



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

*a resilient, mutually supportive urban ecosystem that reconnects people with nature in Pretoria CBD*

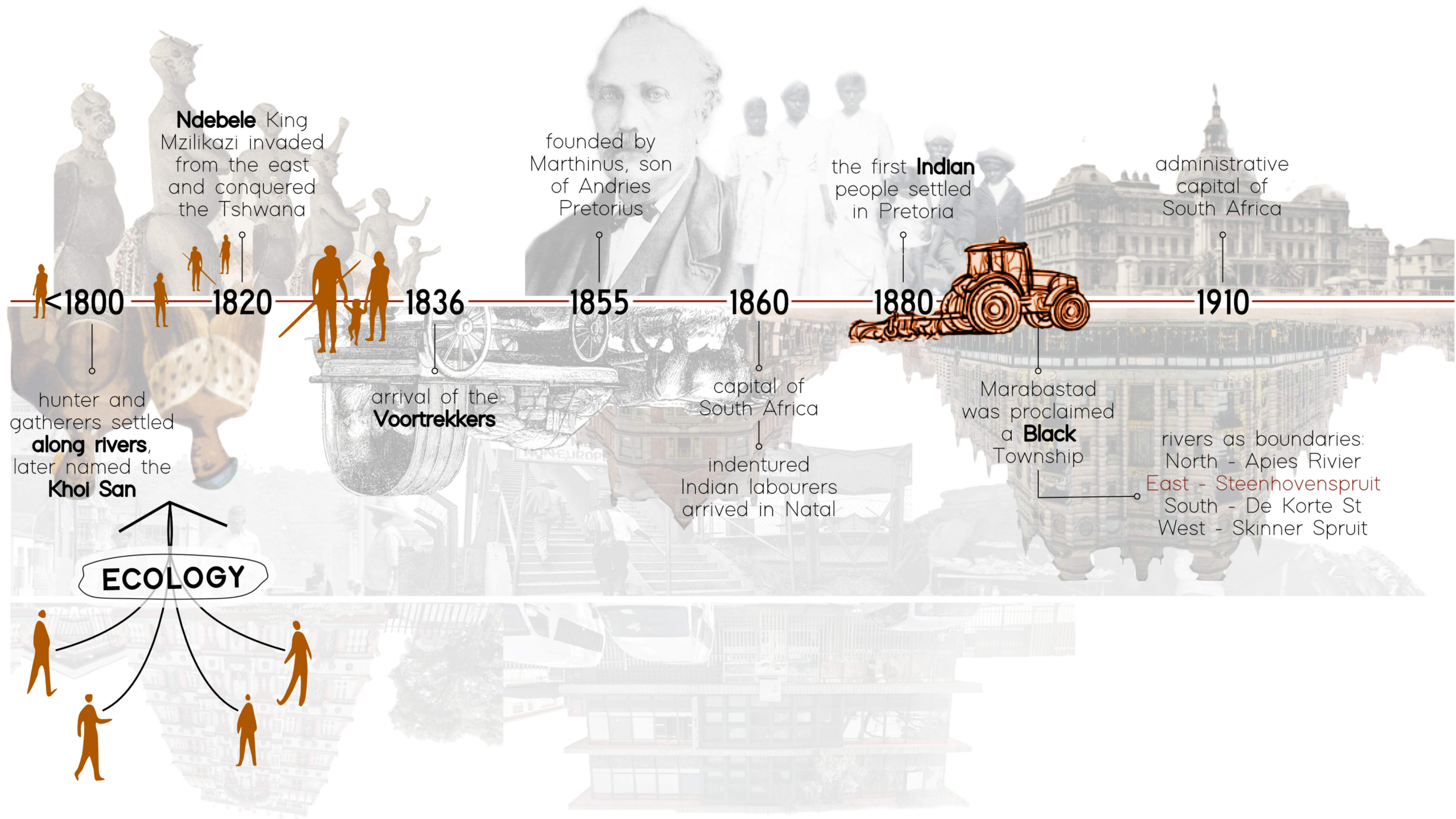


# PRETORIA CEED

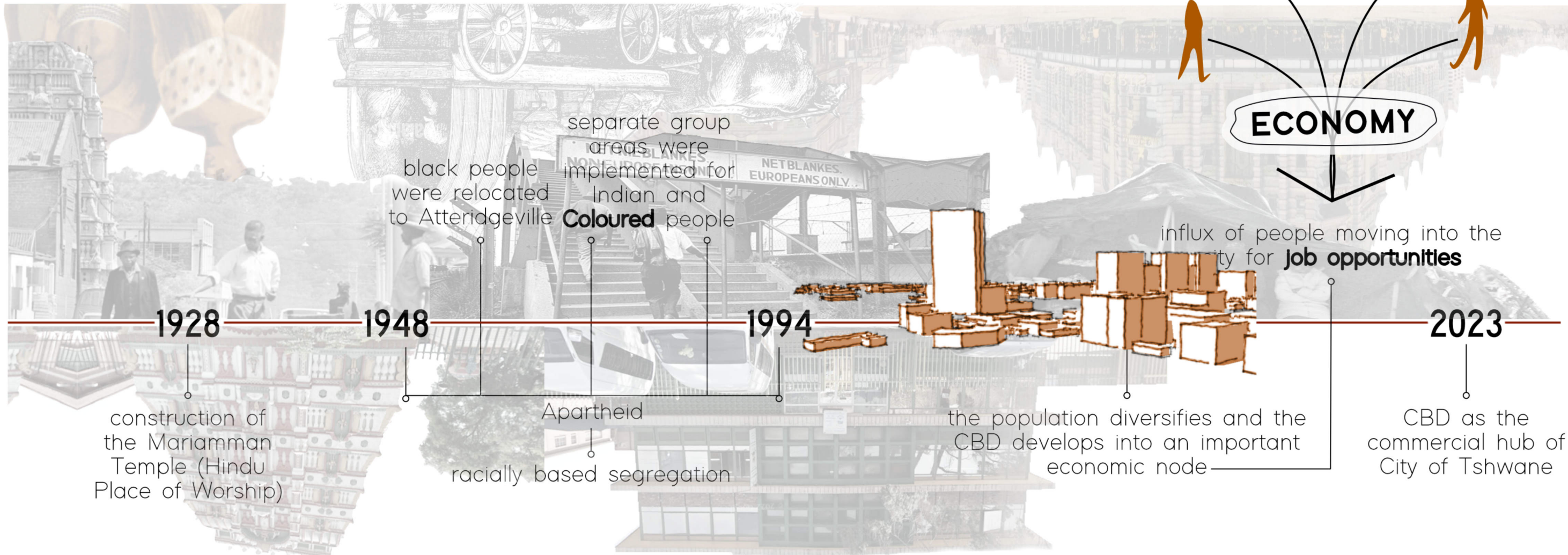
## THE CENTRAL ENVIRONMENTAL DISTRICT



LOCATION | MACRO, MESO



## PRETORIA CENTRAL: A HISTORICAL SUMMARY



## PRETORIA CENTRAL: A HISTORICAL SUMMARY



lack of small economy infrastructure - no support for the vulnerable community

temporary solutions - weather dependant

streetside economies - basic resources, little room for growth

## PEOPLE IN THE CBD

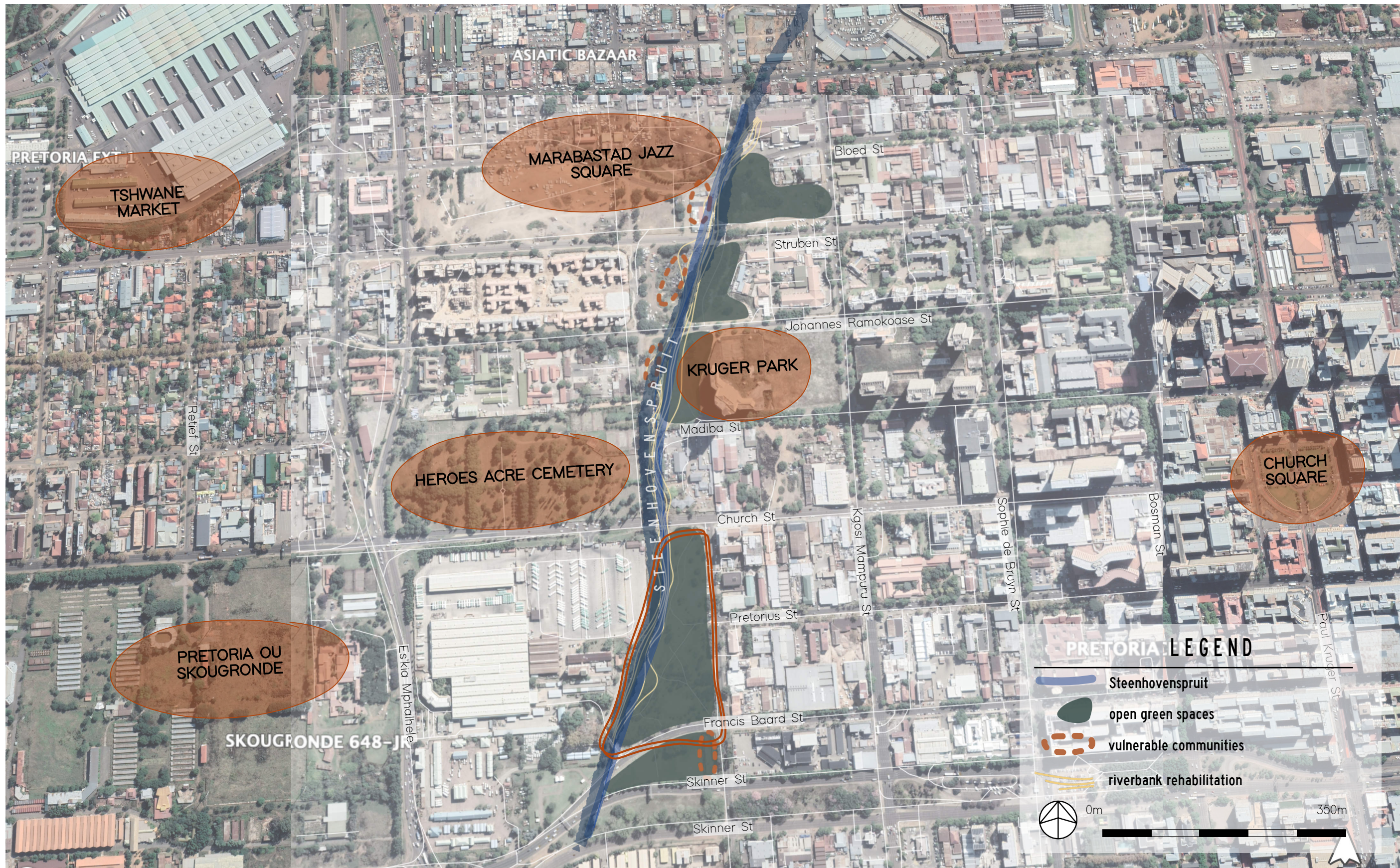


degraded infrastructure - safety risk

non human-scaled solutions - no opportunity for nature connections and relationships

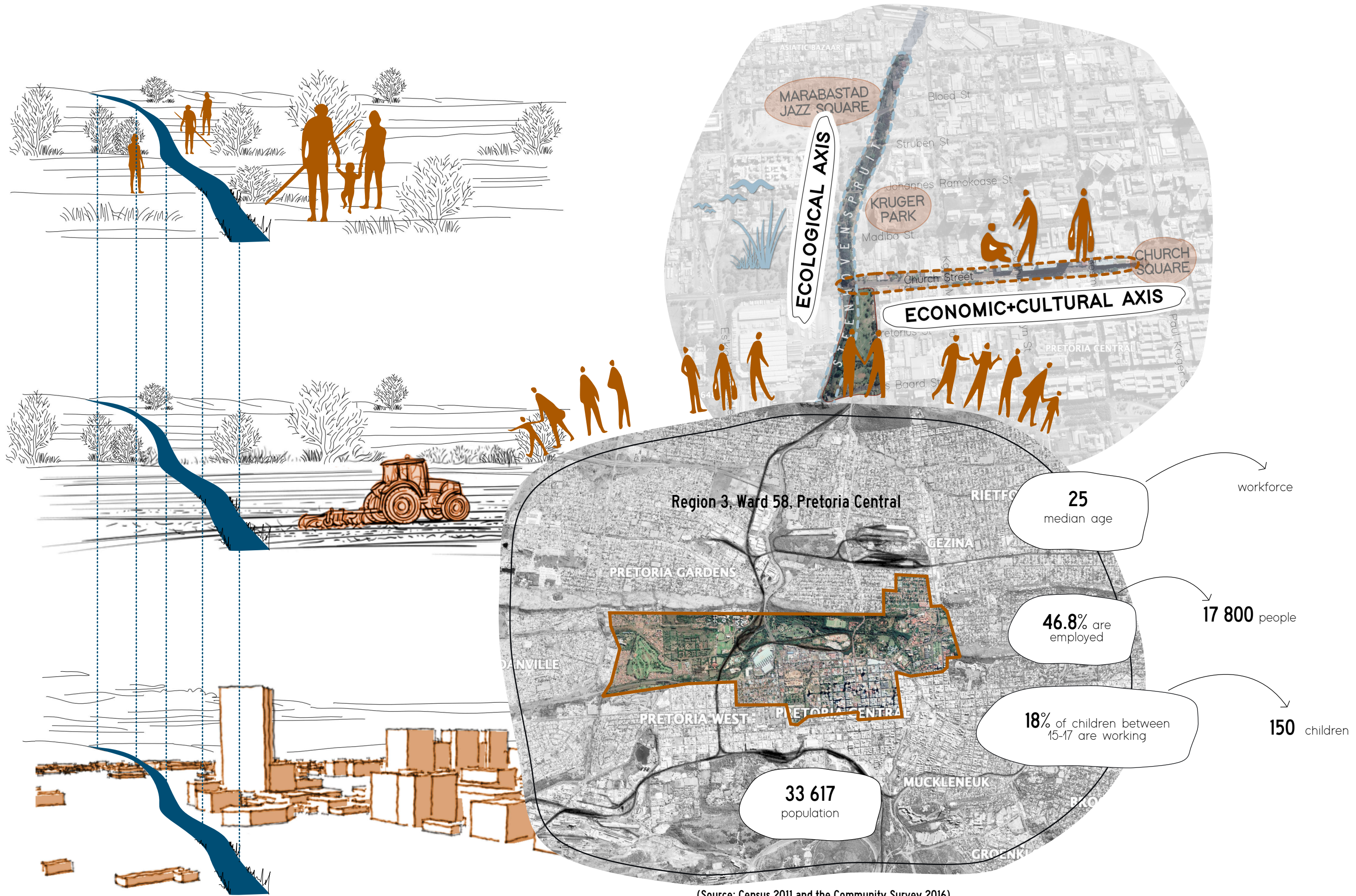
primitive stormwater management - polluted water into apies rivier

## RIVER IN THE CBD



-25.748604, 28.178174 | City of Tshwane, 0183 | South Africa

## LOCATION | MICRO

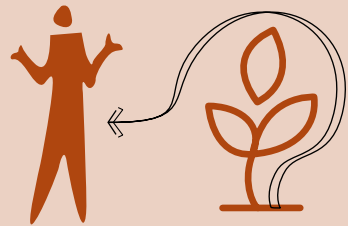


(Source: Census 2011 and the Community Survey 2016)

# PEOPLE OF PRETORIA CBD

function of nature

I can't think of those examples in South Africa because they're not here yet in terms of the functionality of how nature can actually provide to the people.

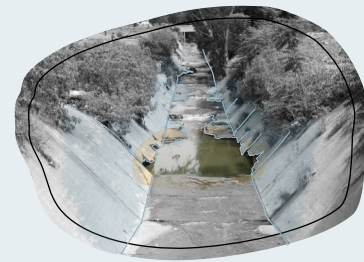


importance of nature

People are destroying nature because some of these people they don't know. They don't even know the importance of nature. For them, it's useless, it's not useful.



CoT Research



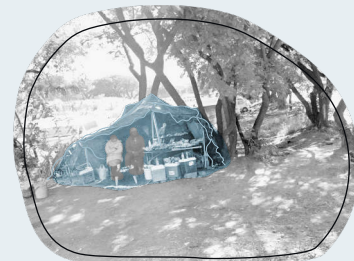
POLLUTION & DEGRADATION

82 % of South Africa's main river ecosystems are threatened (National Spatial Biodiversity Assessment, 2004)



URBAN HEAT ISLAND

temperatures in the city centre have been measured up to 3 degrees warmer than surrounding urban areas due to the UHI



STREET VENDORS

70 000 women and 55 000 men are active street vendors in the City of Tshwane and Johannesburg (Women in Informal Employment, 2019)

Site



CLIMATE CHANGE IN SUB-SAHARAN AFRICAN CITIES



RESILIENT CITIES



NATURE BASED SOLUTIONS



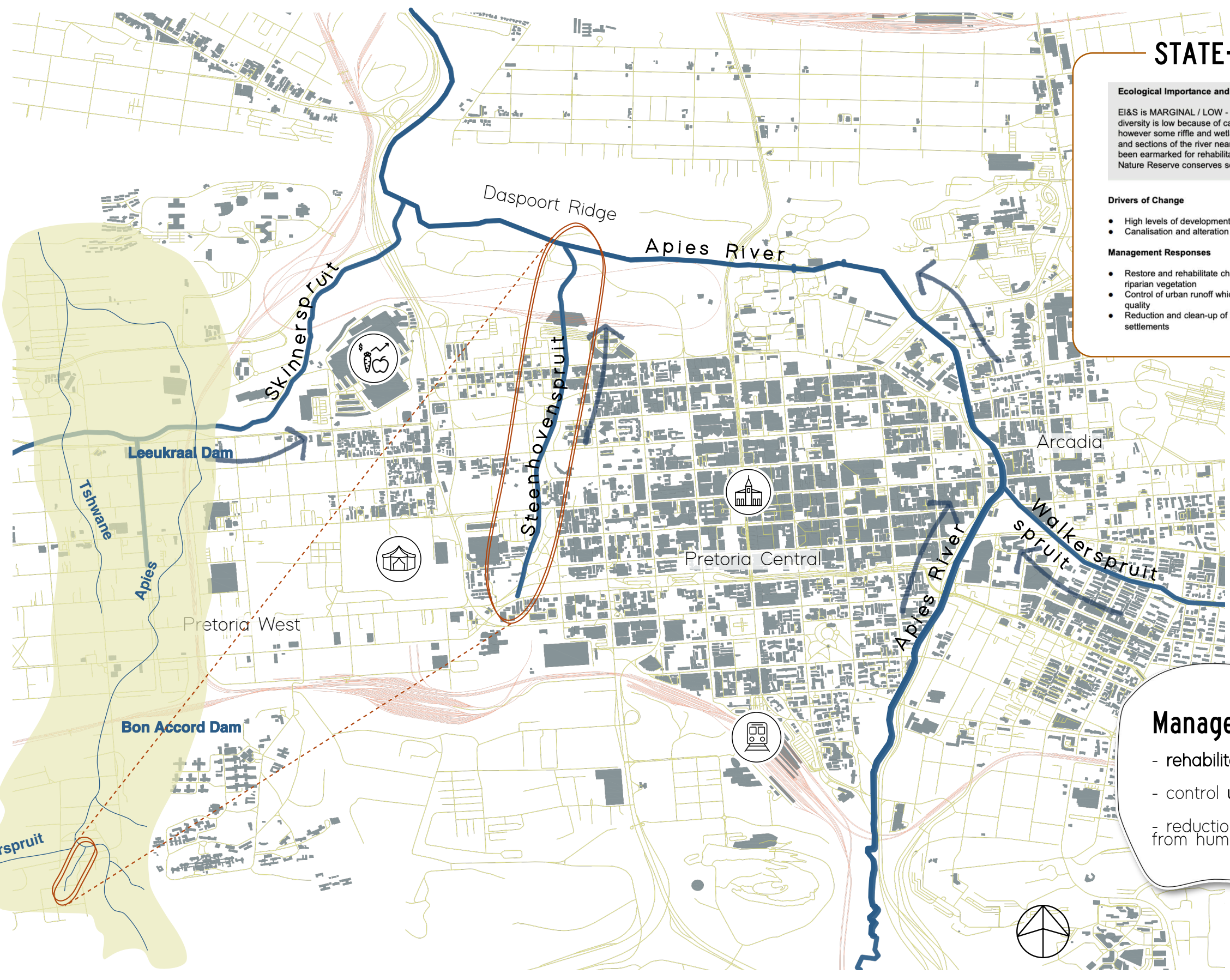
GREEN ECONOMY

Theory

How can nature based solutions form infrastructure frameworks for small economies in the urban domain towards a resilient urban environment for stronger human-nature relationships?

PROJECT INTRODUCTION & RESEARCH QUESTION

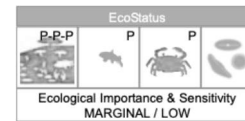




## STATE-OF-RIVERS REPORT

### Ecological Importance and Sensitivity (EI&S)

EI&S is MARGINAL / LOW - species and habitat diversity is low because of canalised system, however some riffle and wetland habitats are present and sections of the river near Bon Accord Dam have been earmarked for rehabilitation. The Wonderboom Nature Reserve conserves some natural area.



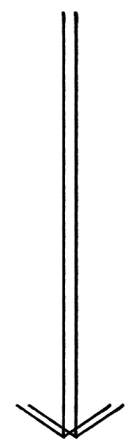
### Drivers of Change

- High levels of development and urbanisation
- Canalisation and alteration of flow patterns

### Management Responses

- Restore and rehabilitate channel morphology and riparian vegetation
- Control of urban runoff which is impacting on water quality
- Reduction and clean-up of litter from human settlements

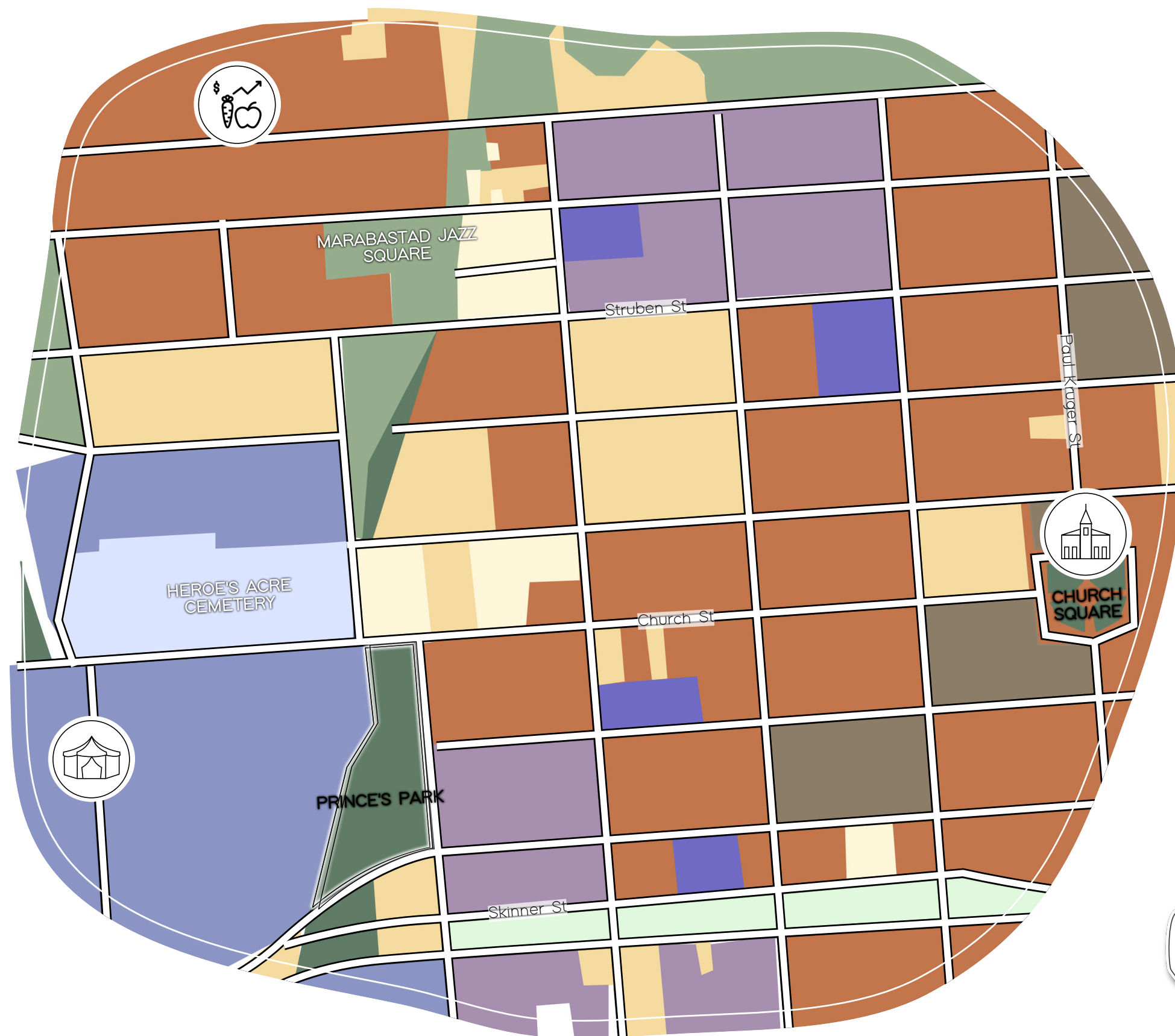
part of the Crocodile (West) Marico Water Management Area



## Management Response

- rehabilitate channel morphology
- control urban runoff
- reduction and clean-up of litter from human settlements

