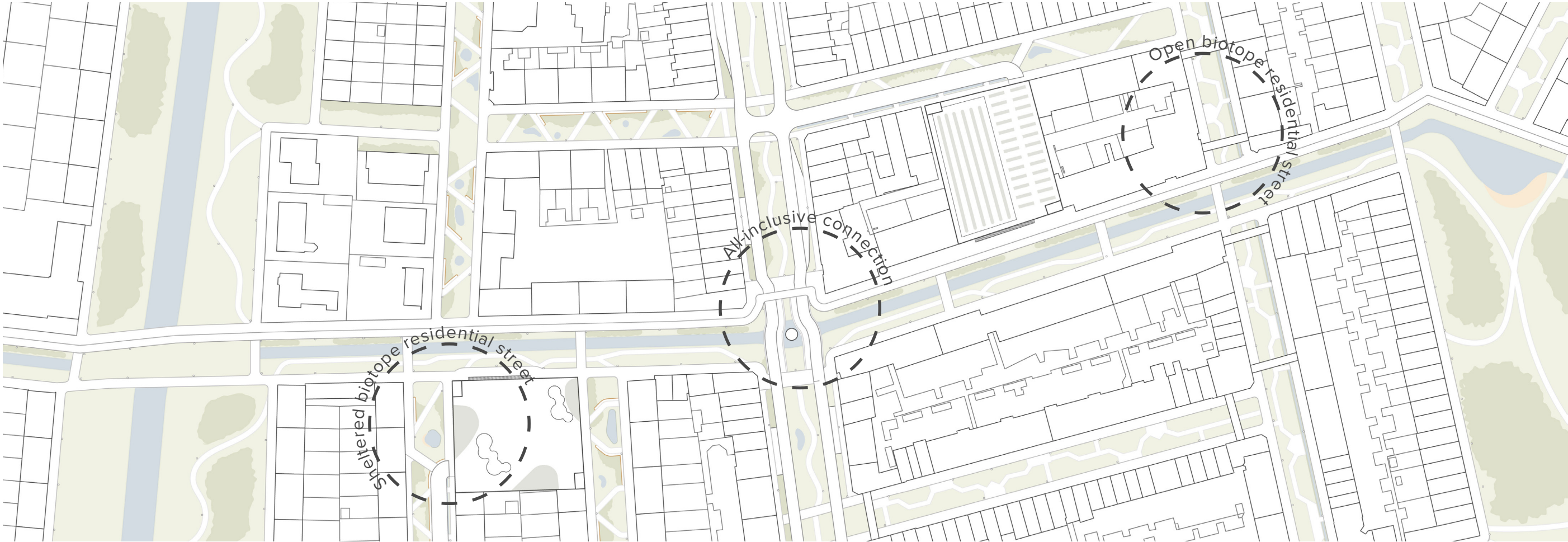


FRAMEWORK

-  Parking garage
-  Open biotope
-  Sheltered biotope
-  All-inclusive biotope
-  All-inclusive connection
-  Car road

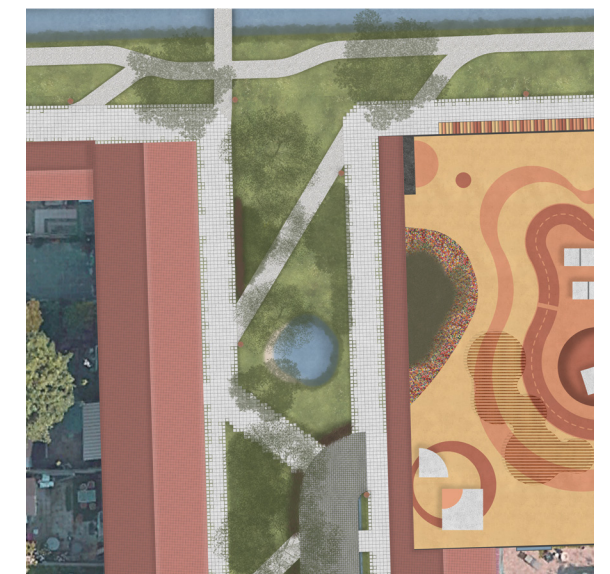
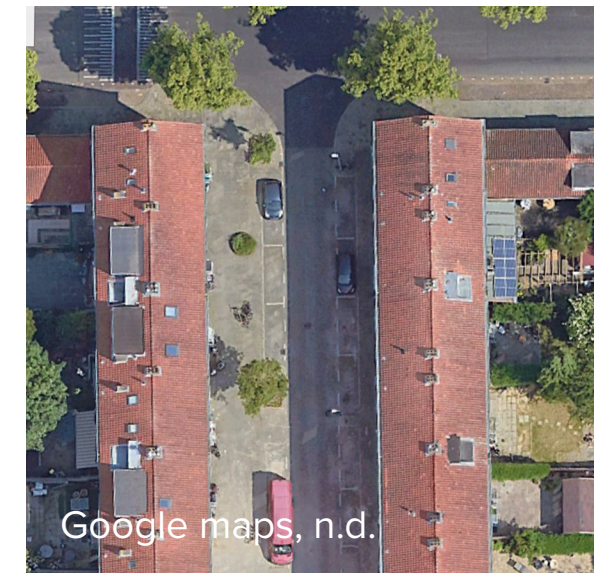


