Urban Planning and Design Lab

Javier Torner

Urban Planning and Design Lab UN-HABITAT

Strategic Plan 2014-19
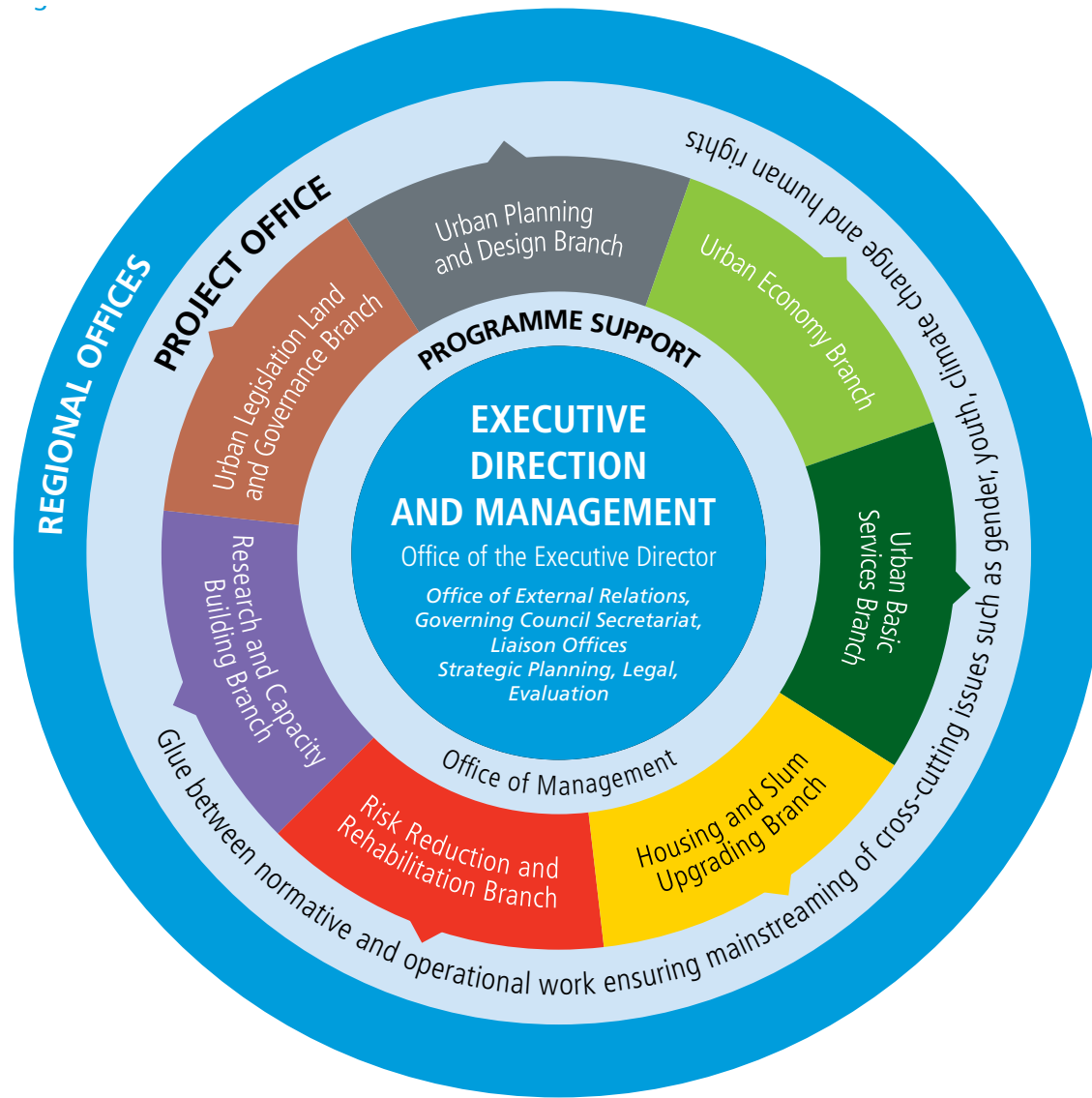
Focus Area 2 – Urban Planning and Design

"City, regional and national authorities have adopted improved policies, plans and designs for more compact, socially inclusive, better integrated and connected cities that foster sustainable urban development and are resilient to climate change."

Sub-expected Accomplishment 2

"Improved policies, plans and designs for compact, integrated and connected cities and neighbourhoods adopted by partner cities."

REGIONAL OFFICES

PROJECT OFFICE

PROGRAMME SUPPORT

EXECUTIVE
DIRECTION
AND MANAGEMENT

Office of the Executive Director

*Office of External Relations,
Governing Council Secretariat,
Liaison Offices
Strategic Planning, Legal,
Evaluation*

Office of Management

Urban Planning
and Design Branch

Urban Economy Branch

Urban Basic
Services Branch

Housing and Slum
Upgrading Branch

Risk Reduction and
Rehabilitation Branch

Research and Capacity
Building Branch

Urban Legislation Land
and Governance Branch

climate change and human rights

cross-cutting issues such as gender, youth,

Glue between normative and operational work ensuring mainstreaming of

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The **Urban Planning and Design Lab** has been established to design tangible pilot projects that showcase the sustainable urban planning principles of UN-Habitat. By linking actual design proposals to knowledge on local legal, economic and financial conditions the Lab aims at creating plans with concrete implementation potential. The 'Urban Planning and Design Lab' will collaborate with local authorities and offers assistance and a range of **services**.

services

I.

Spatial Analysis

Base Data Collection
(GIS) Data Analysis
(GIS) Mapping

II.

Project Definition

Rapid Urban Planning Studio
City Wide Strategy

III.

Urban Planning

Workshops &
Design Options

Concept Plan
Preliminary Plan
Advisory Detailed Plan
Land Use Ordinances

Implementation Strategy
Legal Framework
Feasibility Studies

IV.

Implementation

Supervision
Training
Design Briefs
Competition outlines

V.

Tools & Methodology

Planning Methods
Best Practices

50+ Cities where the Lab assists local governments, as of April 2017

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Urbanization Challenge:
Low density urban growth
Lack of services and infrastructure

Greater Accra, Ghana

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Urbanization Challenge:
Lack of infrastructure and streets
Congestion

Greater Accra, Ghana

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Urbanization Challenge:
Risk and natural disasters
Flooding

Manila, Philippines

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Urbanization Challenge:
Post-disaster rapid urbanization

Canaan, Haïti

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"Business as usual" versus "Sustainable Urban Development"

Urban Sprawl > Compact

Segregation > Integrated

Congestion > Connected

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5

1. ADEQUATE SPACE FOR STREETS AND PUBLIC SPACE IN AN EFFICIENT STREET NETWORK
- 30-35% to the street 15-20% public space / 50 % plots.
- At least 18 km of street length.
- At least 80 crossings per km2

2.MIXED LAND USE
- At least 40 percent of floor space allocated to economic use
- Limited land-use specialization; single use blocks should cover less than 10% of any neighborhood

3.SOCIAL MIX
- 20-50% of residential area should be low cost housing
- Each tenure type should be not more than 50% of the total

4.ADEQUATE DENSITY
At least 15.000 people per km2, that is 150 people/ha

5.CONNECTIVITY
Emphasis on walking distances and public transport

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**URBAN PLANNING
AND DESIGN LABS**

tools for integrated and
participatory urban planning

Quito, Habitat III Version 1.0

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FINANCIAL PLAN

RULES & REGULATIONS
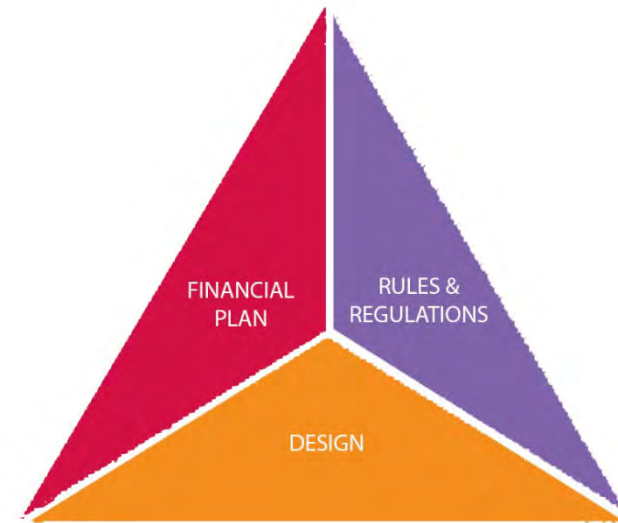
DESIGN

THREE PRONGED APPROACH

1. Rules and Regulations

2. Financial Plan

3. Urban Design

➢ Form that **generates** value.

➢ Good rules and regulations and a financial plan that **manages** value and attracts investment.
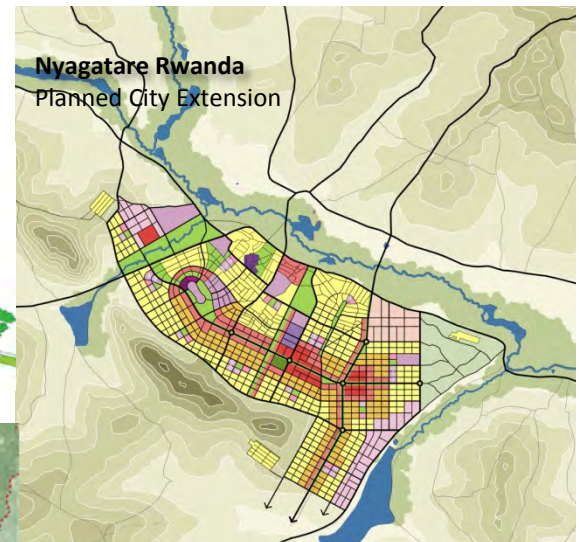
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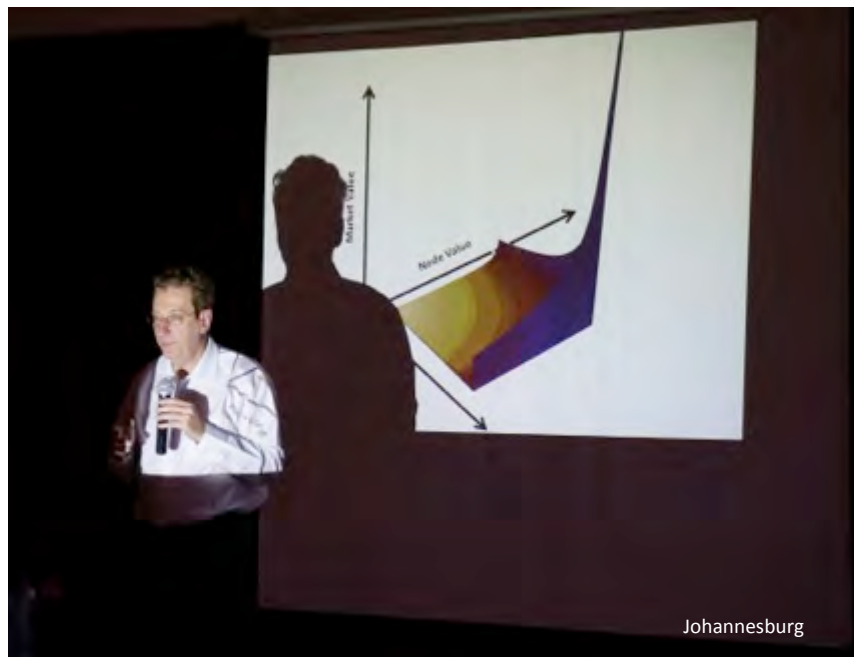
Johannesburg

Nyagatare

Guangzhou

Medellin

The Urban Planning and Design Lab is the hands on integrative facility of UN-Habitat focused on concrete projects and implementation.
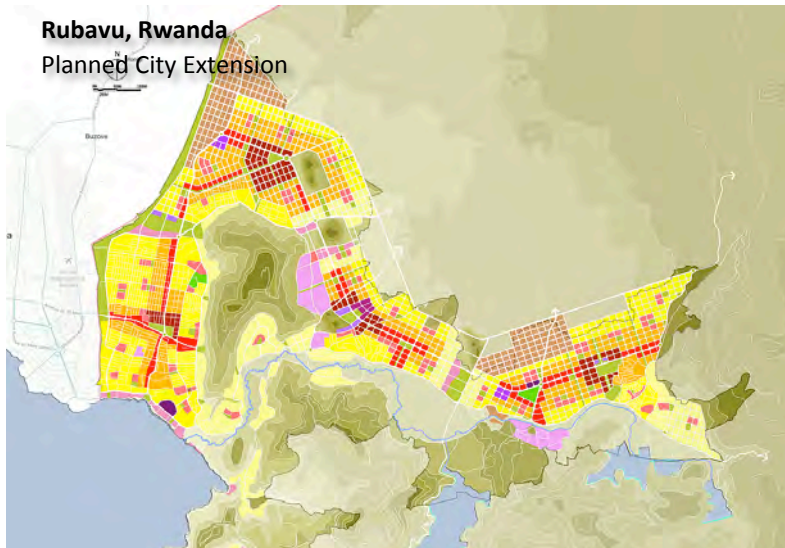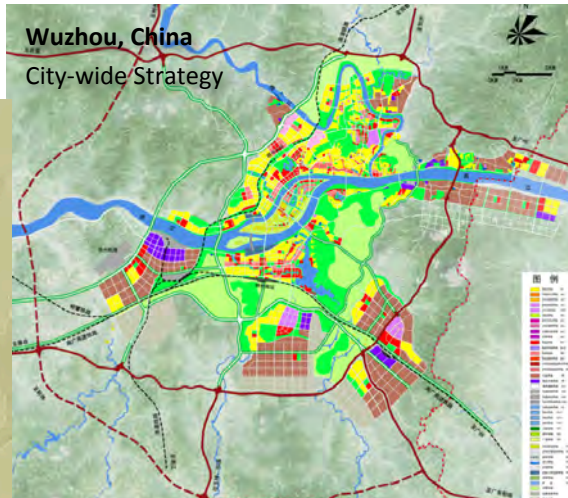
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Johannesburg, South Africa
City-wide Strategy
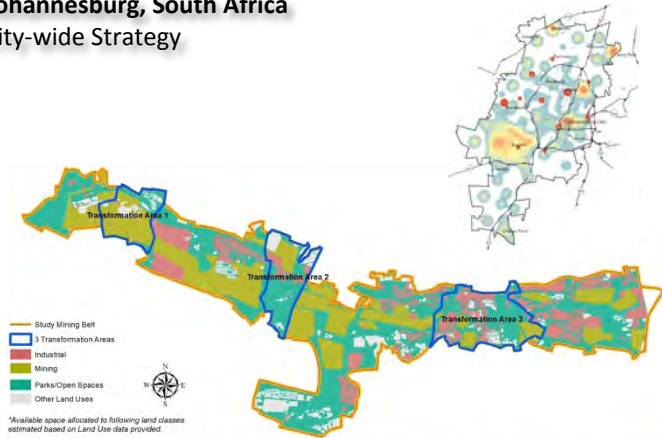
Kisumu, Kenya
Planned City Extension