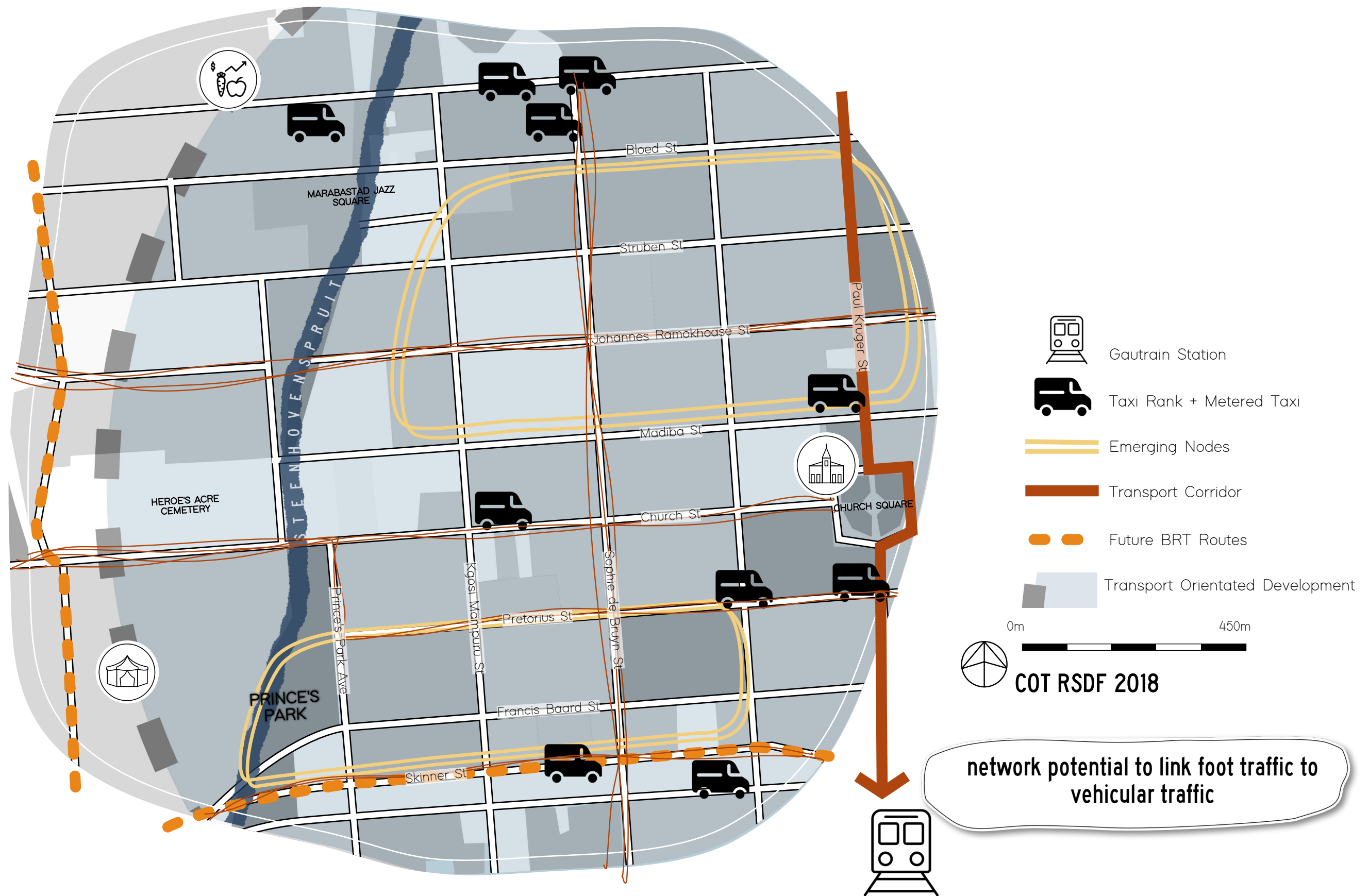
## CONTEXT WATERCOURSES



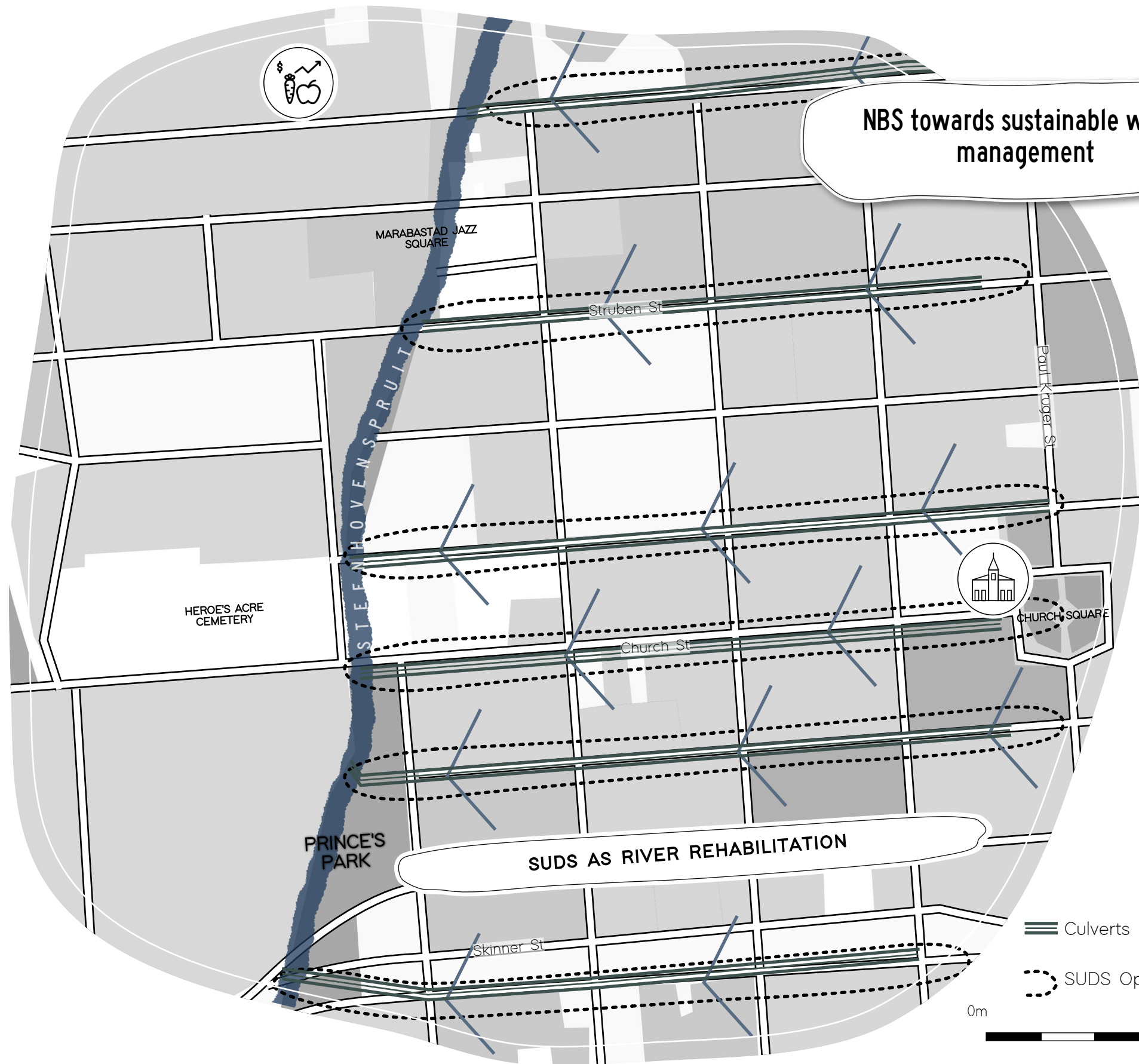
- Business
  - Industrial
  - Educational
  - Municipal
  - Cemetery
  - Public Open Space
  - Special
  - Residential
  - Open Space
  - Undetermined
- 0m 450m

economy as programme driver

## REGIONAL ZONING






## TRANSPORT NODES AND CORRIDORS

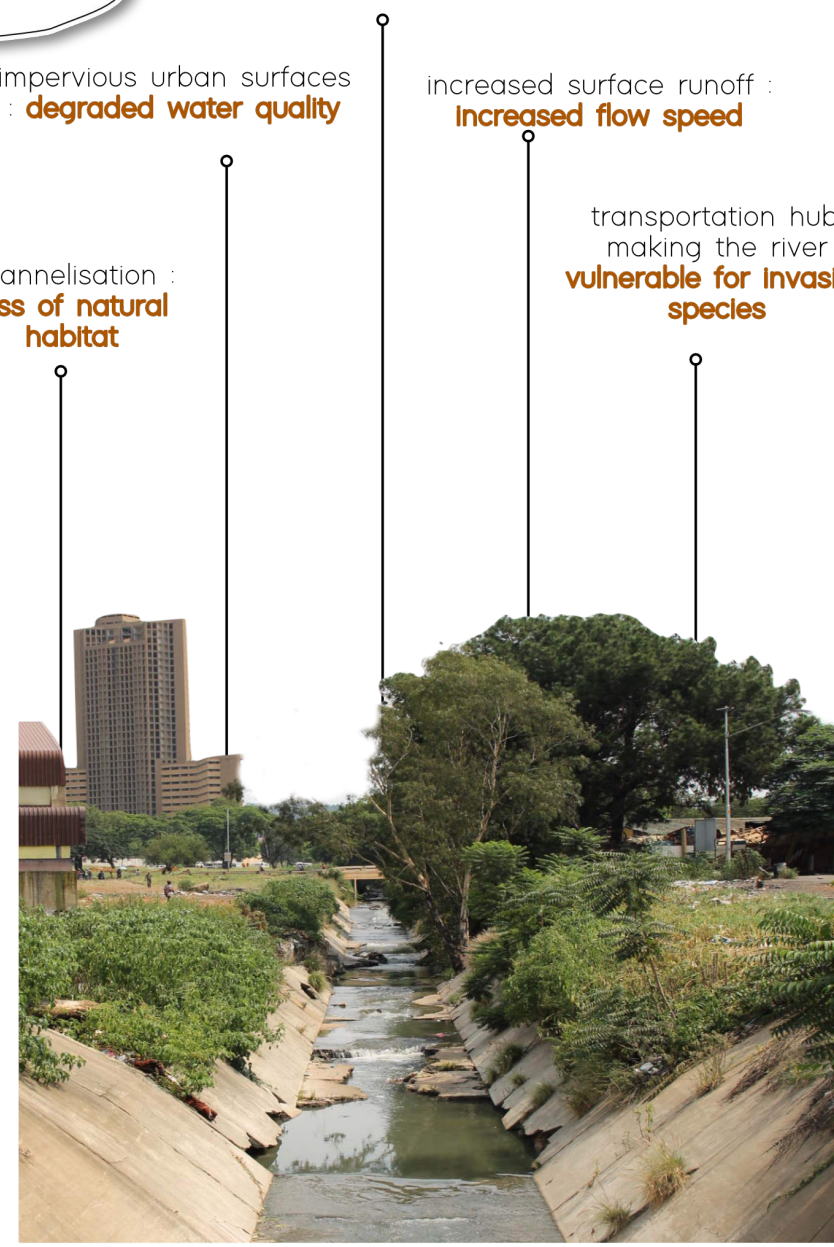


NBS towards sustainable water management

SUDS AS RIVER REHABILITATION

 Culverts  
 SUDS Opportunity  
  
 0m 450m

- removed riparian zone: **decreased habitat variety**
- impervious urban surfaces: **degraded water quality**
- channelisation: **loss of natural habitat**
- increased surface runoff: **increased flow speed**
- transportation hub: **making the river vulnerable for invasive species**



# STORMWATER AND SPRUIT CURRENT STATE

## Existing Frameworks

- Regional Site Development Framework (RSDF)
- Municipal Site Development Framework (MSDF)
- C-Plans

## Existing Acts

- National Environmental Act
- National Environmental Management Biodiversity Act
- National Water Management Act
- Spatial Planning
- Land Use Management Act
- City of Tshwane Town Planning Scheme

### EXISTING POLICIES

## Zoning (Tshwane WebGIS)

Zoning: Public Open Space  
Land Use: Retail

## Gauteng C-Plan 3.3 (SANBI BGIS)

National Biome: Savannah Biome  
National soil description: Red, yellow and / or greyish soils with low to medium base status  
National soil class: Association of Classes 1 to 4: Undifferentiated structureless soils  
National threatened terrestrial ecosystem: Marikana Thornveld  
- extend: vulnerable

## RSDF 2020 (Tshwane WebGIS)

Region 3, Ward 58  
classified as Open Space - Other Natural Area  
Falls on western edge of the largest transport node of City of Tshwane Tshwane  
Park classified as Ecological Support Area 2 along Steenhovenspruit

### INITIAL SITE INFORMATION

where can zoning and land use meet:  
retail vs public open space?

how can the transport sector be involved to  
support small scaled economies?

how can interventions be inclusive,  
developmental, equitable and resilient?

### EARLY CONSIDERATIONS

## Public Amenities Bylaw

"The municipality adopts this By-law with the aim of controlling access to and use of all public amenities owned by or under the control of the municipality."

## Land Use Management Bylaw

"To provide a framework for spatial planning and land use management in the Republic; to specify the relationship between the spatial planning and the land use management system and other kinds of planning; to provide for inclusive, developmental, equitable and efficient spatial planning..."

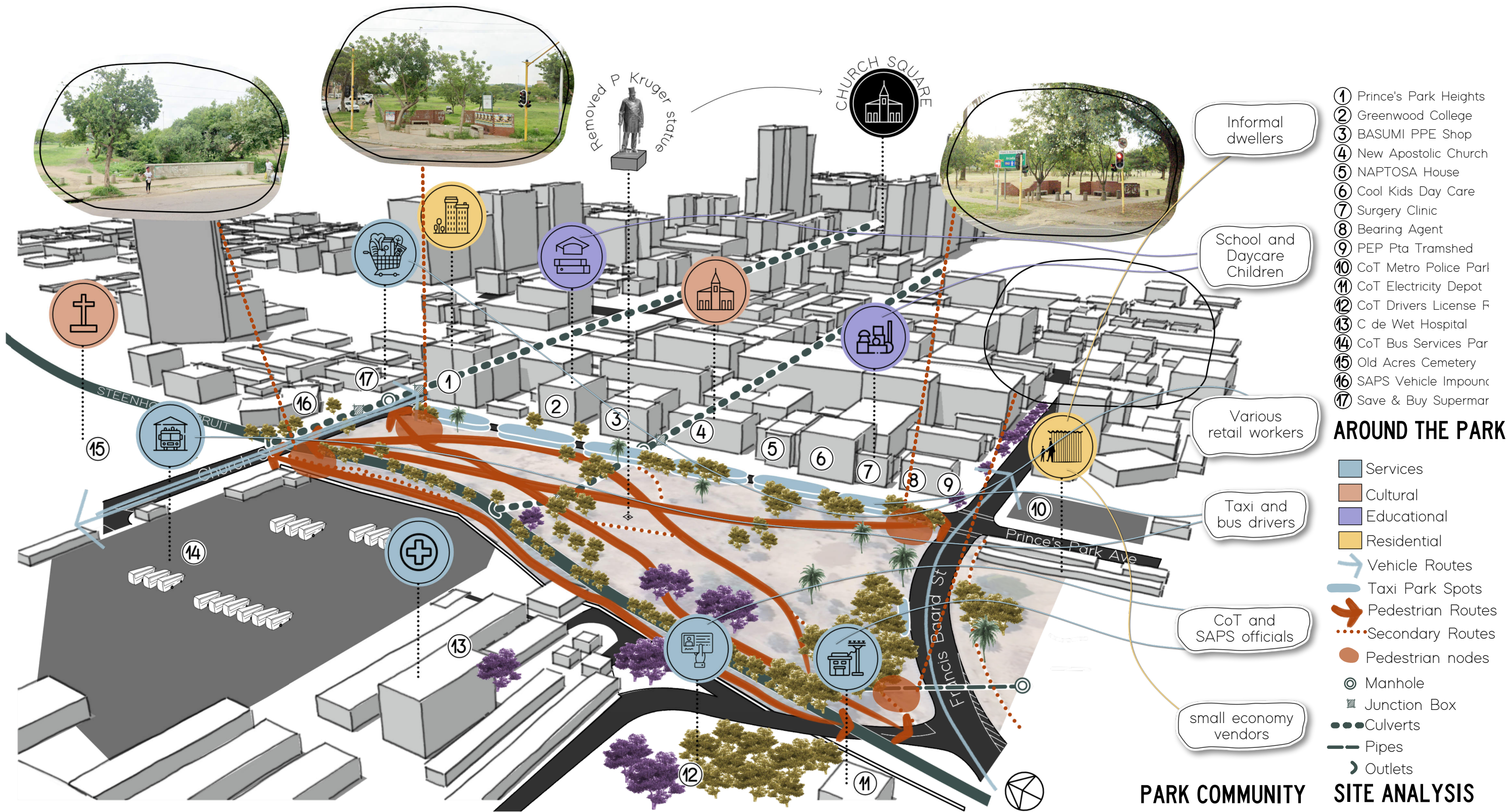
## City of Tshwane Town Planning Scheme

relating to the following matters:

- Part 1: Introduction.
- Part 2: Streets, Building Lines and Building Restriction Areas.
- Part 3: Use of Buildings and Land.
- Part 4: Development Conditions.
- Part 5: Parking and Loading Facilities.
- Part 6: Amenity in and of the Environment and Appearance of Buildings.
- Part 7: General Conditions.
- Part 8: Schedules.

### RELEVANT SITE BYLAWS

# ENVIRONMENTAL LEGISLATION



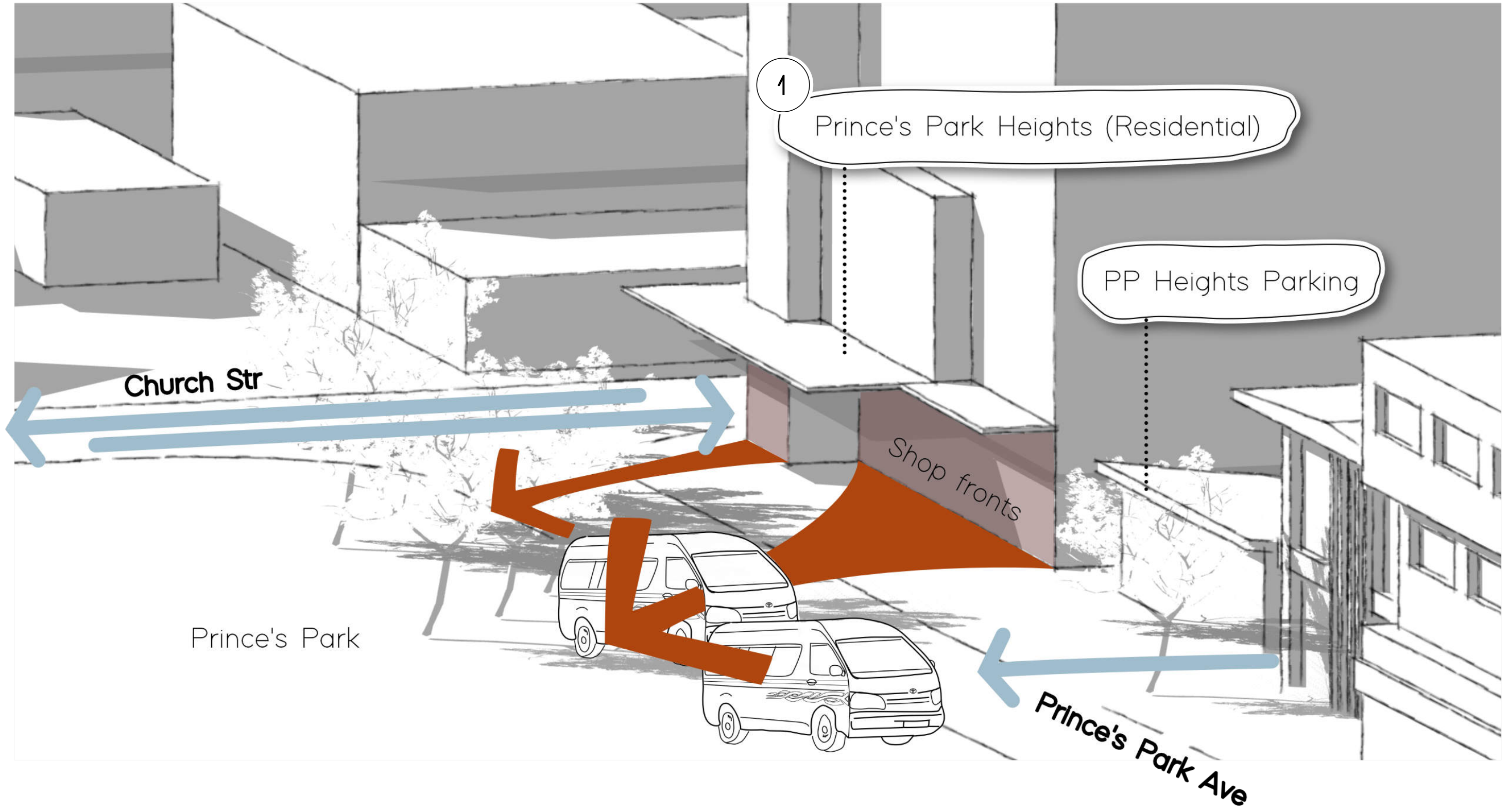
- ① Prince's Park Heights
- ② Greenwood College
- ③ BASUMI PPE Shop
- ④ New Apostolic Church
- ⑤ NAPTOSA House
- ⑥ Cool Kids Day Care
- ⑦ Surgery Clinic
- ⑧ Bearing Agent
- ⑨ PEP Pta Tramshed
- ⑩ CoT Metro Police Parl
- ⑪ CoT Electricity Depot
- ⑫ CoT Drivers License F
- ⑬ C de Wet Hospital
- ⑭ CoT Bus Services Par
- ⑮ Old Acres Cemetery
- ⑯ SAPS Vehicle Impounc
- ⑰ Save & Buy Supermar

**AROUND THE PARK**

- Services
- Cultural
- Educational
- Residential
- Vehicle Routes
- Taxi Park Spots
- Pedestrian Routes
- Secondary Routes
- Pedestrian nodes
- Manhole
- Junction Box
- Culverts
- Pipes
- Outlets

**PARK COMMUNITY SITE ANALYSIS**

**SITE AND CONTEXT ANALYSIS**

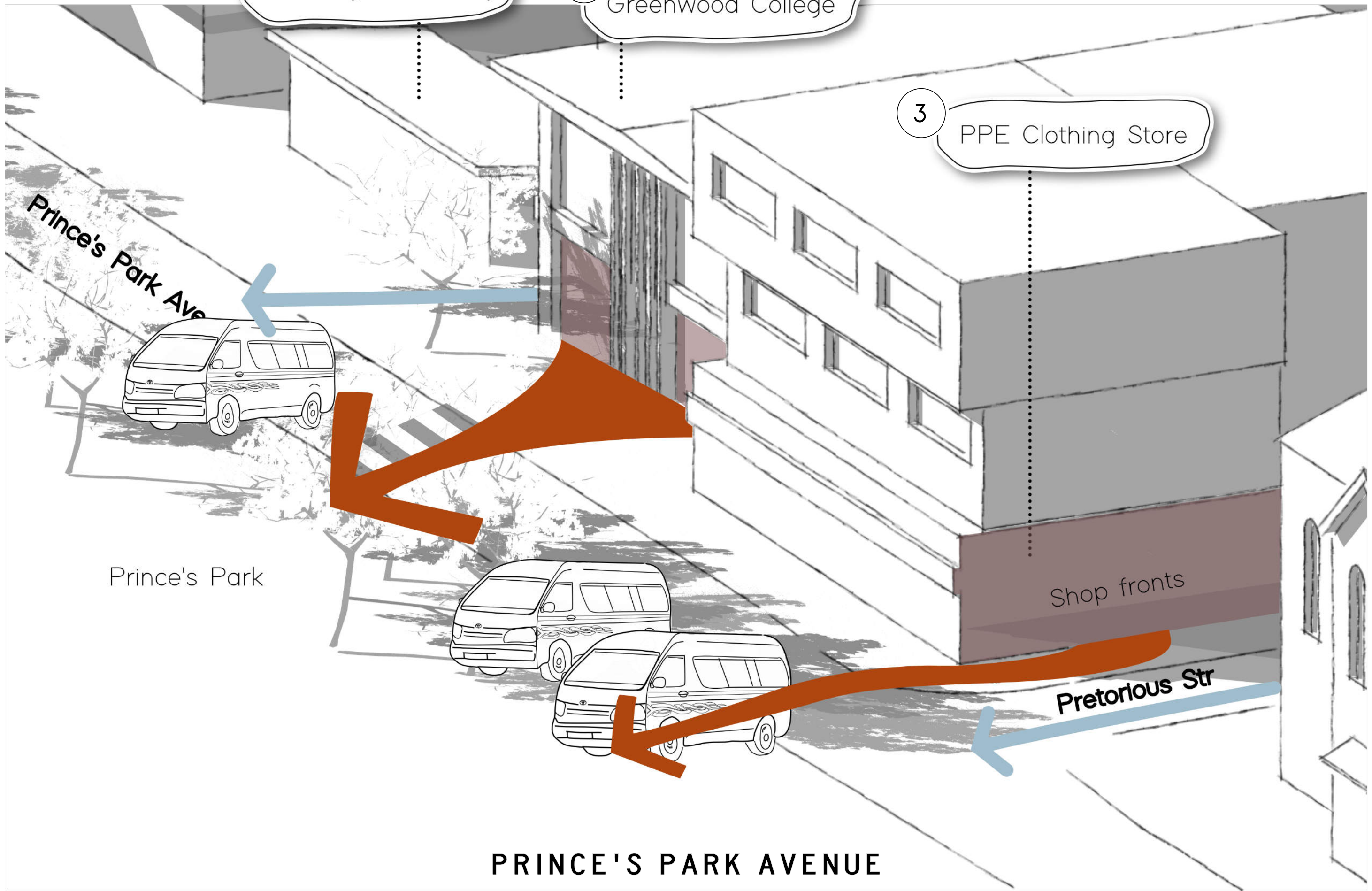


**PRINCE'S PARK AVENUE**

1 PP Heights Parking

2 Greenwood College

3 PPE Clothing Store



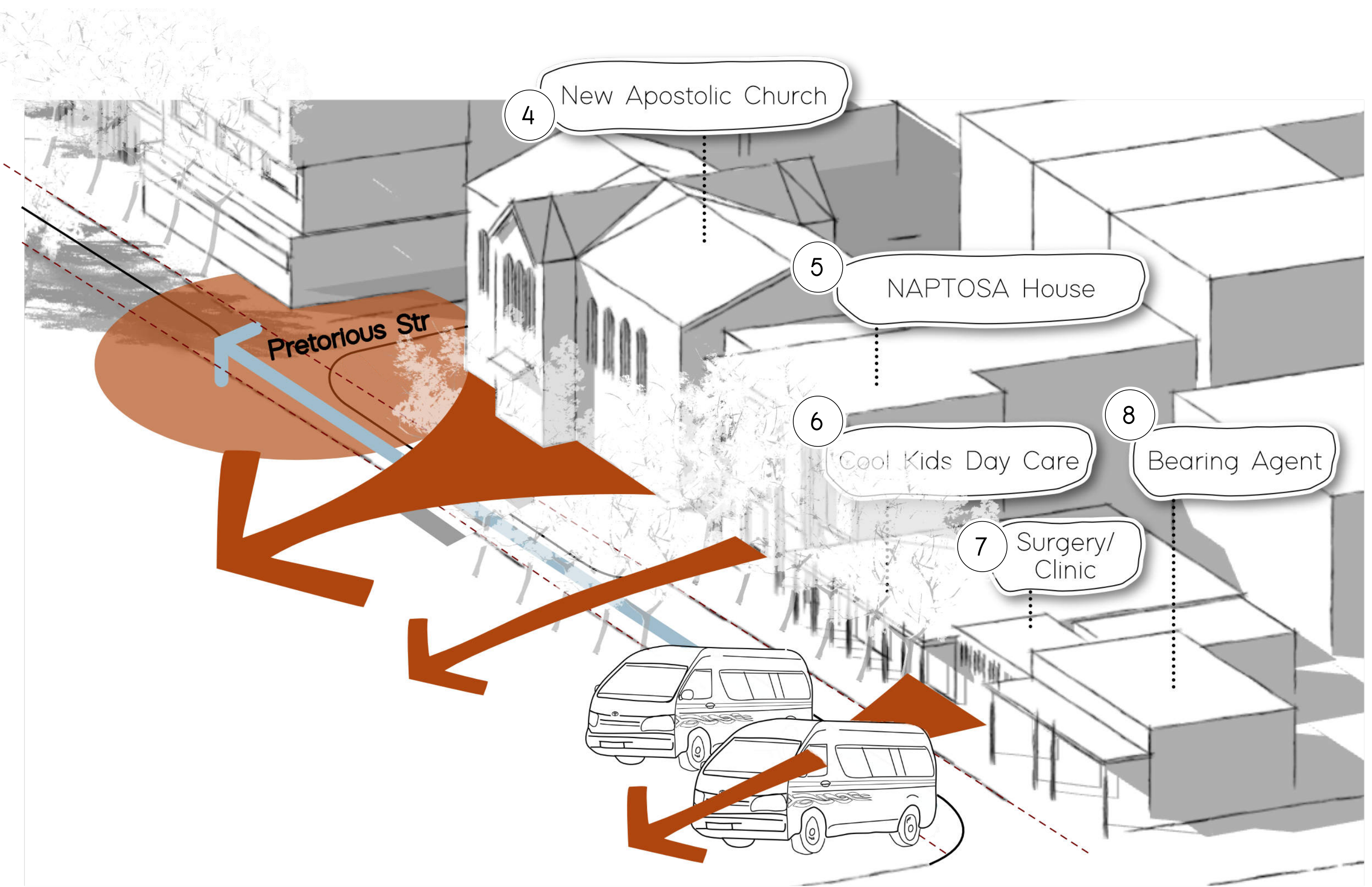
Prince's Park

Shop fronts

Pretorious Str

PRINCE'S PARK AVENUE





PRINCE'S PARK AVENUE

← WEEK DAYS

WEEKENDS →



waiting for transport home → Greenwood School

washing, cooking, sleeping → homeless community

washing, selling of food and goods, resting, open outdoor space → Informal settlers

shelters in proximity providing support for the park community → Angels of Hope shelter  
Community Ministres shelter

street church goers (outreach programme) → outdoor church services and soup hand outs

New Apostolic Church goers → socialising before and after the church service

homeless community → washing before outdoor church service, open fire cooking at night, sleeping

Informal settlers → washing, selling of food and goods

WHAT IS THE PARK USED FOR?

WHO IS THE PARK COMMUNITY?

WHAT IS THE PARK USED FOR?

shelters in proximity providing support for the park community → Kopano Manyano shelter

social gathering, selling of food and goods, resting, open outdoor space → Townlands social housing (residents)

open outdoor space, social gathering → Princes Park Heights (residents)

lunch spot, resting, meeting and waiting for transport to other parts or out of the cbd → commuters (business and retail)

waiting for the next trip, parking, resting, lunch spot, washing their vehicles → taxi & bus drivers

Soccer team → fitness and skills training

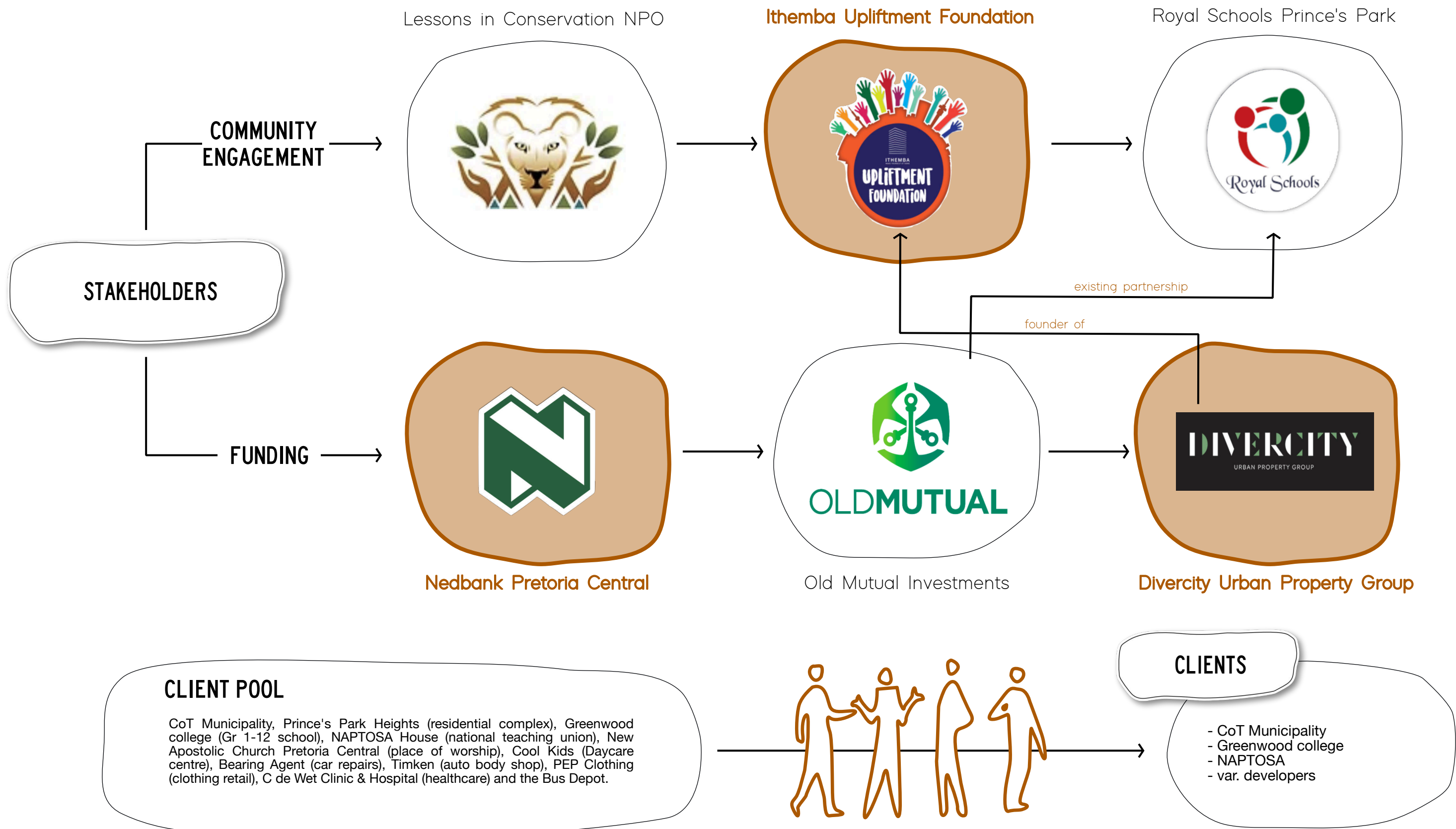
friends and families → social gathering, eating and celebrating

commuters → meeting and waiting for transport to other parts or out of the cbd

Police officials (on Francis Beard and Church St) → traffic control stops and license checking



USER PROFILE AND ROUTINES



## CLIENT AND STAKEHOLDERS



HISTORICAL IMPORTANCE

SMALL ECONOMIES

CHURCH SQUARE

CHURCH STREET  
Square at the historic centre of Pretoria.