OVERVIEW

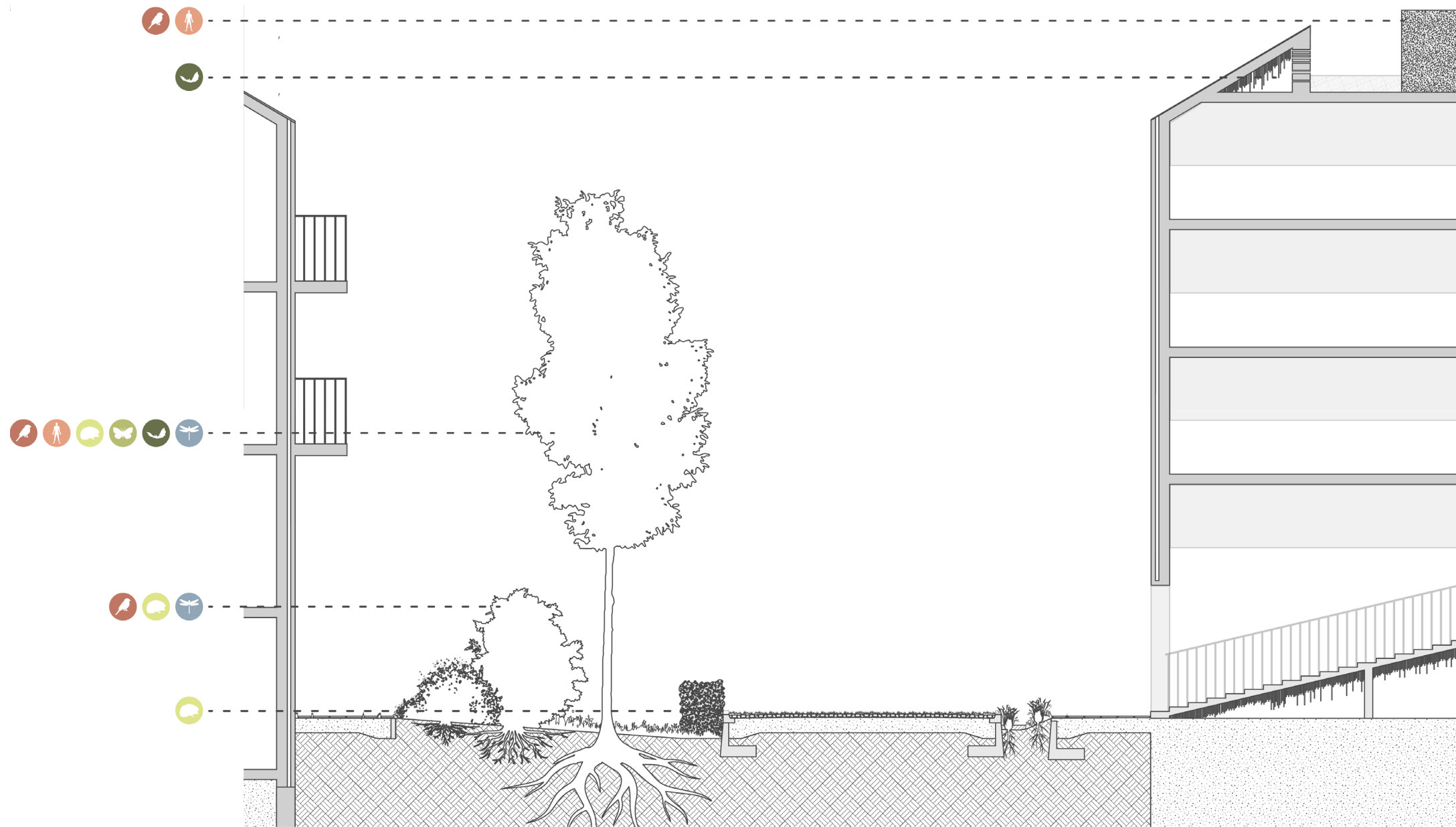


- | | | |
|-----------------------------------|--|-------------------|
| Building | Bike path | Higher vegetation |
| Yard | Shared space: car, bike and pedestrian | Water |
| Pedestrian area semi-paved | Busstop / parking | Sand |
| Pedestrian area tiles | Branchrills | Bird palace |
| Shared space: bike and pedestrian | Herb-rich grassland | Lamppost |

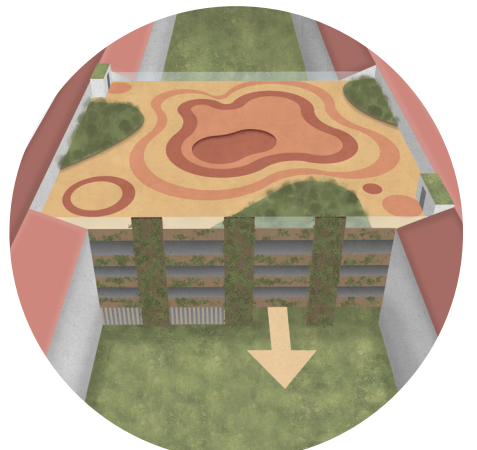
SHELTERED BIOTOPE



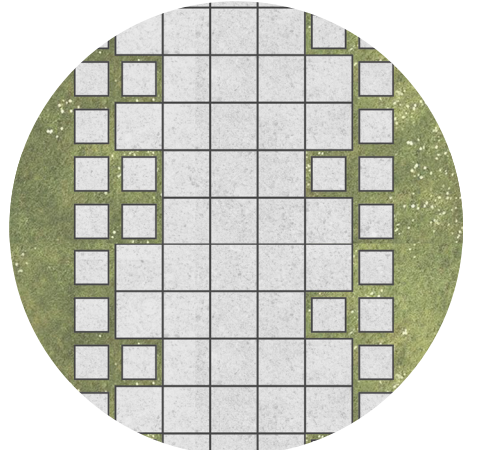
SHELTERED BIOTOPE



Playground equipment
(McCloy + Muchemwa, 2023)