Nyagatare Rwanda
Planned City Extension

Wuzhou, China
City-wide Strategy

Rubavu, Rwanda
Planned City Extension

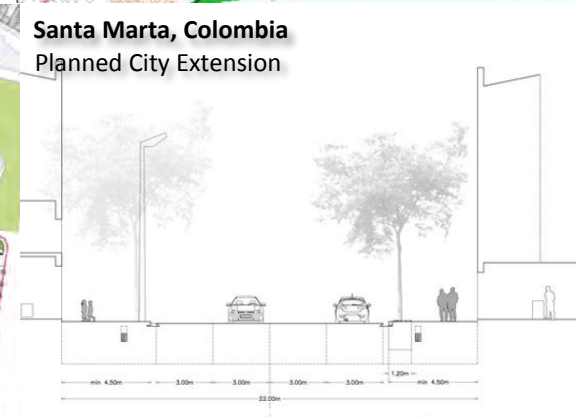**Ningo-Prampram, Ghana**
Planned City Extension
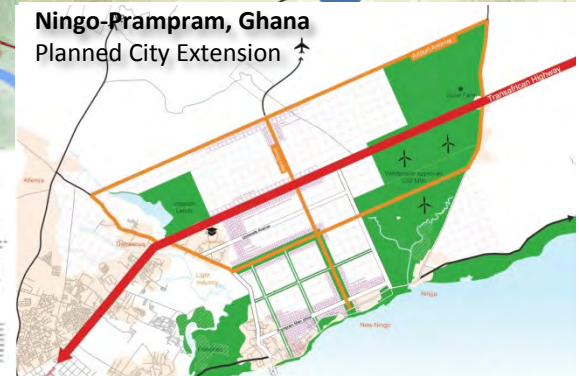
Al-Alamein, Egypt
New Town

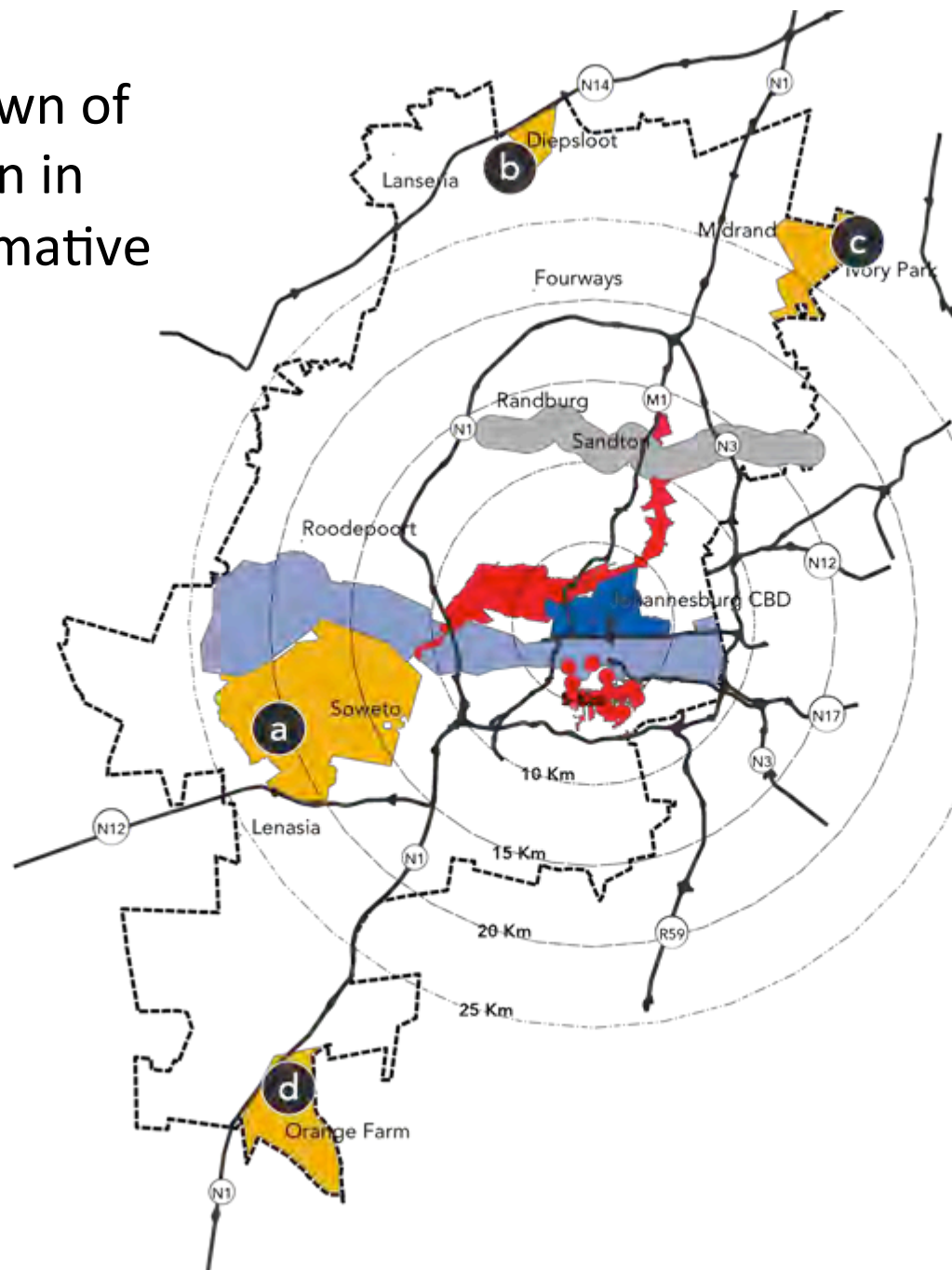**La Candelaria, Colombia**
Planned City Infill / Urban Renewal

Santa Marta, Colombia
Planned City Extension

INTEGRATION OF SCALES

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# Breakdown of the vision in transformative projects

Priority Development Zone

- ▮ Public Transport Backbone
- ▮ Connecting the Airport
- ▮ Strengthening the Core
- ▮ Unlocking the Mining Belt

Investing in Restructuring of Marginalised and Deprived Areas

- **a** Soweto: Normalising an Urban Structure & Land Market
- **b** Diepsloot: Connections with Tshwane; Service Provision & Economic Development
- **c** Ivory Park: Connections with Ekurhuleni; Services & Economic Development
- **d** Orange Farm: Connections with Vaal System; Services & Economic Development

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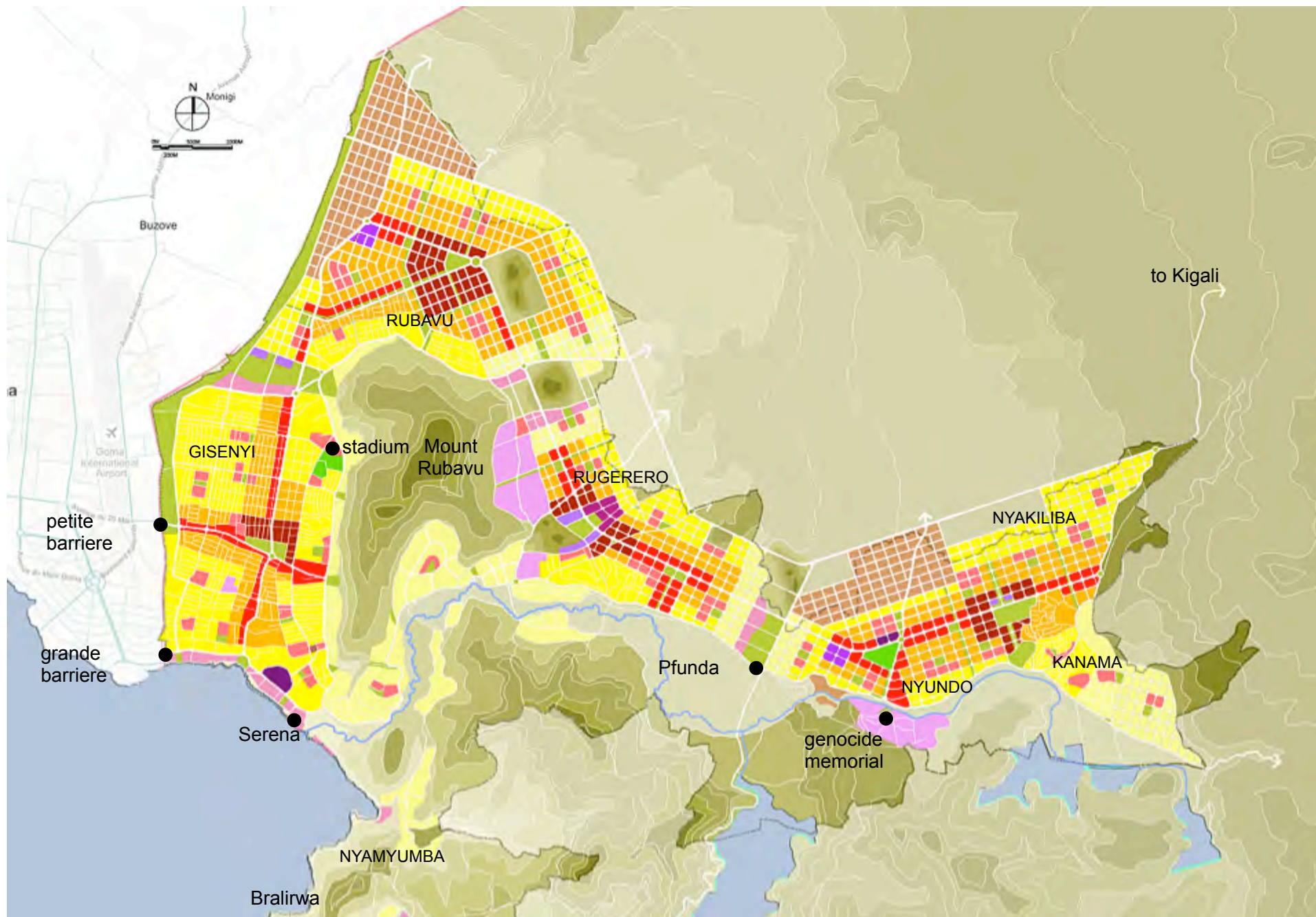
Planned City Extension Rubavu, Rwanda

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Greater Accra Region: Planned City Extension

The process of planning is a key to succesful implementation
Stakeholder forum Planned City Extension Ghana

The Planned City Extension is a tool to accommodate rapid urban growth
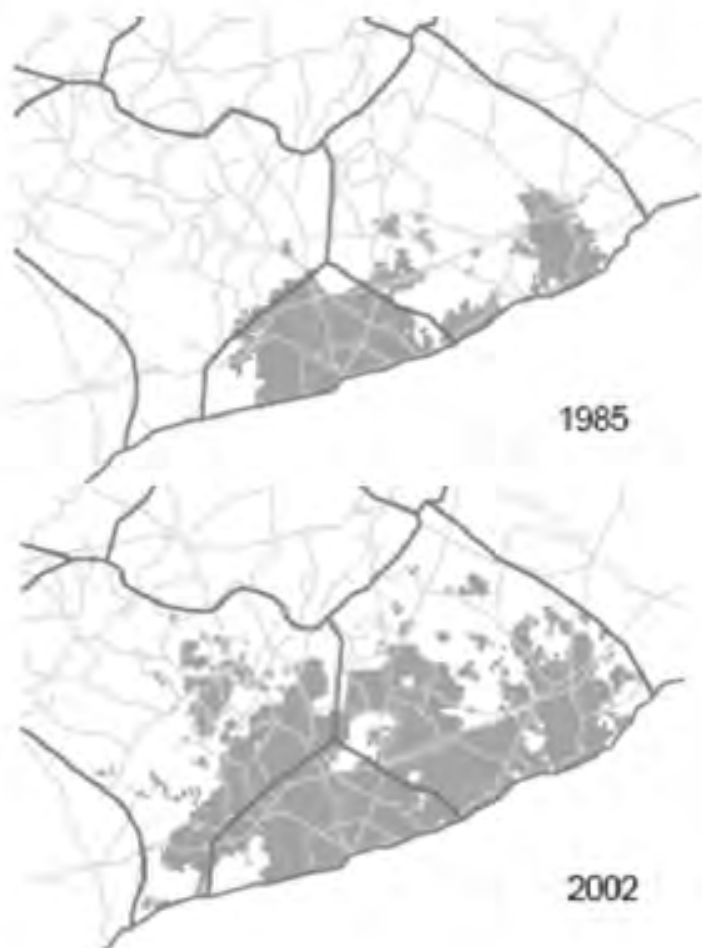
The Urban Lab consults all levels of government;
Minister of Local Government Ghana

The Urban Lab consults all levels of government;
District assembly and traditional chiefs

1985

2002

2002

2002
Transition

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Coastal urban planning and erosion control

Ningo-Prampram
Masterplan Concept

MESO
Topographics

Ningo

Prampram

Tema

Accra

TOPOGRAPHICS

420 meter

-5 meter

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Coastal urban planning and erosion control

Ningo-Prampram
Masterplan Concept

MESO
Water

p. 17

Ningo

Prampram

Tema

Accra

WATER

salt/brakish inland water

risk of flooding, drainage related

highly vulnerable urban occupation

medium vulnerable urban occupati

new coast line, sea level rise

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Coastal urban planning and erosion control