It was the site for the Rivonia Treason Trial was held.  
Today, as well as in history it serves as a meeting place for all sorts of people.

People gather here for lunch, work breaks and occasional concerts on weekends.

Church St axis to draw people into the urban ecology

Google Earth

Gereformeerde Kerk Pretoria

Princefield School

CHURCH STREET

Kruger Museum

MARABASTAD JAZZ SQUARE

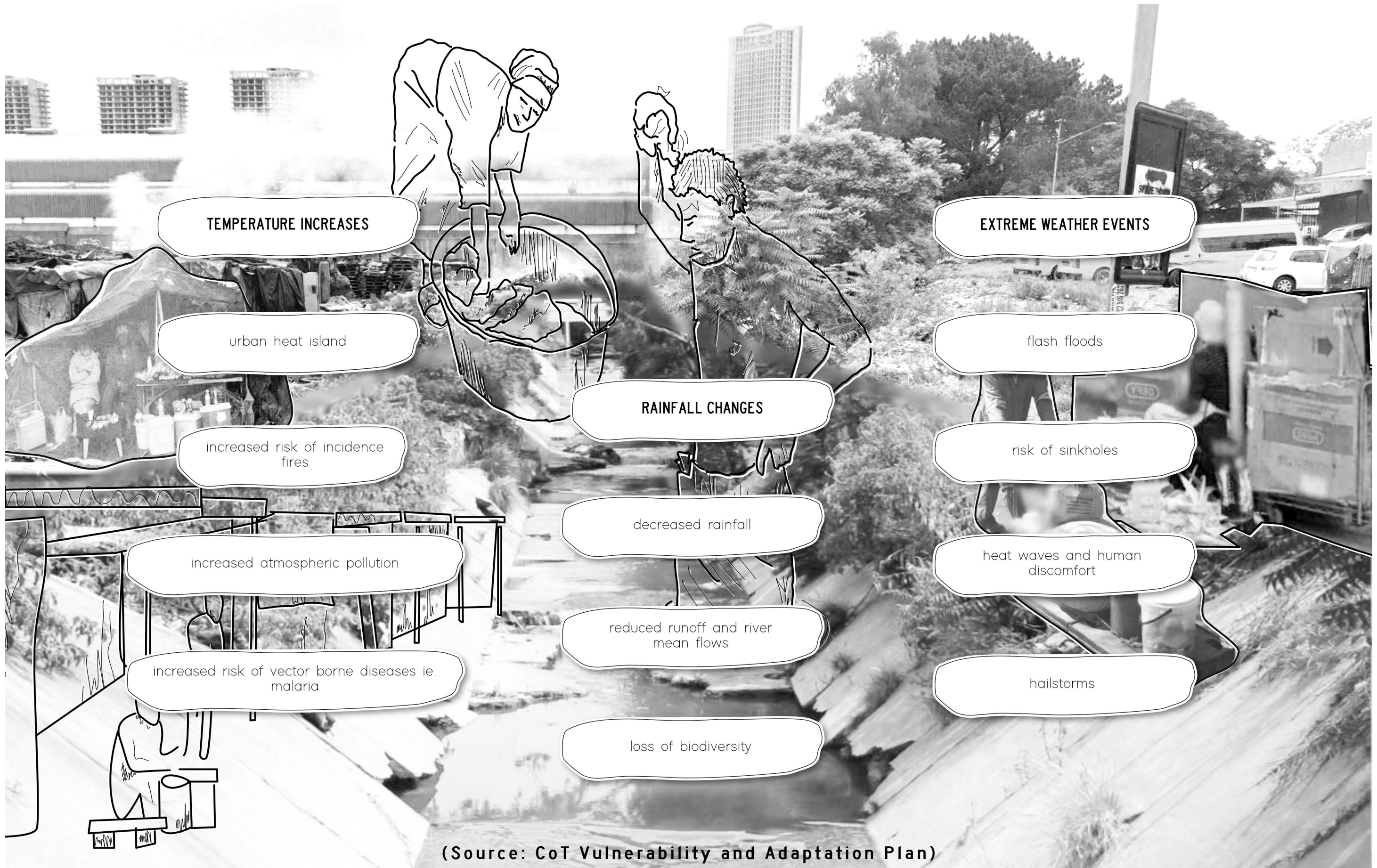
KRUGER PARK

Church St  
PRINCE'S PARK

Steenhoven axis to connect people to their environment in the CBD

STEENHOVENSPRUIT

# WHERE TWO AXIS MEET



**TEMPERATURE INCREASES**

urban heat island

increased risk of incidence fires

increased atmospheric pollution

increased risk of vector borne diseases ie. malaria

**RAINFALL CHANGES**

decreased rainfall

reduced runoff and river mean flows

loss of biodiversity

**EXTREME WEATHER EVENTS**

flash floods

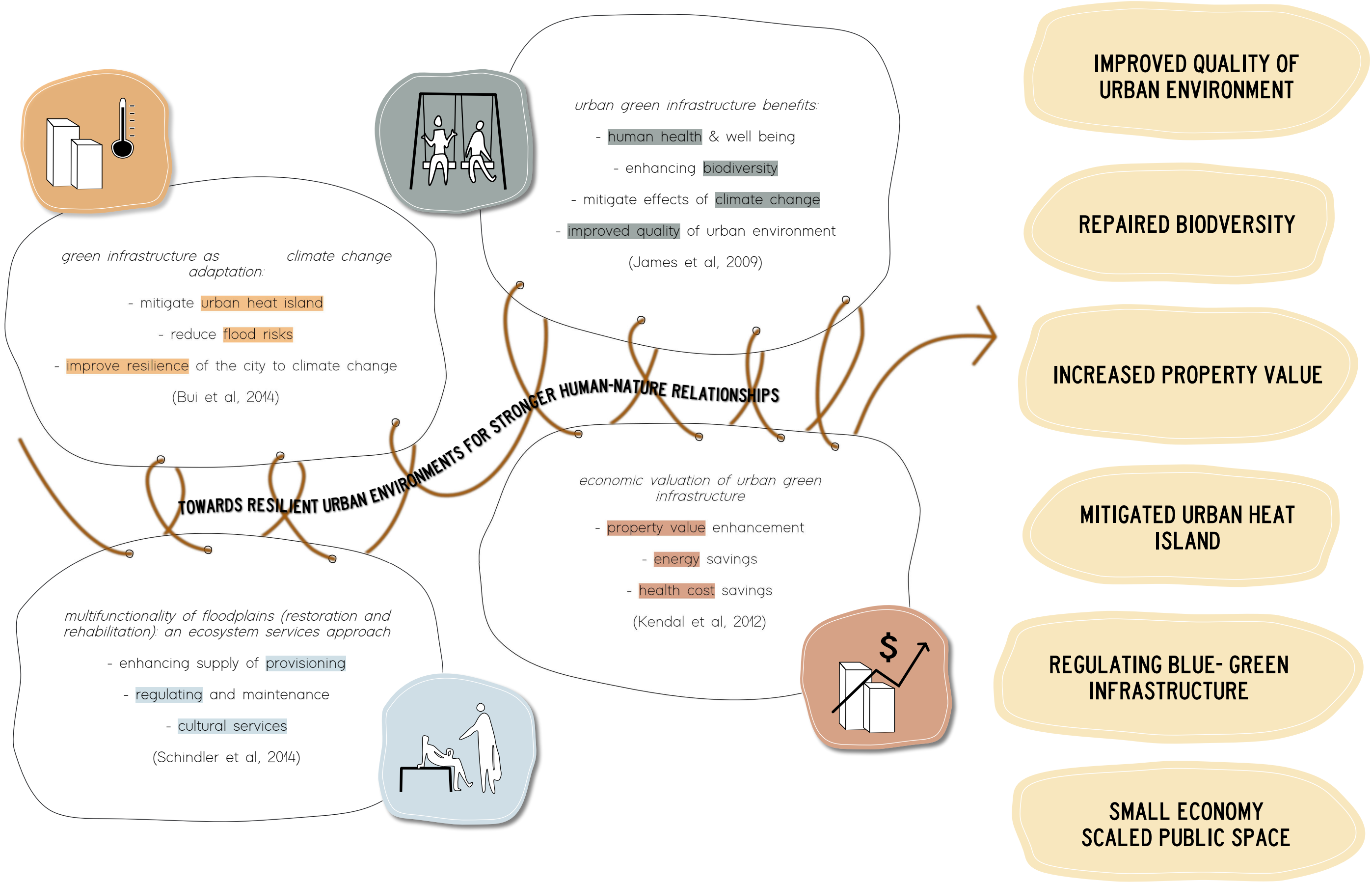
risk of sinkholes

heat waves and human discomfort

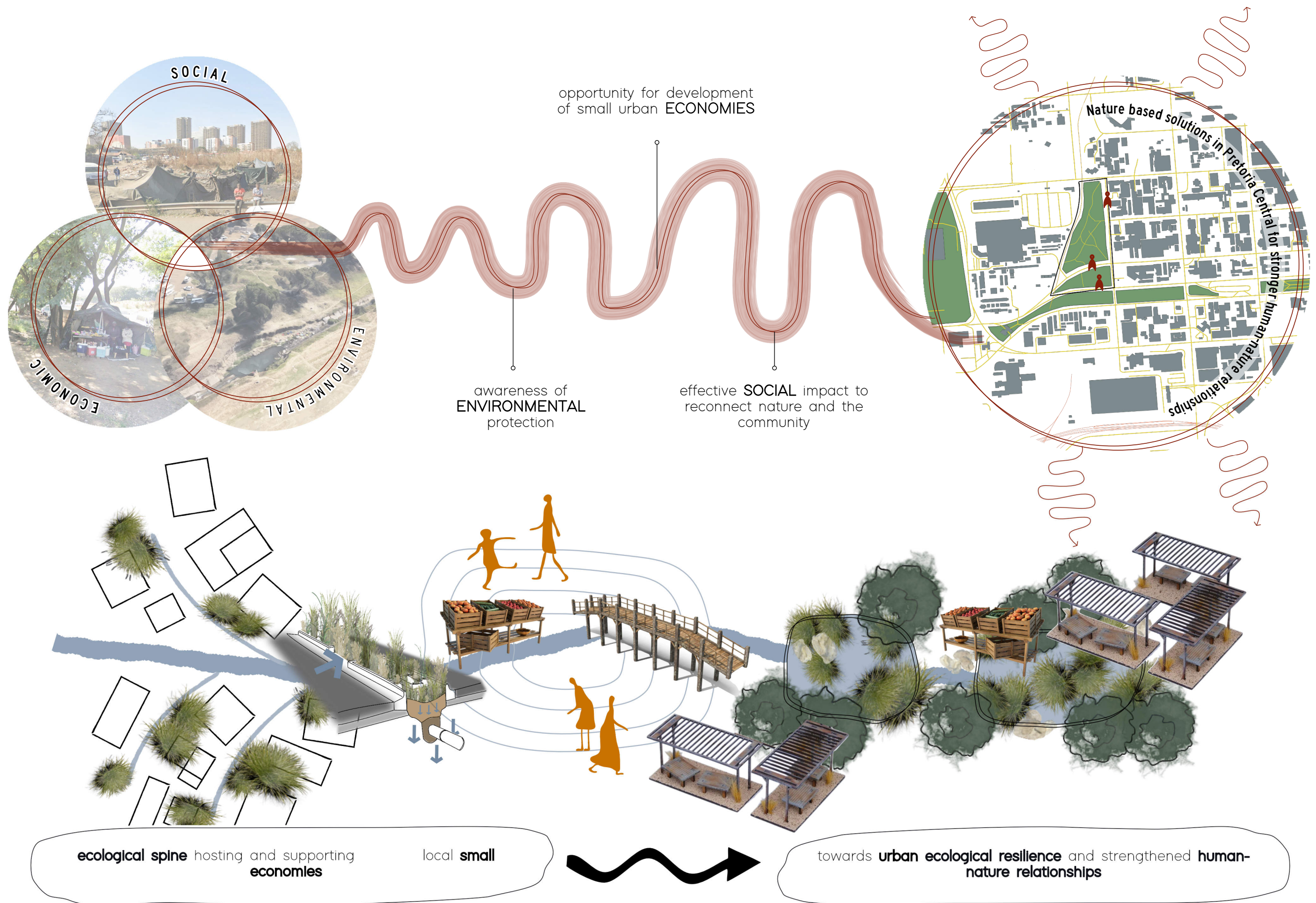
hailstorms

(Source: CoT Vulnerability and Adaptation Plan)

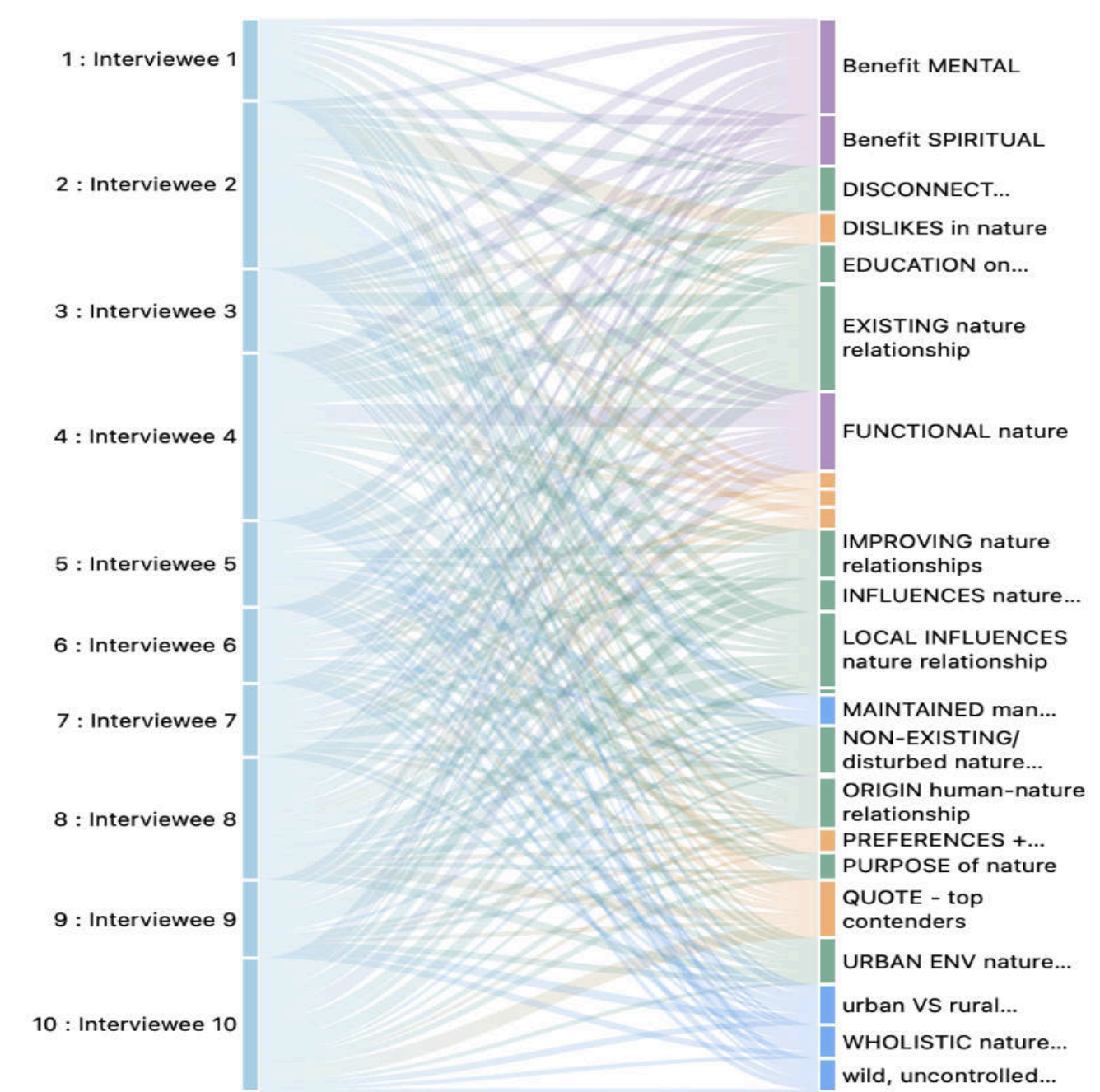
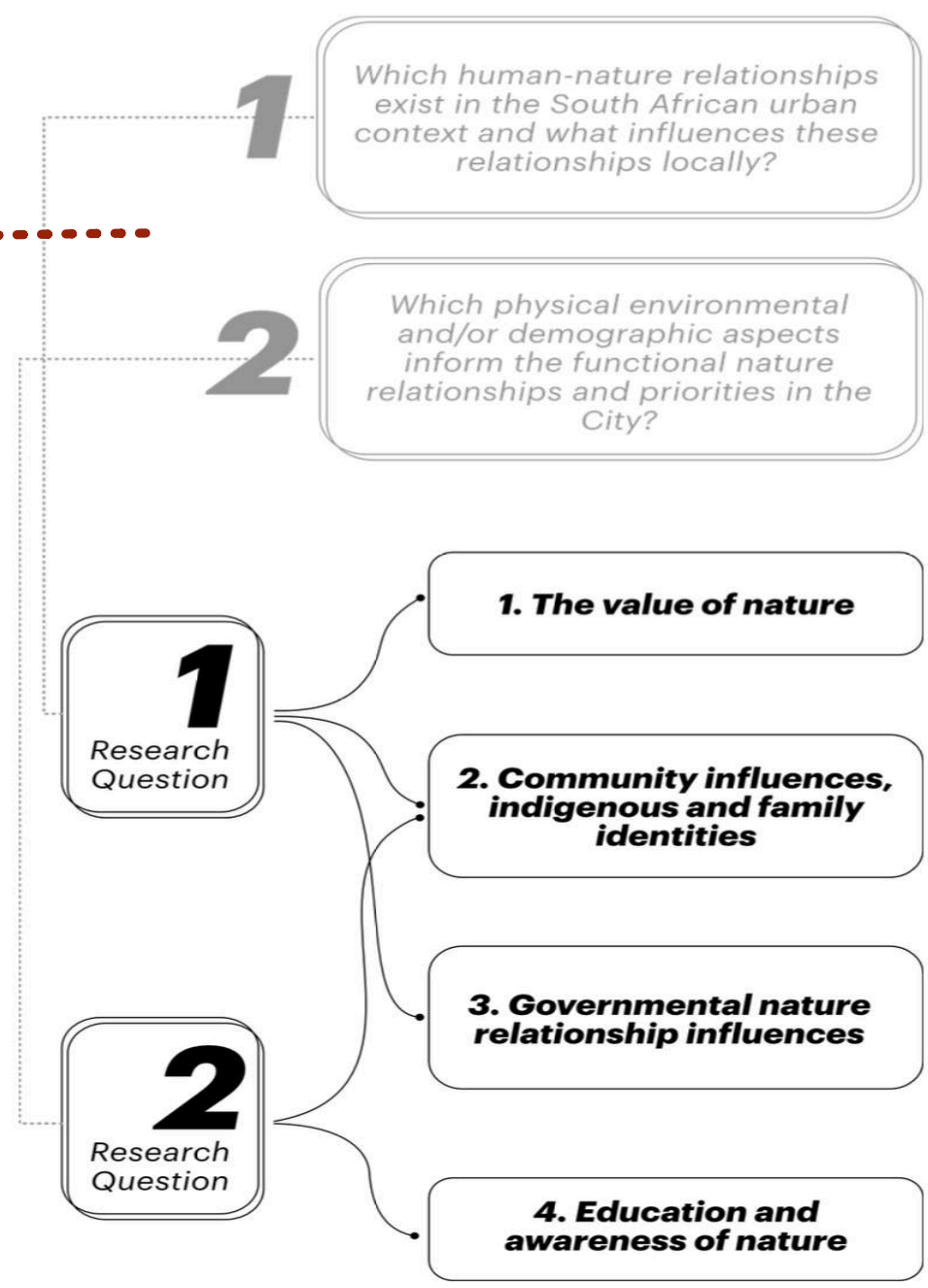
**URBAN REALITIES**



**BROADER SPATIAL THEORY TOWARDS DESIGN GOALS**



# EARLY VISION DEVELOPMENT



nature relationships      community influences      childhood exposure

human nature disconnect

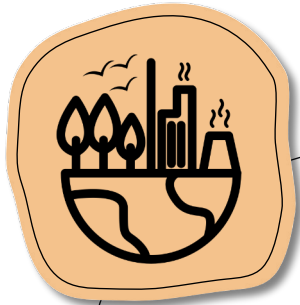
How can **nature based solutions** form infrastructure frameworks for **small economies** in the urban domain towards a **resilient** urban environment for stronger **human-nature relationships**?

economy over environment      accessibility

knowledge and awareness      governmental influence

# COT FIELDWORK RESEARCH





*adressing climate change  
in Sub-Saharan African cities:*

- requires **community enablement** and **co-management** of urban spaces
- **Low-carbon solutions** - lower capital costs - higher local **job creation** - easier to maintain when built on local knowledge

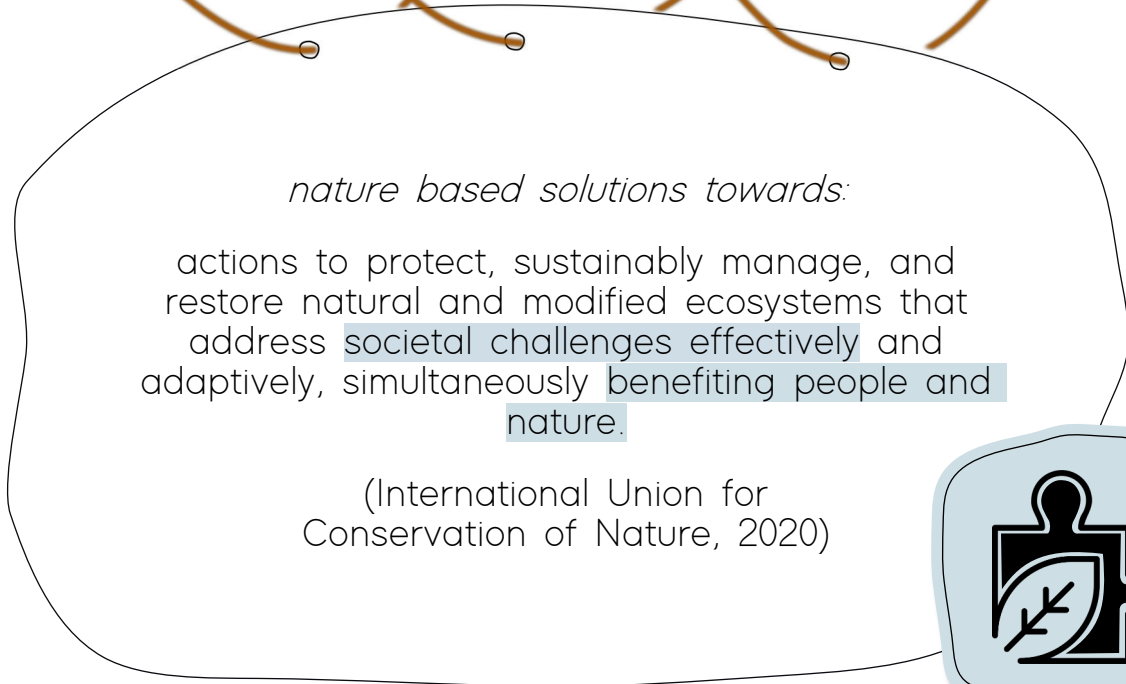
(Lemaire, 2021)



*towards resilient cities:*

- a healthy city implies a closer **contact with nature** through biophilic design and biomimicry
- the recognition of **urbanity as the creation of commons**

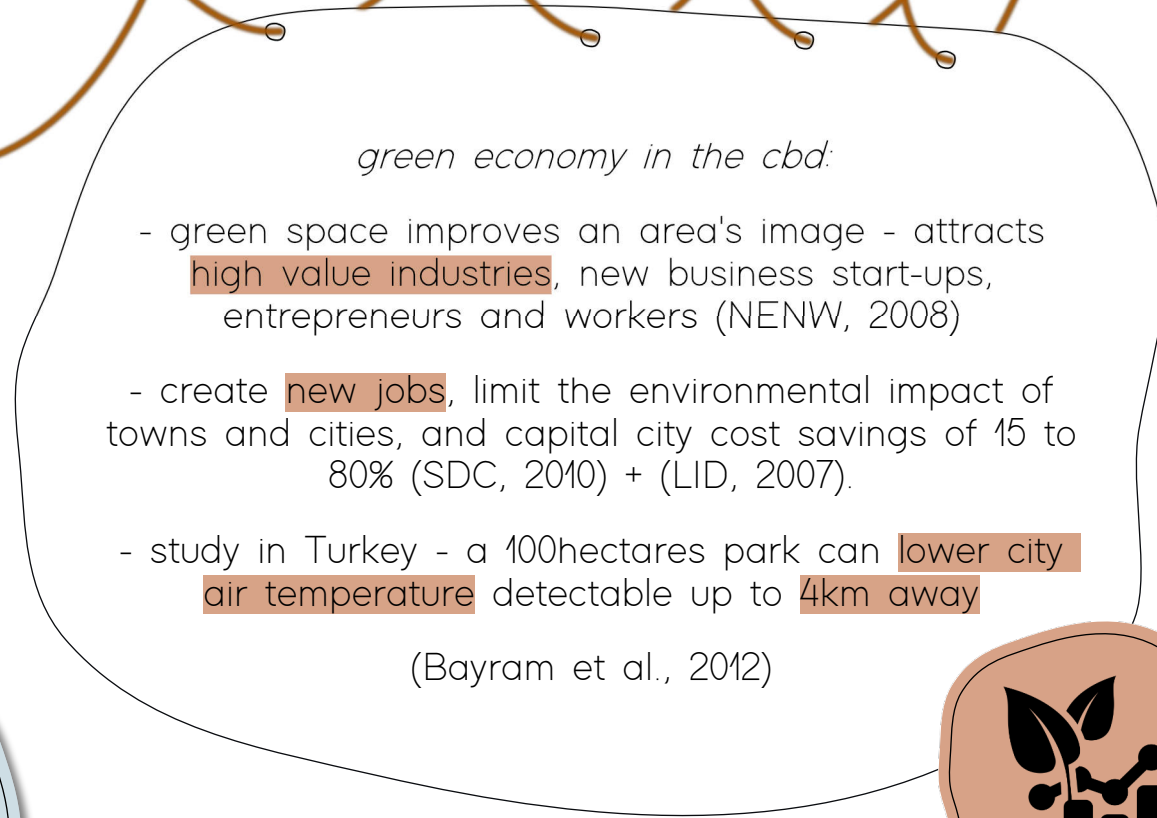
(Chatterton, 2019)



*nature based solutions towards:*

actions to protect, sustainably manage, and restore natural and modified ecosystems that address **societal challenges effectively** and adaptively, simultaneously **benefiting people and nature.**

(International Union for Conservation of Nature, 2020)



*green economy in the cbd:*

- green space improves an area's image - attracts **high value industries**, new business start-ups, entrepreneurs and workers (NENW, 2008)
- create **new jobs**, limit the environmental impact of towns and cities, and capital city cost savings of 15 to 80% (SDC, 2010) + (LID, 2007).
- study in Turkey - a 100hectares park can **lower city air temperature** detectable up to **4km away**

(Bayram et al., 2012)