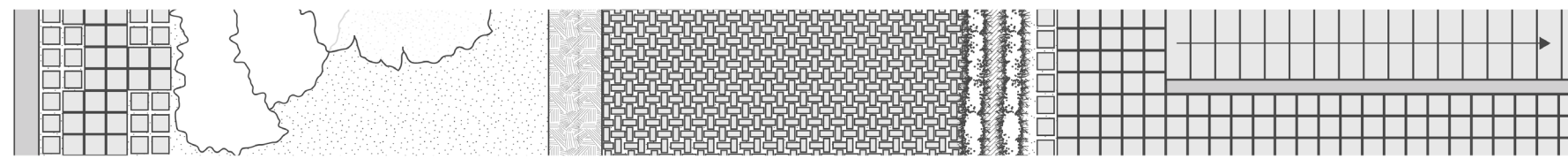
Parking garage



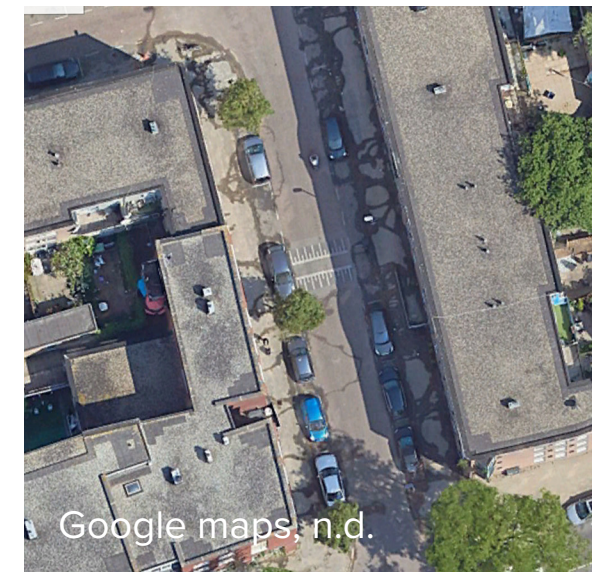
Pavement

Probable species present

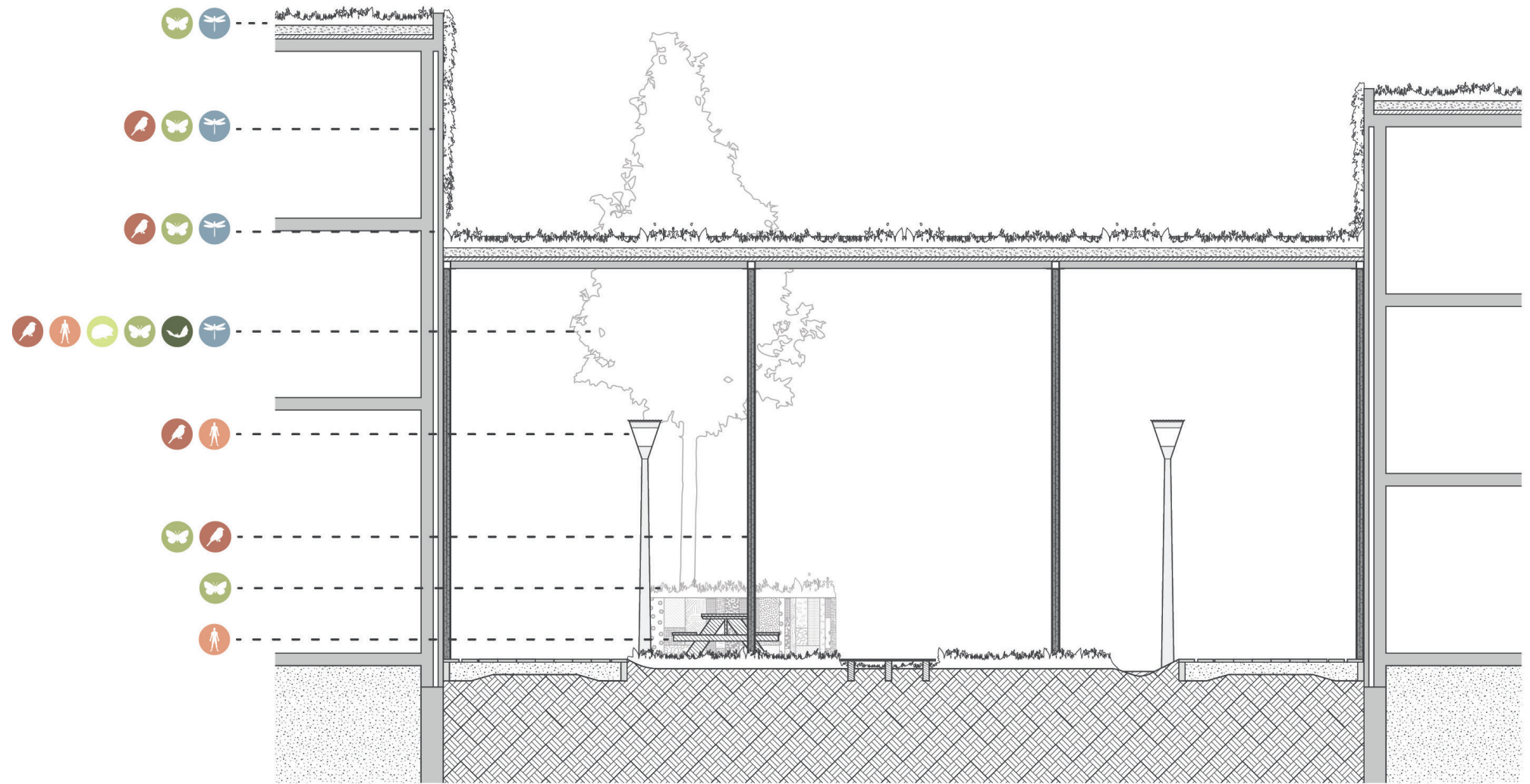
- House sparrow
- Human
- European hedgehog
- Common blue
- Common pipistrelle
- Vagrant darter