Ningo-Prampram
Masterplan Concept

MICRO
Flooding 5m

35 m

25 m

15 m

5 m

Old Ningo

New Ningo

Tema

Prampram

FLOODING AREAS
- sea level rises over 5 m
- sea level rises over 15 m
- sea level rises over 25 m
- sea level rises over 35 m
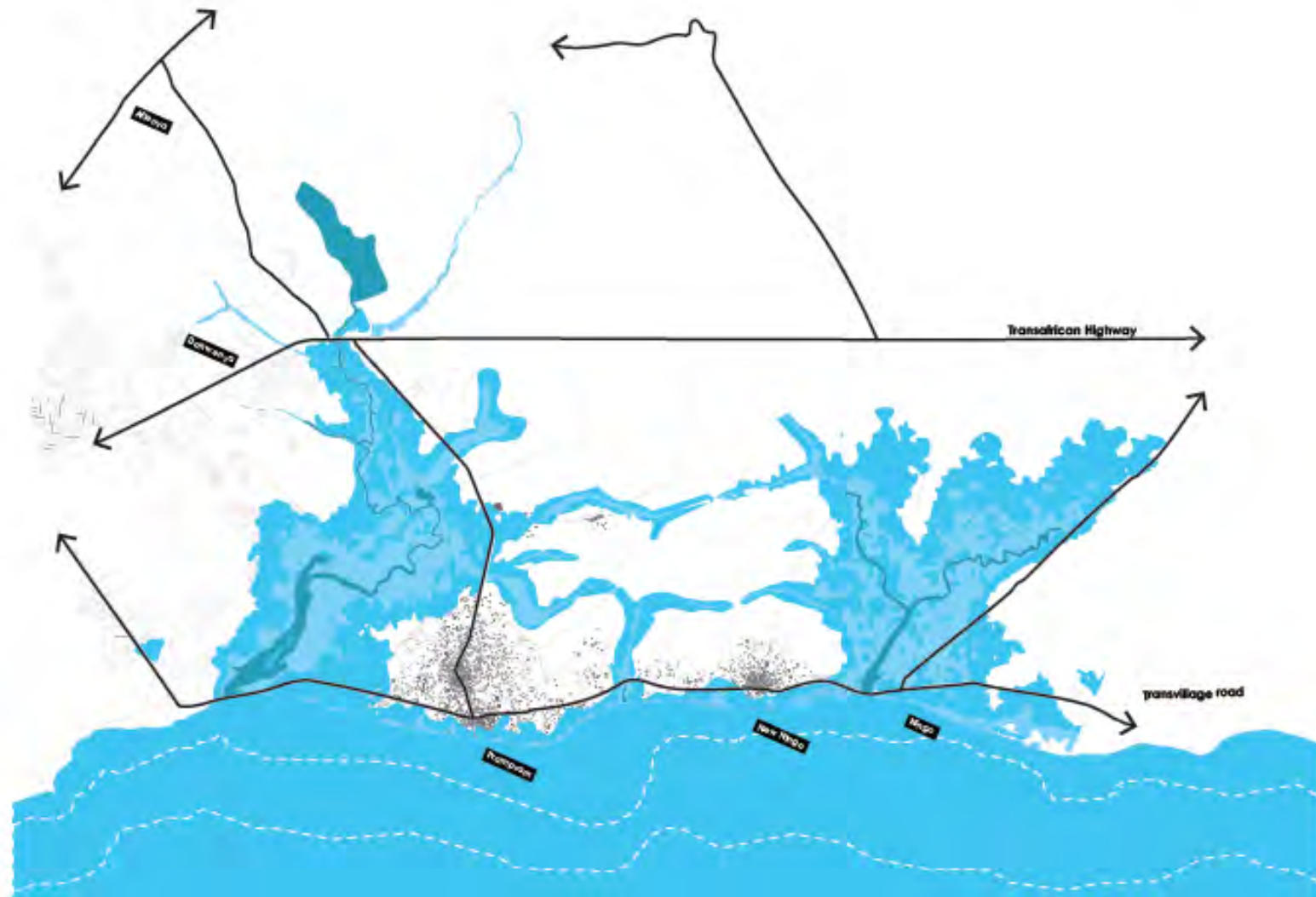- urban

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Coastal urban planning and erosion control

Ningo-Prampram
Masterplan Concept

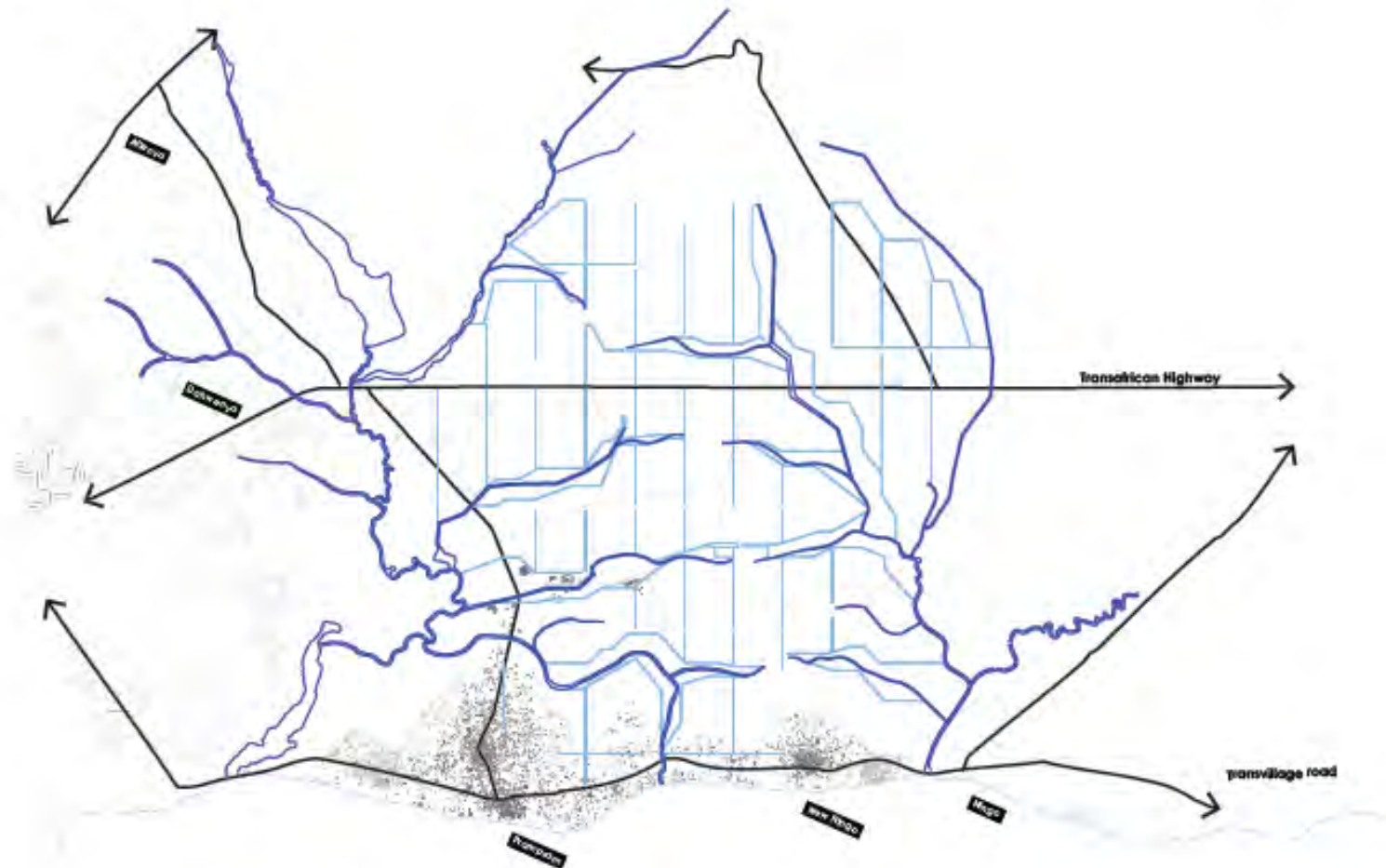Existing watersheds

p. 21

Coastal urban planning and erosion control

Ningo-Prampram Masterplan Concept

Water system & directions

p. 23

Coastal urban planning and erosion control
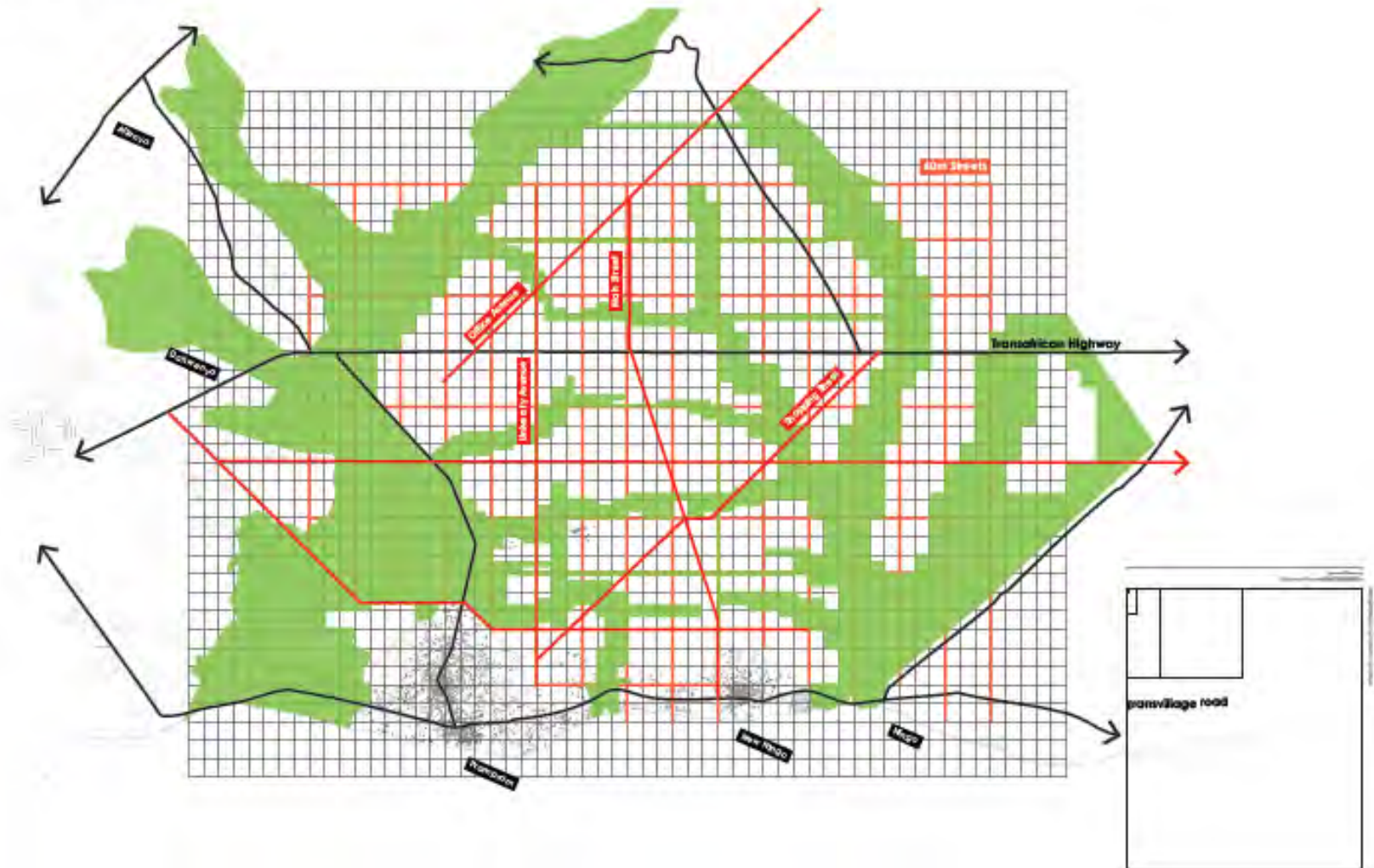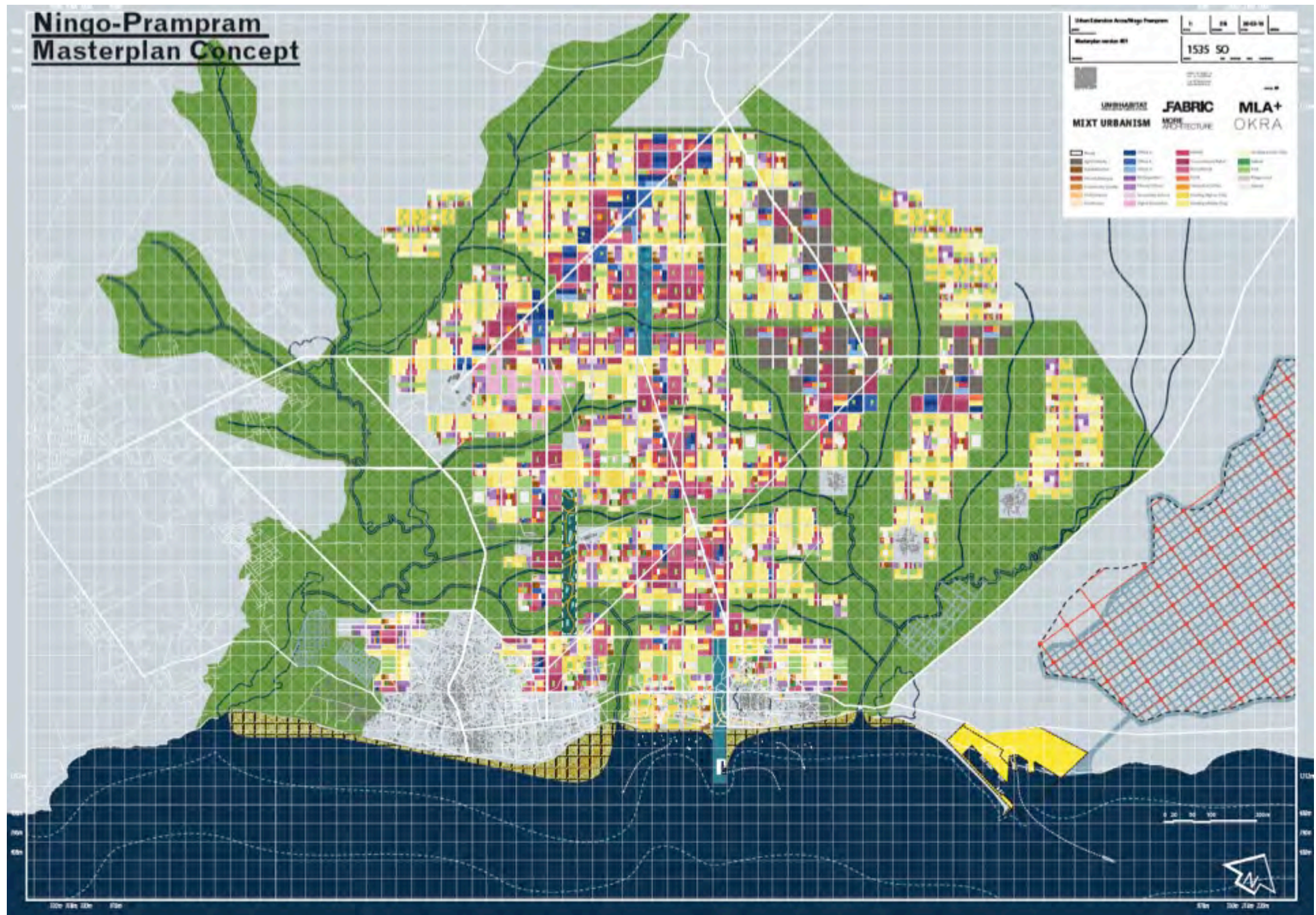
...and defines a block pattern for different urban uses