# FOCUSSED DESIGN QUESTION THEORY



## URBAN CHALLENGE

- degrading river channel infrastructure
- river access and safety
- unmanaged water runoff
- invasive specie domination
- rising urban heat
- weather-exposed produce sale tables
- vulnerable infrastructure and homes
- temporary gazebo vendor stalls
- trolley vendors inbetween cars
- limited accessibility of existing vendor stalls

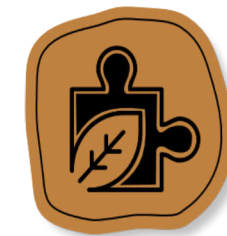
## THEORY



RESILIENT CITIES  
(Chatterton, 2019)



SUB-SAHARAN CLIMATE CHANGE ADAPTATION  
(Lemaire, 2021)

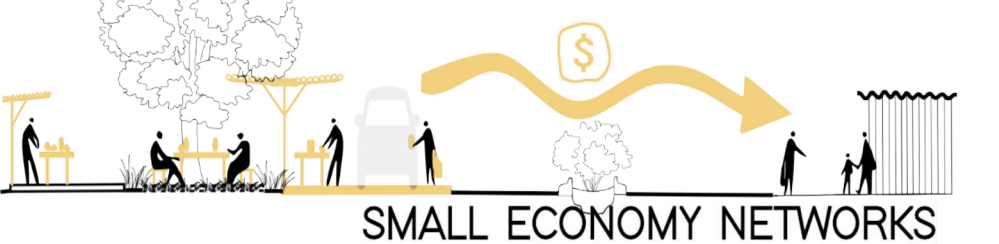
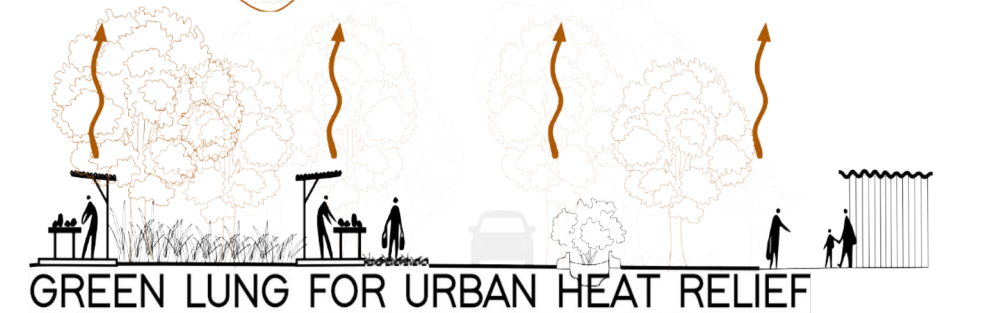
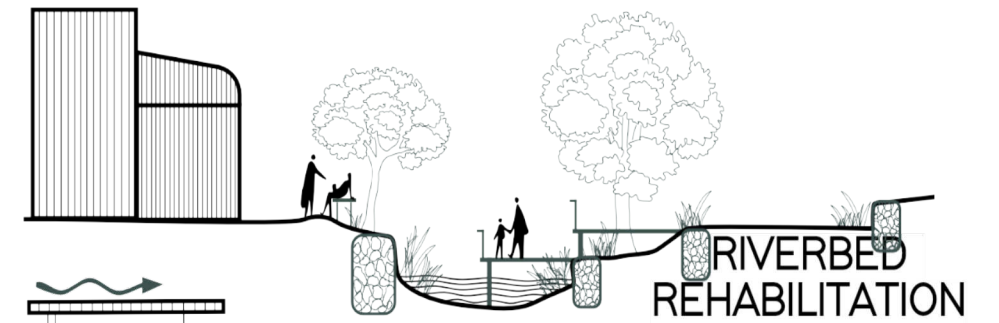


NATURE BASED SOLUTIONS  
(International Union for Conservation of Nature, 2020)



GREEN ECONOMY  
(Bayram et al., 2012)

## SOLUTION / PROPOSAL



# THEORY INFORMING DESIGN DECISIONS | SUMMARY



Kibera Public Space Projects



## OPEN GREEN SPACES

*nature based solution*

**working with residents** of the informal settlement of Kibera

meet their physical, social and economic needs.

design and activate a network of Productive Public Spaces

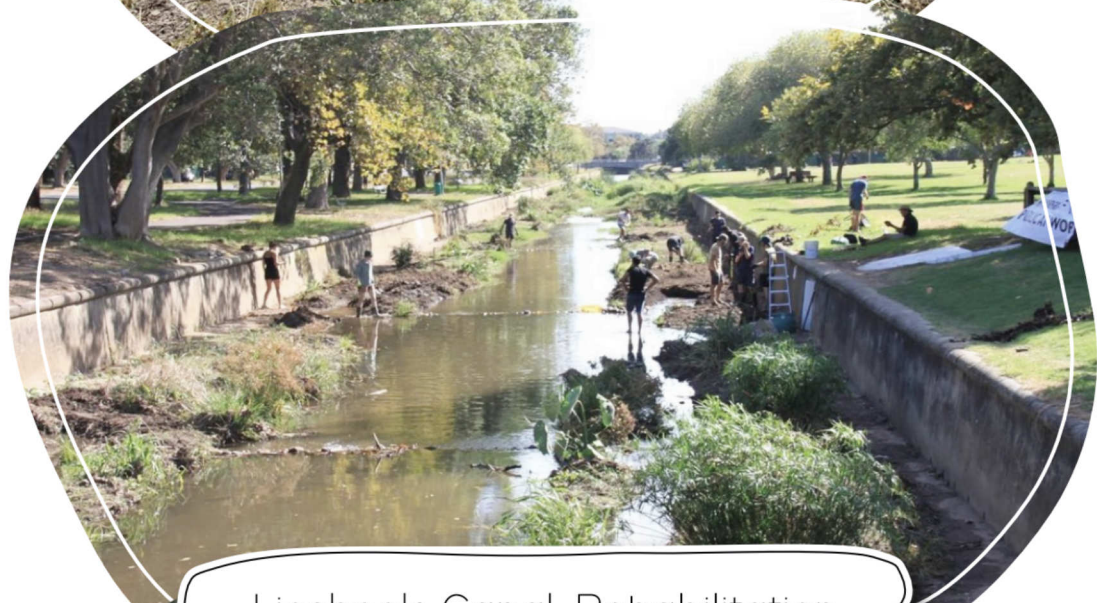
using **local materials** and construction processes

safe environment

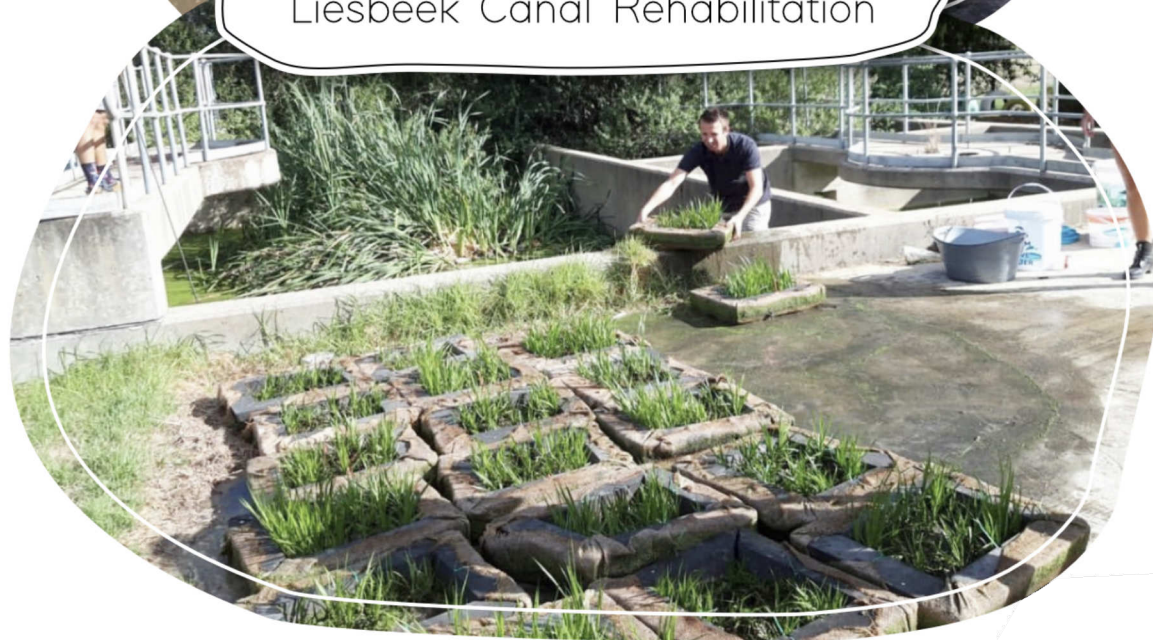
cohesive community

increased **opportunities to generate Income**





Liesbeek Canal Rehabilitation



## NATURE CONNECTIONS

*biodiversity as a key entry point for connecting people to the urban river system*

improving water quality through litter traps, filtration and slowing the water flow

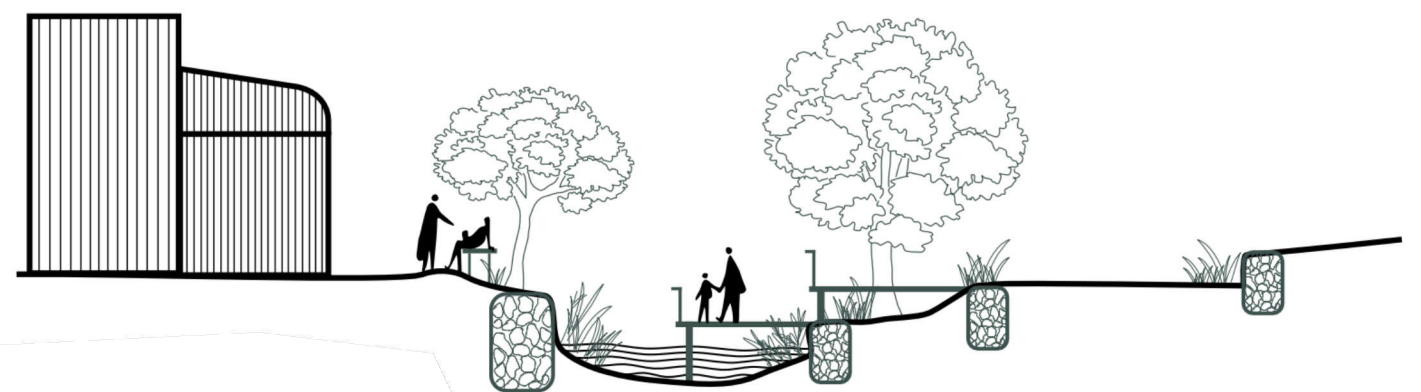
slower water flow for reintroduced biodiversity and habitat creation

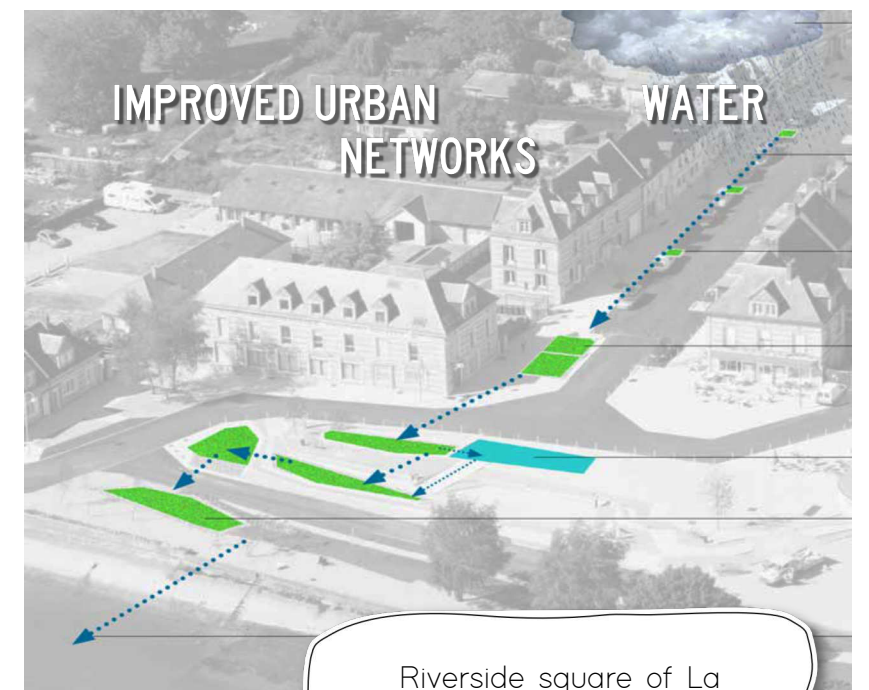
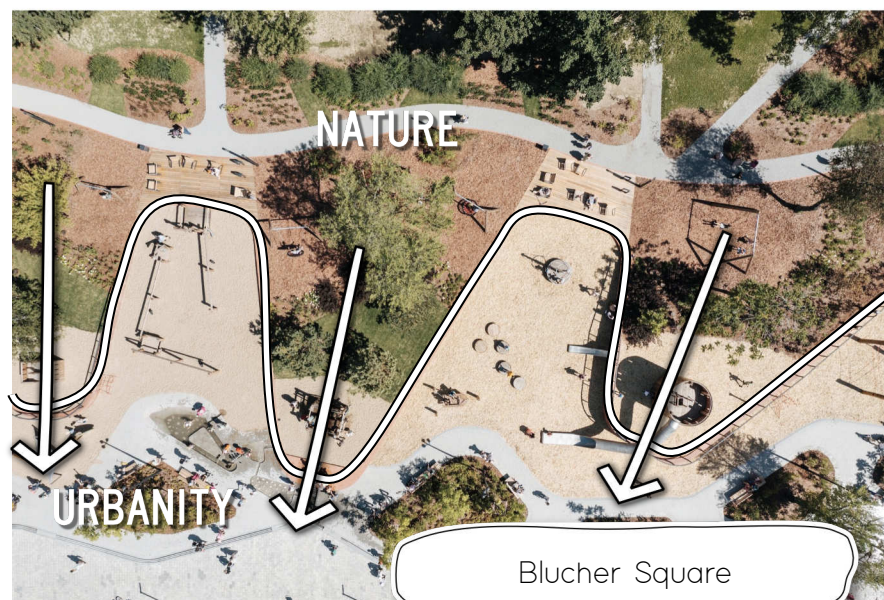
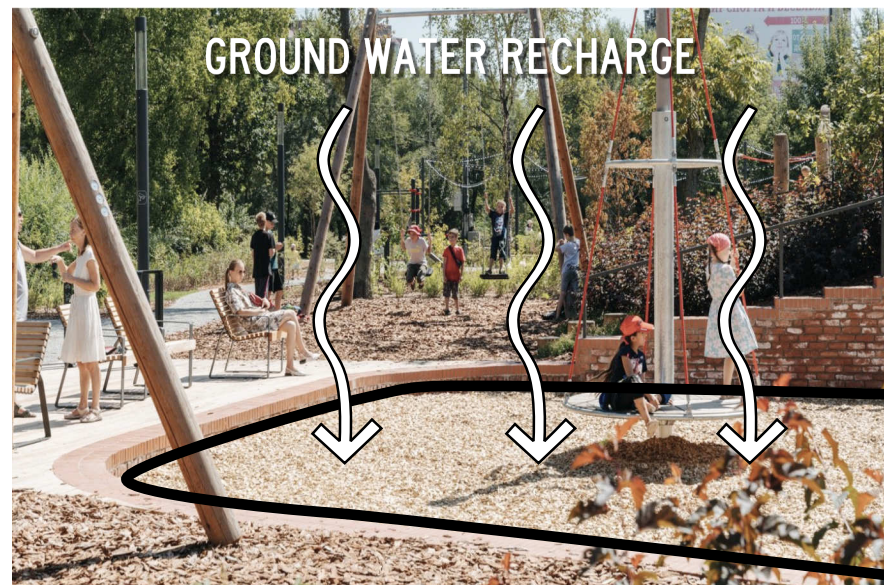
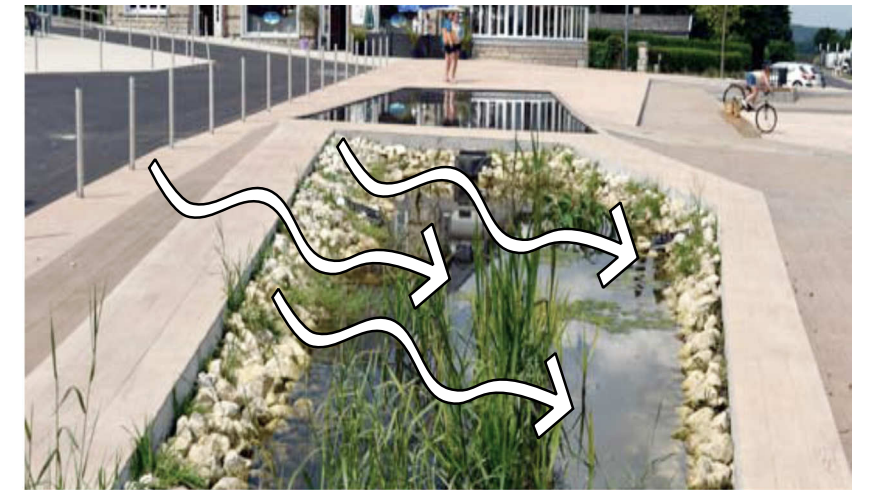
**bring people closer to the river**

natural weir for water aeration

interested and **affected people as key stakeholders**

educating people on how to **work with nature**





by AFA, Russia

by var Urban Planners, Munich

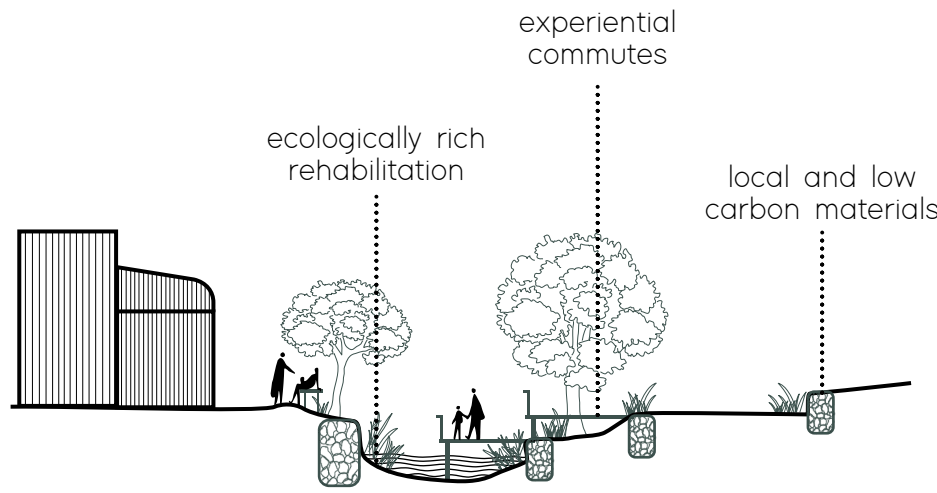
by Agence Babylone, France

## DESIGN DEVELOPMENT | PRECEDENTS

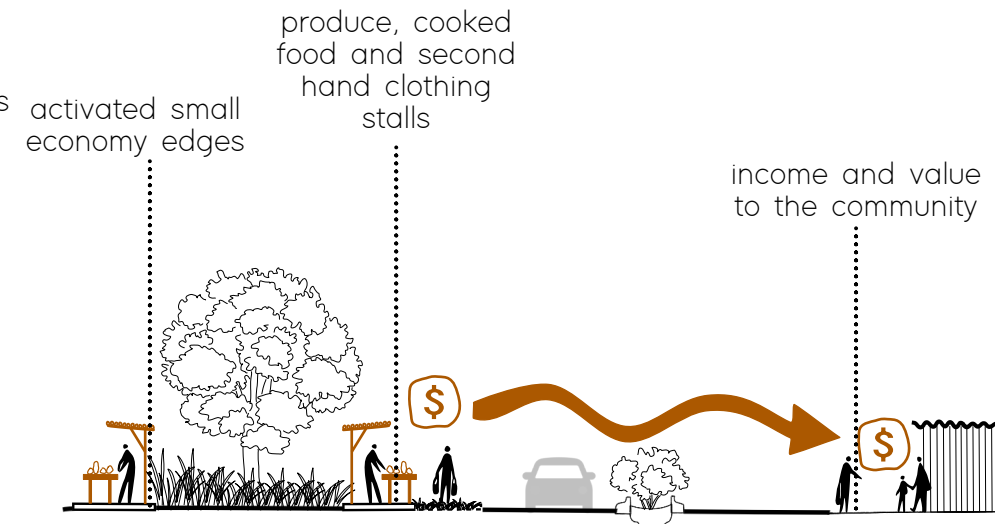


**PROGRAMME DEVELOPMENT | INITIAL ZONING**

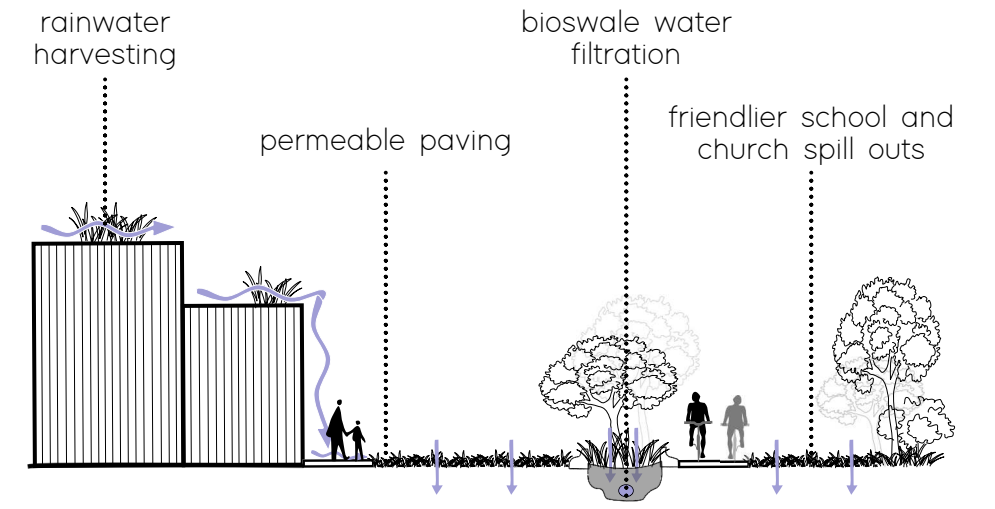
① River and riverbed rehabilitation & SUDS water management



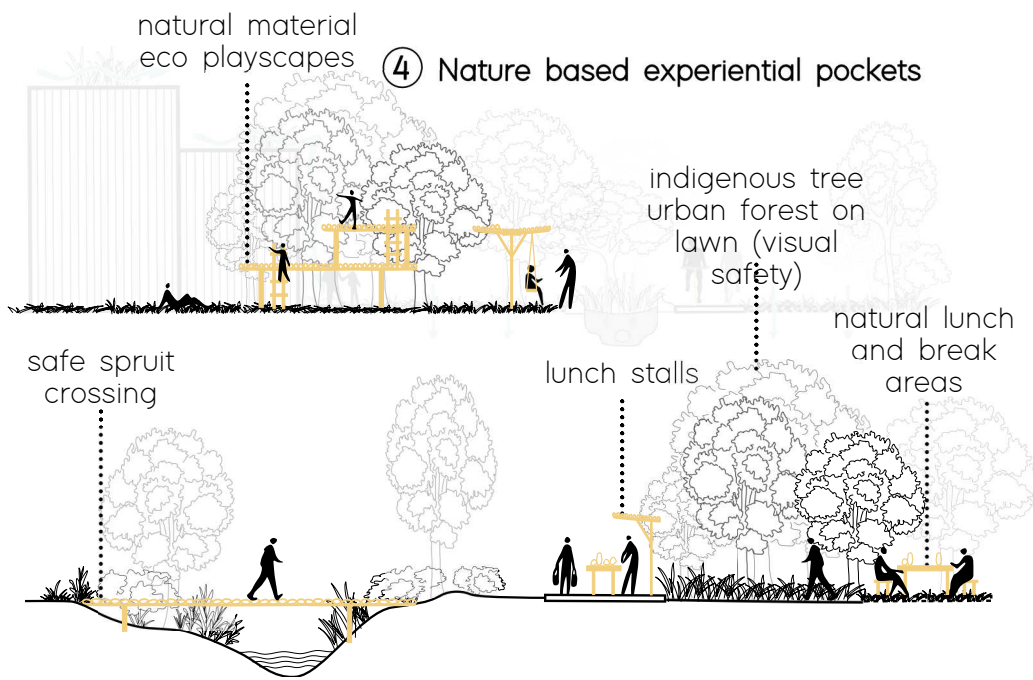
② Small economy infrastructure



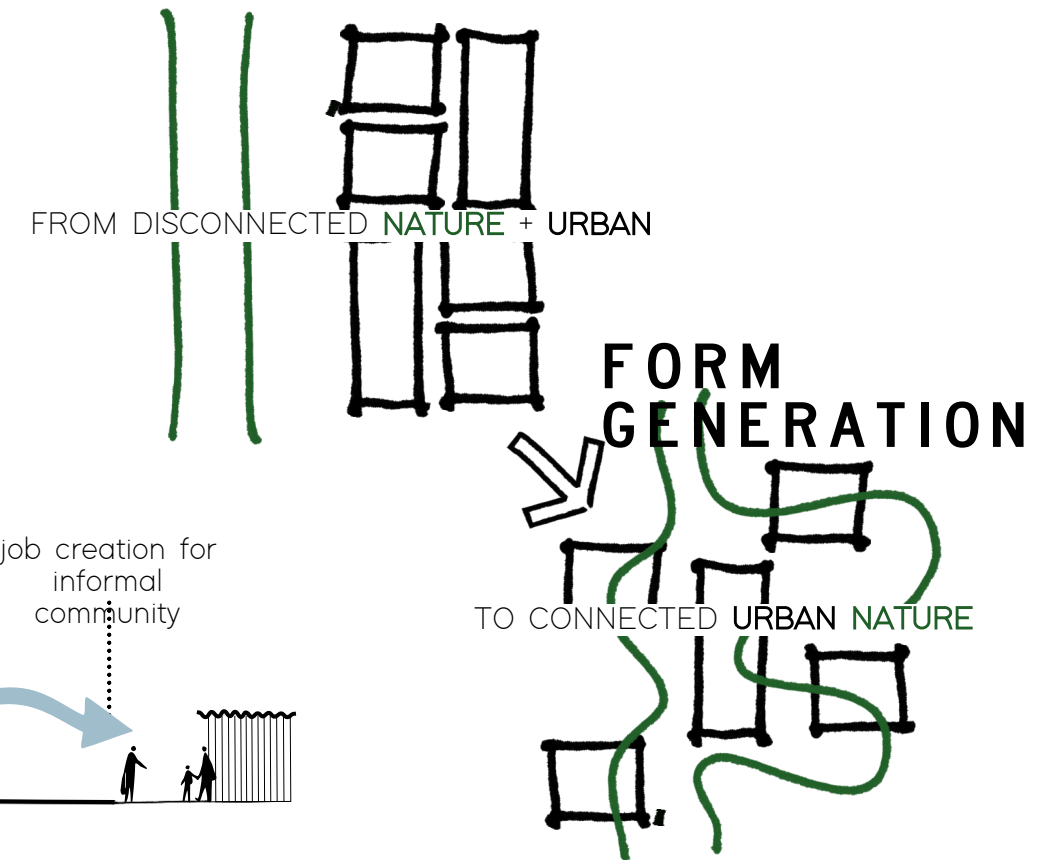
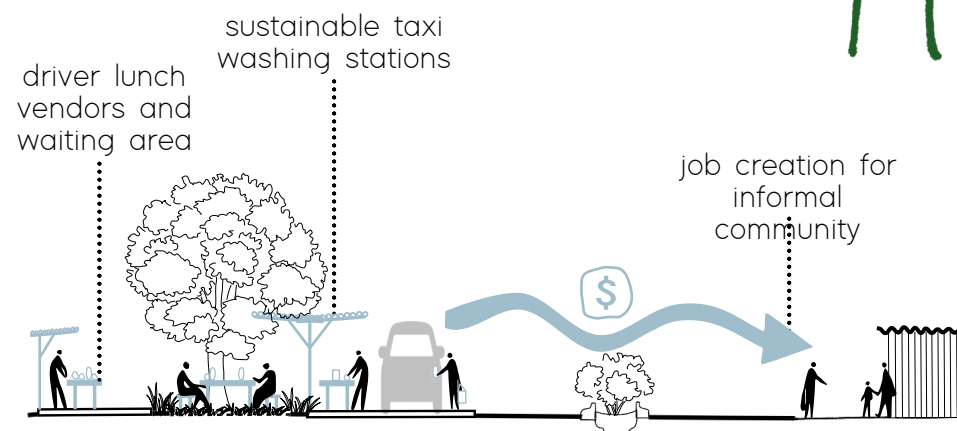
③ Accesible natural public space



④ Nature based experiential pockets



⑤ Taxi wash and waiting area





Project Assessment measure:

SITES

# SITES

## RATING SYSTEM

For Sustainable Land Design and Development

EXISTING CONDITIONS

+

DURING PROJECT DEVELOPMENT

+

FUTURE CONDITIONS

conserve

manage

restore

generate

## GOALS

Create Regenerative Systems and Foster Resiliency

Ensure Future Resource Supply and Mitigate Climate Change

Transform the Market through Design, Development, and Maintenance Practices

Enhance Human Well-Being and Strengthen Community

### RATING SYSTEMS SECTIONS

- SITE CONTEXT
- PRE-DESIGN ASSESSMENT + PLANNING
- SITE DESIGN - WATER
- SITE DESIGN - MATERIALS SELECTION
- CONSTRUCTION
- SITE DESIGN - HUMAN HEALTH + WELL-BEING
- OPERATIONS AND MAINTENANCE
- SITE DESIGN - SOIL + VEGETATION
- EDUCATION + PERFORMANCE MONITORING
- INNOVATION OR EXEMPLARY PERFORMANCE

## ASSESSMENT MEASURE AND PERFORMANCE FRAMEWORK

### SITE CONTEXT RESEARCH

community influences

nature relationships

childhood exposure

human nature disconnect

How can **nature based solutions** form infrastructure frameworks for **small economies** in the urban domain towards a **resilient** urban environment for stronger **human-nature relationships**?