OPEN BIOTOPE



OPEN BIOTOPE



15
627
35
376
1053



Corten steel pillar



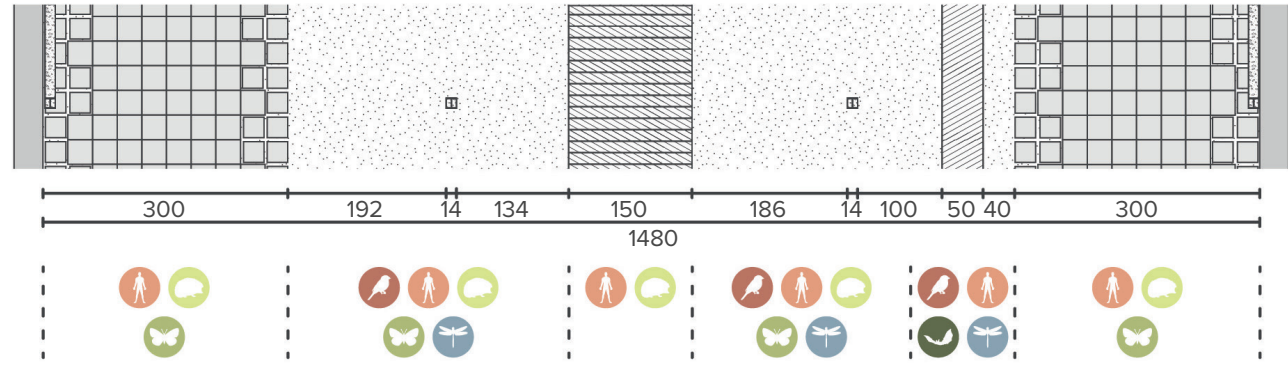
Lamppost



Planter

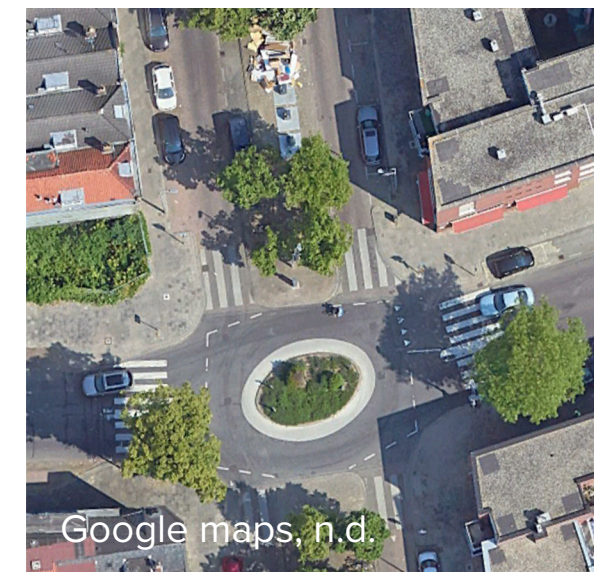
Probable species present

- House sparrow
- Human
- European hedgehog
- Common blue
- Common pipistrelle
- Vagrant darter



