



# Proposed Vision for Skarpnäck: Living Urban Canvas Model

Crimson Vibe Tribe: Feel the Pulse, Live the Energy

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# Guiding Statement/Objective

The guiding objective of the Crimson Vibe Tribe is to:

- Leverage nature-based solutions for a sustainable urban environment in Skarpnäck.
- Maximize ecosystem services benefits for all society members.
- Emphasize utilitarian values of nature.
- Enhance human well-being.
- Mitigate environmental risks.
- Promote equitable access to natural resources.



# The Four Societal & Environmental Challenges

## Urban Heat Island Effect

- Cause: High-density housing, concrete, and asphalt usage, loss of vegetation.
- Impact: Increased temperatures, higher energy demands, health issues.

## Biodiversity Loss

- Cause: Urban expansion, pollution, invasive species.
- Impact: Weakened ecosystem services, increased vulnerability to pests and diseases.

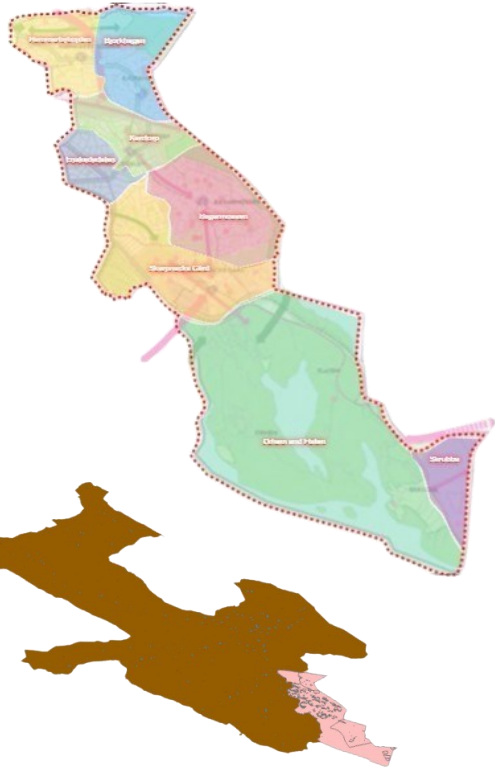
## Flooding Risks

- Cause: Intense rainfall, impermeable surfaces, altered waterways.
- Impact: Property damage, disruption of services, health risks.

## Social Cohesion and Quality of Life

- Cause: Rising Population, economic disparities, cultural differences, urban design. Limited access to recreational and cultural facilities.
- Impact: Reduced safety, health impacts, lower community resilience.

# Study Area & Framework



**City:**  
Skarpnäck district

**Location:**  
Southern Stockholm, Sweden

**Size:**  
15.66km<sup>2</sup>

**Population:**  
Actual: ≈ 46,000  
Projected: ≈ 64,000 (by 2040)

**Development**  
Three schools, one sports field  
& 3,500 new houses

## The DPSIR Framework

### DRIVING FORCES

Human influences and natural conditions driving environment change

### RESPONSES

Responses by government and society to the environmental situation

### PRESSURES

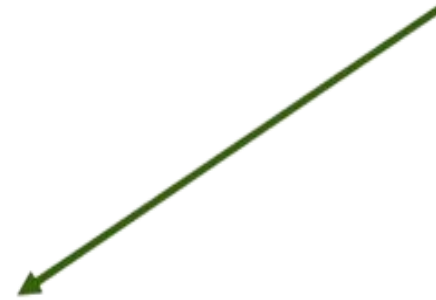
Stresses that human activities and natural conditions place on the environment

### IMPACTS

Biological, economic and social effects of environmental change

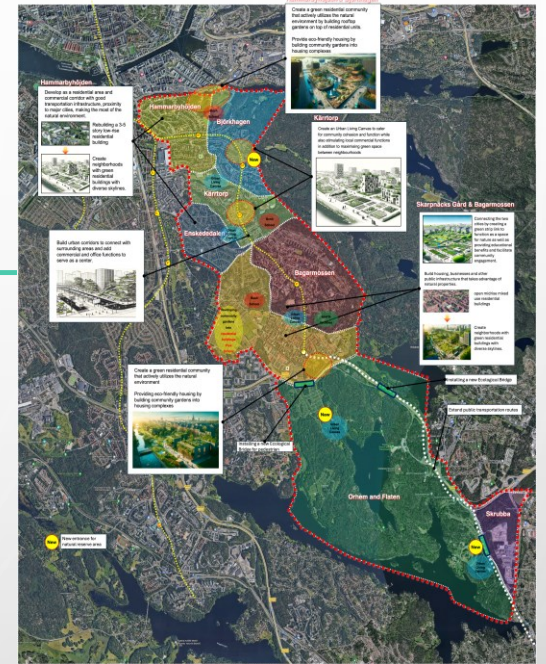
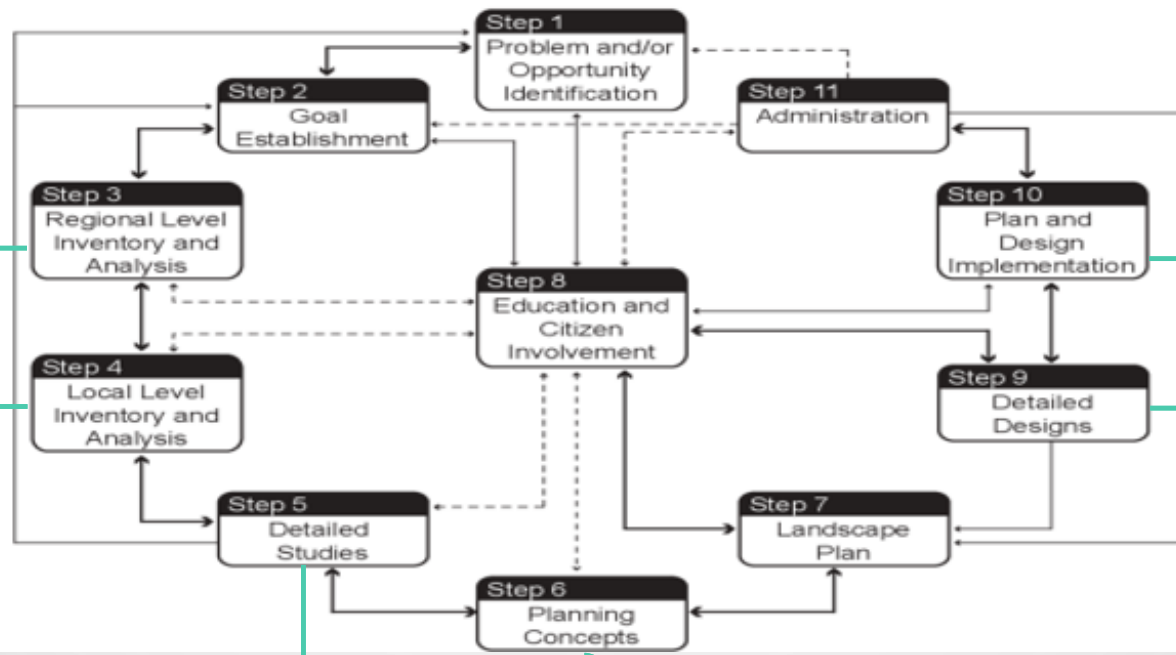
### STATE