### RESEARCH QUESTION

### MOST RELEVANT CRITERIA

SITE CONTEXT

PRE-DESIGN ASSESSMENT + PLANNING

**SITE DESIGN - WATER**

SITE DESIGN - MATERIALS SELECTION

CONSTRUCTION

**SITE DESIGN - HUMAN HEALTH + WELL-BEING**

OPERATIONS AND MAINTENANCE

**SITE DESIGN - SOIL + VEGETATION**

EDUCATION + PERFORMANCE MONITORING

INNOVATION OR EXEMPLARY PERFORMANCE

### ADDRESSED ON SITE

manage precipitation on site  
 reduce water use for landscape irrigation  
 manage precipitation beyond baseline  
 design functional stormwater features as amenities  
 restore aquatic (riverbed) ecosystems

provide optimum site accessibility, safety and way finding  
 promote equitable site use  
 support mental restoration  
 support physical activity  
 provide on site food production  
 encourage fuel efficient and multi-modal transportation  
 support local economy

control and manage invasive plants  
 use appropriate plants  
 conserve healthy soils and appropriate vegetation  
 conserve and restore native plant communities  
 reduce urban heat island effect

## CRITERIA SELECTION

economy over environment

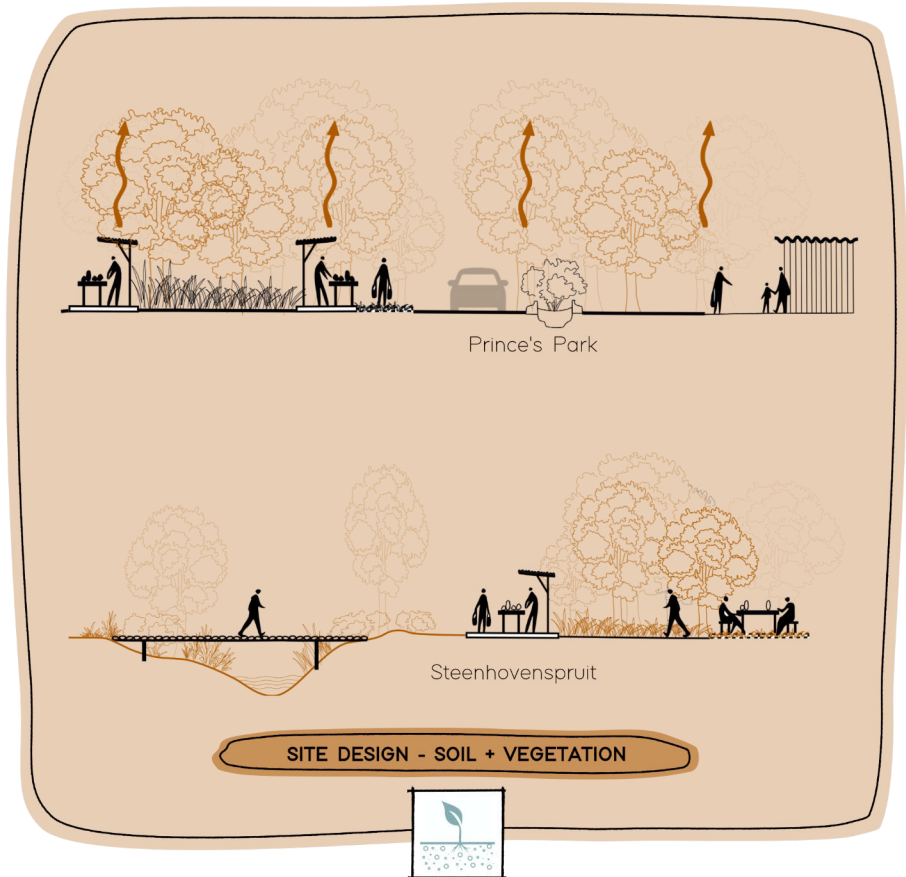
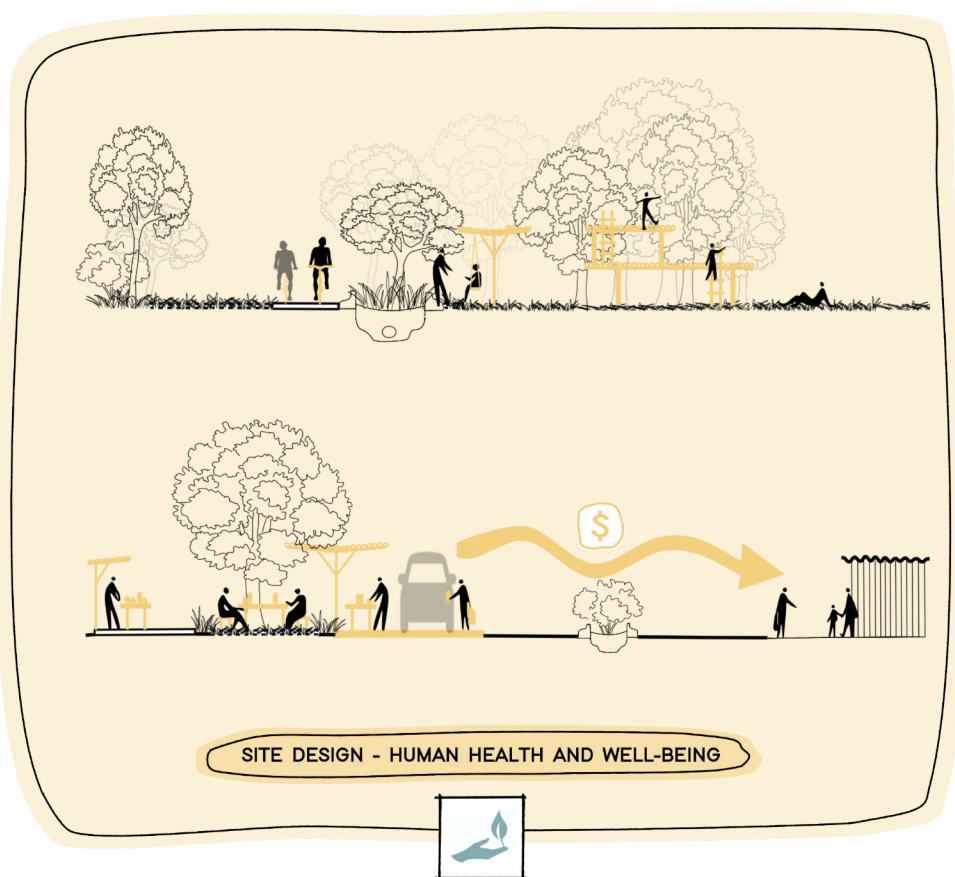
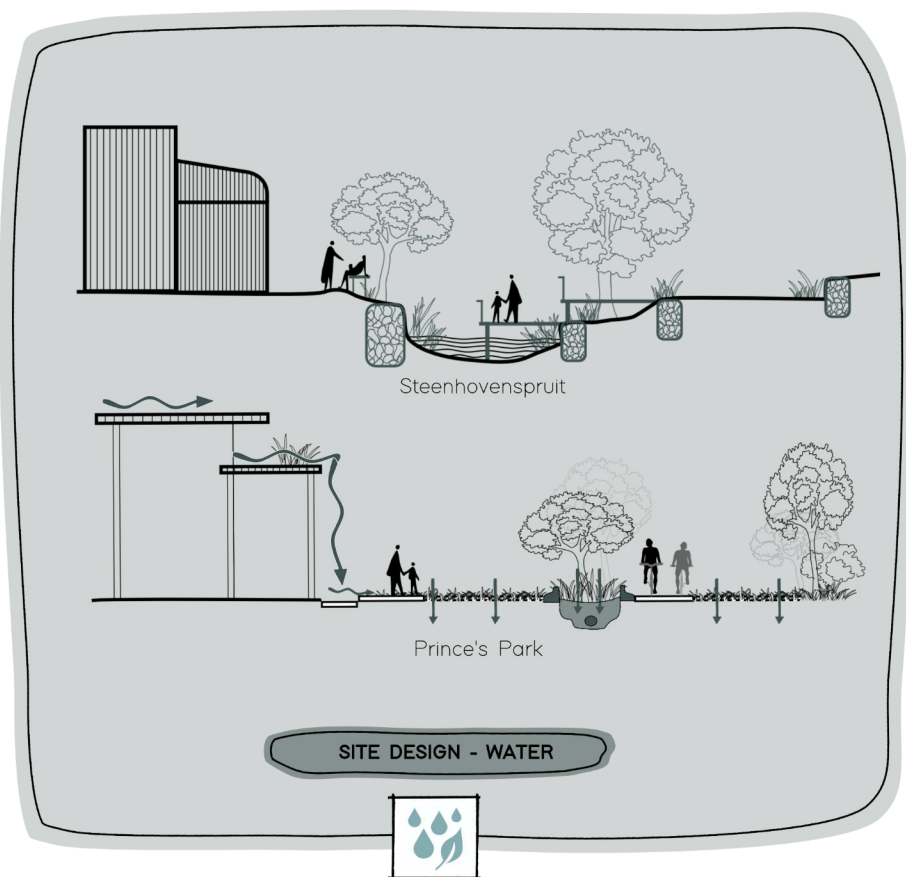
accessibility

governmental influence

knowledge and awareness



CONCEPT AND DESIGN ITERATIONS PER CRITERIA



captured water retention

- flood mitigation
- rainwater harvesting
- water filtration system
- groundwater recharge
- SUDS at city scale

activated safe public spaces

- physical activity zones
- community and get together zones
- food preparation and sales
- multi purpose waste picker, vendor delivery and bicycle lane
- job creation during and after construction

rehabilitated terraced riverbed ecosystems

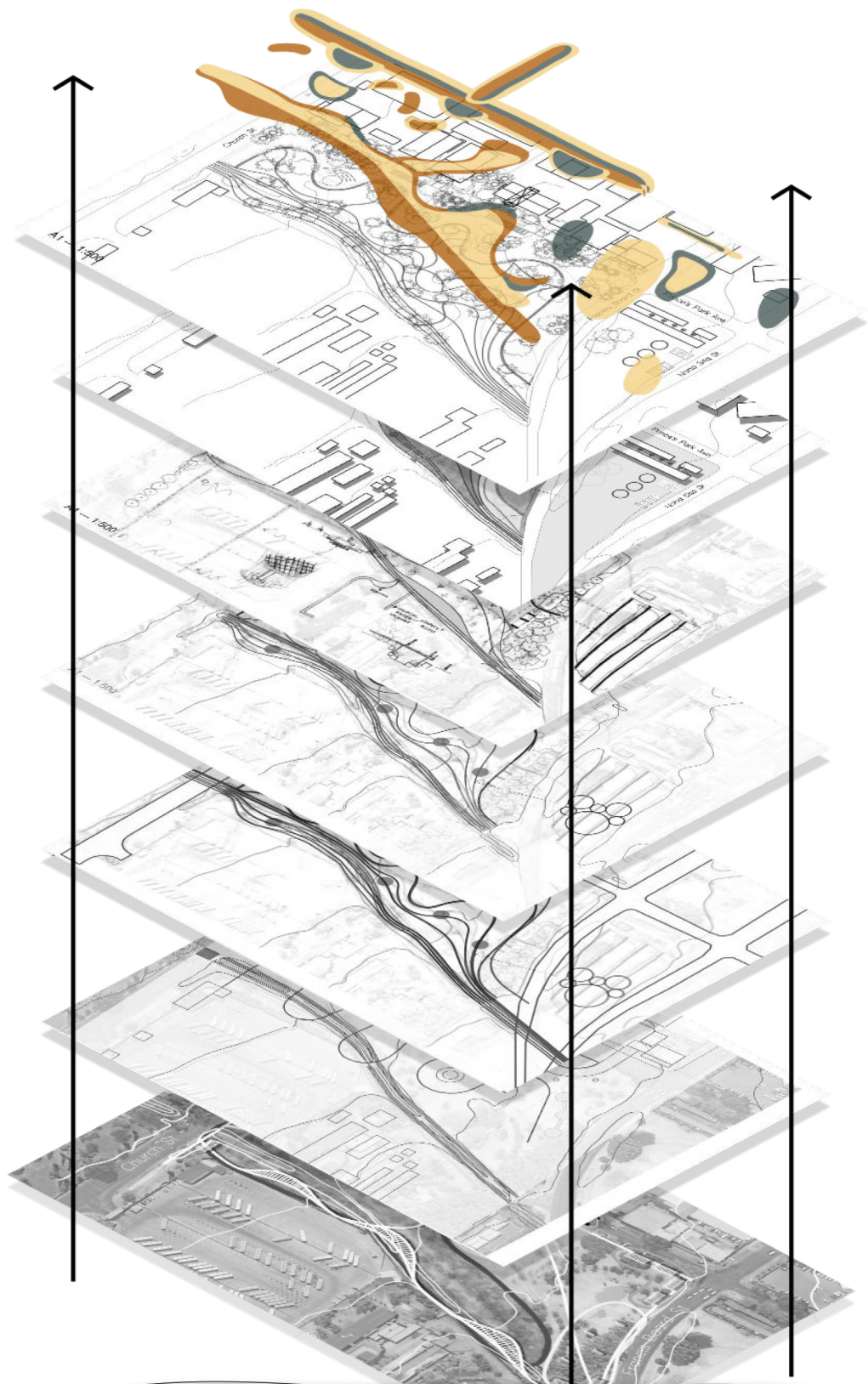
- implementation of native plant communities
- managed invasive species
- conserved existing native tree species
- soft scaping and urban tree networks for micro and macro climate control

SITES ES FRAMEWORK RELEVANCE



For Sustainable Land Design and Development      EXISTING CONDITIONS      +      DURING PROJECT DEVELOPMENT      +      FUTURE CONDITIONS

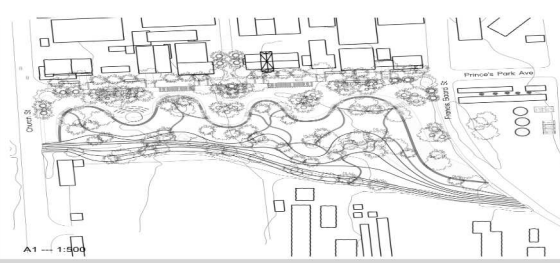
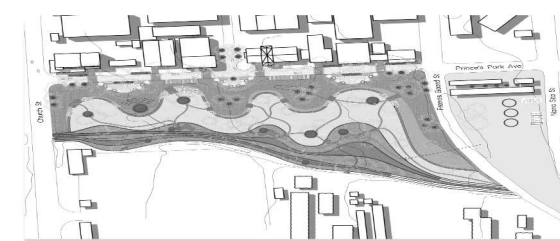
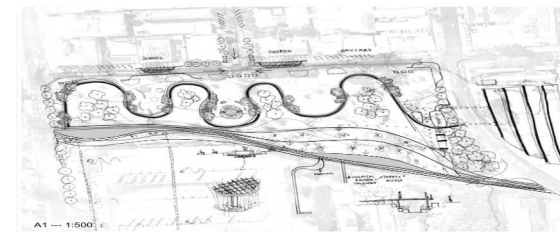
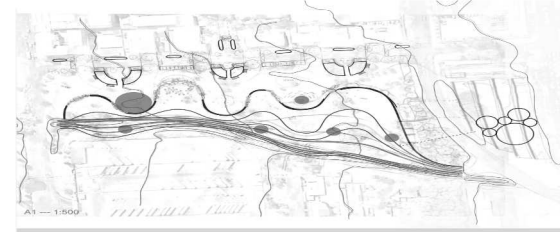
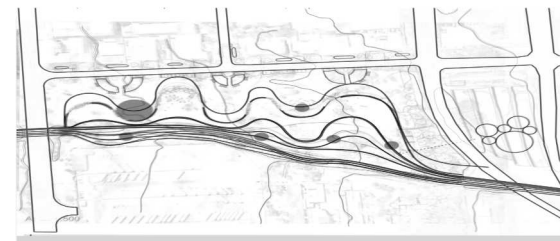
CRITERIA SELECTION



1

Urban Challenge 1

degrading river channel infrastructure  
 river access and safety  
 unmanaged water runoff  
 invasive specie domination



2

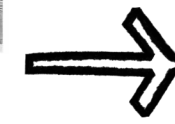
Urban Challenge 2

rising urban heat  
 weather-exposed produce sale tables  
 vulnerable infrastructure and homes

3

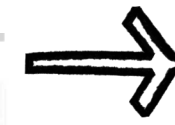
Urban Challenge 3

temporary gazebo vendor stalls  
 vulnerability of trolley vendors on streets  
 limited accessibility of existing vendor stalls



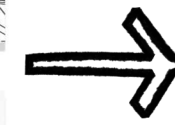
**PROBLEM:** zoning single use spaces

**PROPOSAL:** where can zones **meet** and **support each other**



**PROBLEM:** river/ access to nature disconnected to the urban social space

**PROPOSAL:** **weave** human activity and programmes into nature



**PROBLEM:** how to get **feet** to the park

**PROPOSAL:** **activate** street **nodes** along park border - food!



**PROBLEM:** can you rehabilitate a river that is constantly **fed with polluted** city scale water

**PROPOSAL:** develop **city wide implementations** and rehabilitate parts of the river **ecosystem** (riverbanks)



**PROBLEM:** lack of connection and **accessibility** of park neighbours

**PROPOSAL:** implement shared street to allow for a **community integrated** public space



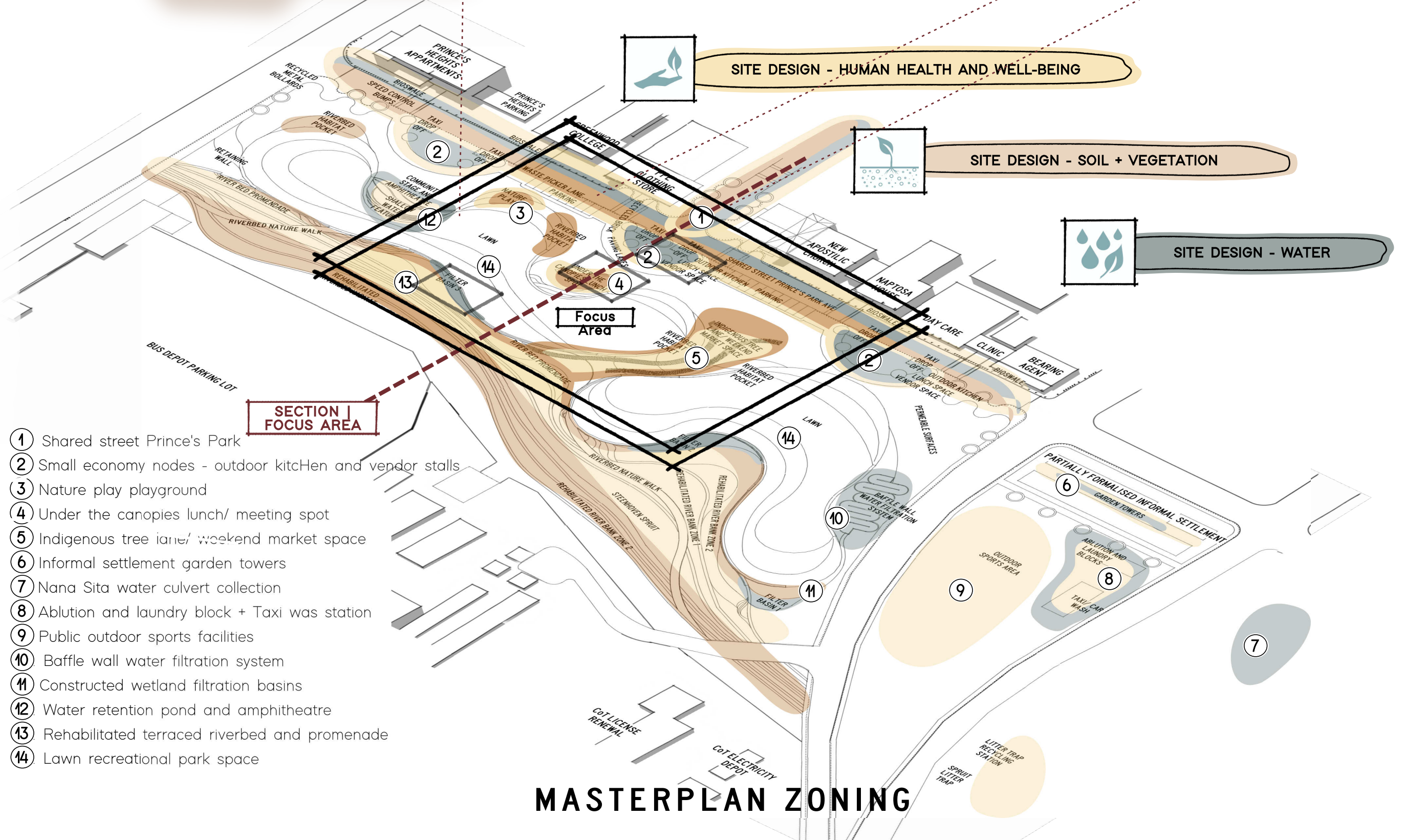
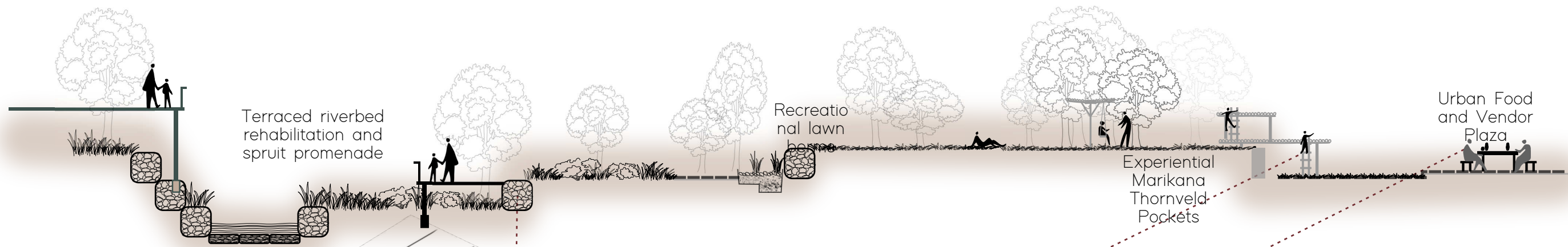
**PROBLEM:** still very **static** design

**PROPOSAL:** implement **interactive** spatial elements, break berm for clear axis

How can nature based solutions form infrastructure frameworks for small economies in the urban domain towards a resilient urban environment for stronger human-nature relationships?

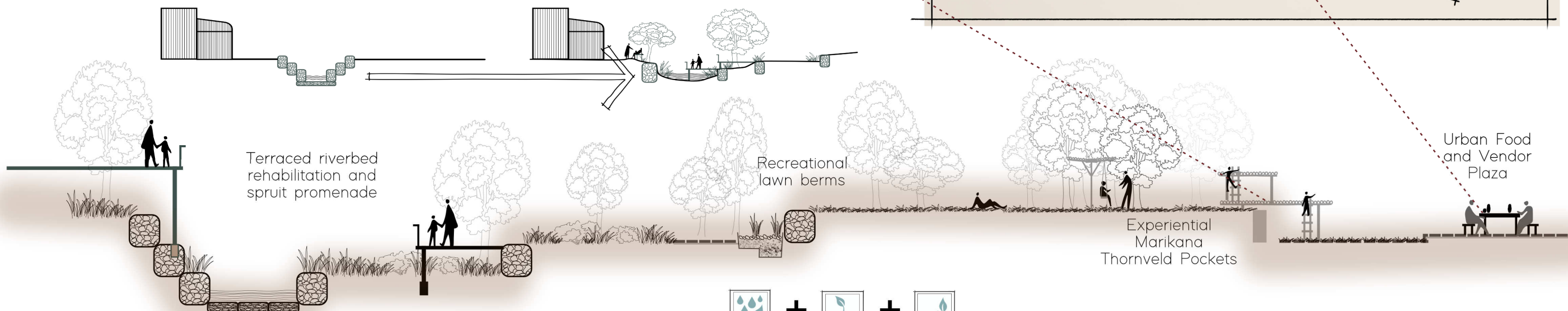
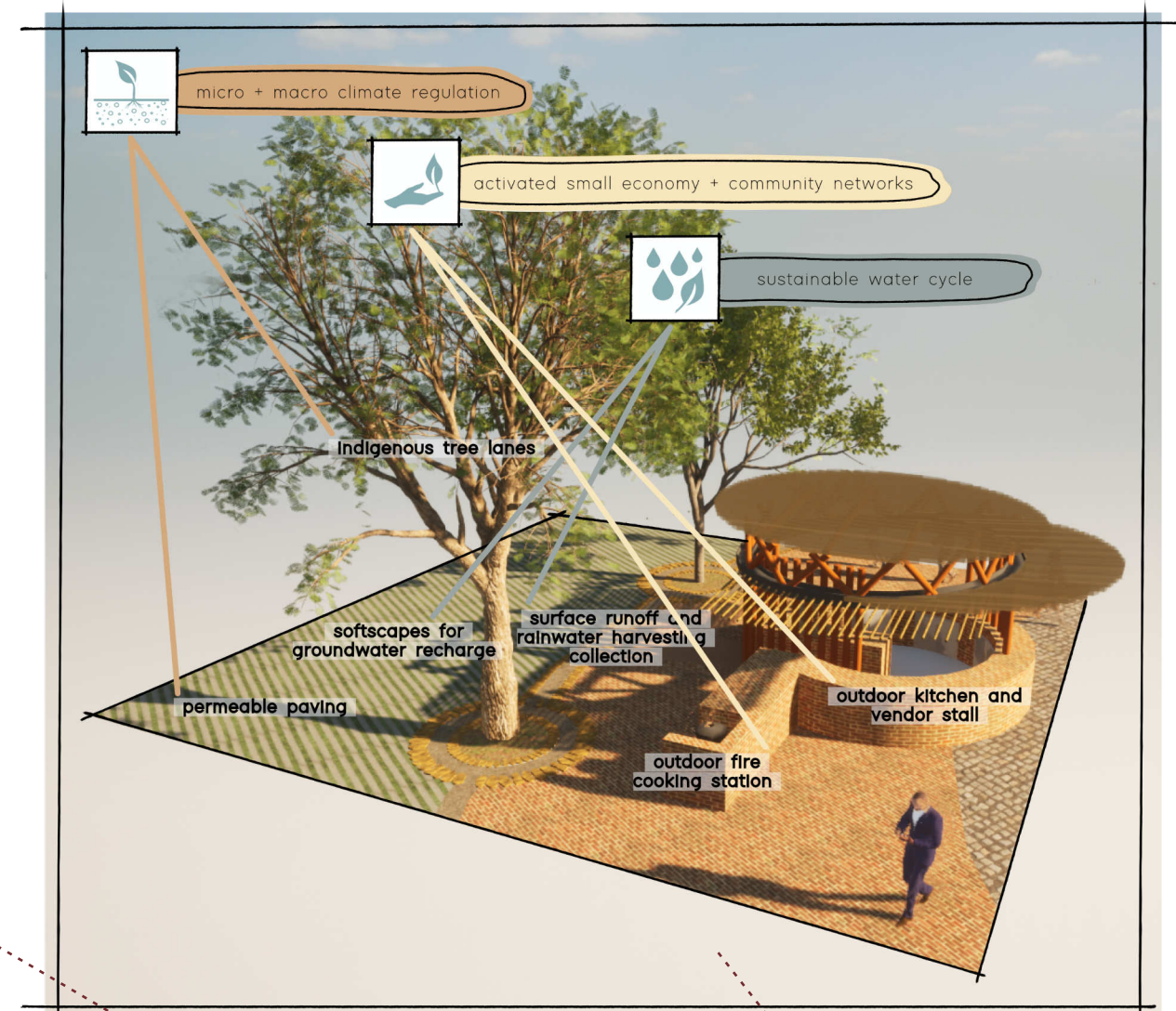
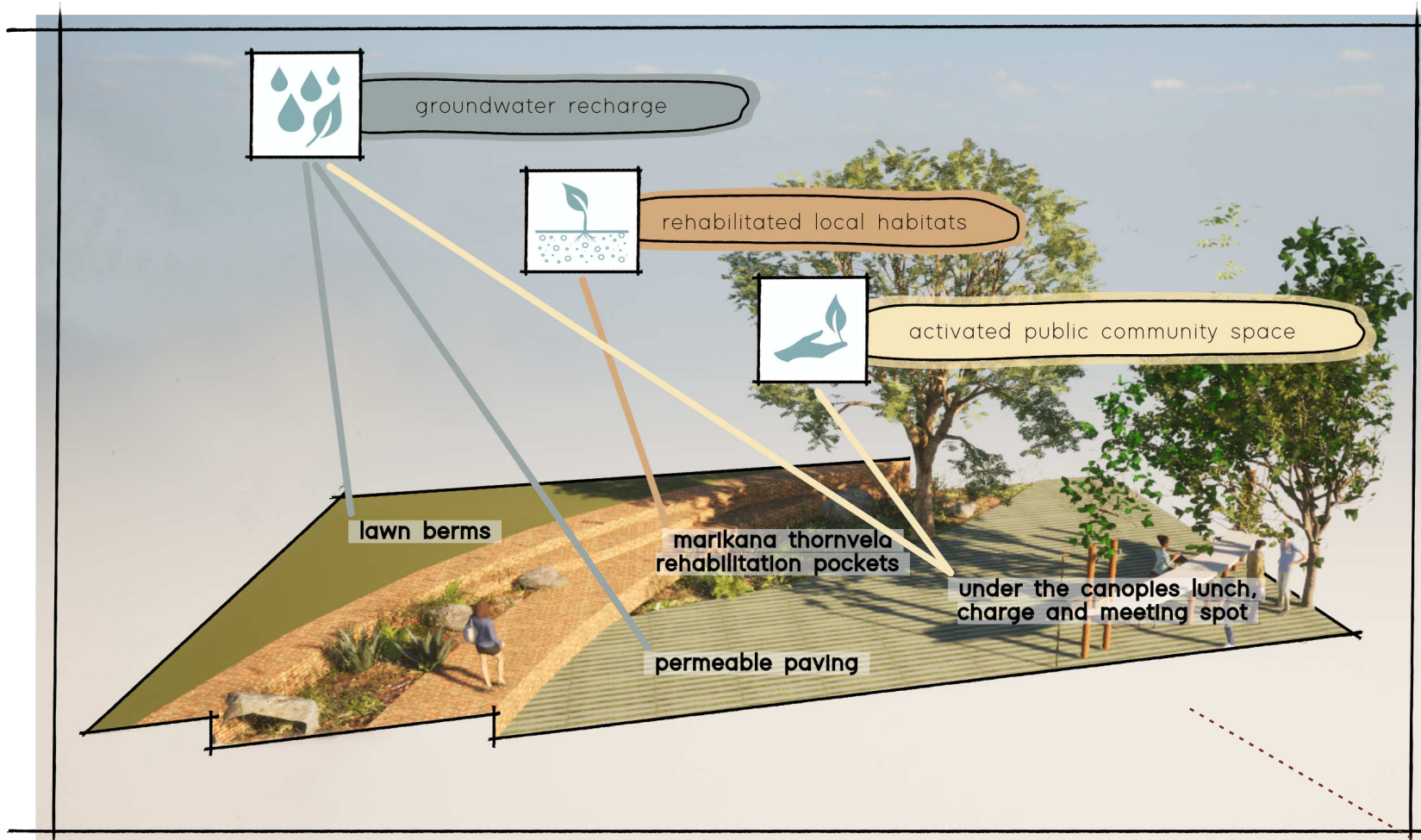
RESEARCH QUESTION

MASTERPLAN DEVELOPMENT



- SECTION | FOCUS AREA**
- ① Shared street Prince's Park
  - ② Small economy nodes - outdoor kitchen and vendor stalls
  - ③ Nature play playground
  - ④ Under the canopies lunch/ meeting spot
  - ⑤ Indigenous tree lane/ weekend market space
  - ⑥ Informal settlement garden towers
  - ⑦ Nana Sita water culvert collection
  - ⑧ Ablution and laundry block + Taxi was station
  - ⑨ Public outdoor sports facilities
  - ⑩ Baffle wall water filtration system
  - ⑪ Constructed wetland filtration basins
  - ⑫ Water retention pond and amphitheatre
  - ⑬ Rehabilitated terraced riverbed and promenade
  - ⑭ Lawn recreational park space

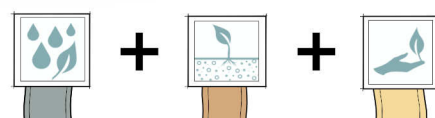
# MASTERPLAN ZONING



How can nature based solutions form infrastructure frameworks for small economies in the urban domain towards a resilient urban environment for stronger human-nature relationships?