0 1 2 m

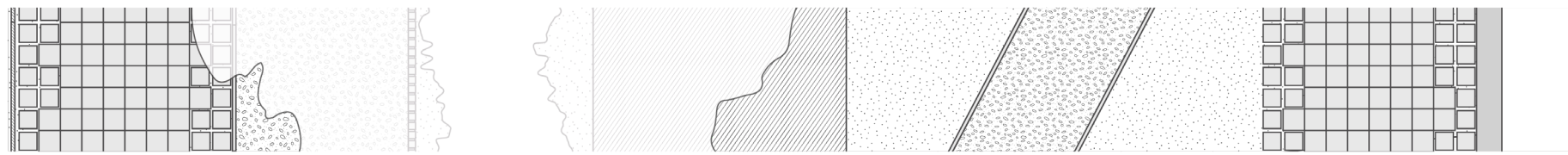
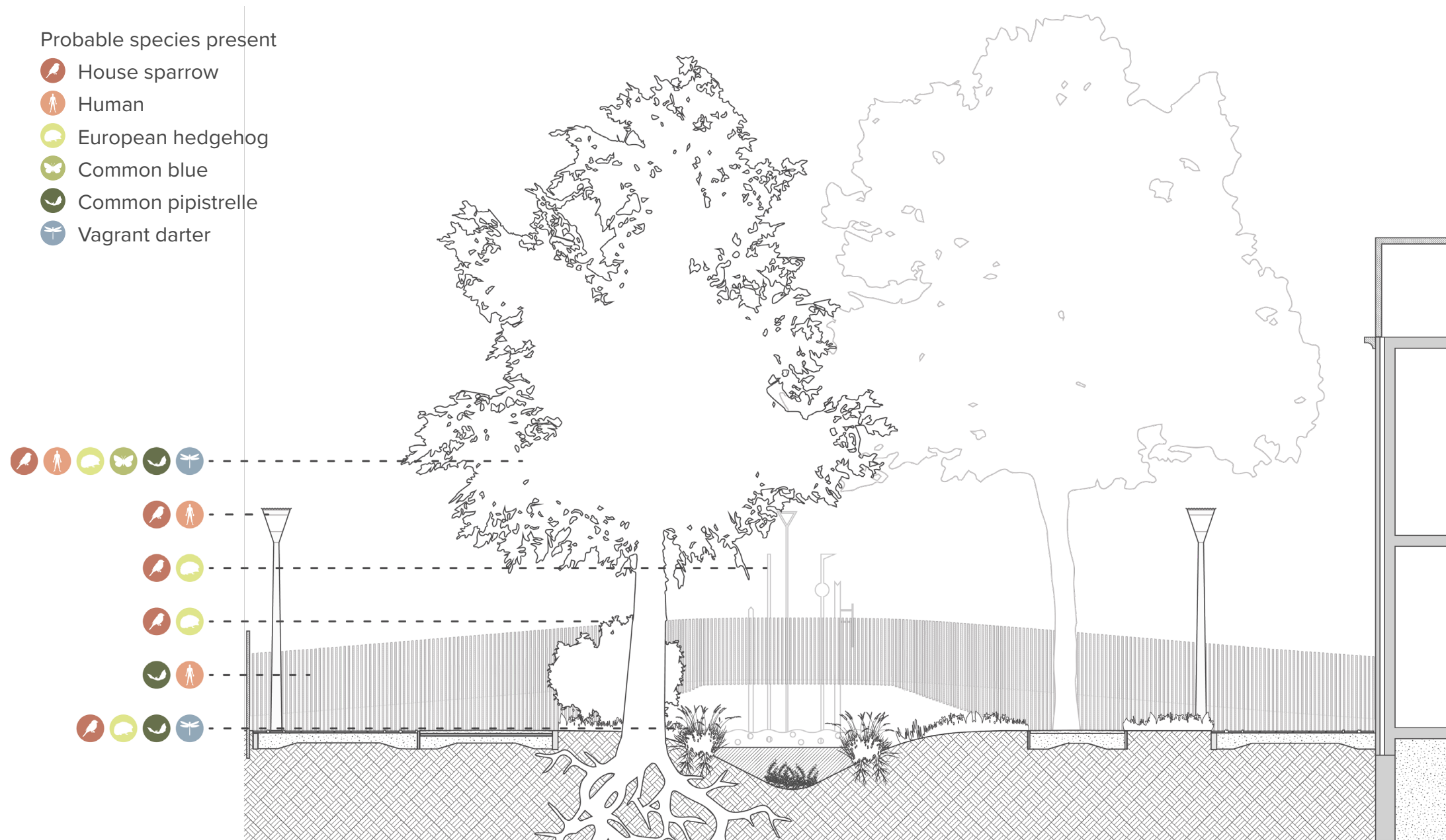
ALL-INCLUSIVE CONNECTION



ALL-INCLUSIVE CONNECTION

Probable species present

-  House sparrow
-  Human
-  European hedgehog
-  Common blue
-  Common pipistrelle
-  Vagrant darter



0 1 2 m



Birds palace
(Studio Ossidiana, 2021)



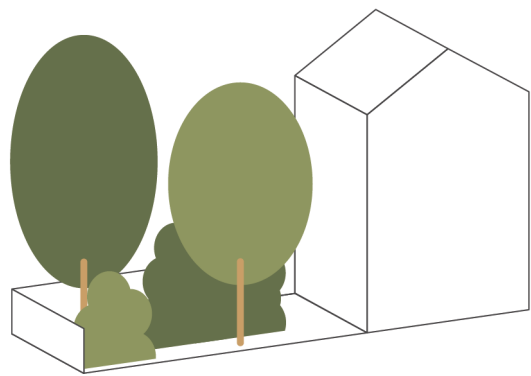
Bat bridge (Rutting, 2015)



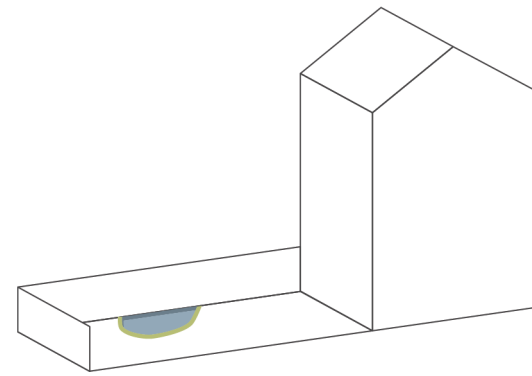
Red pebbles
(GSB Tuinmaterialen, n.d.)