State or condition of the environment



# Ecological Planning Model

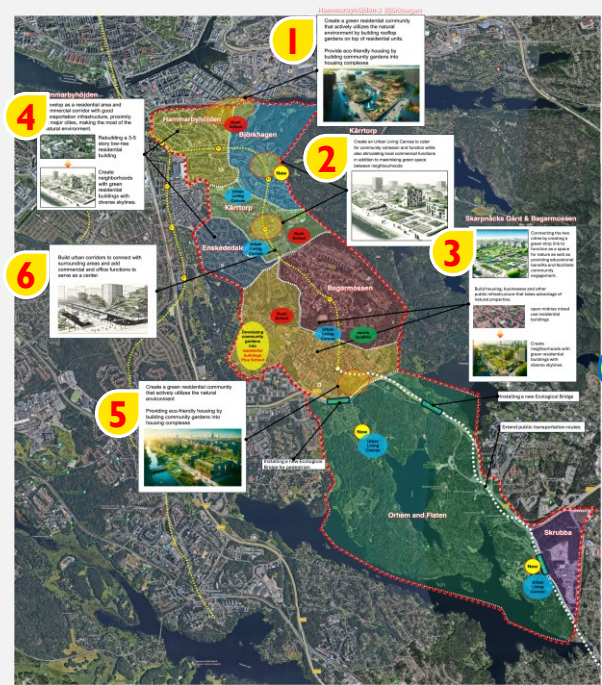
No.	District	Contents
1.	Hammarbyhöjden	Develop with new housing Overbuilding or by redeveloping the existing roads
2.	Björkhagen	Olaus Magnus Väg-Sjammansvägen corridor and the Finn Malmgrensväg-Malmisvägen corridor will strengthen
3.	Källtorp	Källtorp centre, offers some opportunities for development in terms of homes and services.
4.	Enskededalen	There is scope for a certain amount of additional building.  Links to Dalen and destinations such as Källtorp centre and Nytorps Gärdé should be developed
5.	Bagarmossen & Skarpnåcks Gärd	Add homes, services, businesses, more public spaces and interventions to increase safety and reassurance  The central green strip between Bagarmossen and Skarpnäck will be enhanced with new activities and destinations  Skarpnäck industrial area is to be developed, with more non-disruptive businesses.
6.	Örhem and Flaten	Be enhanced with more places for social contact, clearer entrances, and link.
7.	Skrubba	In the longer term, urban development could be trialed, and the area could be turned into a mixed-use development as Stockholm and Tyresö grow.



No.	District	City plan	Inventory
1.	Hammarbyhöjden	new housing Overbuilding or by redeveloping roads	Close to the existing city center, train connection, low-rise housing of 3-5 stories. Large green spaces between residential buildings.
2.	Björkhagen	Corridors strengthen	train connection, low-rise housing of 3-5 stories. Connected to natural reserve area.
3.	Källtorp	development in terms of homes, services.	train connection, low-rise housing of 3-9 stories. Many public and commercial facilities.
4.	Enskededalen	adding building. Some Links should be developed	low-rise housing of 2-3 stories. Large natural spaces.
5.	Bagarmossen & Skarpnåcks Gärd	Add homes, services, businesses, more public spaces The central green strip will be enhanced	Low-rise housing, 3-5 stories. Public transportation connectivity, proximity to nature reserve area, and high development potential. Industrial zone location. Centralized green belt allows for various community facilities.
6.	Örhem and Flaten	Be enhanced with more places	A natural environment that can be reserved and utilized at the same time.
7.	Skrubba	urban development, be turned into a mixed-use development	High potential for future development as an industrial area with connections to urban areas



# Living Canvas Skarpnäck City Planning Outline

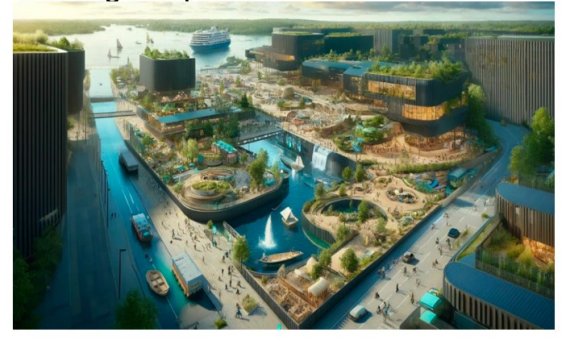


- Bush School
- Urban Living Canvas
- Sports Facility
- New
- Ecological Corridor
- New entrance for natural reserve area**

## 1 Hammarbyhöjden & Björkhagen

Create a green residential community that actively utilizes the natural environment by building rooftop gardens on top of residential units.