RESEARCH QUESTION

HOW?

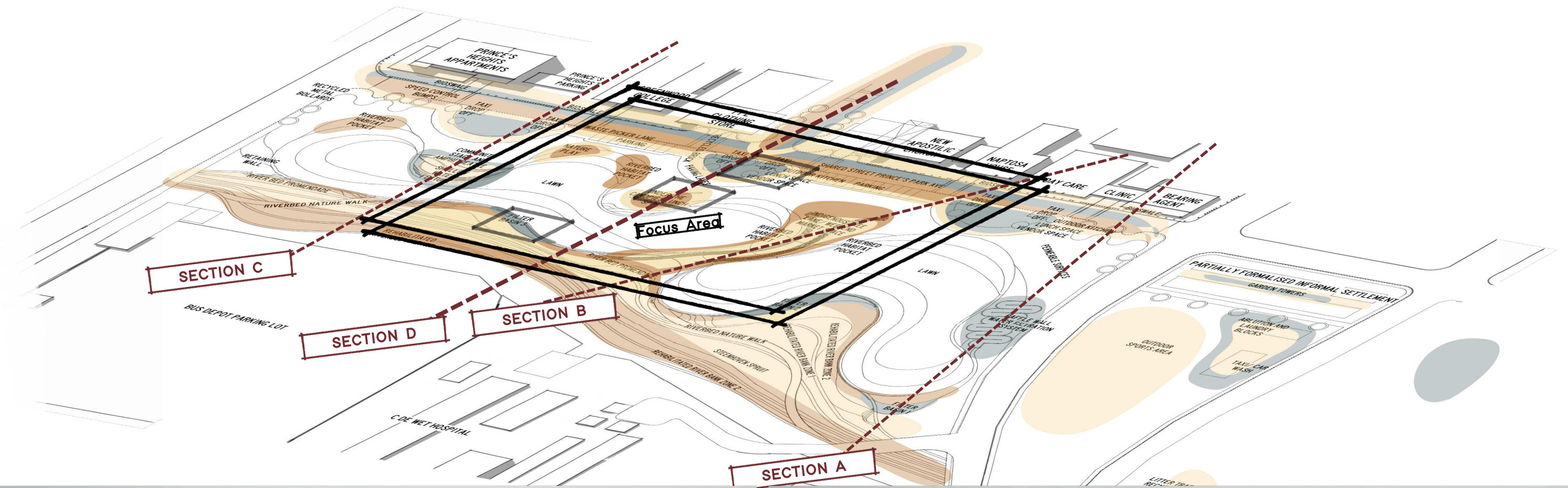


PRETORIA CED JUNCTION:  
RESILIENT URBAN  
ENVIRONMENTS WITH  
STRONG HUMAN-NATURE  
RELATIONSHIPS

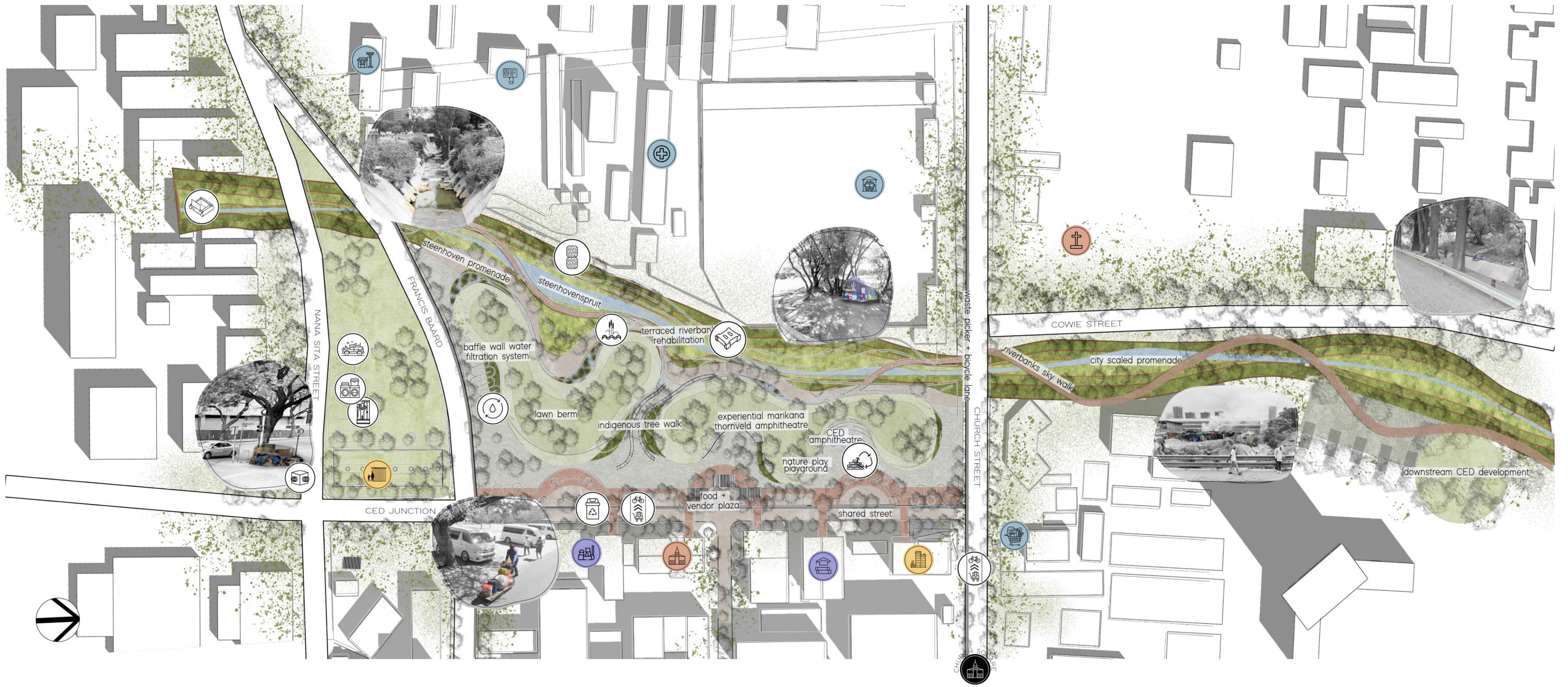
WHY?

The selected focus area best represents the project's approach on resilient urban environments driven by small economies and human-nature relationships at SITES standards.

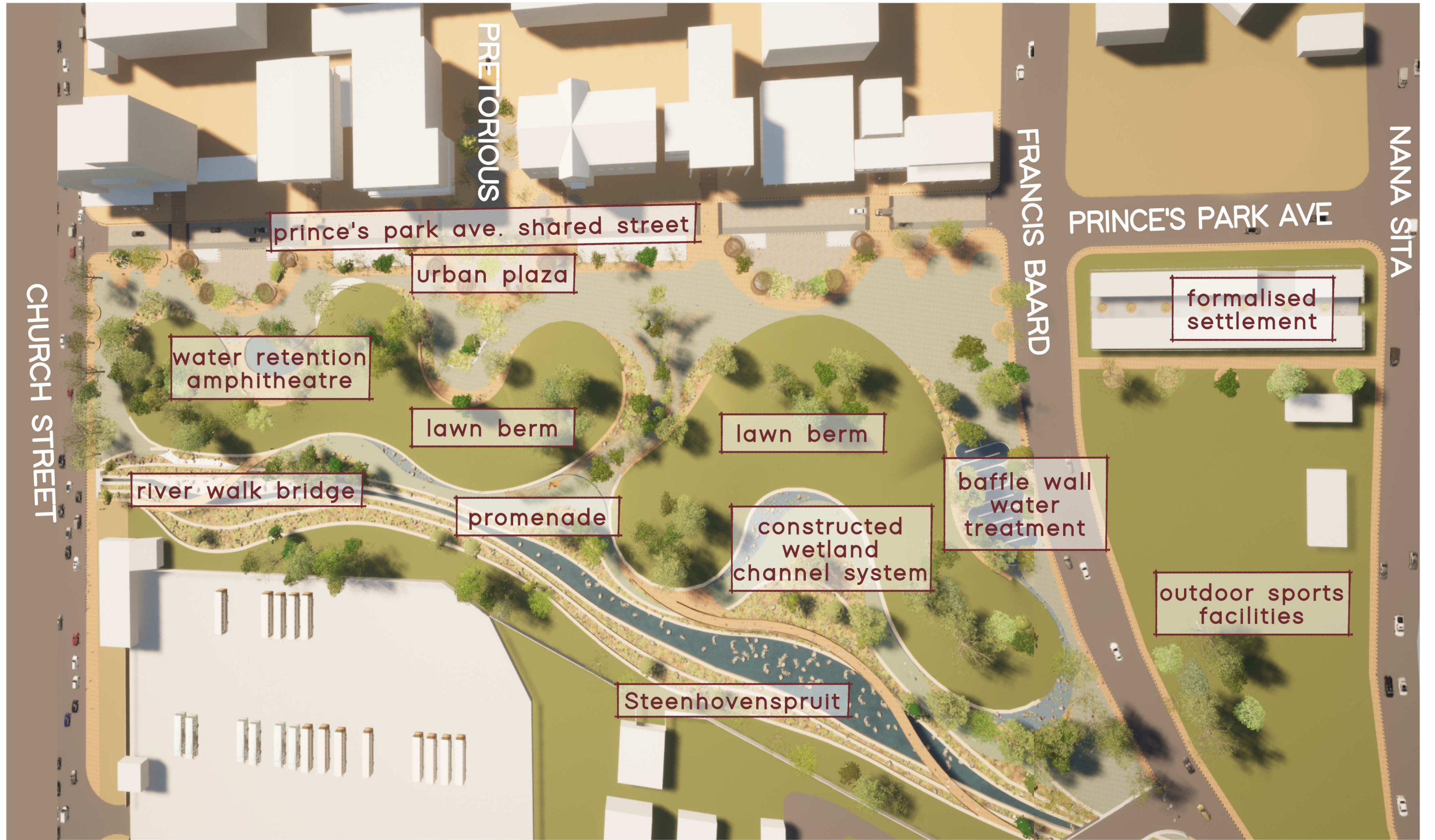
# SPATIAL DEVELOPMENT



**LEVEL DEVELOPMENT**



**MASTERPLAN | URBAN SCALE**



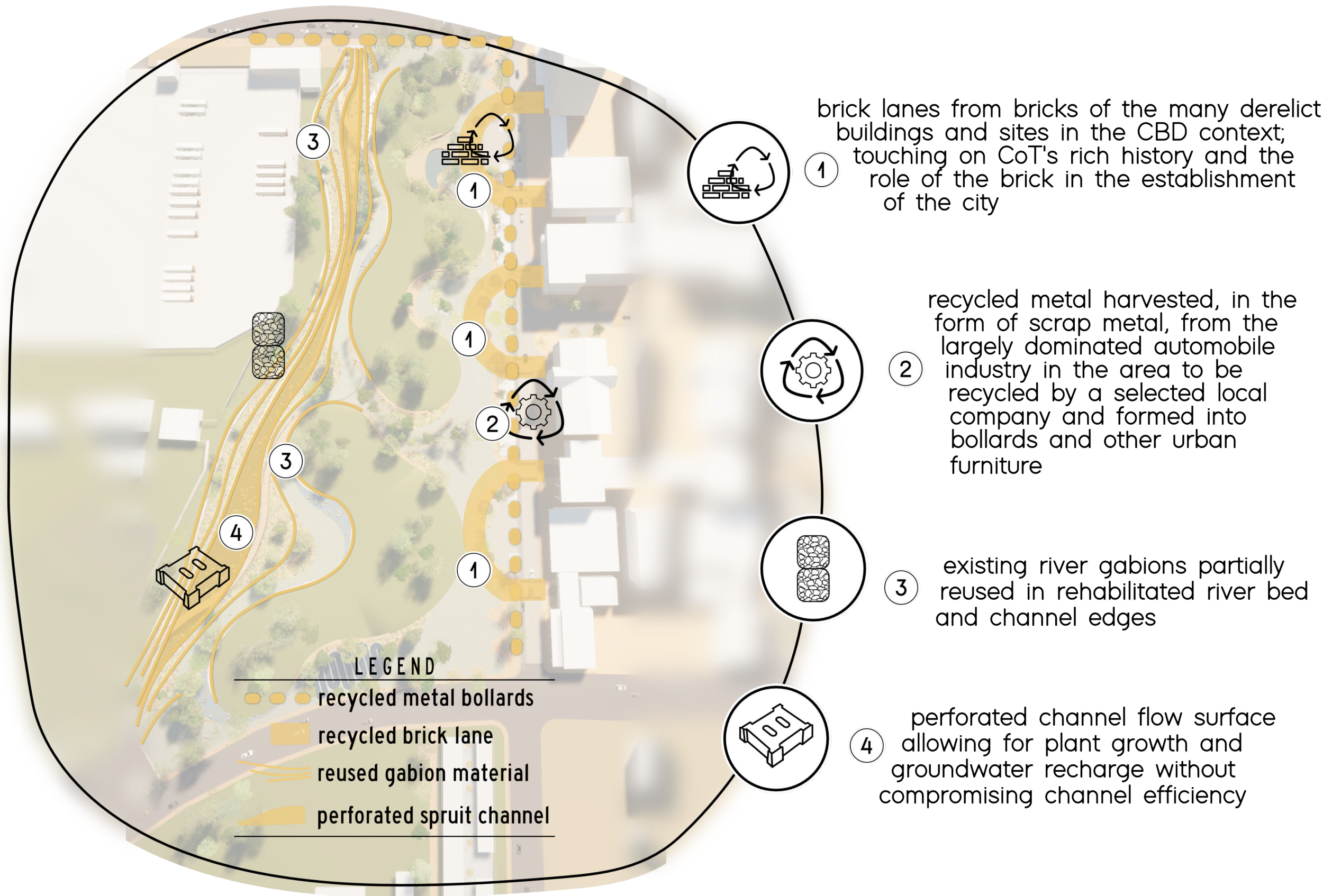
MASTERPLAN | PARK SCALE



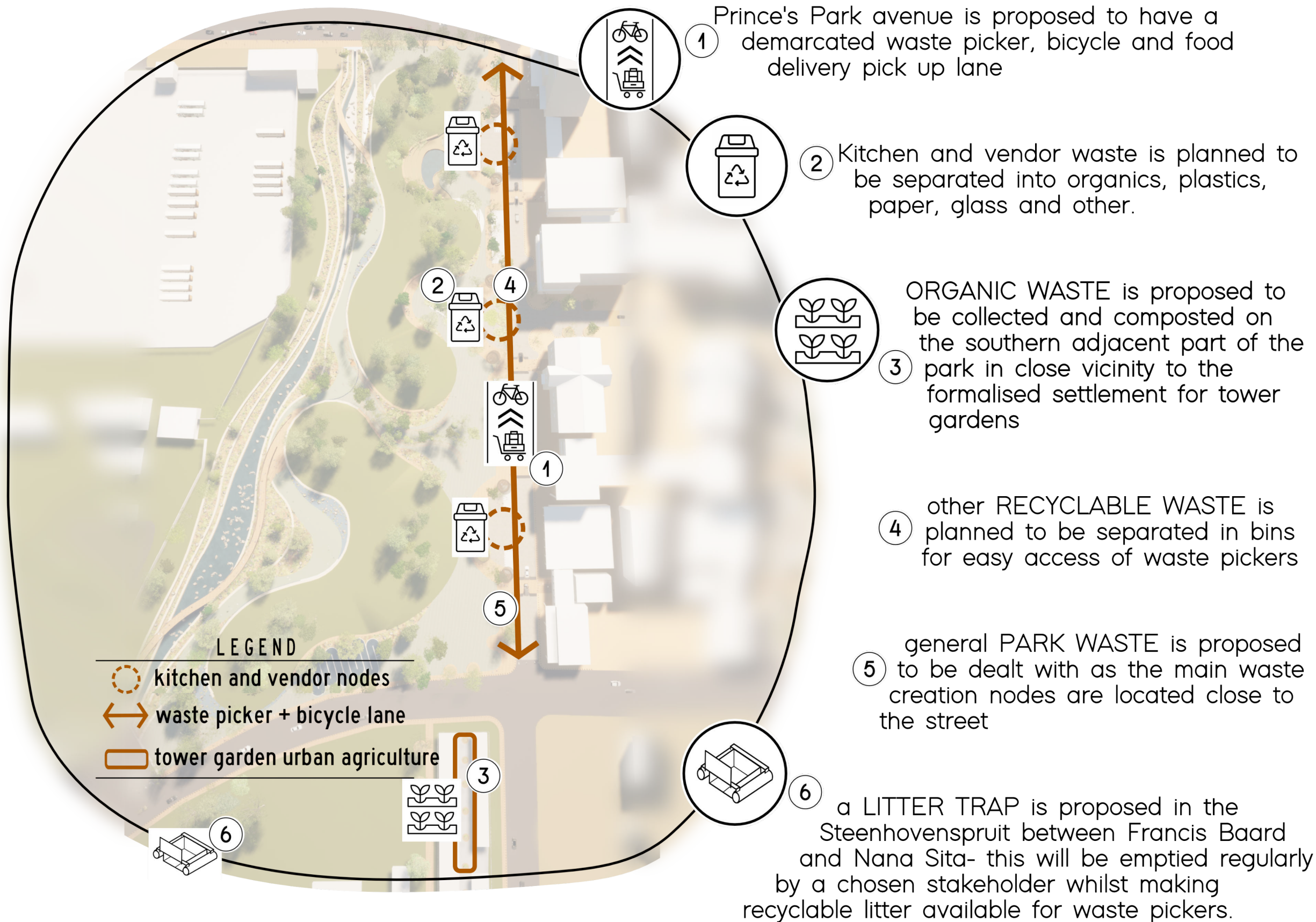
- ① Marabastad Jazz Square Park
- ② Struben St Open Green Space
- ③ Kruger Park
- ④ Pretoria CED Junction
- ⑤ Francis Baard Open Green Space

**SYSTEMS | PRETORIA CED PRECINCT NODES**

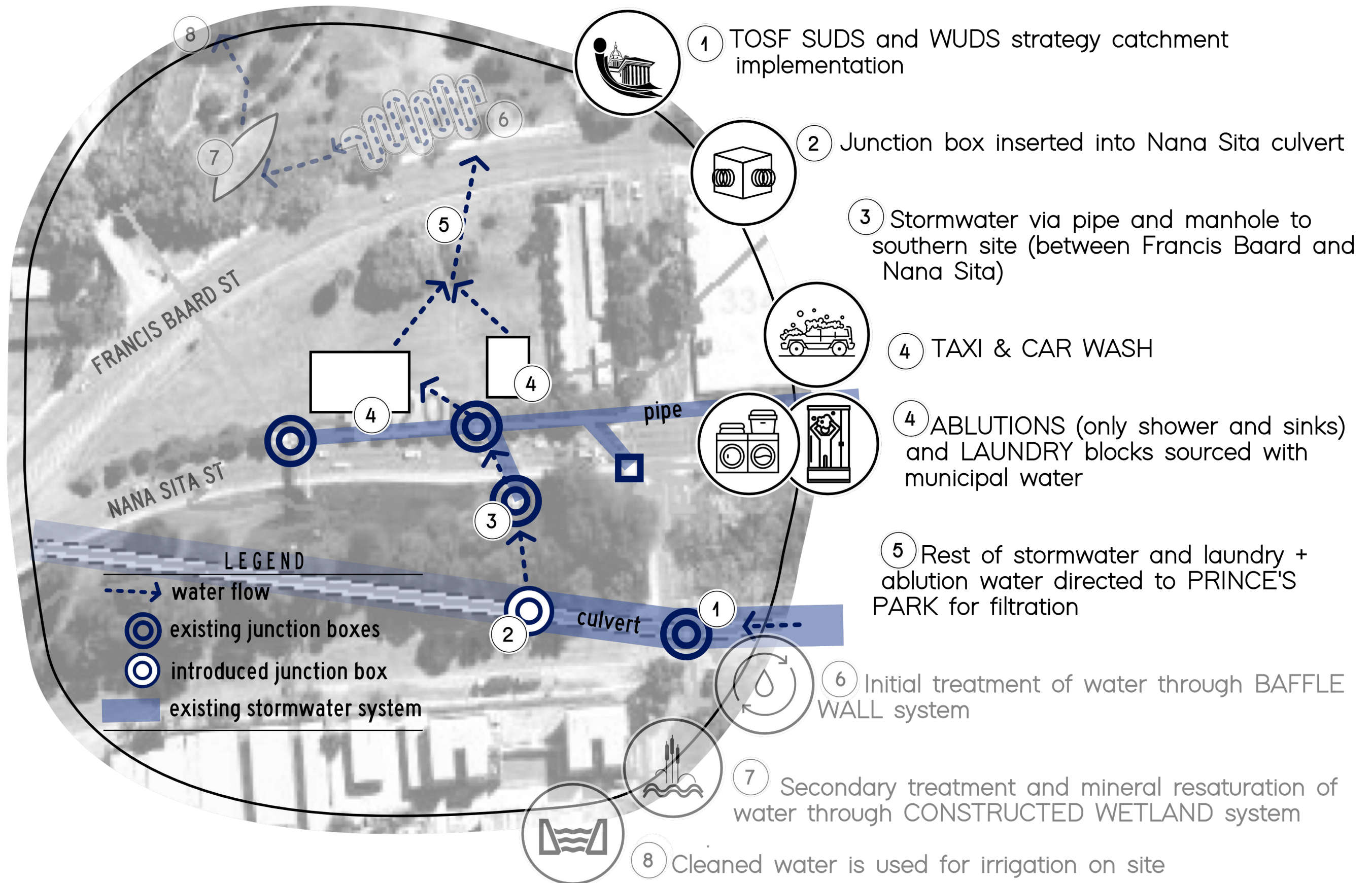


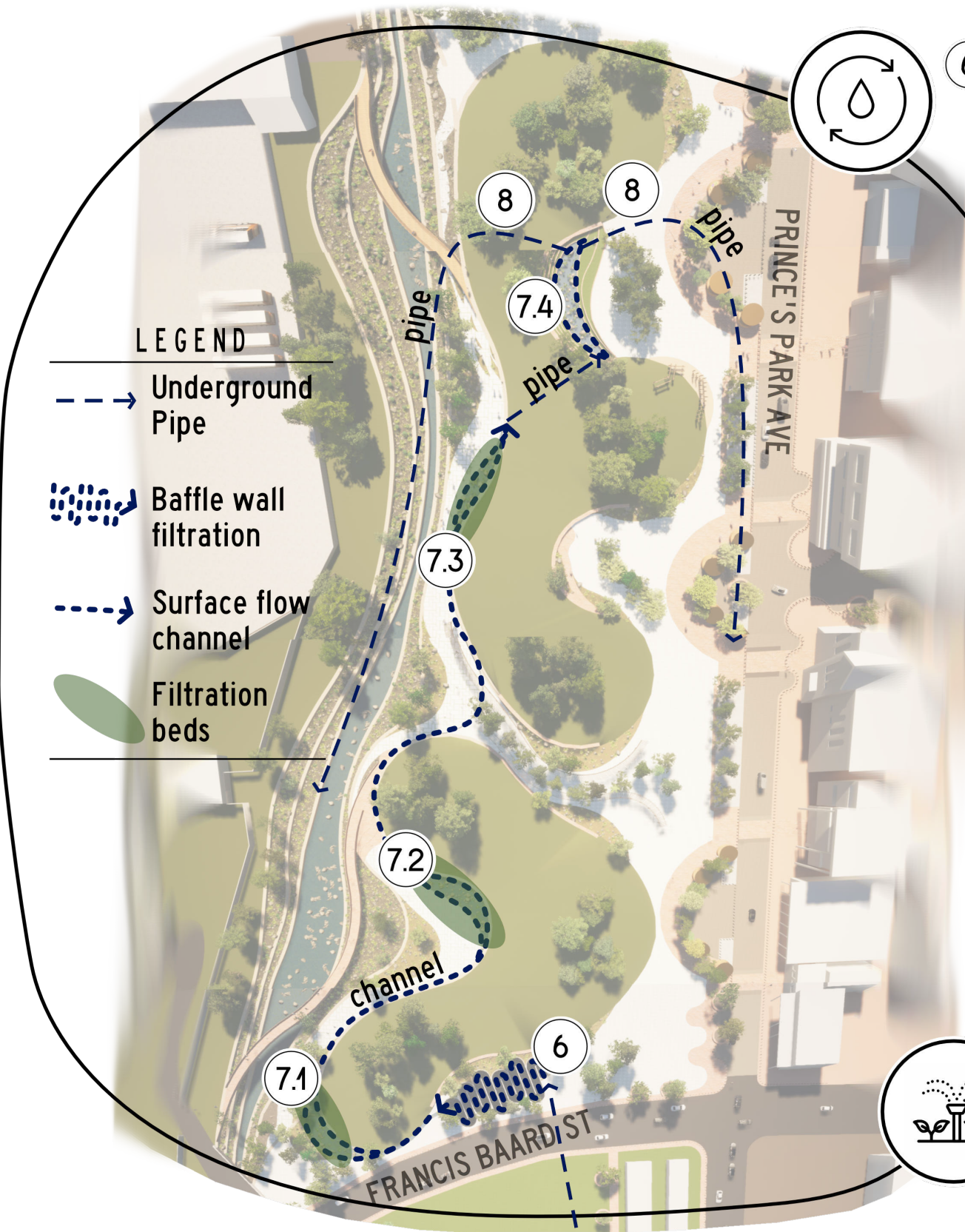


**SYSTEMS | MATERIALITY**



**SYSTEMS | WASTE**





⑥ Initial treatment of water through BAFFLE WALL system and into shallow surface flow channel