Coastal urban planning and erosion control

Ningo-Prampram Masterplan Concept

18m/36m/60m Streets' profile

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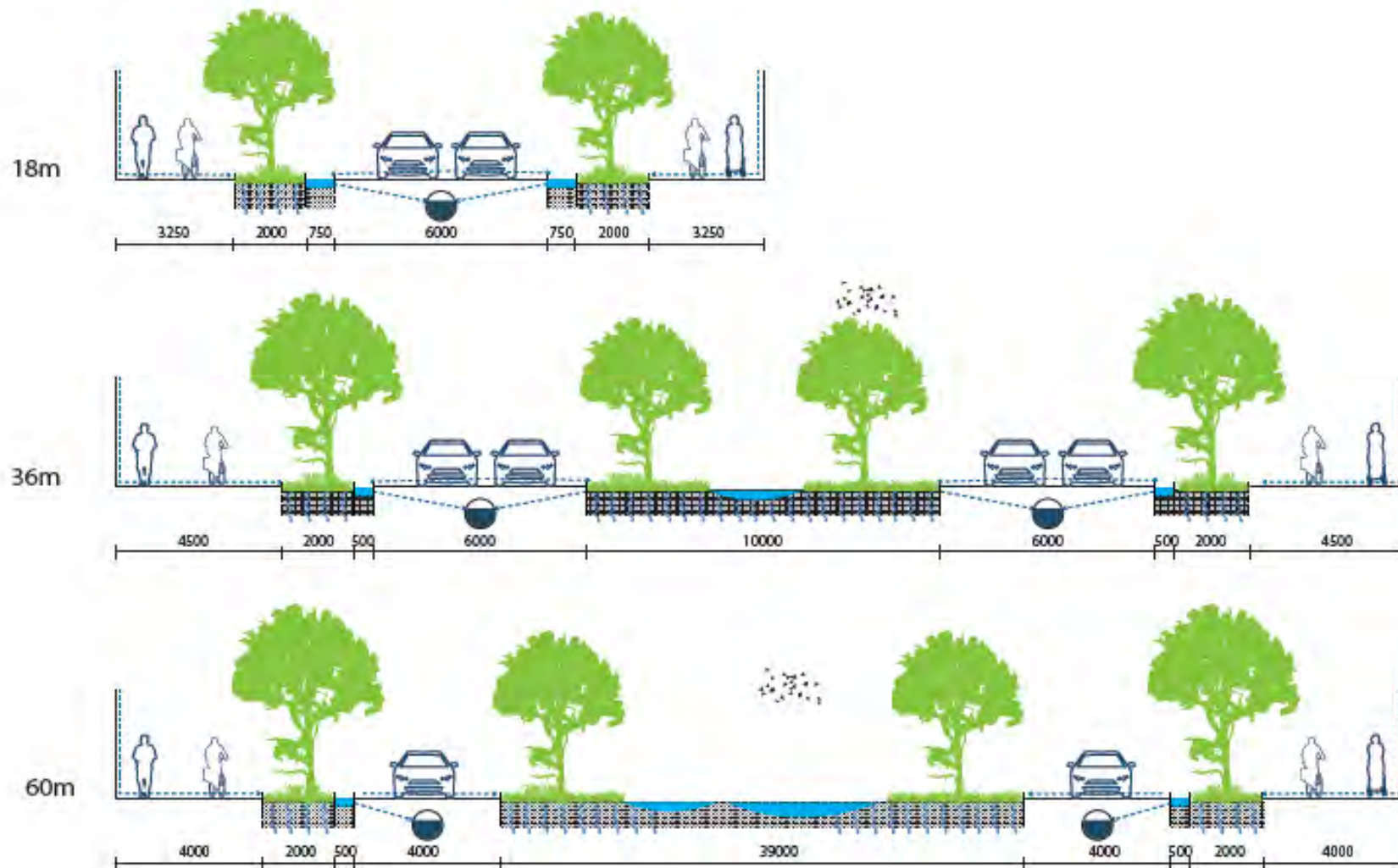
Mexico City: Urban regeneration and the network of public space

CREATIVE
INDUSTRY
FUND
NL

URBAN LAB
ONU-HABITAT

Desarrolladores e
inversionistas
Developers and
investors

Usuarios
locales
+ compañías
+ instituciones
Local users
+ companies
+ institutions

Gerwin de Vries
(LINT)

Marco Broekman
(marco.broekman)

EQUIPO
ULMEX
TEAM

Jaap Klaarenbeek
(Klaarenbeek)

Kristin Jensen
(Morgenstad)

SEDUVI

Propietarios
Property owner

Local expert
Finance and
Legislation
Especialistas locales
Finanzas y
Legislación

ONU-HABITAT
MEXICO

NGO
ONG

UN@HABITAT
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AV. CUAHUTÉMOC

VIADUCTO MIGUEL ALEMAN

EJE CENTRAL LÁZARO CÁRDENAS

FRAY SERVANDO TERESA DE MIER

CALZADA DE TLALPÁN

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Network of public space
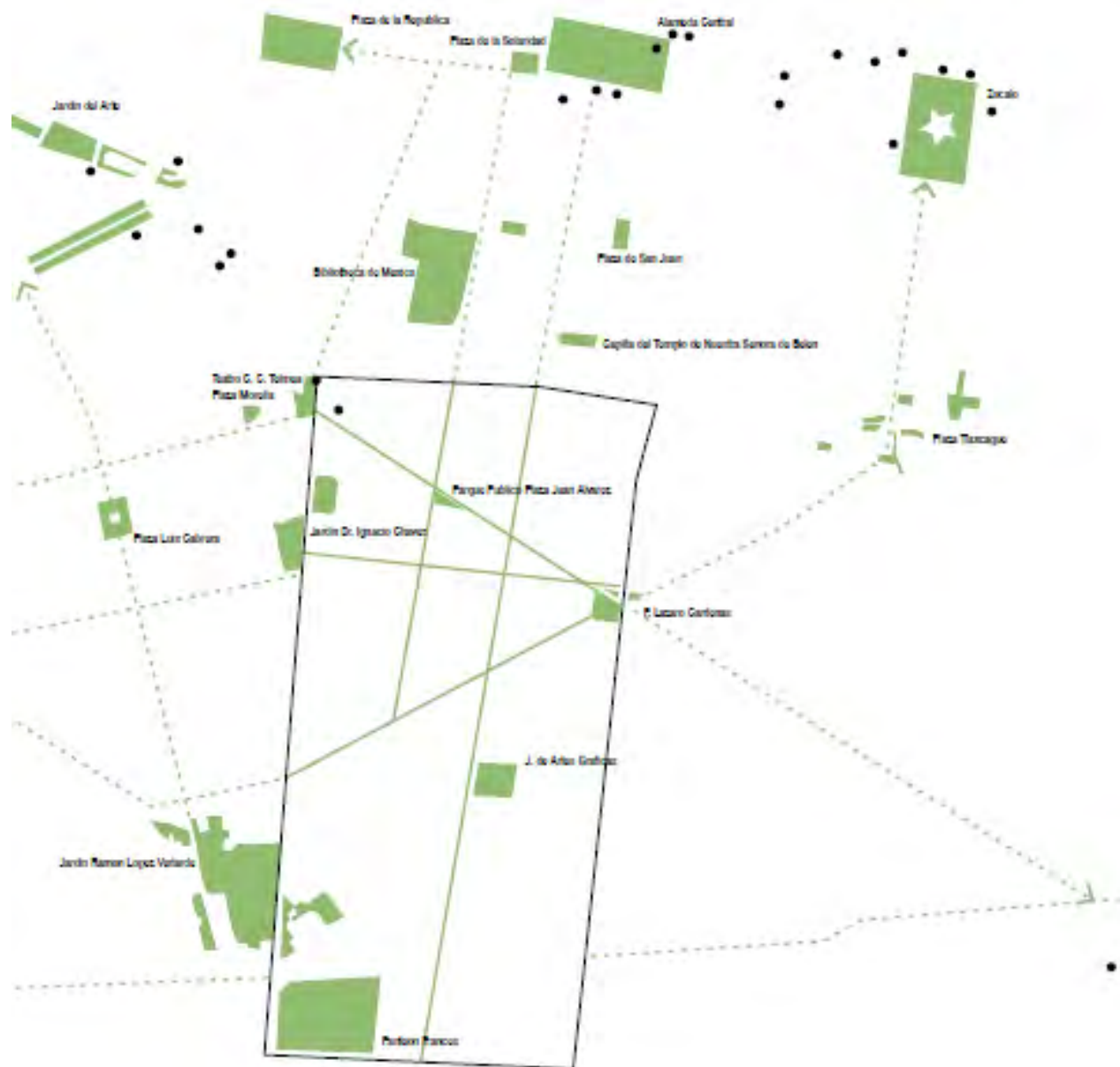
Network of public space

2017	2018-2025	2025	2025<
1.) Proyectos estratégicos - strategic projects	2.) Atrayer desarrollo - attract development	3.) Proyectos estratégicos 2.0 - strategic projects 2.0	4.) Desarrollo siguiente - Further development

Urban regeneration and climate change

Rainwater is collected and used on rooftopgardens which provides fruit and vegetables

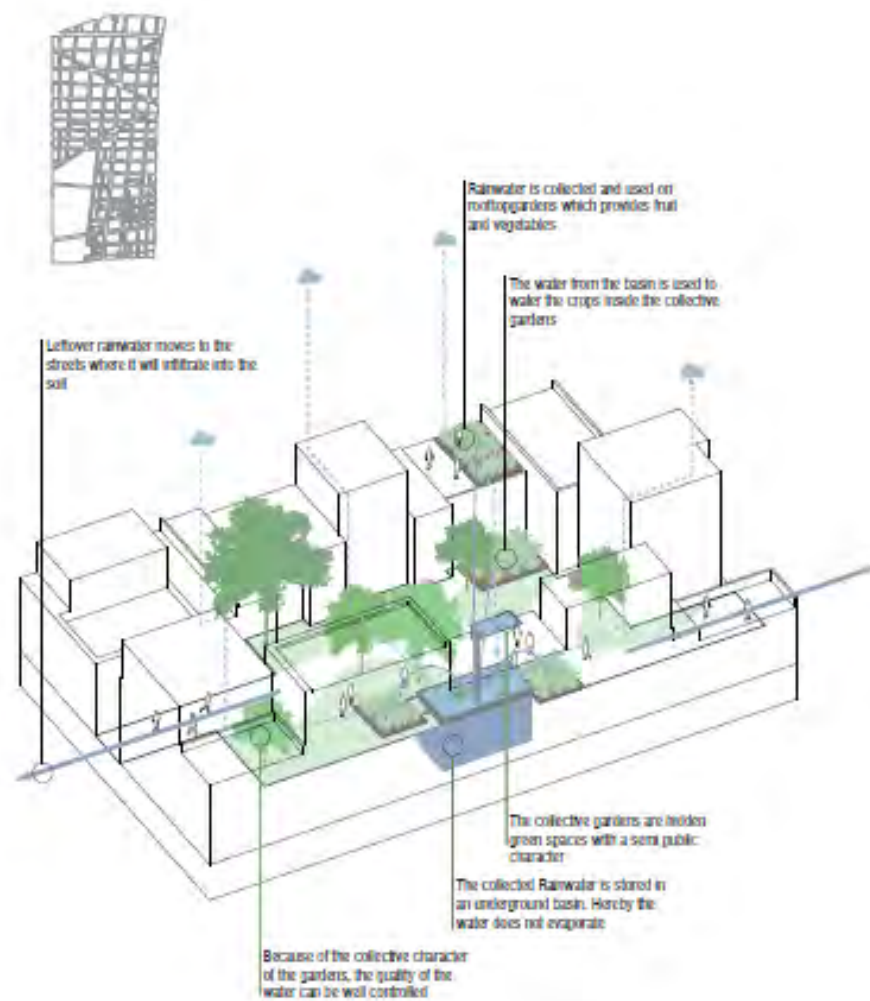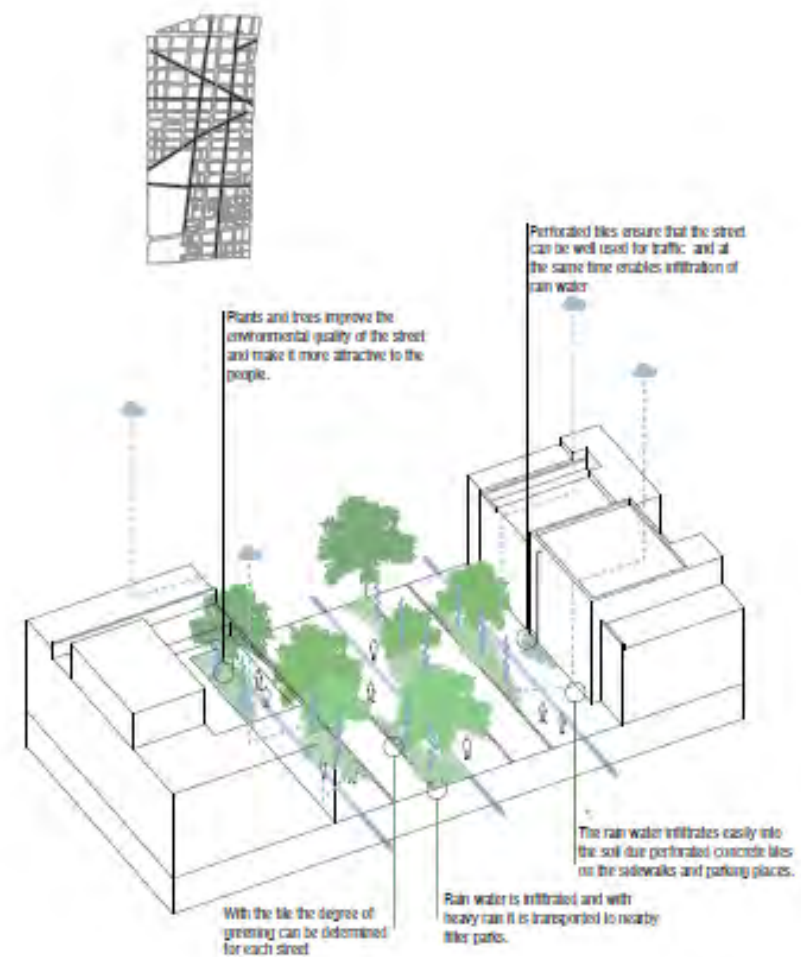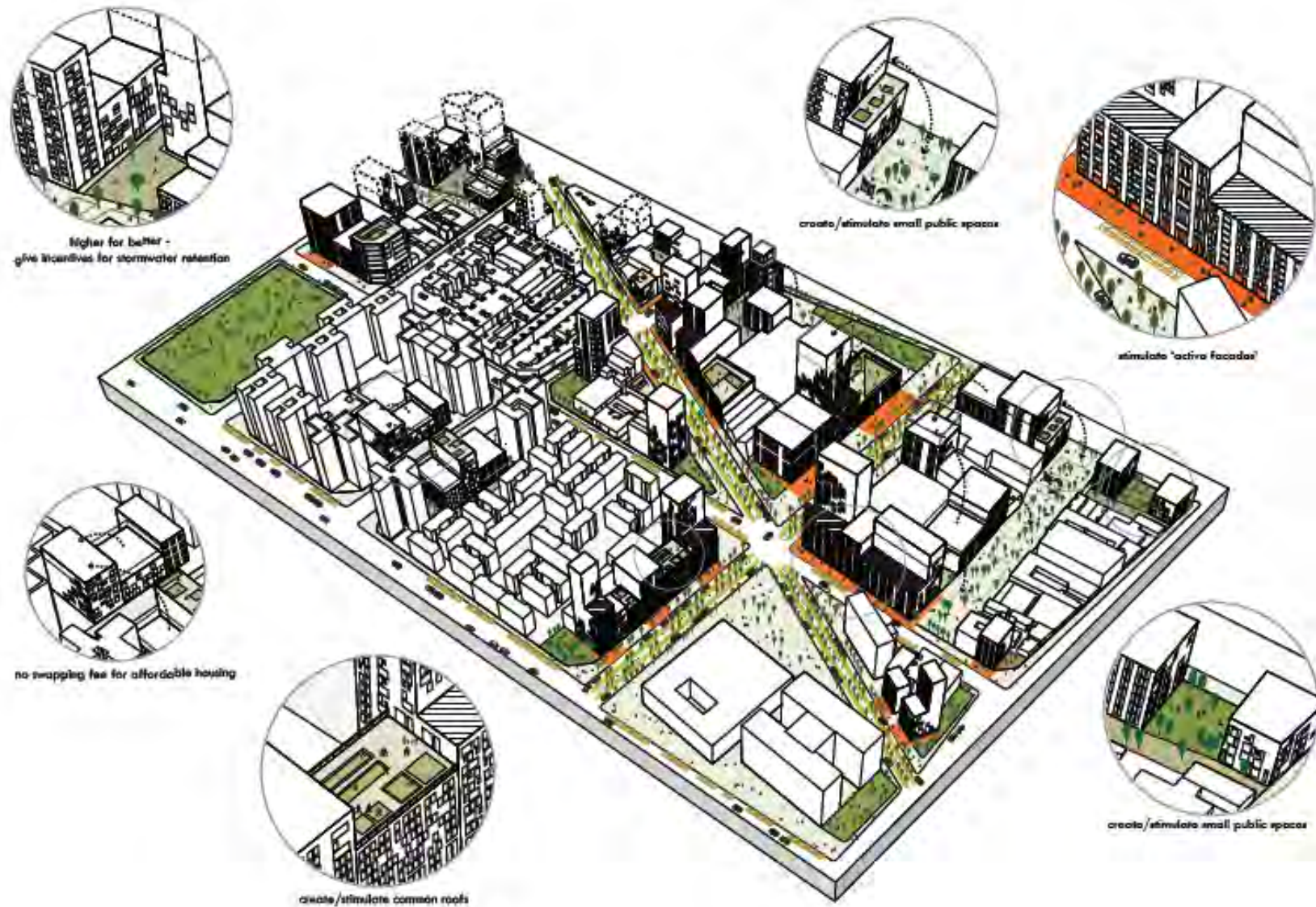The water from the basin is used to water the crops inside the collective gardens