Provide eco-friendly housing by building community gardens into housing complexes



## 4 Hammarbyhöjden

Develop as a residential area and commercial corridor with good transportation infrastructure, proximity to major cities, making the most of the natural environment.



Rebuilding a 3-5 story low-rise residential building



Create neighborhoods with green residential buildings with diverse skylines.

## 2 Kärrtorp

Create an Urban Living Canvas to cater for community cohesion and function while also stimulating local commercial functions in addition to maximising green space between neighbourhoods



## 5 Skarpnåcks Gård

Create a green residential community that actively utilizes the natural environment

Providing eco-friendly housing by building community gardens into housing complexes



## 3 Skarpnåcks Gård & Bagarmossen



Connecting the two cities by creating a green strip link to function as a space for nature as well as providing educational benefits and facilitate community engagement.

Build housing, businesses and other public infrastructure that takes advantage of natural properties.



open midrise mixed use residential buildings

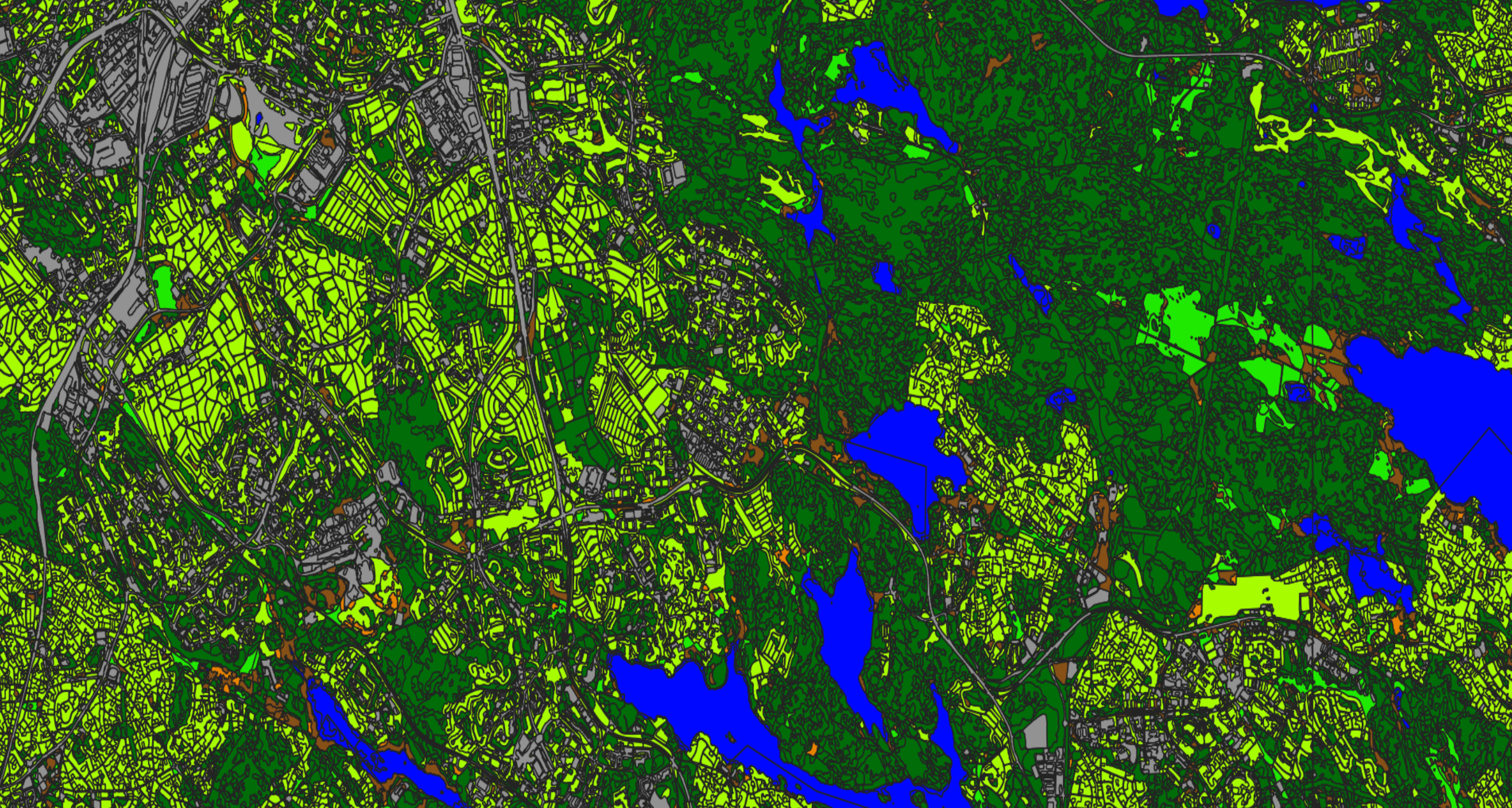


Create neighborhoods with green residential buildings with diverse skylines.

## 6

Build urban corridors to connect with surrounding areas and add commercial and office functions to serve as a center.