⑦ Natural treatment of water through CONSTRUCTED WETLAND channel system

⑦.1 EMERGED ZONE 1 — water passes through coarse crushers removing more particles

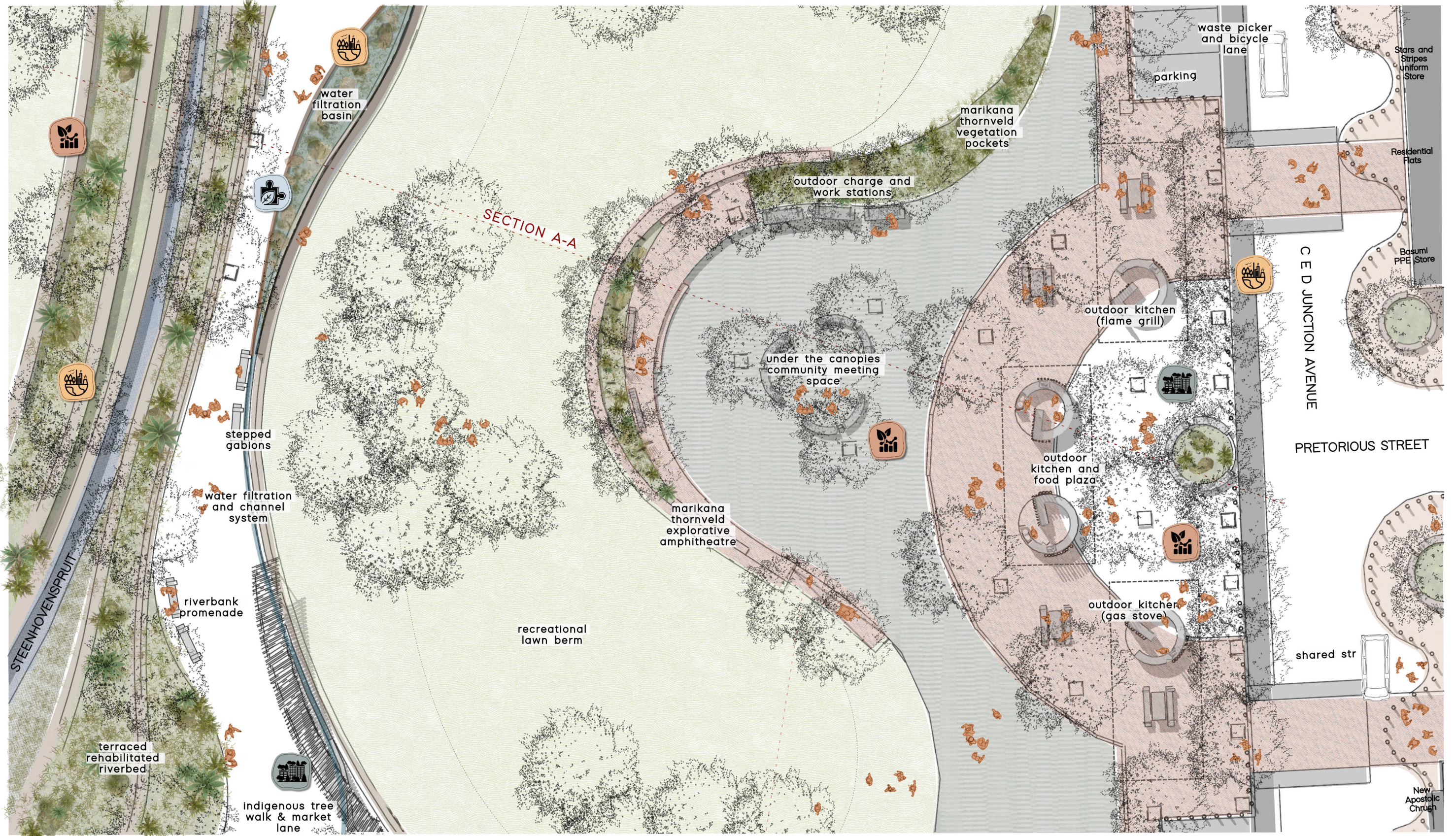
⑦.2 EMERGED ZONE 2 — water passes through medium crusher

⑦.3 EMERGED ZONE 3 — water passes through medium-small crusher

⑦.4 SUBMERGED ZONE — water is stagnant in fine crusher until drained into pump system

⑧ Cleaned water is pumped across site for Marikana Thornveld and riverbed irrigation

**SYSTEMS | SITE WATER**



"lowered city air temperature"  
"creation of jobs"



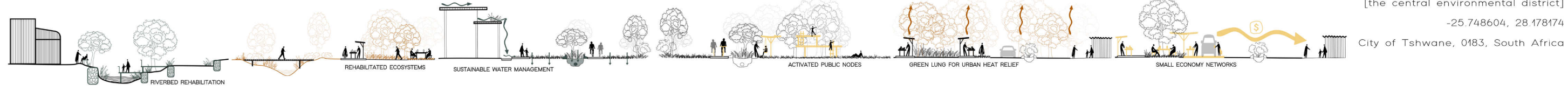
"urbanity as the creation of commons"



"benefitting people and nature"



"low carbon solutions"  
"community enablement"



Scale 1:100

# PRETORIA C E D JUNCTION

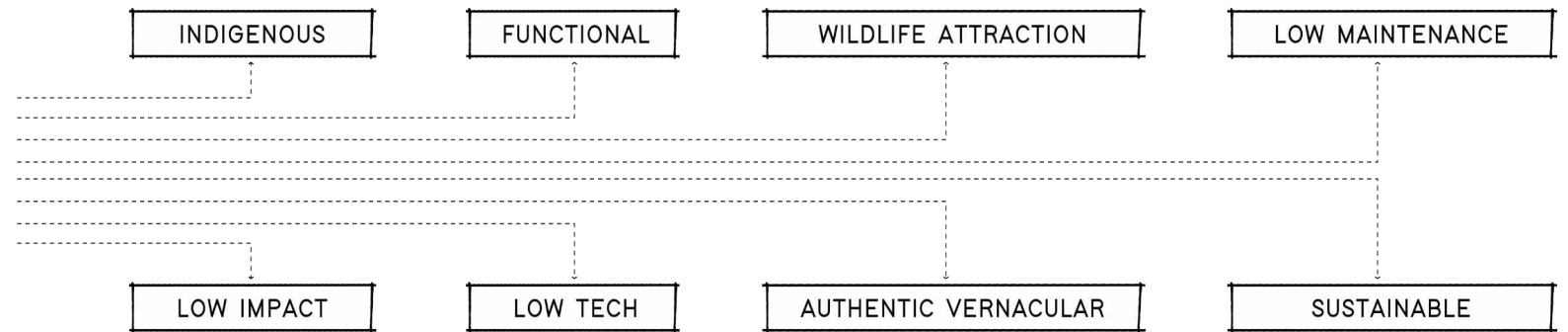
[the central environmental district]

-25.748604, 28.178174

City of Tshwane, 0183, South Africa

# planting strategy

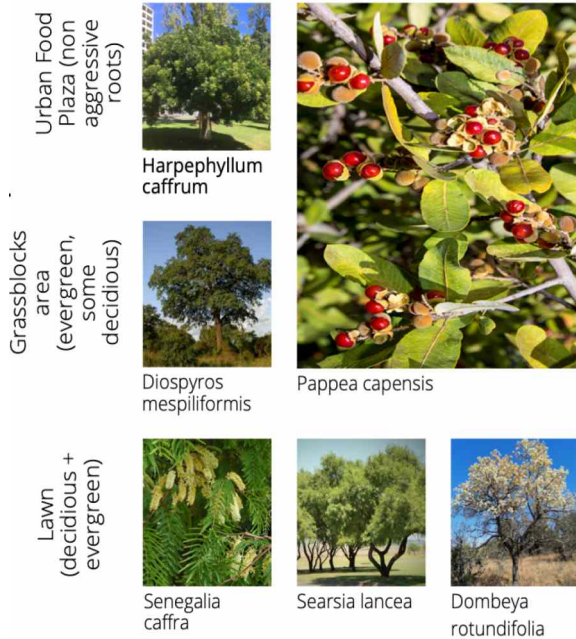
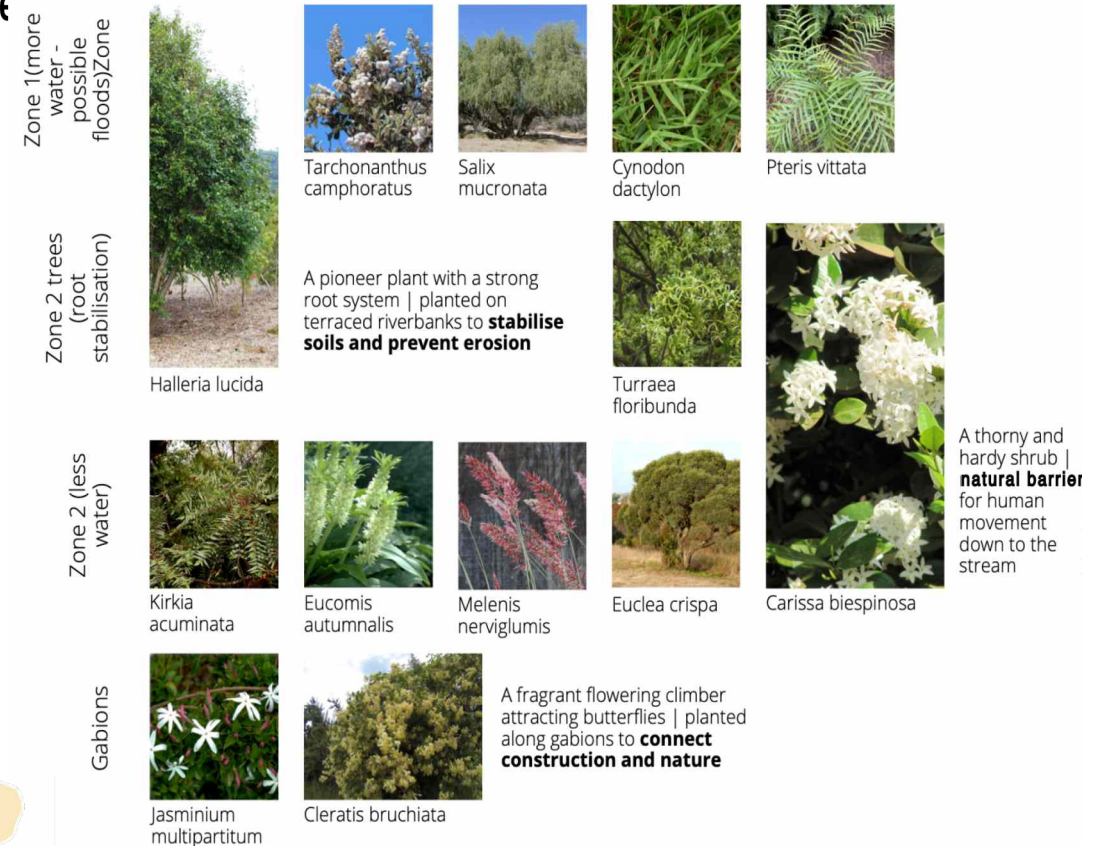
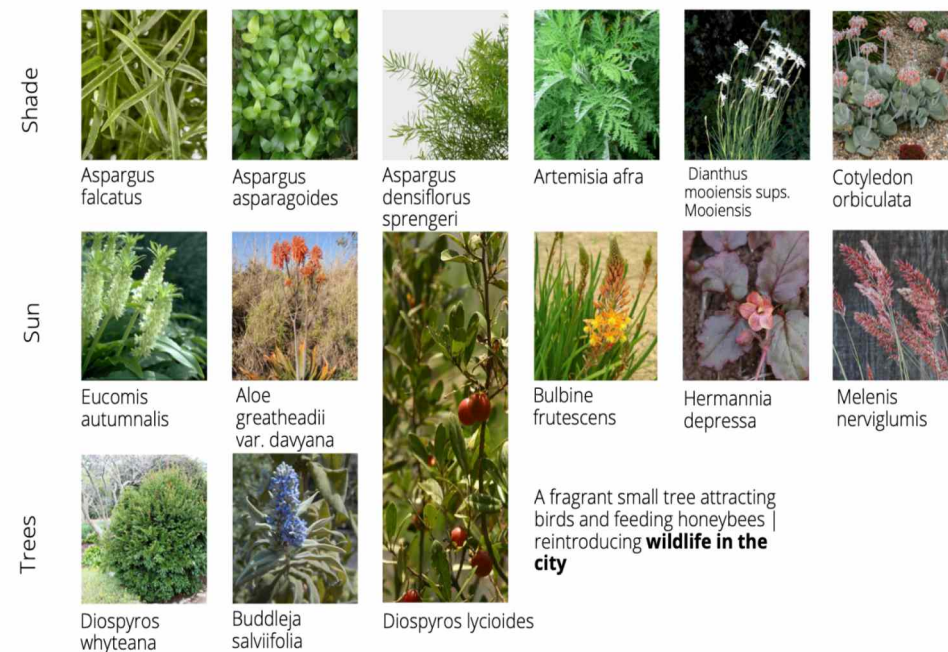
How can **nature based solutions** form infrastructure frameworks for **small economies** in the urban domain towards a **resilient** urban environment for stronger **human-nature relationships**?



## materiality & construction methods

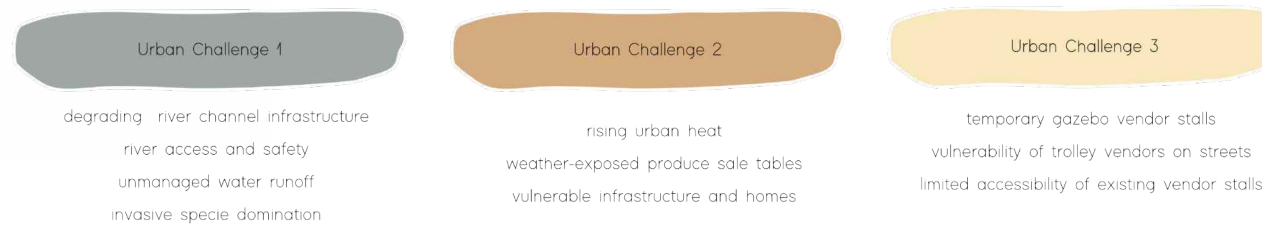


### WATER FILTRATION BASIN



### ADDITIONAL TREES

### MARIKANA THROVELD REHABILITATION POCKETS



degrading river channel infrastructure  
river access and safety  
unmanaged water runoff  
invasive specie domination

rising urban heat  
weather-exposed produce sale tables  
vulnerable infrastructure and homes

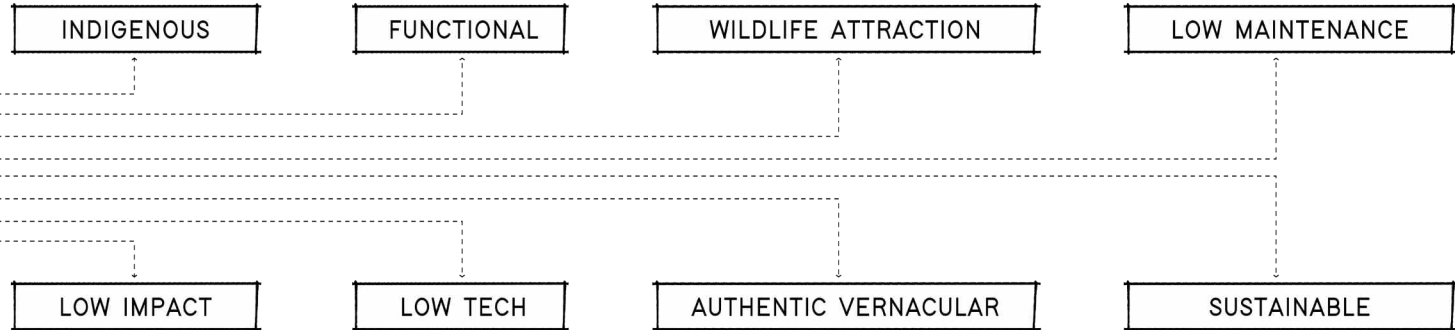
temporary gazebo vendor stalls  
vulnerability of trolley vendors on streets  
limited accessibility of existing vendor stalls

### REHABILITATED RIVERBANK TERRACES

CED JUNCTION AS A PIONEER PROJECT LAUNCHING THE REST OF THE CENTRAL ENVIRONMENTAL DISTRICT ALONG THE STEENHOVENSPRUIT

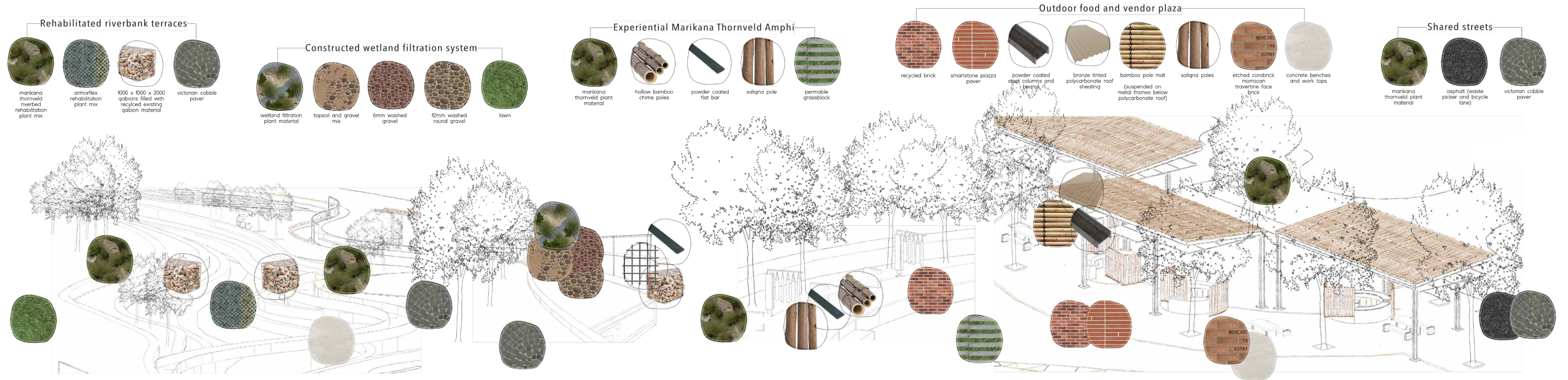
# PLANTING STRATEGY

planting strategy



How can **nature based solutions** form infrastructure frameworks for **small economies** in the urban domain towards a **resilient** urban environment for stronger **human-nature relationships**?

materiality & construction methodology



MATERIALITY AND CONSTRUCTION METHODOLOGY

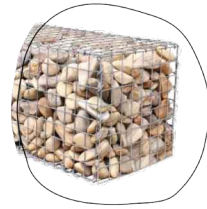
Rehabilitated riverbank terraces



marikana thornveld riverbed rehabilitation plant mix



armorflex rehabilitation plant mix



1000 x 1000 x 2000 gabions filled with recycled existing gabion material

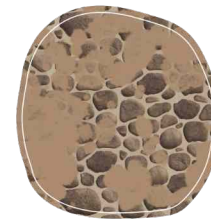


victorian cobble paver

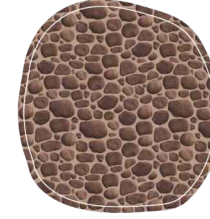
Constructed wetland filtration system



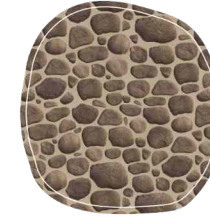
wetland filtration plant material



topsoil and gravel mix



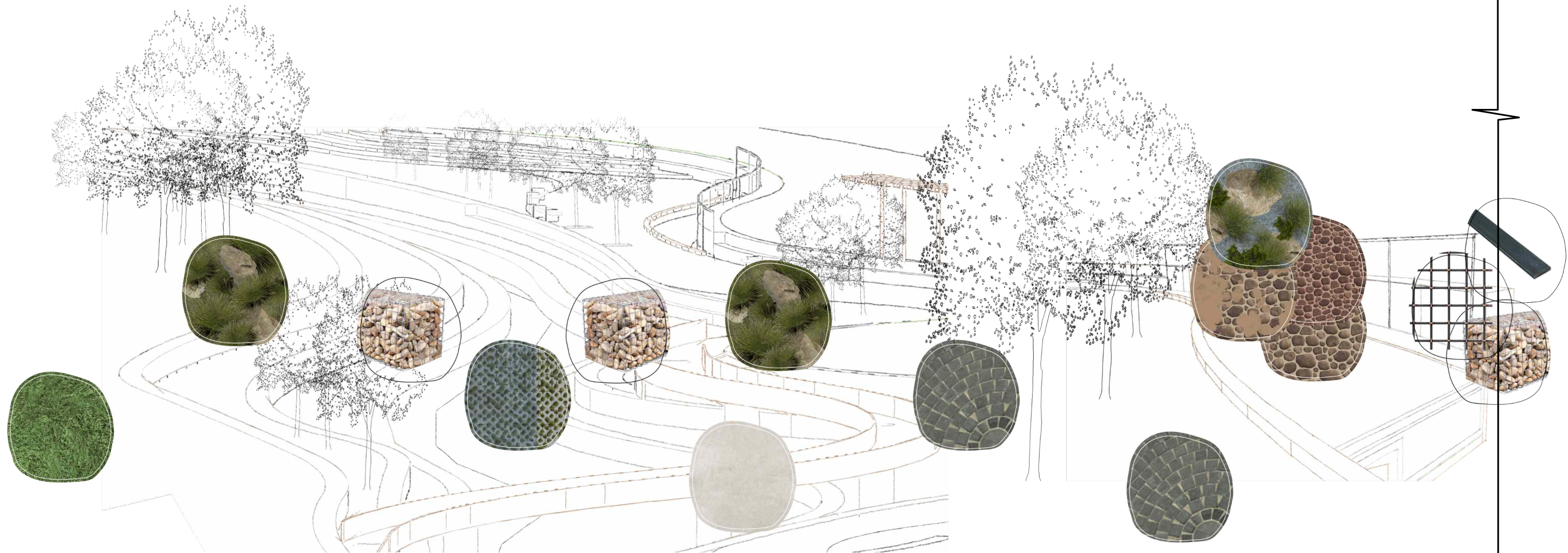
6mm washed gravel



12mm washed round gravel



lawn



**MATERIALITY AND CONSTRUCTION METHODOLOGY**



# Experiential Marikana Thornveld Amphi



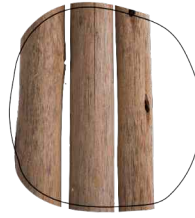
marikana thornveld plant material



hollow bamboo chime poles



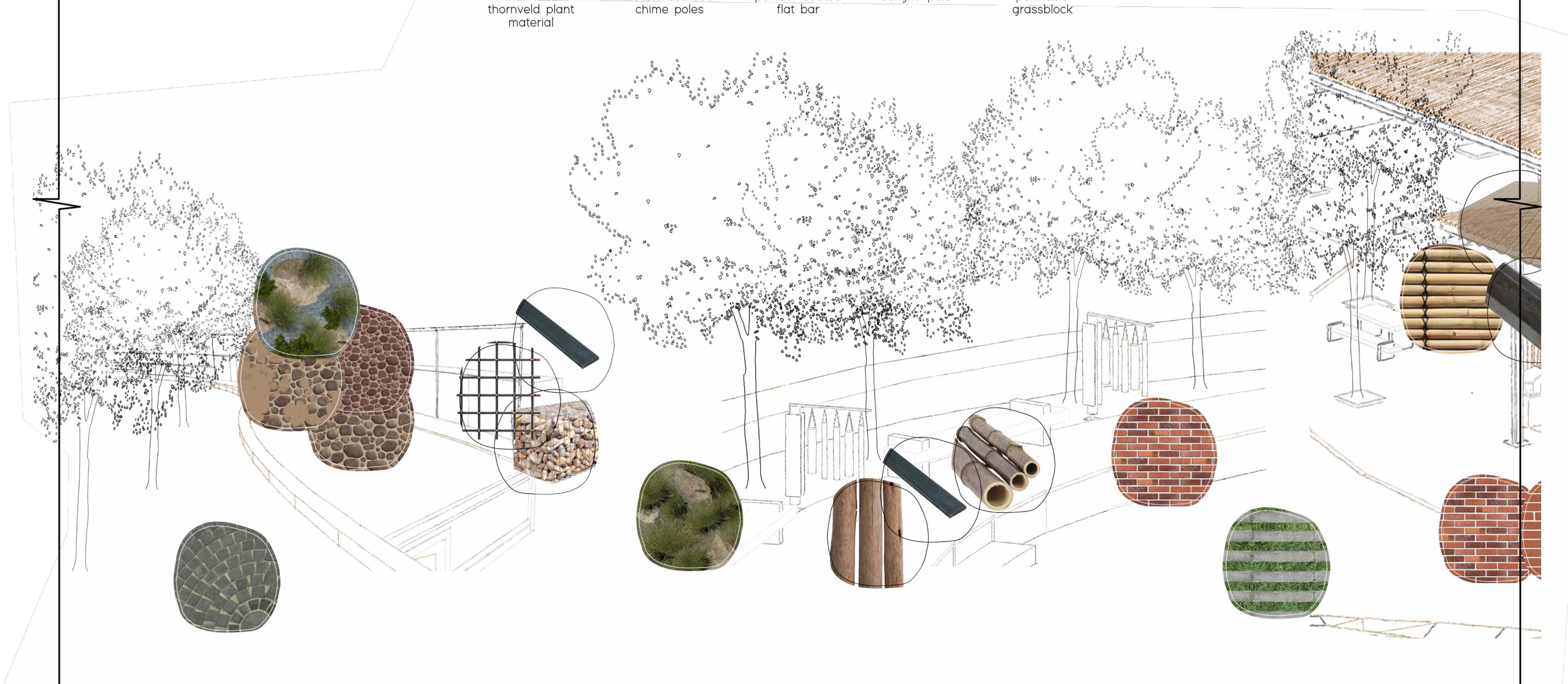
powder coated flat bar



saligna pole

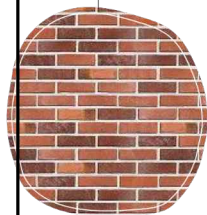


permeable grassblock

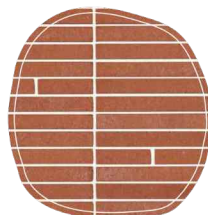


## MATERIALITY AND CONSTRUCTION METHODOLOGY

## Outdoor food and vendor plaza



recycled brick



smartstone piazza paver



powder coated steel columns and beams



bronze tinted polycarbonate roof sheathing



bamboo pole mat  
(suspended on metal frames below polycarbonate roof)