Leftover rainwater moves to the streets where it will infiltrate into the soil

The collective gardens are hidden green spaces with a semi public character

The collected Rainwater is stored in an underground basin. Hereby the water does not evaporate

Because of the collective character of the gardens, the quality of the water can be well controlled

1. Jardines collectivos (retención) – collective gardens (retain)

Perforated tiles ensure that the street can be well used for traffic and at the same time enables infiltration of rain water

Plants and trees improve the environmental quality of the street and make it more attractive to the people.

The rain water infiltrates easily into the soil due perforated concrete tiles on the sidewalks and parking places.

With the tile the degree of greening can be determined for each street

Rain water is infiltrated and with heavy rain it is transported to nearby filter parks.

2. Calles verdes (infiltración) – green streets (infiltrate)

Network of public space

higher for better -
give incentives for stormwater retention

create/stimulate small public spaces

stimulate "active facades"

no swapping fee for affordable housing

create/stimulate common roofs

create/stimulate small public spaces

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Rules, regulations and financial mechanisms
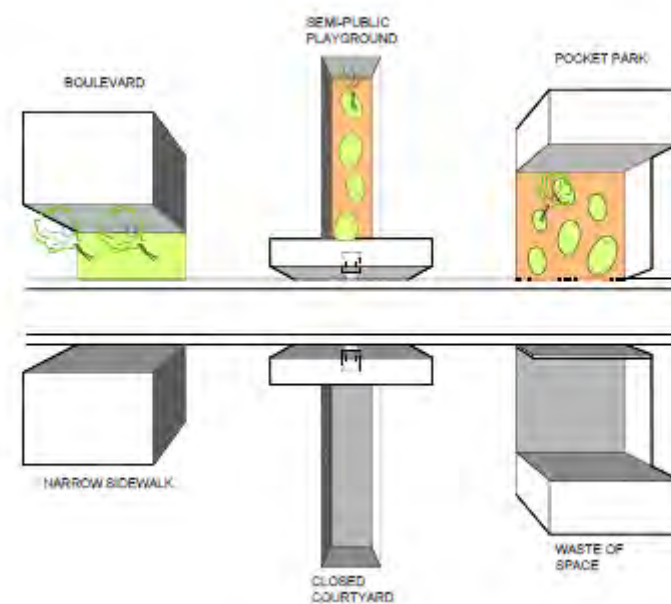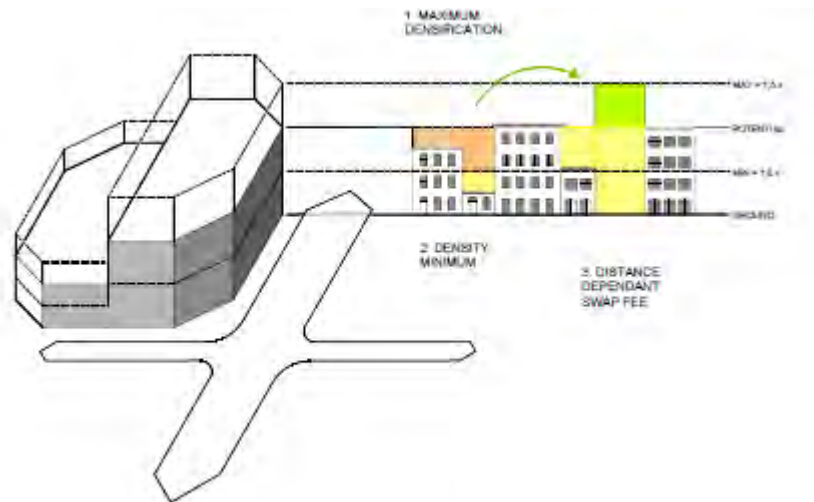
1. Minimum density for new developments
2. Selling of construction rights
3. Public space creation
4. Permeability incentive
5. Affordable housing incentive
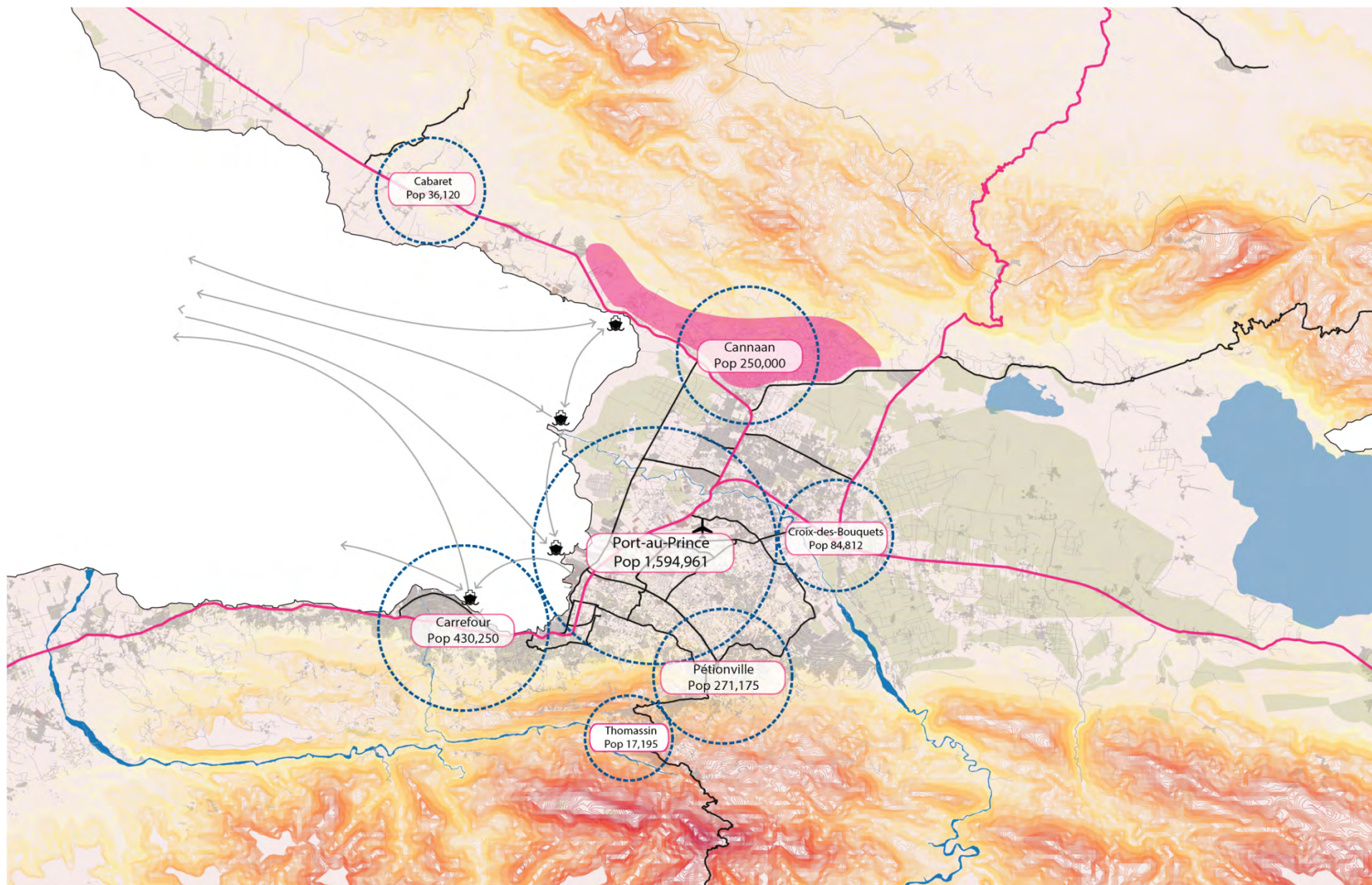6. Active first floor incentive

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PORT-AU-PRINCE, HAITI
Canaan Urban Development Strategy

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Canaan, Haïti
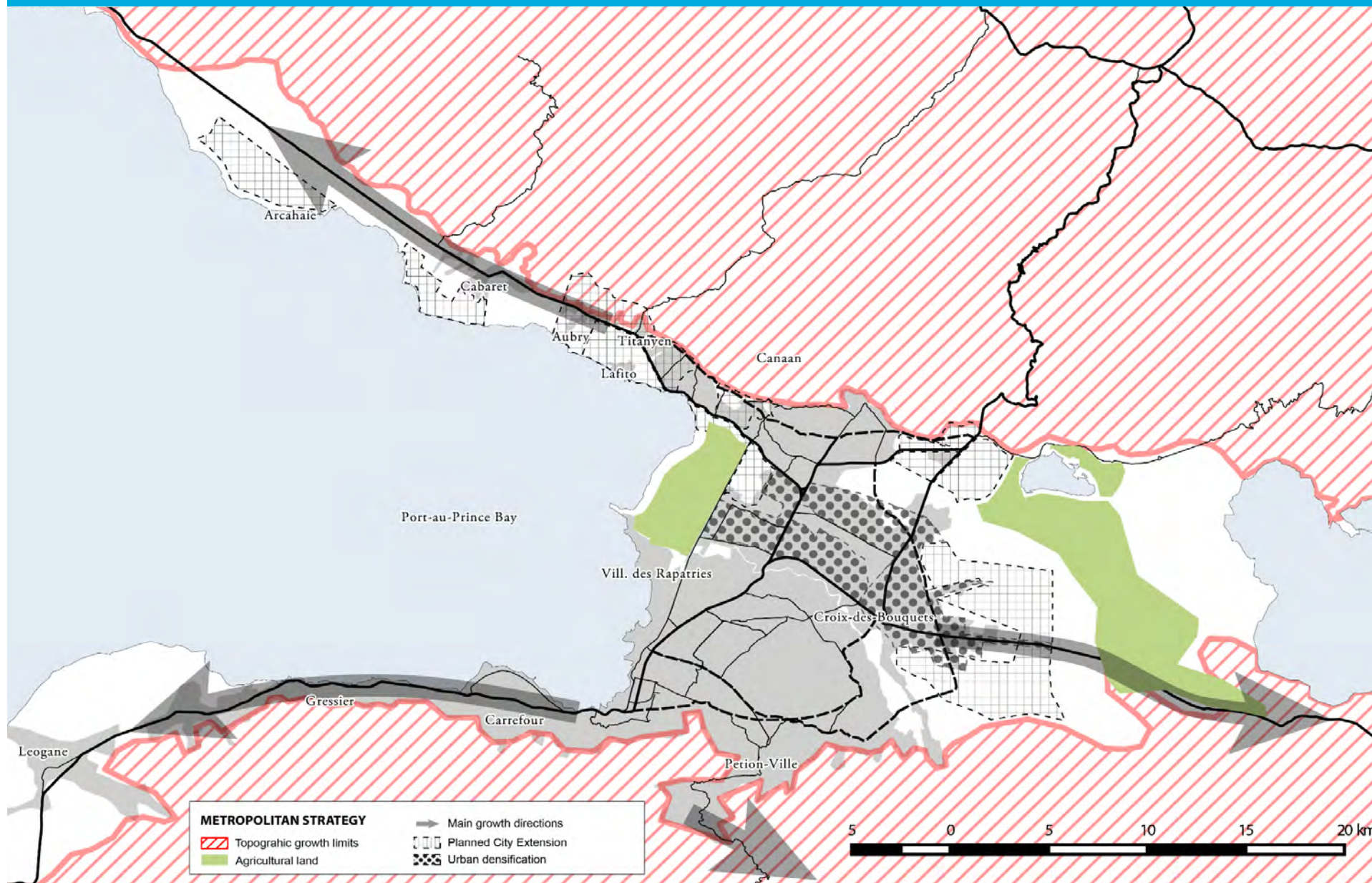
250.000 victims of the 2010 Haïti earthquake have settled in 4 years time on the flood prone and remote hills of Canaan..