🔍 Type to locate (Ctrl+K)

Coordinate 6576835, 670314



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# Land Use Assessment & Biotope Data



Forested Areas and Green Corridors in Hammarbyhöjden (Biotope: Pine-Dominated Forest Land - Class 611):

- Functions: Carbon sequestration, habitat provision, recreational space, air purification.
- Impact: Increased green cover will enhance carbon sequestration, provide habitats for urban wildlife, and offer recreational spaces for residents.
- Location: Near Hammarbybacken.

Wetlands and Bioswales in Flaten Nature Reserve (Biotope: Water with Mixed Vegetation - Class 723):

- Functions: Water filtration, flood mitigation, biodiversity support, recreational space.
- Impact: Improved water quality, reduced flood risks, enhanced biodiversity, and new recreational opportunities for the community.
- Location: Southern part of Flaten Nature Reserve.

Community Gardens and Urban Farms in Bagarmossen (Biotope: Cultivated Grassland - Class 320):

- Functions: Local food production, social cohesion, pollination, educational space.
- Impact: Greater food security, strengthened community bonds, support for pollinators, and educational opportunities for sustainable practices.
- Location: Vacant lots near Bagarmossen Centrum.



# Addressing The Urban Heat Island Effect

## Current Challenges:

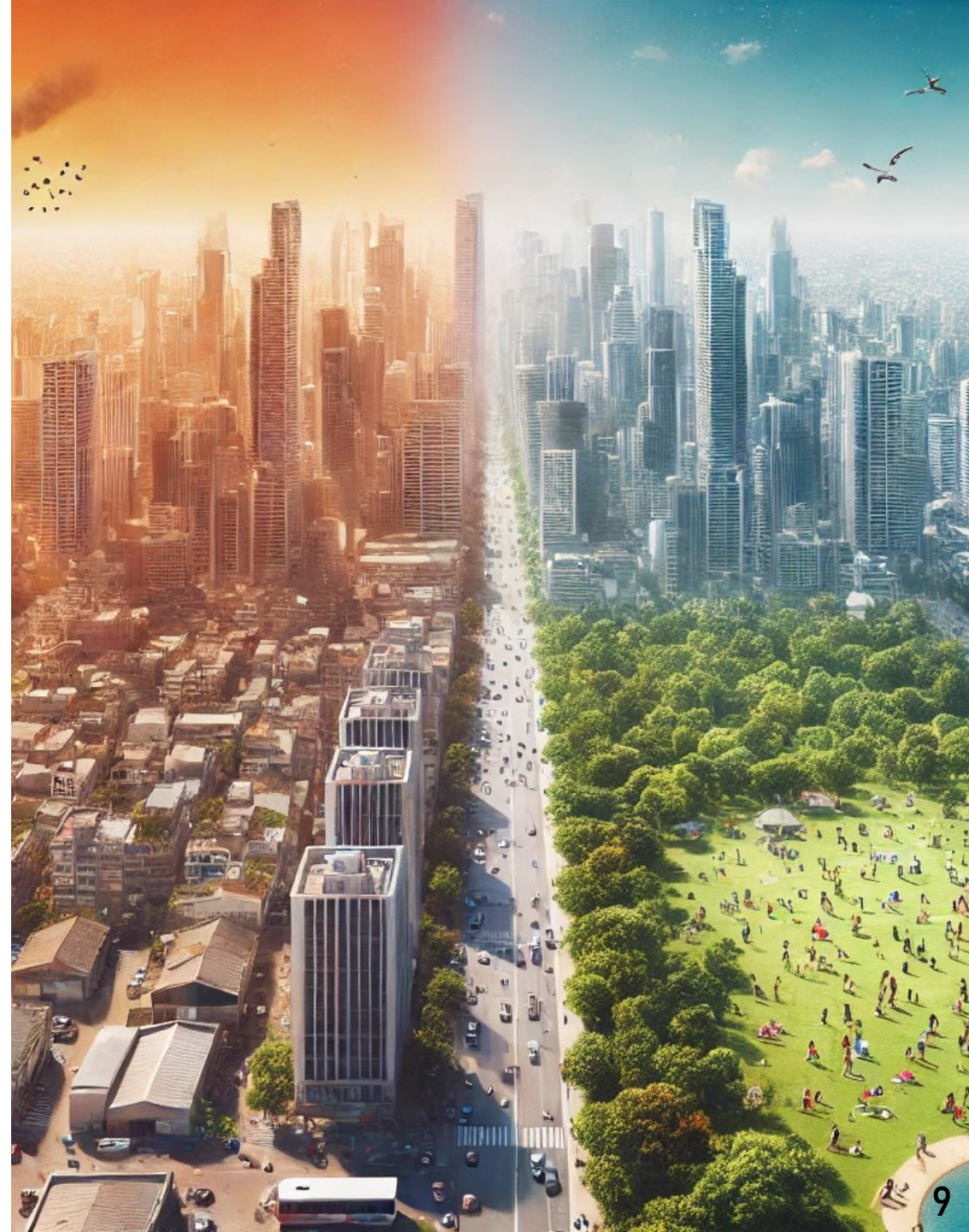
- High-density urban structures with materials that absorb and re-radiate heat.
- Fragmentation of natural habitats due to urban development.
- Limited green spaces contributing to higher temperatures.

## Solutions Using Existing Biotope Assets:

- Urban Green Structure of Tree Character in Residential Areas (Biotope: Urban Green Structure of Tree Character - Class 230): Enhance existing green spaces with additional trees and vegetation in residential blocks to provide shade and cooling. These areas, such as Skarpnäck Gård, can significantly lower ambient temperatures and improve residents' comfort.

## New Interventions:

- Green Roofs and Walls in Skarpnäck Central (Biotope: Green Roofs - Class 212): Incorporate green roofs and vertical gardens in new and existing buildings around Skarpnäck Torg to reduce heat absorption. These green structures provide cooling through evapotranspiration and shading, reducing the Urban Heat Island effect and enhancing air quality.