491
895
200
120
84
106

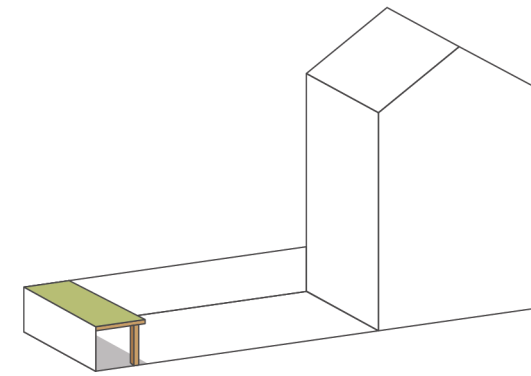
PRIVATE PROPERTIES



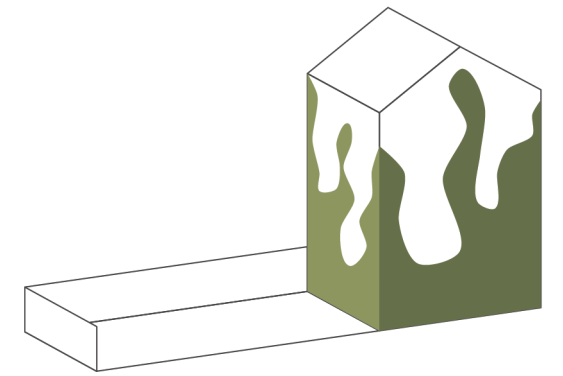
Upright vegetation



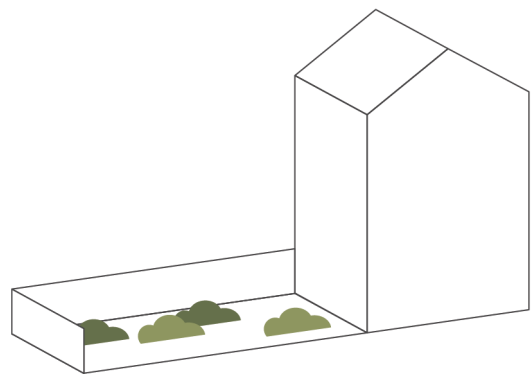
Pond



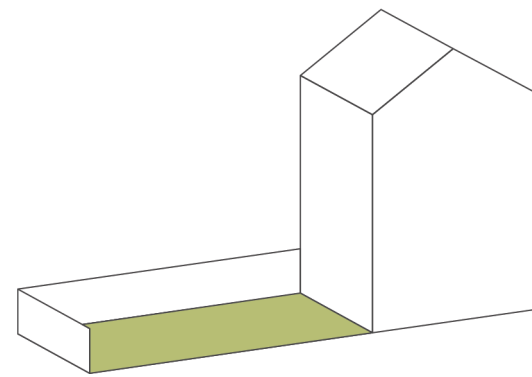
Canopy with herb-rich grassland



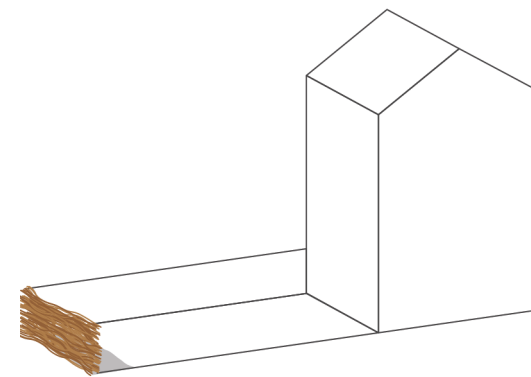
Climbing plants on façade



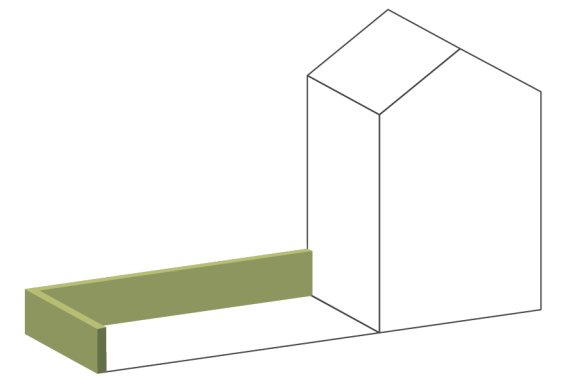
Low vegetation



Herb-rich grassland



Branch rills instead of fences



Hedges instead of fences

CONNECTED BIOTOPES



CONCEPT

NPRZ PLAN

PURPOSE

Improve **liveability of human citizens** present

PARTICIPATION

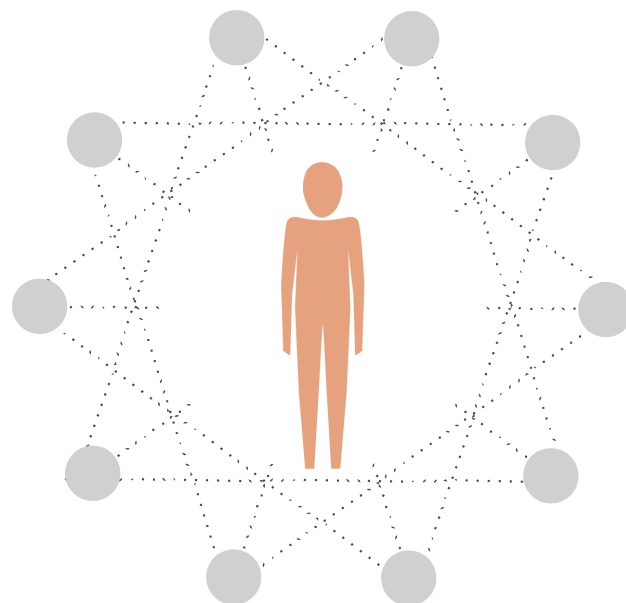
Humans participate in the process

PRIORITIZATION

Humans have a central position

APPROACH

Seperated physical and social domain



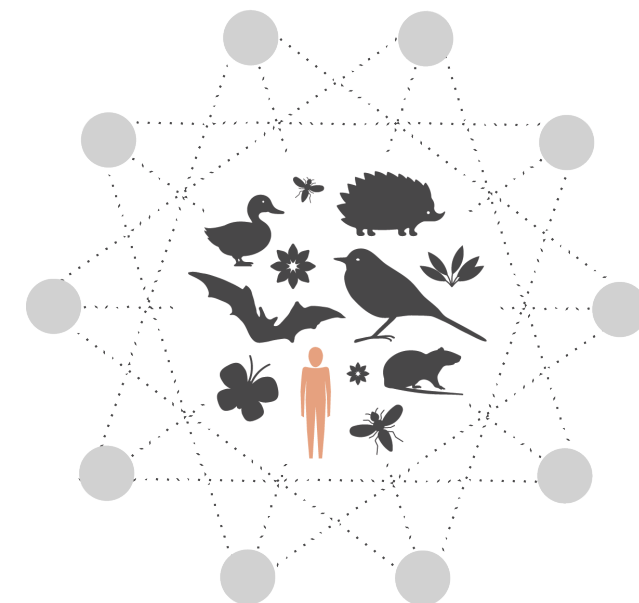
PROPOSED PLAN

Improve **liveability of all species** present

Human and non-human species participate in the process

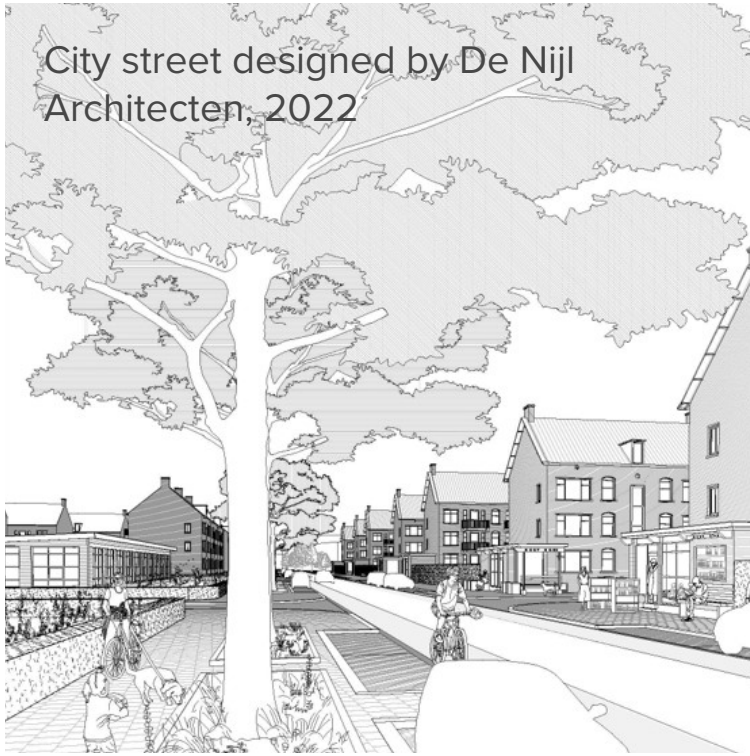
Human and non-human species share their central position

Integrated physical and social domain