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Cabaret
Pop 36,120

Cannaan
Pop 250,000

Croix-des-Bouquets
Pop 84,812

Port-au-Prince
Pop 1,594,961

Carrefour
Pop 430,250
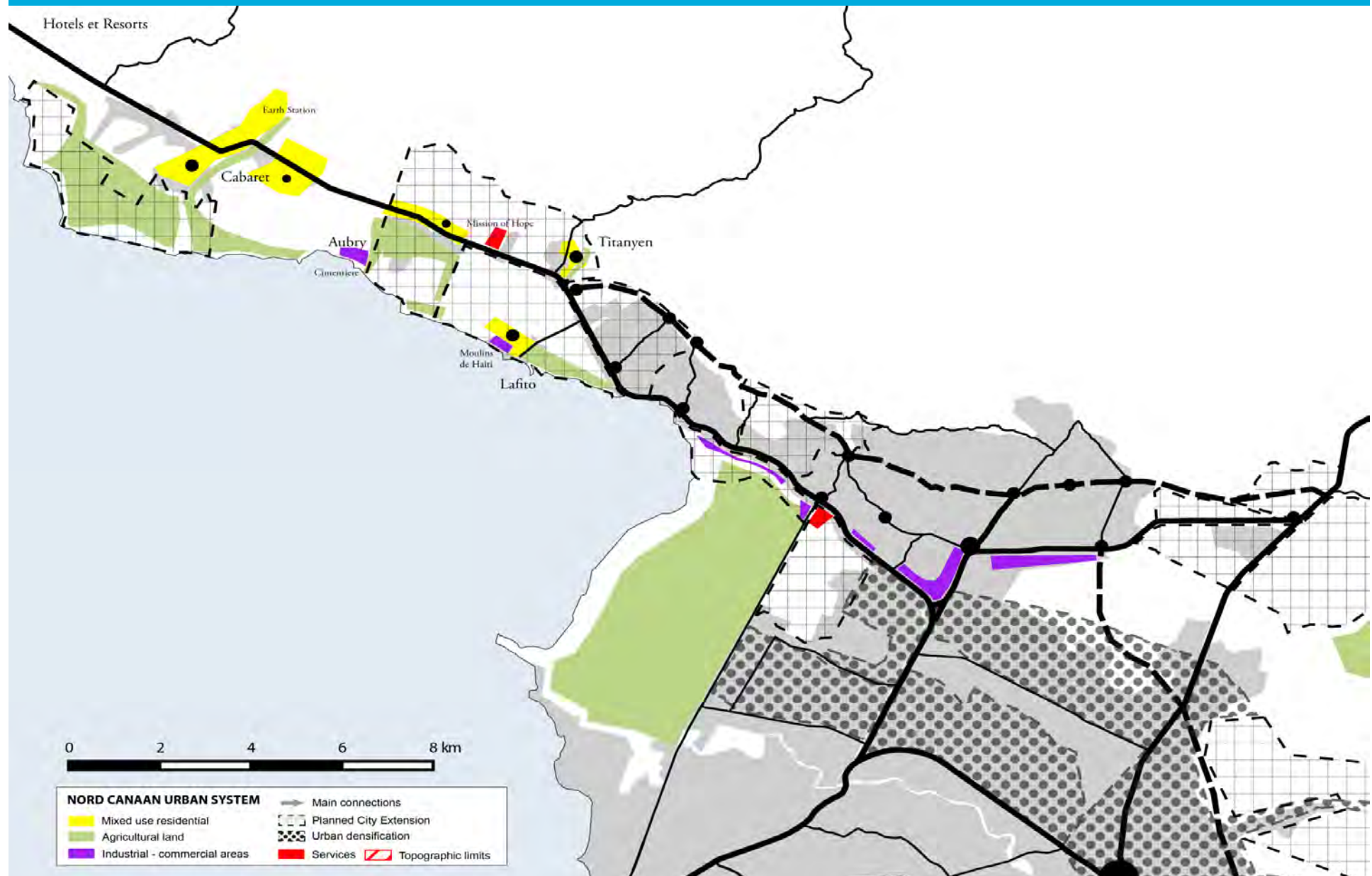
Pétionville
Pop 271,175

Thomassin
Pop 17,195

Metropolitan-Populaion of Main Districts:Pop in total 2,684,513(Data from Institut Haïtien de Statistique et d'Informatique, 2009)
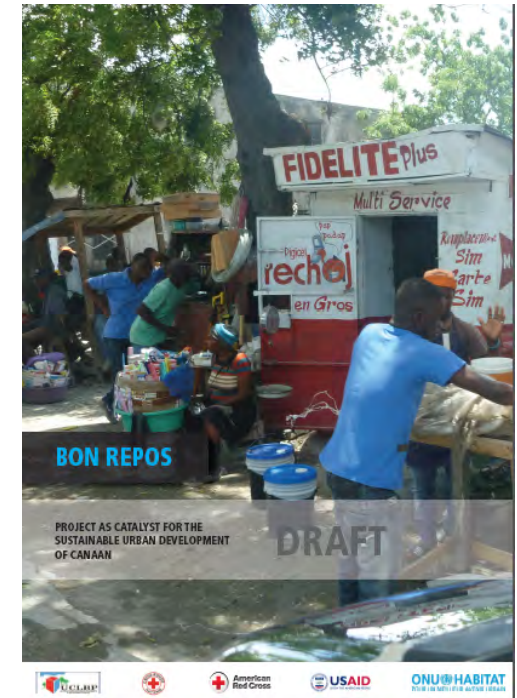
2 0 2 4 6 8 10 km

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METROPOLITAN STRATEGY

- ▨▨▨ Topograhic growth limits
- 🟩 Agricultural land
- ➜ Main growth directions
- ▯▯▯ Planned City Extension
- ▨▨▨ Urban densification

Arcahaie

Cabaret

Aubry

Titanyen

Lafito

Canaan

Port-au-Prince Bay

Vill. des Rapatries

Croix-des-Bouquets

Gressier

Carrefour

Petion-Ville

Leogane

5 0 5 10 15 20 km

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Hotels et Resorts

Earth Station

Cabaret

Aubry

Cimentiere

Mission of Hope

Titanyen

Moulins
de Haiti

Lafito

0   2   4   6   8 km

NORD CANAAN URBAN SYSTEM

- Mixed use residential
- Agricultural land
- Industrial - commercial areas

- Main connections
- Planned City Extension
- Urban densification

- Services   Topographic limits

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Agriculture

Slopes

Flooding

Erosion

Suitability

TREE PLANTING STRATEGY

PART OF A STRATEGIC PLAN FOR THE SUSTAINABLE URBAN DEVELOPMENT OF CANAAN

DRAFT

BON REPOS

PROJECT AS CATALYST FOR THE SUSTAINABLE URBAN DEVELOPMENT OF CANAAN

DRAFT

HAZARD ADDRESSED

INITIATIVE DE DÉVELOPPEMENT URBAIN

CANAAN II

PLANIFICATION PARTICIPATIVE DES

CONNECTIVITY TYPOLOGIES

PART OF A STRATEGIC PLAN FOR THE SUSTAINABLE URBAN DEVELOPMENT OF CANAAN

.PLANNED CITY EXTENSIONS

A.
800ha

B.
500ha

St-Christophe

C.
450ha

D.
200ha

Jerusalem

Ona-Ville

Canaan

Corail

G.
Area for
agriculture

E.
500ha

F.
500ha

H.
Area for
agriculture

POTENTIAL EXPANSION AREAS   FLOODING RISK   SLOPES

low   medium   high   very high   8-12 %   +12 %

0   1   2   3   4   5 km

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PROMOTE ECONOMIC CORRIDORS: improve the connection through transversal arteries that promote new potential economic development

PROVIDE ACCESSIBILITY IN CITY SCALE: improve the Northern road and the access points to the national road

IMPROVE THE PUBLIC SPACES NETWORK: increase the amount of public spaces and amenities

SUSTAIN SMOOTH TRAFFIC FLOW IN NATIONAL ROADS: add bypass/ service lane to improve economic development

IMPROVE THE STREET NETWORK IN NEIGHBOURHOOD SCALE: create more secondary streets for community

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CENTERS AND URBAN STRUCTURE   1:50 000

centers
dense mixed-use area
built up area

public space
agriculture
sport

services / retail/
industrial area (small scale)

0   1   2   3   4   5 km

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Charrettes bring together the different stakeholders in order to collaboratively create a tentative common vision for Canaan.
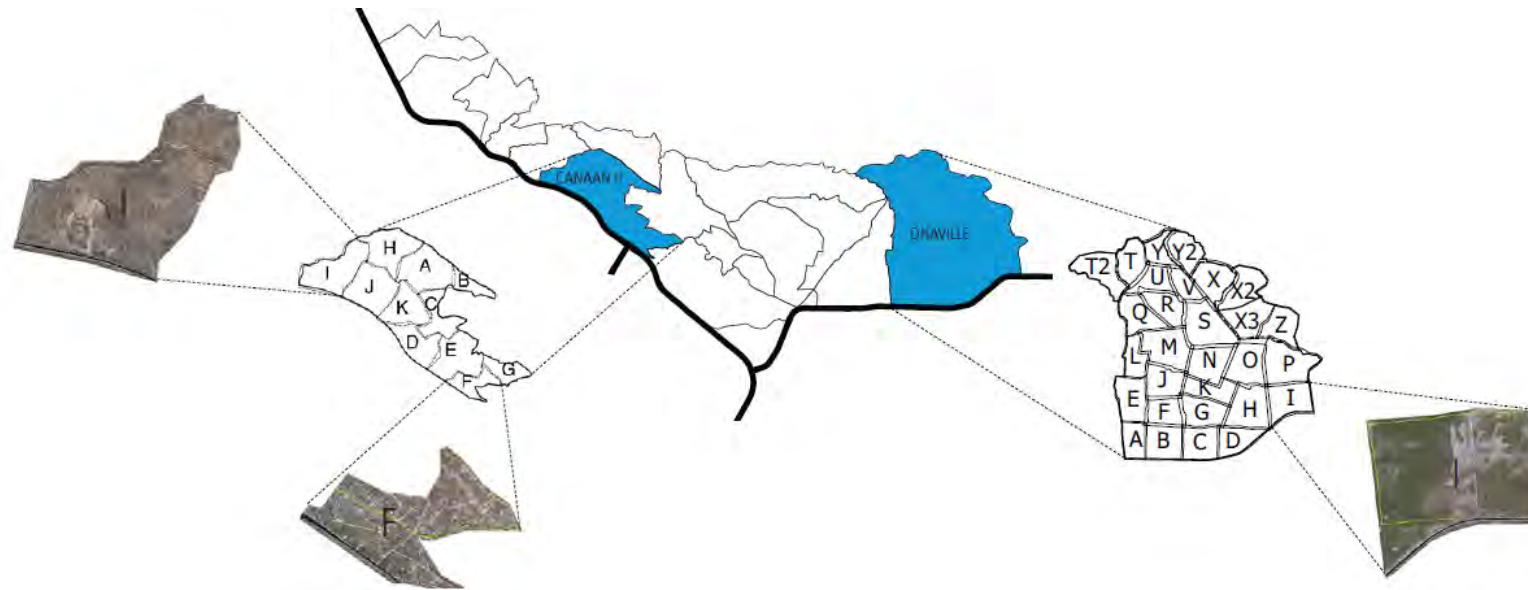
CHARRETTES

A series of focus groups with the community are held in each of the 15 neighborhoods in means to validate the design and respond to their concerns and needs.

PARTICIPATORY APPROACH

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NEIGHBOURHOOD STRATEGY

EXITING SITUATION

The planning area consists of 15 different neighborhoods. Each neighborhood was divided to blocks. The existing street network and services were mapped.

PROPOSED INTERVENTIONS

Each neighborhoods and blocks were analyzed. Following the UN-Habitat principles, more street connections and public spaces were proposed.