# Enhancing Biodiversity

Solution:

Urban Green Structure of Lush Character in Skarpnäck Gård  
(Biotope: Urban Green Structure of Lush Character - Class 220):

Preserve and enhance urban green structures such as parks, tree-lined streets, and gardens. These areas provide habitats for various species and contribute to urban biodiversity.

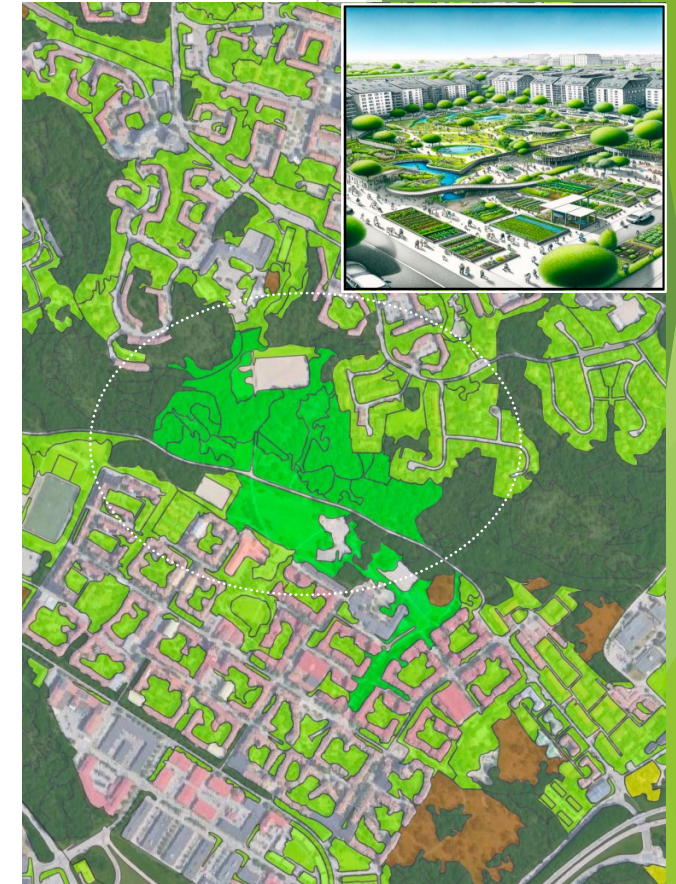


# Enhancing Biodiversity

## Solution:

Community Gardens and Urban Farms in Bagarmossen (Biotope: Cultivated Grassland - Class 320):

Convert vacant lots into community gardens to support local biodiversity and provide habitats for pollinators. These gardens enhance social cohesion and provide educational opportunities for sustainable practices.

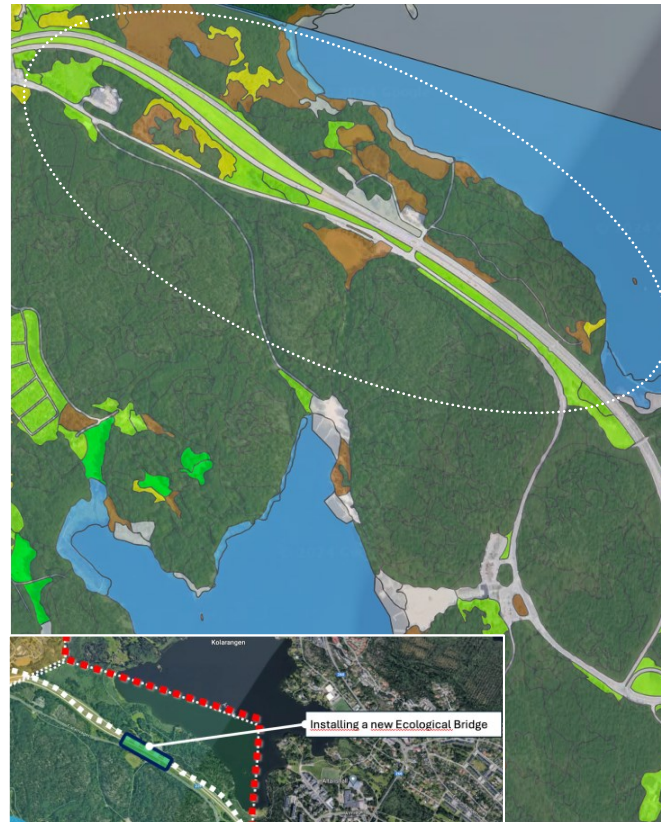


# Enhancing Biodiversity

## Solution:

Green Corridors Connecting Nacka Nature Reserve and Flaten Nature Reserve (Biotope: Mixed Coniferous and Deciduous Forest - Class 634):

Create green corridors connecting fragmented green spaces to allow wildlife movement and increase biodiversity.



# Incorporating Flora & Fauna



## Fauna:

- **European Hedgehog in Gardens and Parks (Class 210):**  
 Provides pest control and acts as a biodiversity indicator. Create habitats in gardens and green corridors. Plant in green corridors and parks to boost biodiversity. Location: Between Bagarmossen and Skarnäck.
- **Common Frog in Constructed Wetlands (Class 723):**  
 Provides pest control and supports biodiversity.
- **Common Reed in Constructed Wetlands (Class 722):**  
 Used for water filtration, erosion control, and habitat creation in wetlands and bioswales. Location: Flaten Nature Reserve.
- **Nature Reserve Wildflower Meadows (Class 320):**  
 Support pollination and biodiversity.
- **Wildflowers in Community Gardens (Class 520):**  
 Support pollinators, enhance aesthetics, and promote biodiversity. Plant in community gardens and on green roofs. Location: Community gardens in Bagarmossen.