SPATIAL PLAN

City street designed by De Nijl Architecten, 2022



Residential street designed by De Nijl Architecten, 2022



City street proposed design



Residential street proposed design

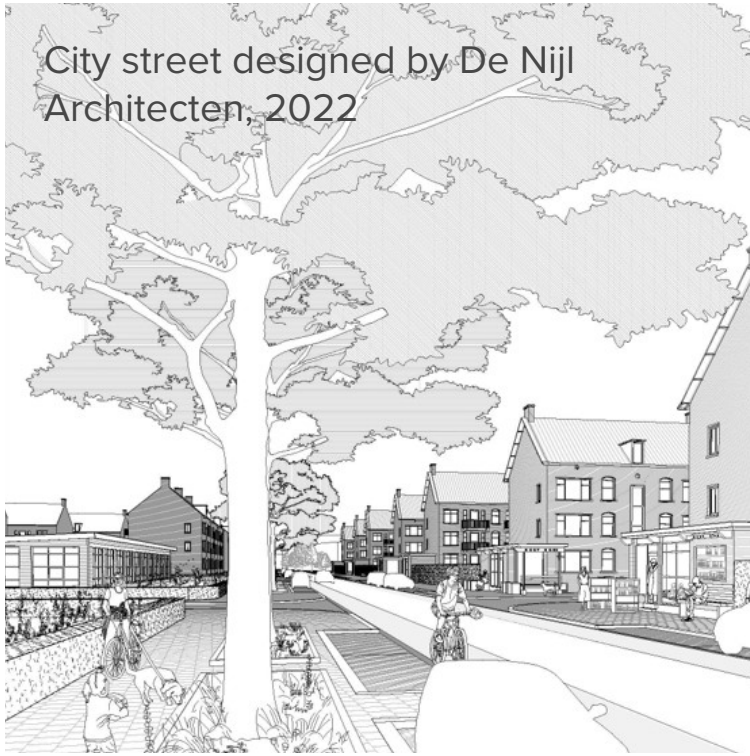


Residential street proposed design



SPATIAL PLAN

City street designed by De Nijl Architecten, 2022



Residential street designed by De Nijl Architecten, 2022



Positive side effects greenery, water and biodiversity :

- Increased climate adaptation
- Reduced urban crime
- Increased mental and physical well-being
- Stimulating interaction between humans
- Better protection against diseases and pests
- Improved air quality
- Reduced urban heat island effect
- Enhanced water quality
- Reduced loneliness
- Enhanced social cohesion

(Kennisportaal Klimaatadaptatie, n.d.; Shepley et al., 2019; STOWA & Stichting RIONED, 2014; Wageningen University & Research, n.d.; Vink et al., 2017)

City street proposed design



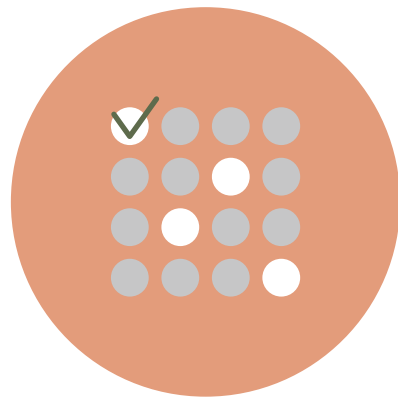
Residential street proposed design



Residential street proposed design



HOW?