REVIEWING BY THE COMMUNITY

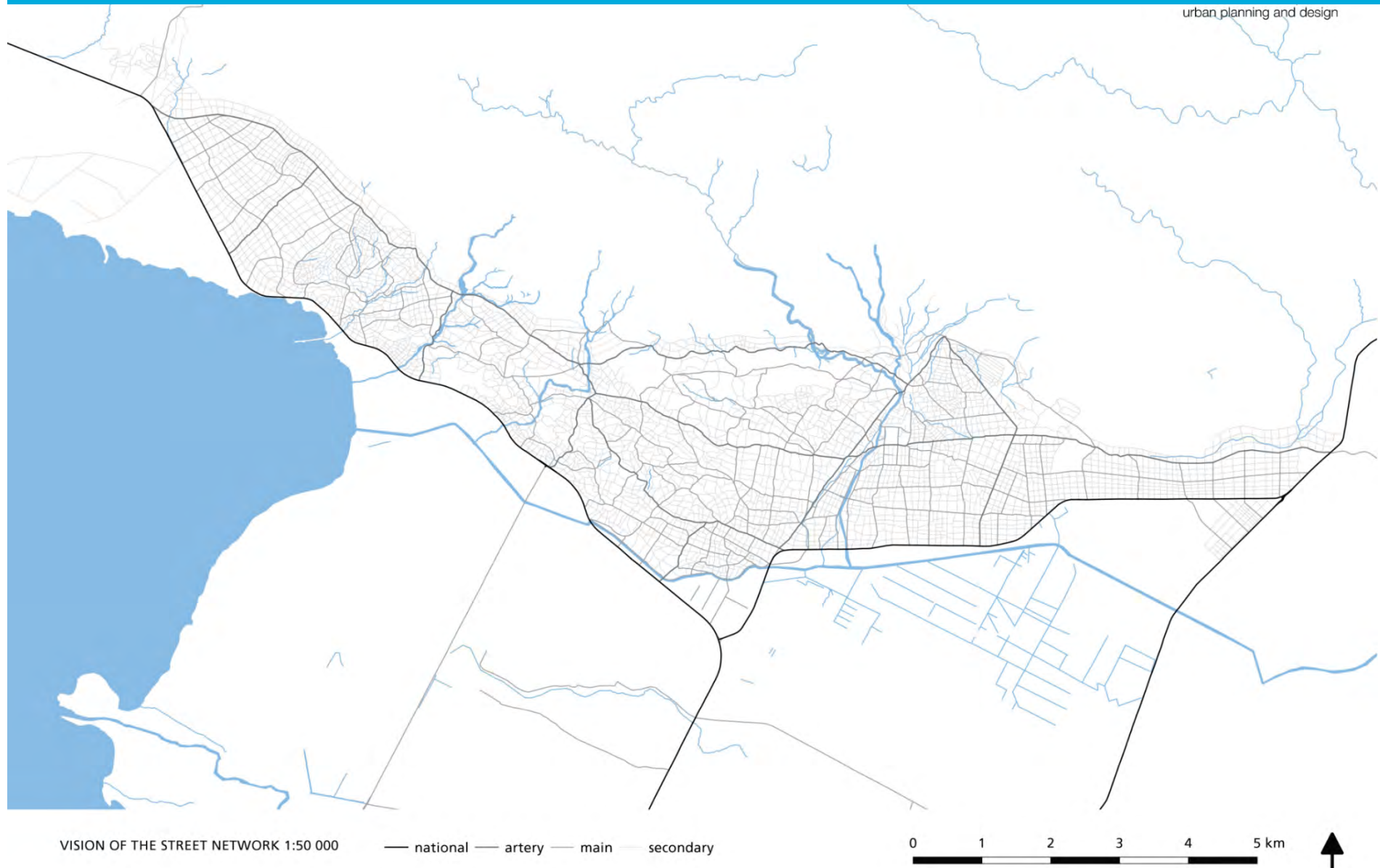Plans and mapped services were reviewed by the community. Risk areas and flood-prone areas were marked.
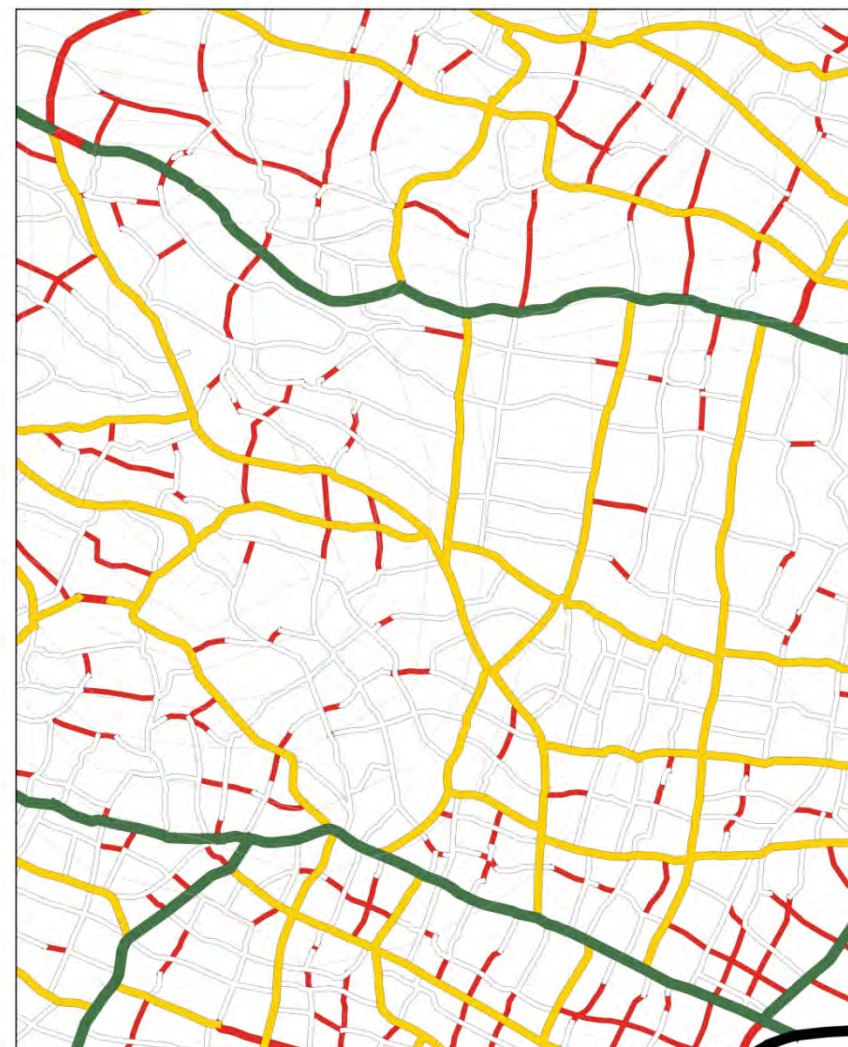
NEW PROPOSAL

Feedback from the community were taken into consideration and the plans were adjusted.

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urban planning and design

VISION OF THE STREET NETWORK 1:50 000 — national — artery — main — secondary

0   1   2   3   4   5 km

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VISION OF THE STREET NETWORK

artery **main** secondary **new connection**

0   0.25   0.5   0.75   1 km

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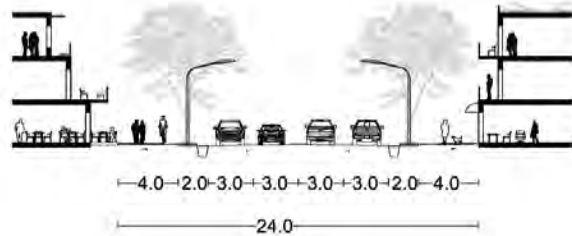
ARTERIAL ROAD 24m

MAIN STREET 18m
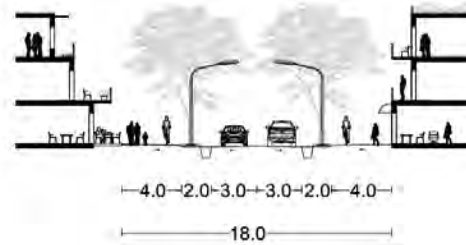
SECONDARY STREET 12m

├─4.0─┤2.0├3.0┤3.0┤3.0┤3.0├2.0┤4.0─┤

├───────24.0───────┤

├─4.0─┤2.0├3.0┤3.0├2.0┤4.0─┤

├──────18.0──────┤

├─3.0─┤3.0┤3.0┤3.0─┤

├───12.0───┤
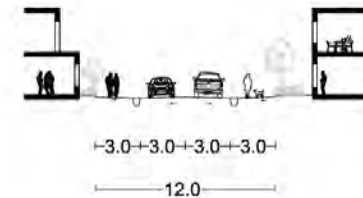
ARTERIAL ROAD 24m
one side parking
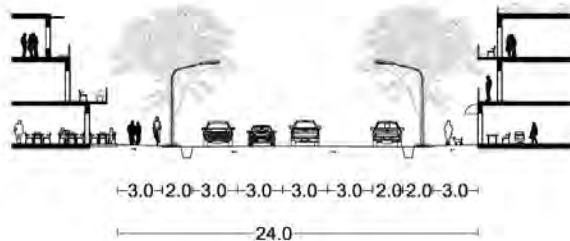
MAIN STREET 18m
pocket parking

├3.0┤2.0├3.0┤3.0┤3.0┤3.0├2.0┤2.0├3.0┤

├───────24.0───────┤

├3.0┤3.0├3.0┤3.0┤3.0├3.0┤

├──────18.0──────┤

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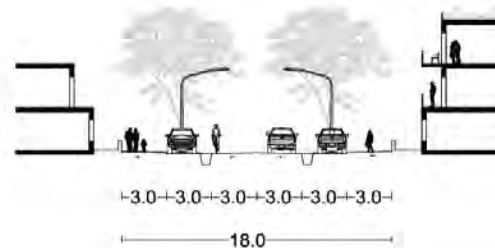
.PUBLIC SPACES

Espaces publics et zone tampon (5 à 10 minutes de marche)

Localiser les nouveaux espaces publics autour des services publics existants
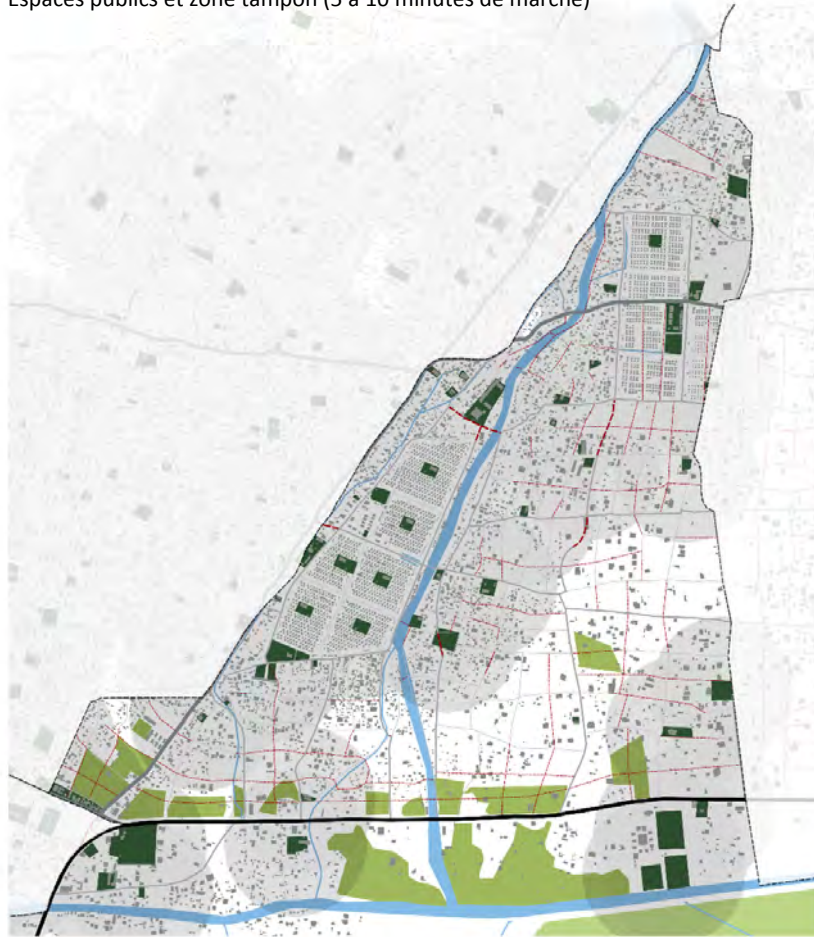
■ Espaces bâtis	■ Espaces publics existants	■ Espaces verts	— Rivières	• Centre communautaire • Sport — Routes
	■ Espaces publics potentiels	■ Rivière principale	• Ecoles	• Services Religieux • Services commerciaux — Routes proposées

0   500   1000 m

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The amount of public facilities per 100,000 people

Educational

5
secondary school
Kuala Lumpur

10
primary school
Kuala Lumpur

0.1
university
Capetown

0.3
post matric
skills training
Capetown

5
EDC resource hub
Capetown

14.3
primary school
Capetown

5
pre-school
Canada

Health

2x
hospital
Kuala Lumpur

4
clinic
Kuala Lumpur

1.7
hospital
Abu Dhabi

3.3
clinic
Abu Dhabi

8.3
clinic (medium)
Abu Dhabi

0.056
Regional
Hospital
Capetown

1.4
primary health
clinic
Capetown

1
clinics / health
centres
Hong Kong

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NATURAL FLOW DIRECTION

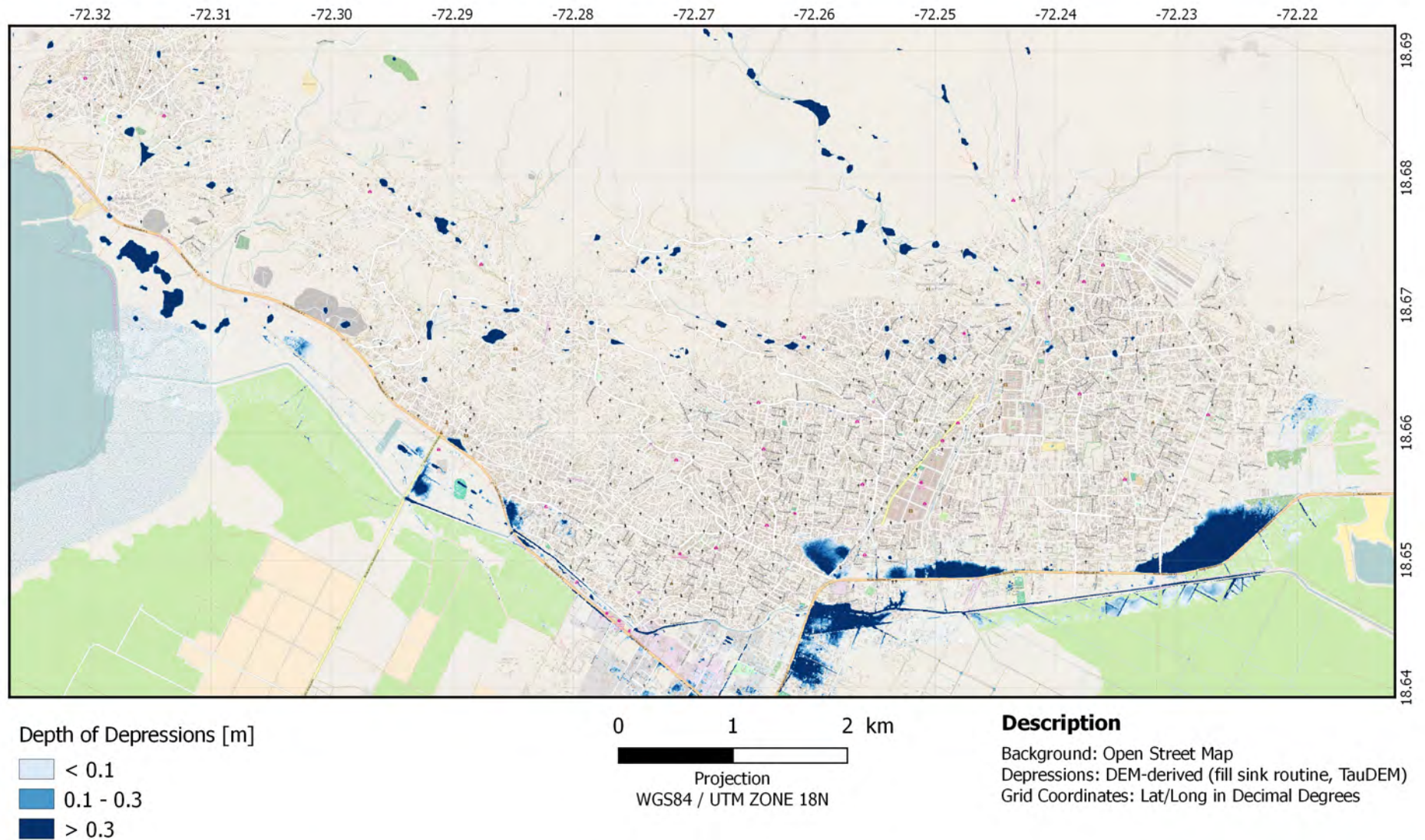→ Natural Flow Direction   ☐ Watersheds Primary Canals
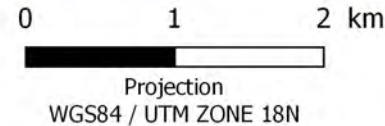
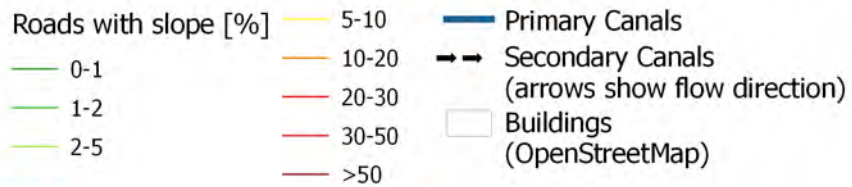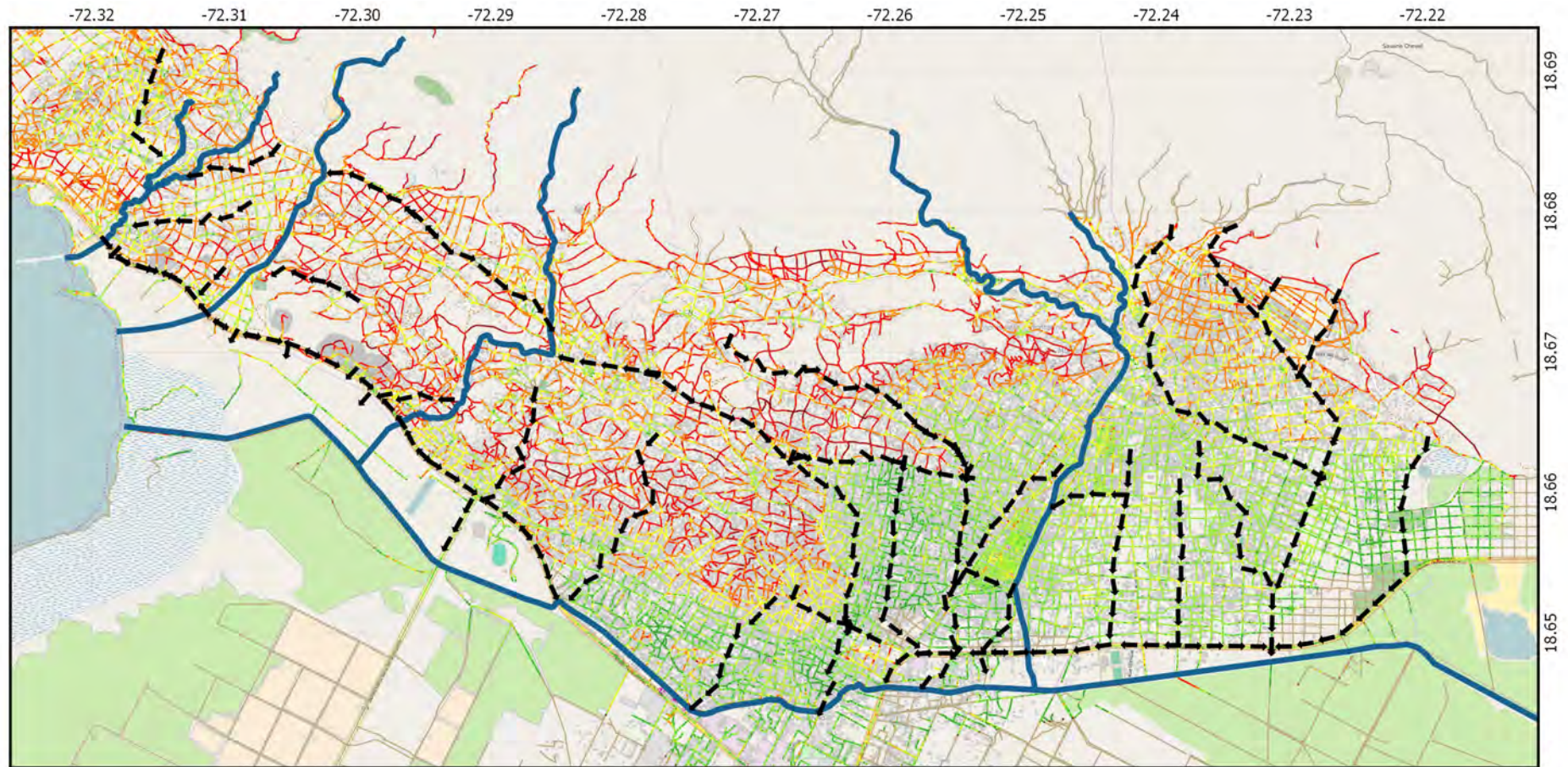0   1   2 km