# Mitigating Flooding Risks Land Use Changes to be Implemented

Constructed Wetlands and Bioswales in Flaten Nature Reserve (Biotope: Water with Mixed Vegetation -Class 723):

- Develop wetlands and bioswales to manage stormwater, reduce flooding risks, and create natural habitats.

Rain Gardens (Biotope: Urban Green Structure on SGU Bedrock Outcrop - Class 250):

- Rain gardens in urban landscapes to absorb rainwater and reduce runoff.
- Native plants with deep root systems to maximize rainwater absorption and reduce surface runoff



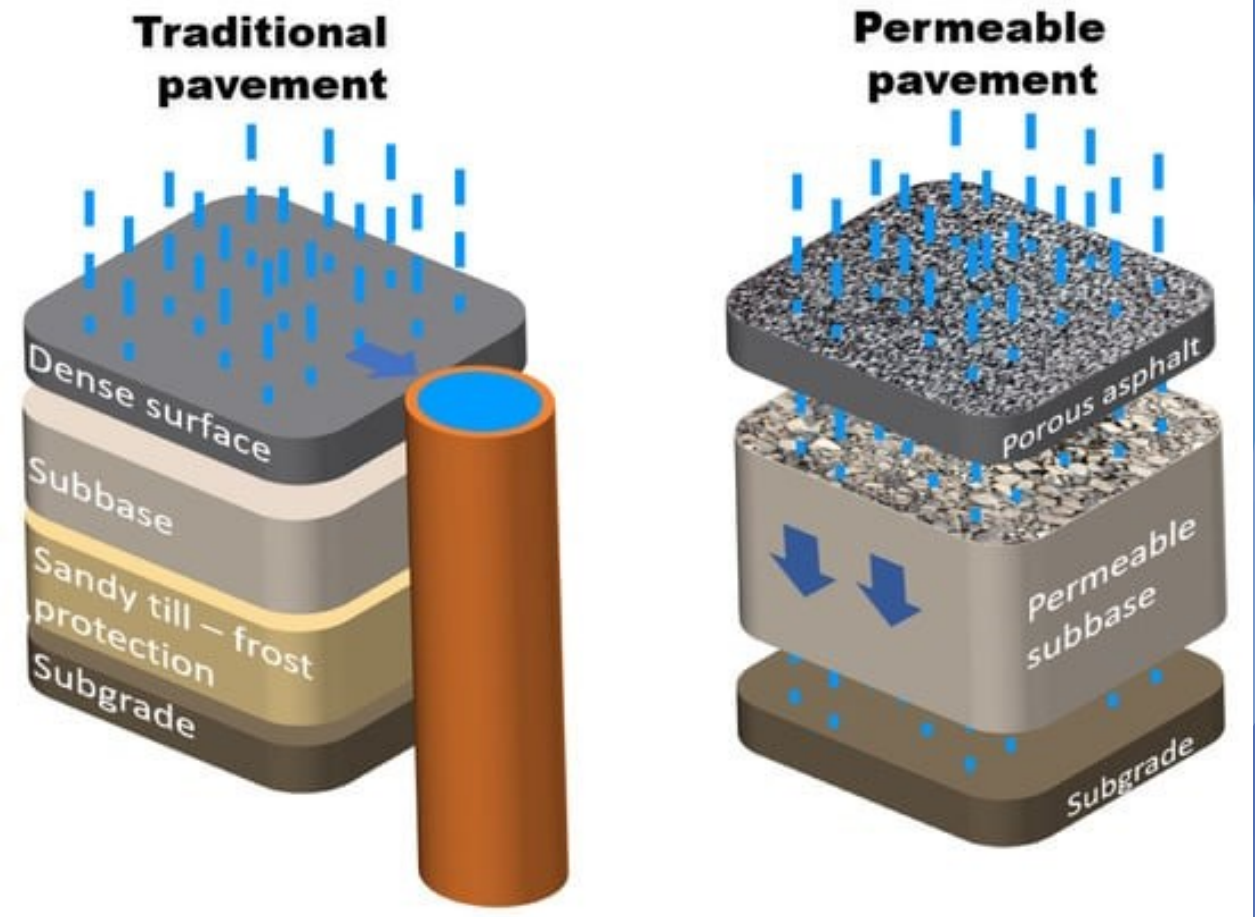
Source: Karolina Kawiaka AIA, Dartmouth College

# Mitigating Flooding Risks

## Land Use Changes to be Implemented

Permeable Pavements (Biotope:  
Infrastructure, Road Area  
Gravel/Unsealed - Class 142):

- Permeable materials for pavements and roads to enhance water infiltration and reduce runoff.
- Materials such as porous asphalt, pervious concrete, and interlocking pavers to enhance water infiltration - on the sidewalks, parking spots and low traffic roads