saligna poles



etched corobrick morrocan travertine face brick

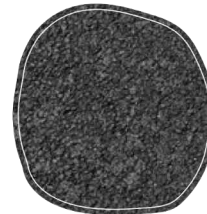


concrete benches and work tops

## Shared streets



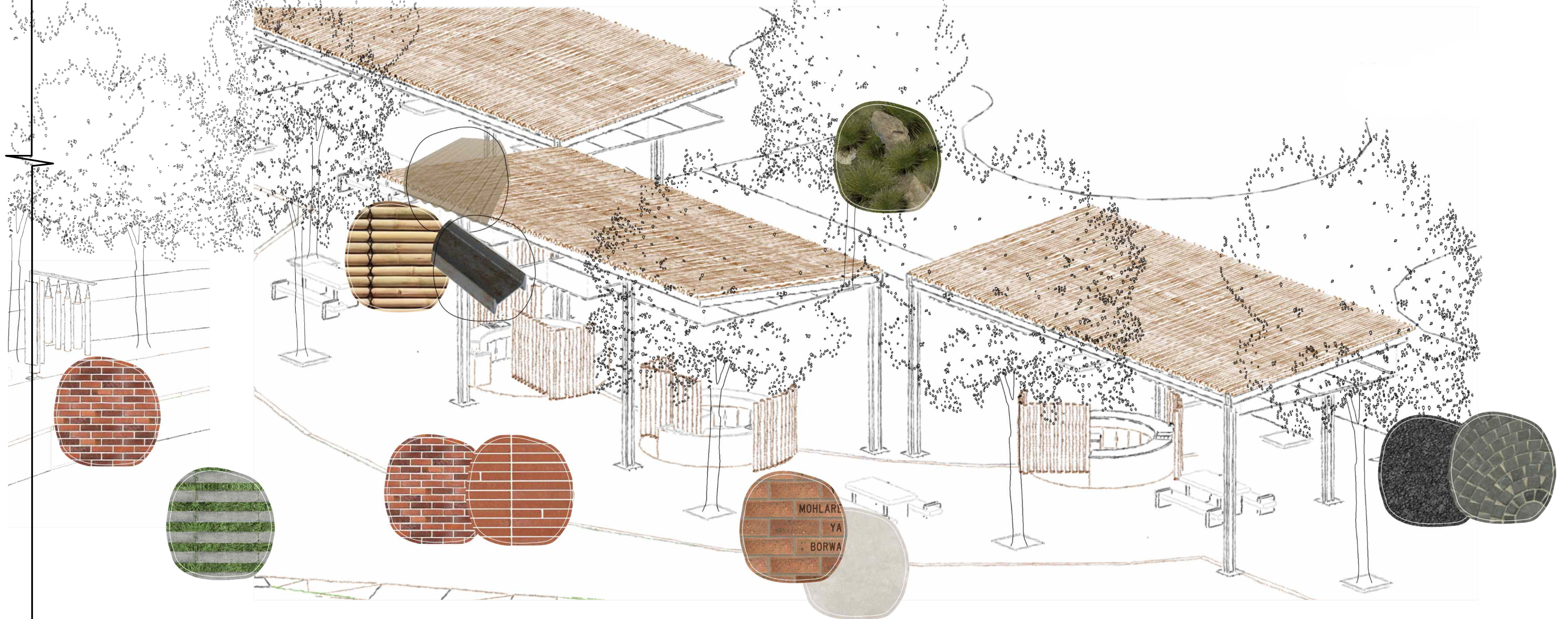
marikana thornveld plant material



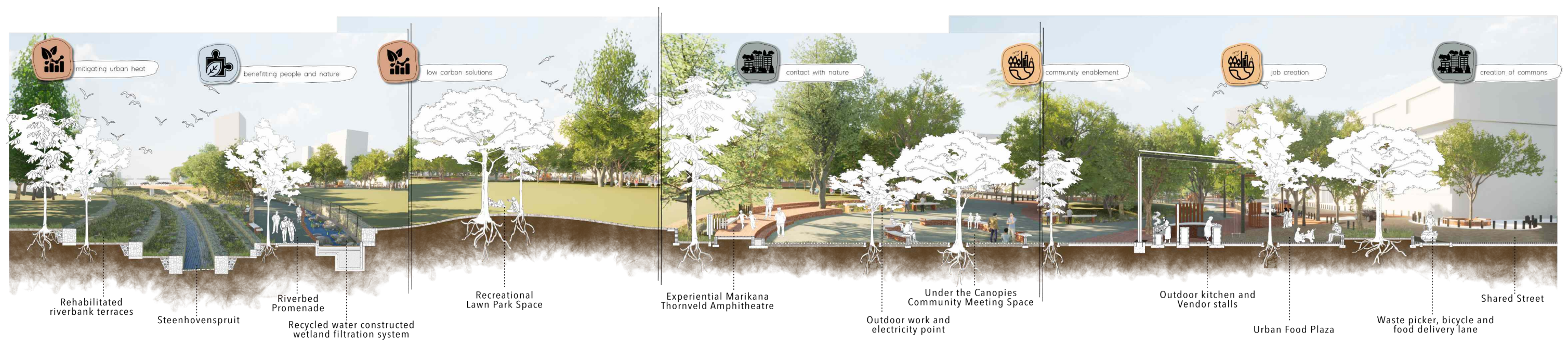
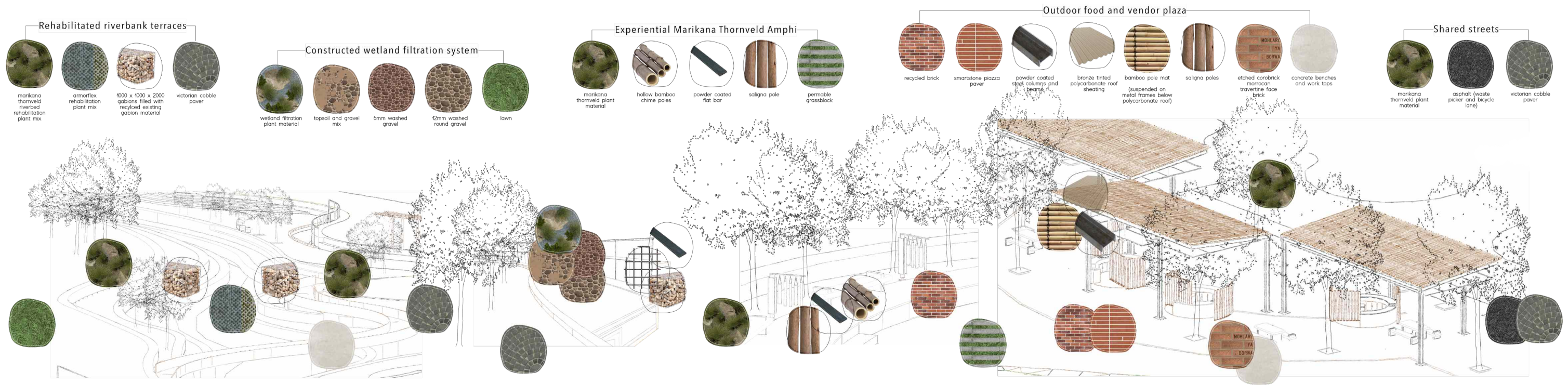
asphalt (waste picker and bicycle lane)



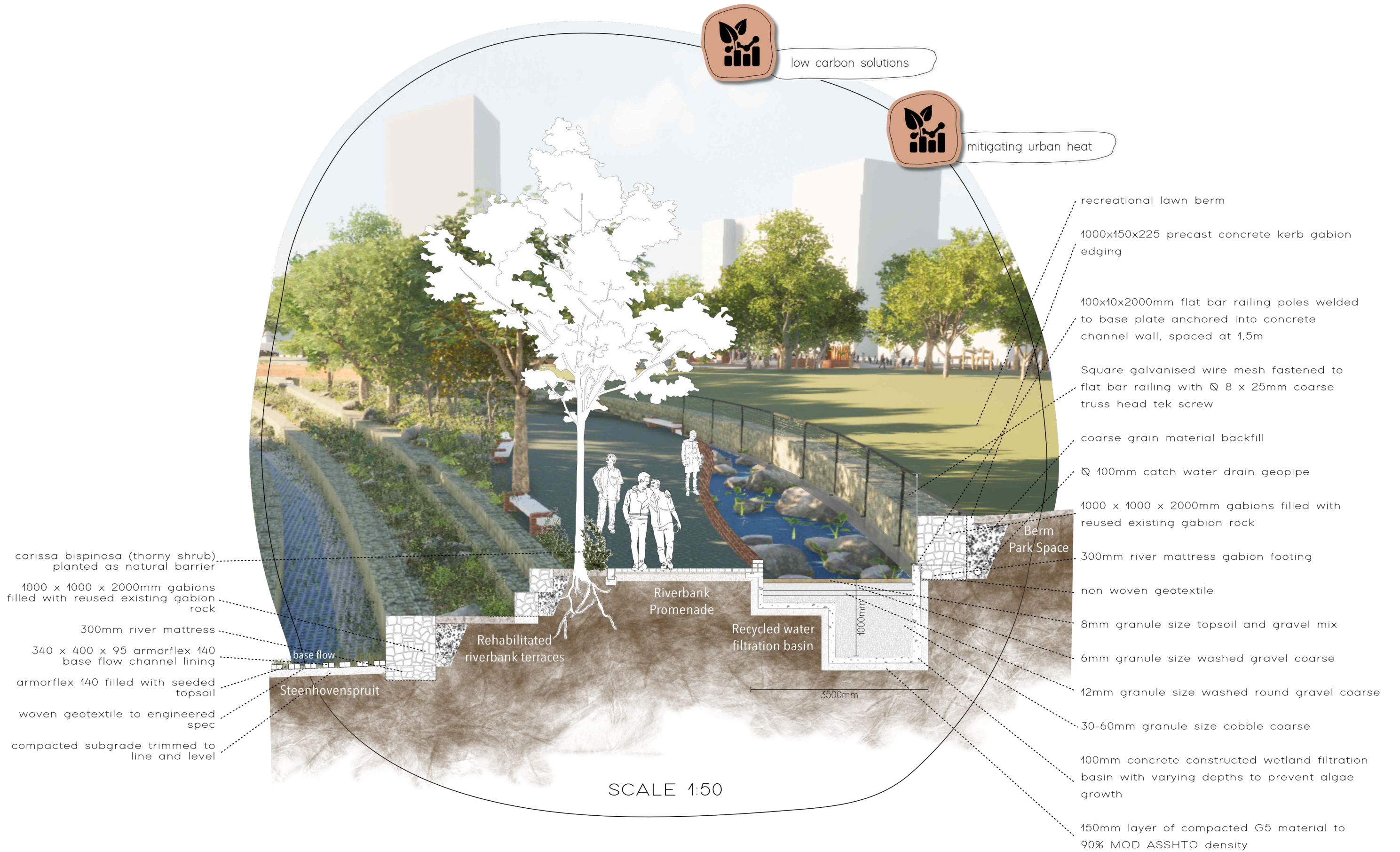
victorian cobble paver



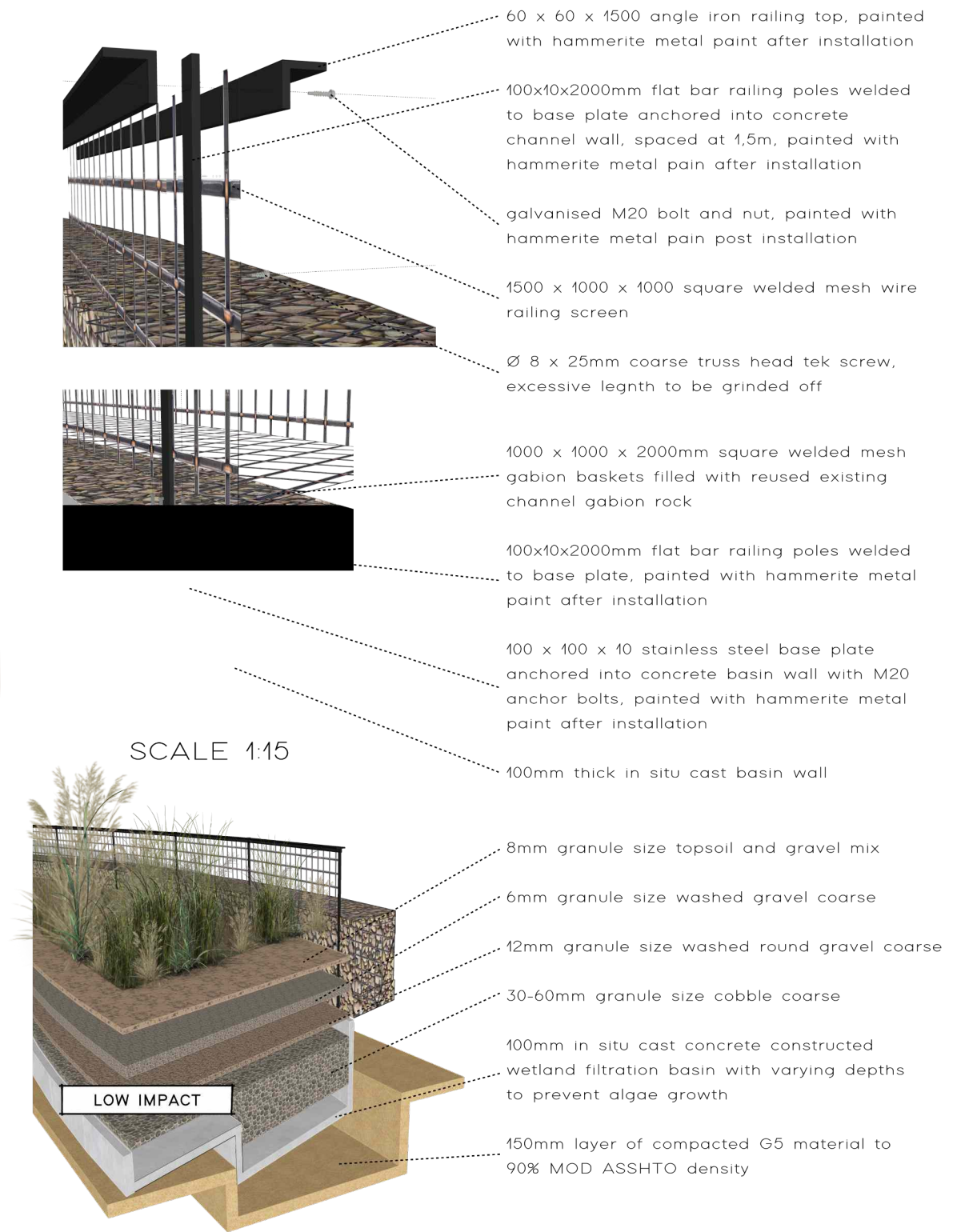
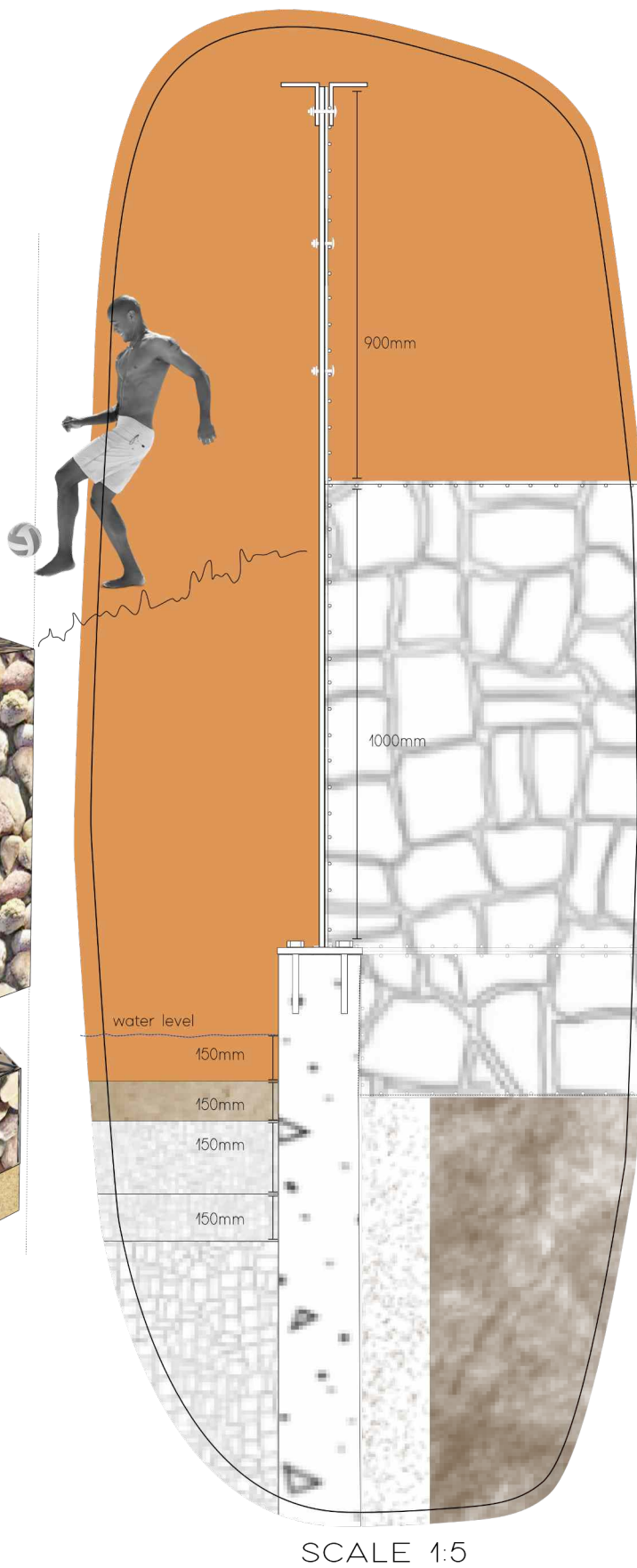
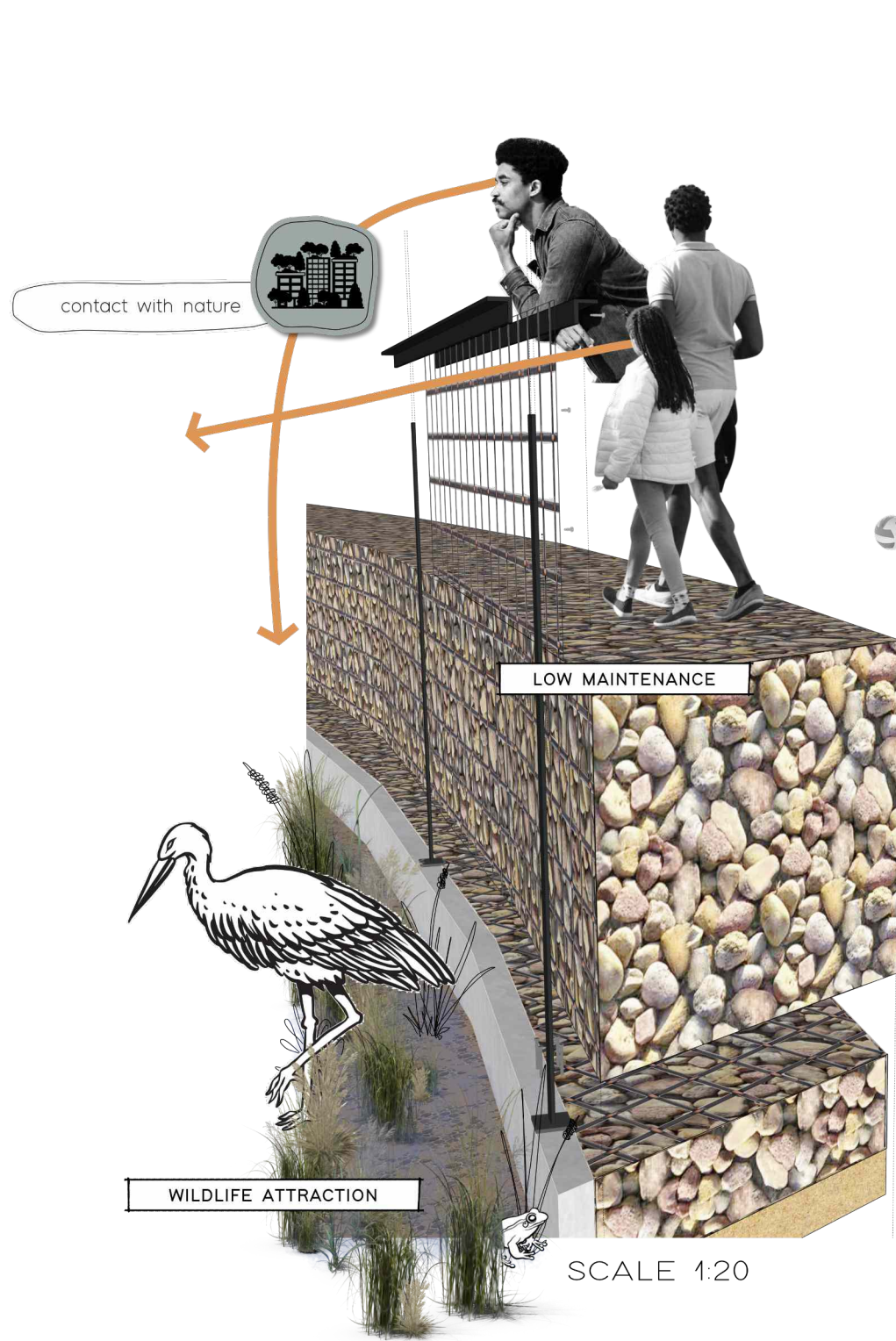
# MATERIALITY AND CONSTRUCTION METHODOLOGY



# MATERIALITY AND CONSTRUCTION METHODOLOGY




## PROMENADE FILTRATION SYSTEM



# PROMENADE FILTRATION SYSTEM


  
 SENANATSWI
   
 BUSHVELD RAIN FROG


  
 HADEDA
   
 INKANKANE


  
 BLUE-HEADED WARBLER
   
 AGAMA YA MOHLARE YA BORWA



- 1000mm brick retaining wall
- reinforced in situ cast concrete footing
- 150mm layer of compacted G5 material to 90% MOD ASSHTO density
- coarse grain material backfill
- Ø 100mm catch water drain geopipe
- marikana thornveld plant material

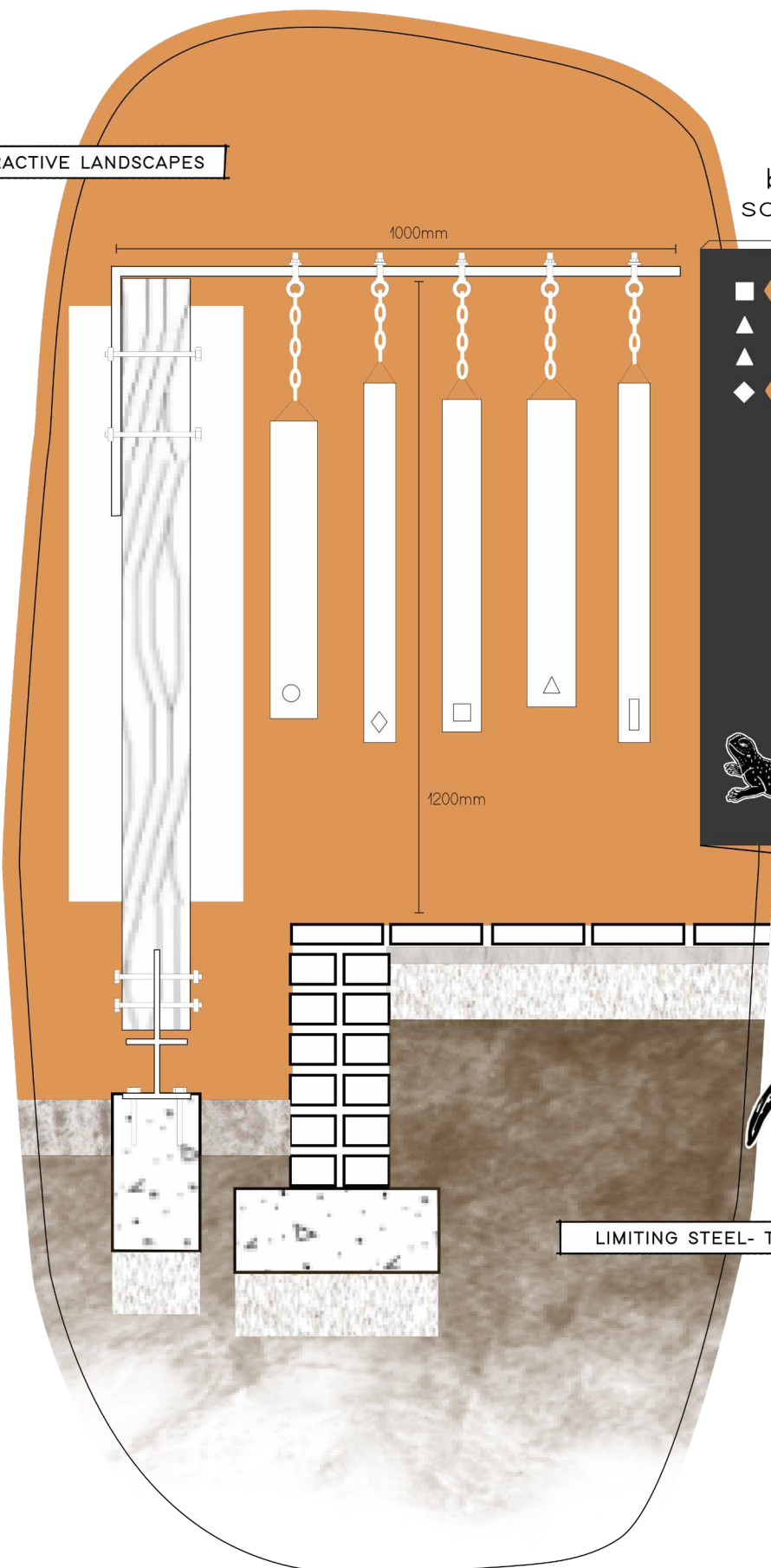
- marikana thornveld plant material
- interactive bushveld sounds chime instrument
- 10mm angled flatbar bolted to saligna pole with galvanised M20 bolts
- M10 stainless steel eye nut
- M10 stainless steel bolt
- stainless steel chain suspending hollow bamboo chimes
- var. sized, hollow bamboo poles selected according to their sounds
- perspex bushveld sounds information boards fastened to saligna pole with
- Ø 120mm saligna treated pole
- 120 x 120 x 200mm galvanised steel post base anchored to 150 x 150 x 300mm concrete footing with galvanised m20 anchor bolts
- 220 x 52 x 50mm smartstone plaza paver
- 480 x 480 x 100mm smartstone grassblock filled with seeded topsoil
- 20mm bedding sand
- 150mm crusher
- 150mm layer of compacted G5 material to 90% MOD ASSHTO density

SCALE 1:50



# MARIKANA THORNVELD LEARN AND PLAY

INTERACTIVE LANDSCAPES



bushveld sound code

▲  
 ▲  
 ◆  
 BLUE-HEADED WARBLER  
 AGAMA YA MOHLARE YA BORWA  


bamboo bushveld sound chime

- 10mm angled flatbar bolted to saligna pole with galvanised M20 bolts
- M10 stainless steel eye nut
- M10 stainless steel bolt
- stainless steel chain suspending hollow bamboo chimes
- var. sized, hollow bamboo poles selected according to their sounds
- perspex bushveld sounds information boards bolted to saligna pole

- Ø 120mm CCA treated saligna pole
- 120 x 120 x 200mm galvanised steel post base anchored to 150 x 150 x 300mm concrete footing with galvanised m20 anchor bolts

220 x 52 x 50mm smartstone plaza paver

bushveld wildlife animal and plant specie name etched on plaza paver, etching process: sandblast over stencil name cut out



VERNACULAR MATERIALITY



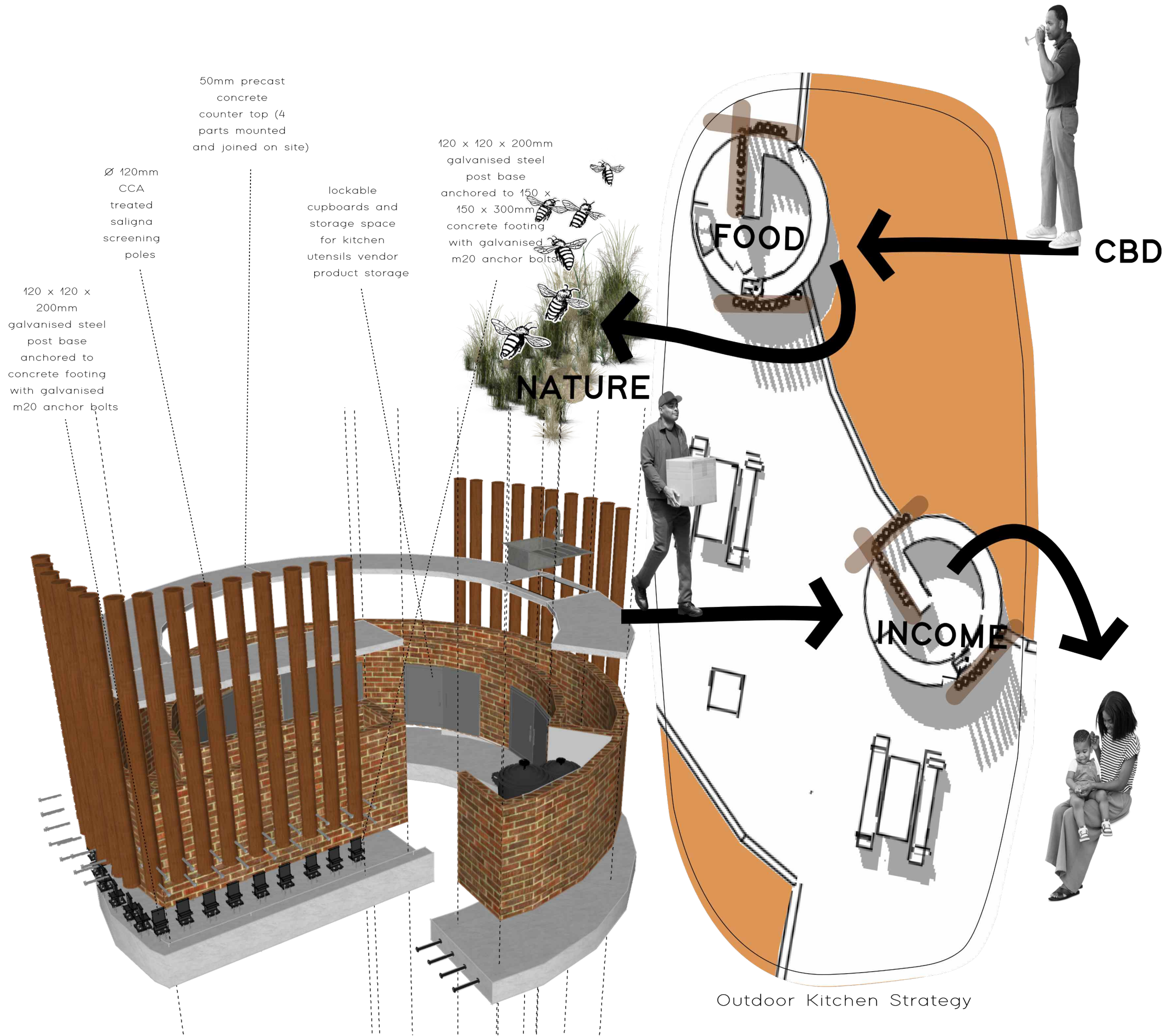
benefitting people and nature

SCALE 1:5



# URBAN FOOD AND VENDOR PLAZA







**MARIKANA THORNVELD LEARN AND PLAY**



**URBAN FOOD AND VENDOR PLAZA**



**REHABILITATED RIVERBED | PROMENADE | WATER FILTRATION BASIN**



SHARED STREET WASTE PICKER LANE



**OUTDOOR WORK AND CHARGE**