Projection
WGS84 / UTM ZONE 18N

Description
Background: Open Street Map
Primary Canals: Ravines and Boukambrou Canal
Watersheds: DEM-derived (SRTM30m and LiDAR1m)
General Flow Direction: Engineering Assessment
Grid Coordinates: Lat/Long in Decimal Degrees

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NATURAL DEPRESSIONS

Depth of Depressions [m]

- ☐ < 0.1
- ☐ 0.1 - 0.3
- ☐ > 0.3

0   1   2 km

Projection
WGS84 / UTM ZONE 18N

Description

Background: Open Street Map
Depressions: DEM-derived (fill sink routine, TauDEM)
Grid Coordinates: Lat/Long in Decimal Degrees

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PRIMARY AND SECONDARY DRAINAGE PLAN

Roads with slope [%]
- 0-1
- 1-2
- 2-5
- 5-10
- 10-20
- 20-30
- 30-50
- >50

Primary Canals
Secondary Canals (arrows show flow direction)
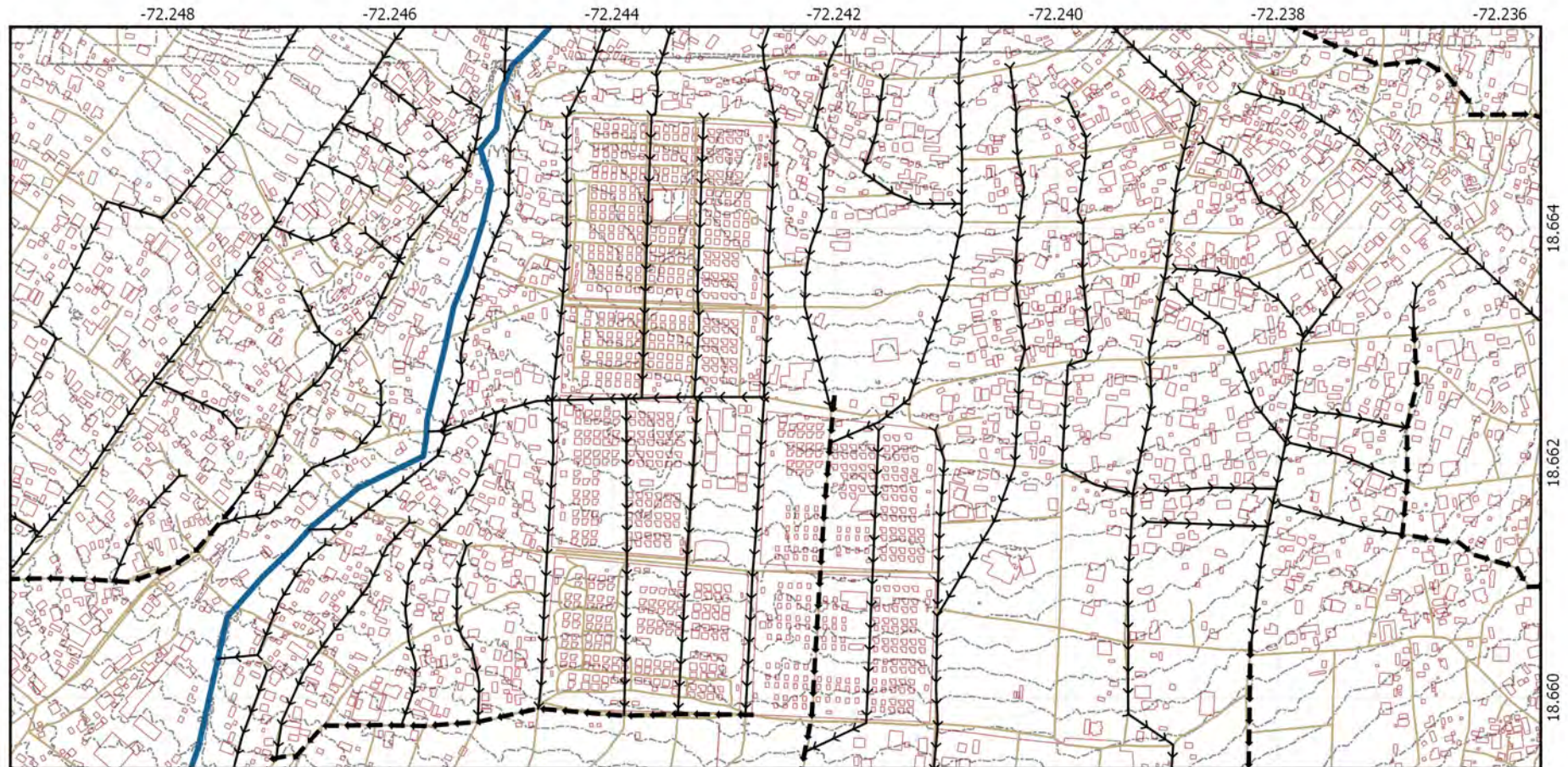Buildings (OpenStreetMap)

0   1   2 km

Projection
WGS84 / UTM ZONE 18N

Description
Roads: ONU Habitat, Open Street Map, slopes from DEM
Background: Open Street Map
Primary Canals: Ravines and Boukambrou Canal
Secondary Canals: Engineering Assessment

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EXAMPLE OF TERTIARY DRAINAGE PLAN

Legend:

- Buildings (OpenStreetMap)
- Contour lines (1m intervals)
- Roads/Streets
- Primary Canal (Ravine Lan Couline)
- Secondary Canals (arrows show flow direction)
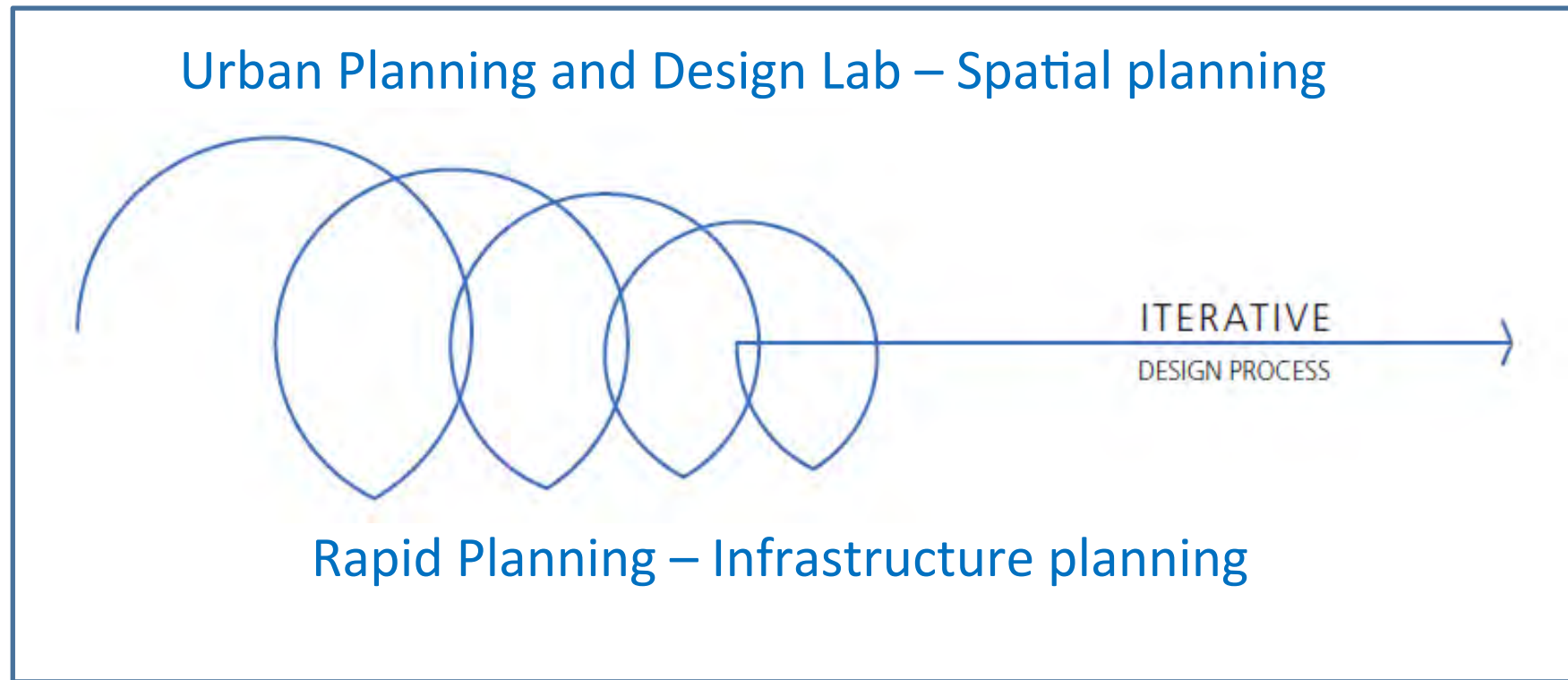- Tertiary Canals (arrows show flow direction)

0   100   200 m
Projection
WGS84 / UTM ZONE 18N

Description

Roads: ONU Habitat, Open Street Map
Buidlings: Open Street Map
Primary Canals: Ravines and Boukambrou Canal
Secondary/Tertiary Canals: Engineering Assessment
Contour Lines: Derived from DEM

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Rapid Planning in relation to

Iterative, complementarity and phased process

Urban Planning and Design Lab – Spatial planning

ITERATIVE
DESIGN PROCESS

Rapid Planning – Infrastructure planning

Infrastructure – Urban Planning – Urban form

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Integration of urban planning and infrastructure (across scales)

UPD-LAB (strategic – metro – city – neighbourh.)	RAPID PLANNING (infrastructure plan)
Data collection (Environmental and urban)	Data collection (for infrastructure)
Environmental and urban analysis (drainage and watershed management)	Energy
Urban structure	Water
Road and street network (sections)	Waste water and sanitation
Public space (open + health + education)	Solid waste
Plots and blocks	Urban agriculture
Rules, regulations and financial mechanisms	Tools (Trans-sectoral, simulation, scenario building, capacity development)

Relevant tools in rapid growth context

- Data collection and remote sensing – how to simplify, automatize, create a replicable structure, data base

  Land use – Land cover – urban morphology

- Material Flow analysis
- Trans-sectorial modeling
- Rapid Planning simulation tool
- Scenario building process
- Rapid Planning Knowledge System
- Stakeholder engagement
- Capacity development

"Fit for purpose" – Complexity vs. order of magnitude

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Way forward

- "Litmus test" of integration of Rapid Planning and UPD-Lab

  Concrete projects of the UPD Lab: Ghana, Mexico, Iraq…

  i)   Planned City Extension ii) Urban infill – different approach

- Integrate data collection processes: spatial and infrastructure

  Urban data warehouse – "plug in and use" for municipalities

- Package and simplify tools in a "fit for purpose" way and unified methodology and consistent user interface-Customer experience
  Comprehensive vs. Rapid --- order of magnitude
  Formal   vs. Informal

- Shape tools to promote ministerial – municipal coordination
- Capacity development: partners and municipalities package
- Strengthen linkages with political decision-making process