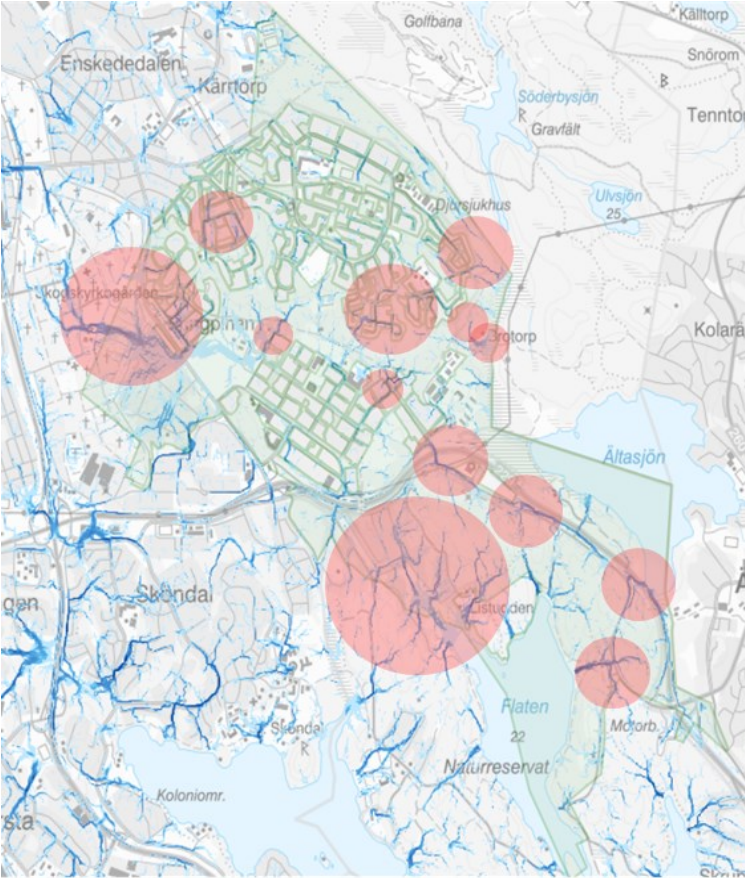
Source: Sustainability 2022, 14(19), 12432

# Mitigating Flooding Risks

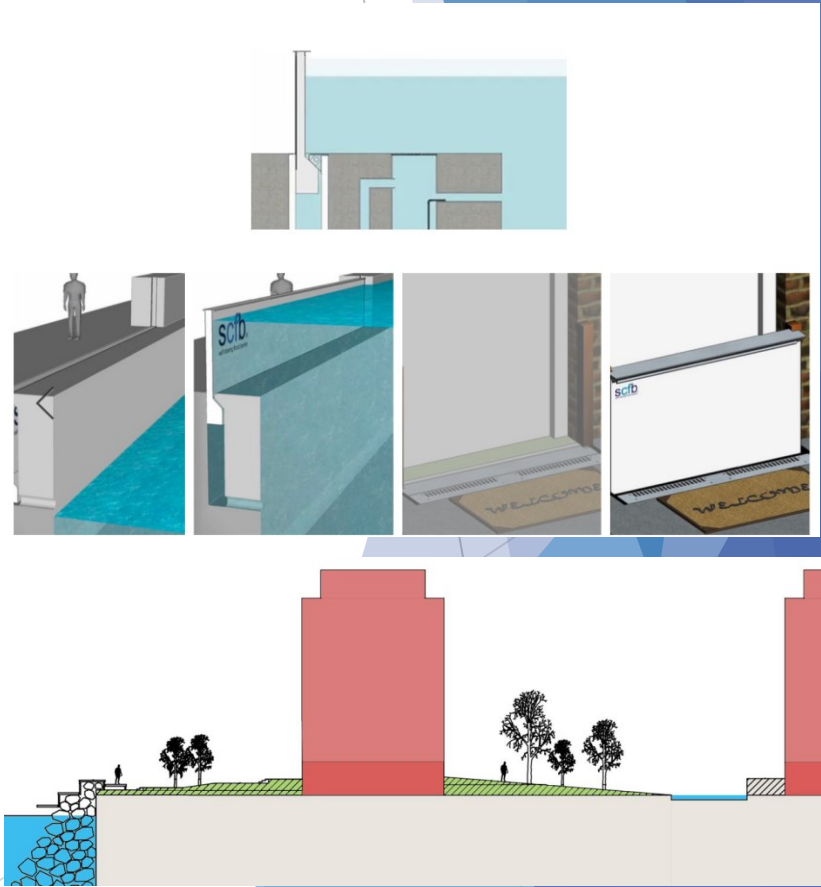
Existing waterbodies



Skyfall Project; maximum water flows during a 100-year rainfall The flood protection



The flood protection solution examples





# IMPROVING SOCIAL COHESION & QUALITY OF LIFE

**3,500 units of green housing (Classes 110 & 212):** These medium density units with green roofs, & green facets are proposed to house an additional 18,000 people to accommodate the population by 2040.

**3 new schools with green playgrounds:** Enhancement of learning environments, promote physical activity, and provide natural spaces for children to explore and play.