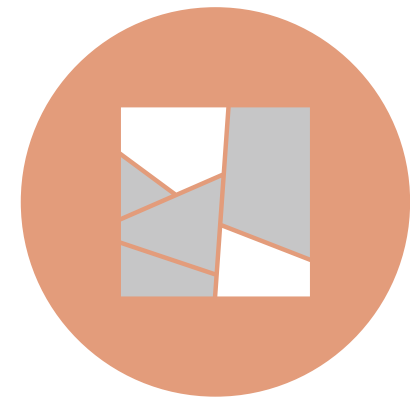
Implement the toolbox



Preserve current private buildings and back yards



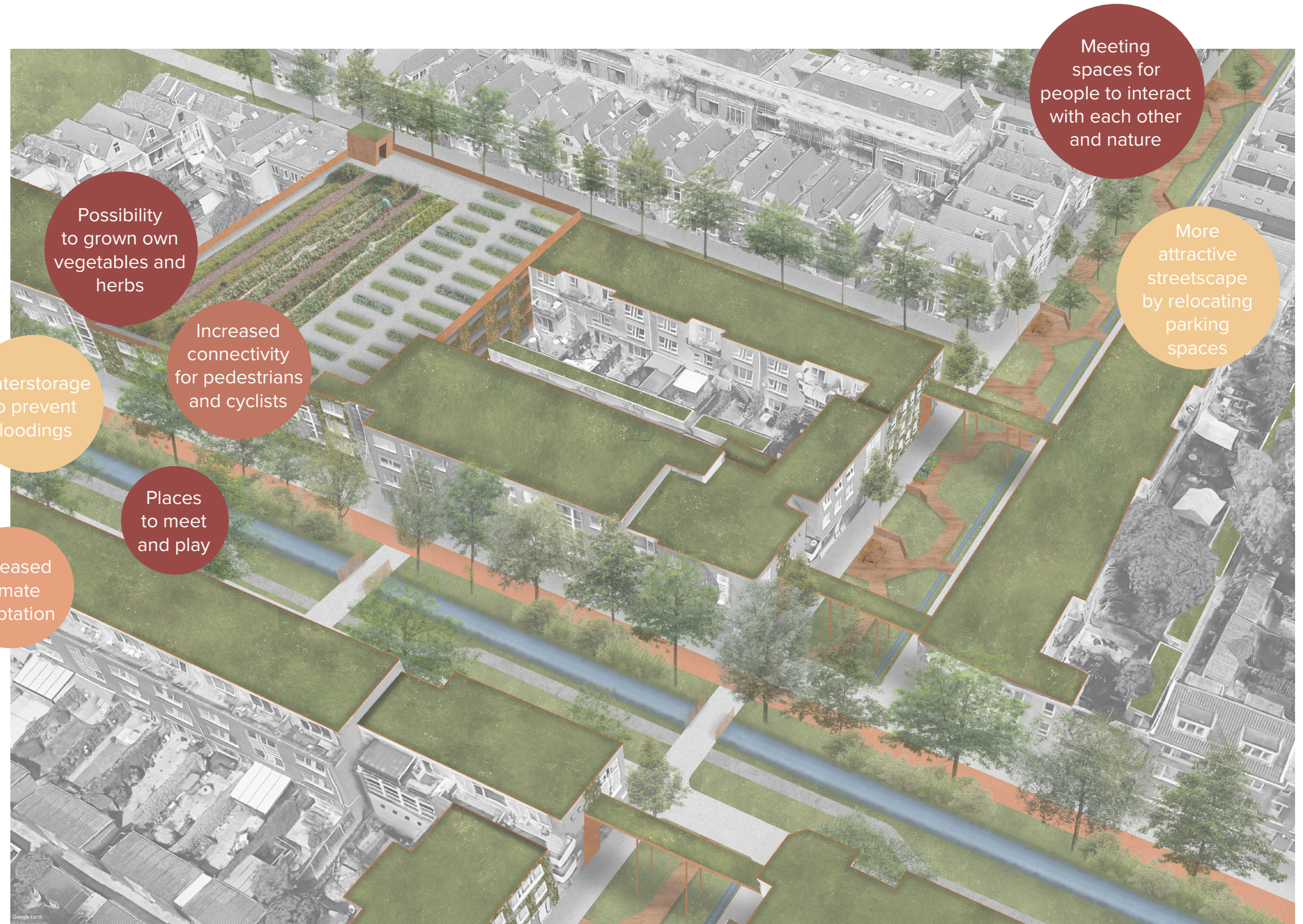
Take context-consideration into account



Use zoning in case of conflicts

CONTRIBUTION

- Arcadian position
- Resourcist position



Reduced urban heat island effect

Improved air quality

Increased physical and mental well-being

Reduced urban crime

Better protection against diseases

Increased climate adaptation

Waterstorage to prevent floodings

Possibility to grown own vegetables and herbs

Places to meet and play

Increased connectivity for pedestrians and cyclists

Meeting spaces for people to interact with each other and nature

More attractive streetscape by relocating parking spaces

LET'S CREATE A CITY FOR EVERYONE

Emy Steenbergen // 4688341 // January 17, 2024
1st mentor: Ir. Leo van den Burg // 2nd mentor: Dr. Ir. Nico Tillie