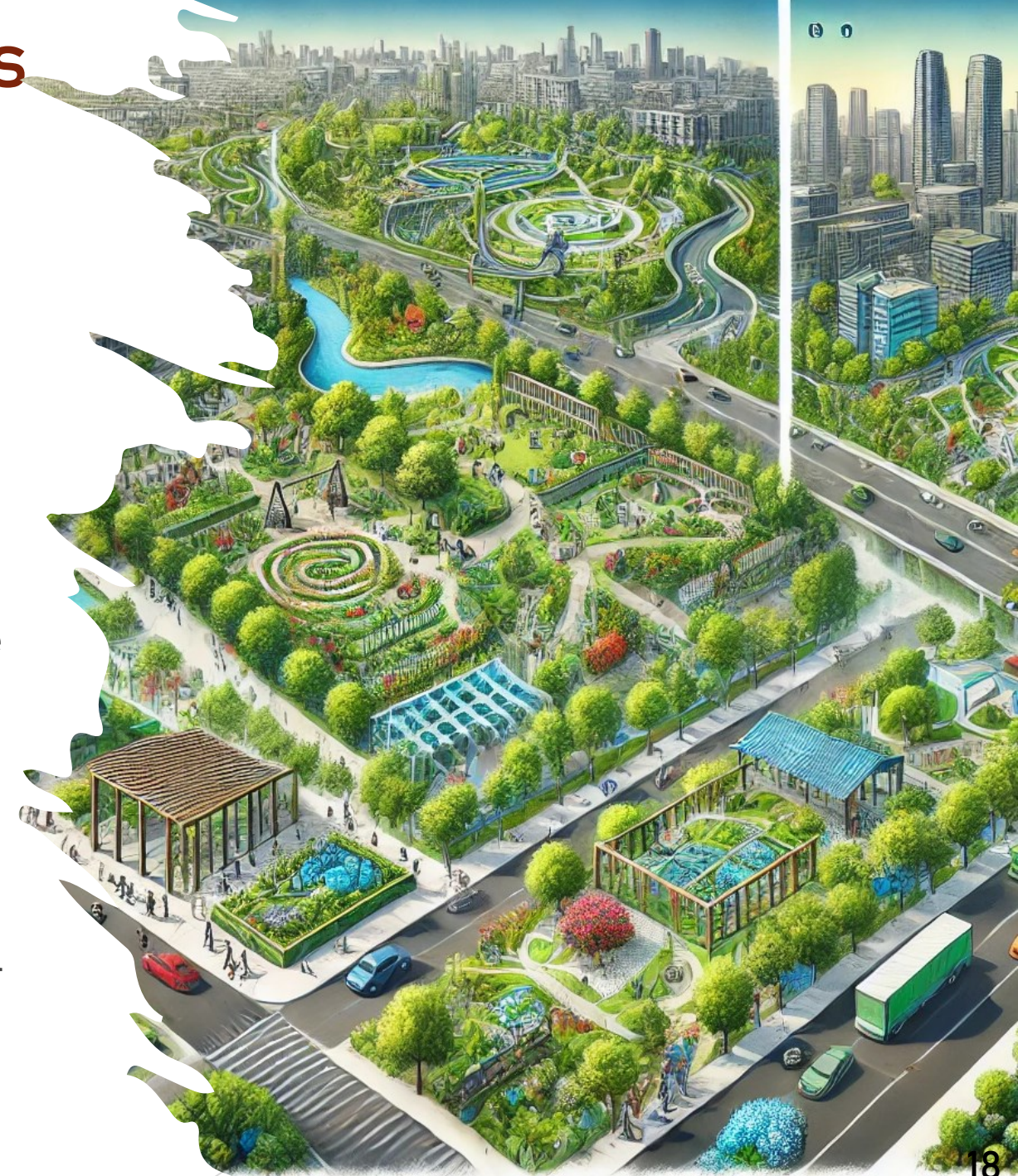
**Multi-functional community spaces (Class 200):** More parks and community centres that can host markets, cultural events, and social gatherings to enhance social cohesion.

**Recreational facilities:** New sports fields, playgrounds, and outdoor classrooms to promote physical activity and community engagement.



# Summary of Land Use Changes

- ▶ Transformation of Vacant Lots in Enskededalen (Biotope: Other Deciduous Shrubland - Class 525): Convert unused or underutilized urban areas into green spaces, community gardens, and recreational areas. These biotopes support biodiversity and provide social and ecological benefits.
- ▶ Revamping Road Networks in Kärrtorp (Biotope: Infrastructure, Road Area Sealed - Class 141): Transform over-wide streets and urban corridors into green corridors with dedicated pedestrian and bicycle paths, reducing car dependency.
- ▶ Integration of Green and Blue Infrastructure in Flaten Nature Reserve (Biotope: Water with Floating Vegetation - Class 722): Incorporate bioswales, rain gardens, and green roofs into urban planning to manage stormwater, improve air quality, and enhance urban biodiversity.
- ▶ Establishment of Mixed-Use Zones in Orhem (Biotope: Urban Green Structure of Grey Character - Class 240): Designate areas for mixed-use development combining residential, commercial, and recreational functions to create vibrant, walkable neighbourhoods.
- ▶ Smart and Sustainable Building Practices: Encourage the use of sustainable building materials, energy-efficient designs, and smart technologies in new developments.



# CONCLUSION

LIVING URBAN CANVAS MODEL: THE PROPOSED VISION FOR SKARPNÄCK INTEGRATES ADAPTIVE LAND USE DESIGN, SUSTAINABLE URBAN DEVELOPMENT, AND ENHANCED ECOSYSTEM SERVICES TO CREATE A VIBRANT, RESILIENT, AND INCLUSIVE COMMUNITY.

## IMPACT ON ECOSYSTEM SERVICES:

- ENHANCED BIODIVERSITY: GREEN CORRIDORS AND COMMUNITY GARDENS PROVIDE HABITATS FOR VARIOUS SPECIES AND SUPPORT URBAN BIODIVERSITY.
- IMPROVED AIR AND WATER QUALITY: GREEN INFRASTRUCTURE FILTERS POLLUTANTS, IMPROVING AIR AND WATER QUALITY.
- CLIMATE REGULATION: INCREASED VEGETATION MITIGATES THE URBAN HEAT ISLAND EFFECT AND ENHANCES CLIMATE RESILIENCE.
- STORMWATER MANAGEMENT: CONSTRUCTED WETLANDS AND PERMEABLE PAVEMENTS REDUCE RUNOFF AND LOWER FLOODING RISKS.
- SOCIAL COHESION AND WELL-BEING: ACCESSIBLE GREEN SPACES AND COMMUNITY-DRIVEN INITIATIVES ENHANCE SOCIAL COHESION, MENTAL HEALTH, AND OVERALL QUALITY OF LIFE FOR RESIDENTS.

## LOOKING FORWARD:

- SKARPNÄCK AS A MODEL OF SUSTAINABLE URBAN LIVING: BY LEVERAGING EXISTING BIOTOPE ASSETS AND IMPLEMENTING STRATEGIC INTERVENTIONS, SKARPNÄCK CAN BECOME A MODEL FOR SUSTAINABLE URBAN LIVING, DEMONSTRATING HOW NATURE-BASED SOLUTIONS CAN BENEFIT SOCIETY.

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