From **SPRAWL** to **COMPACT PRIMARY CITY**

The application of Transit-Oriented Development and resurrection of water transport to enable livable and socially diverse environments in Bangkok

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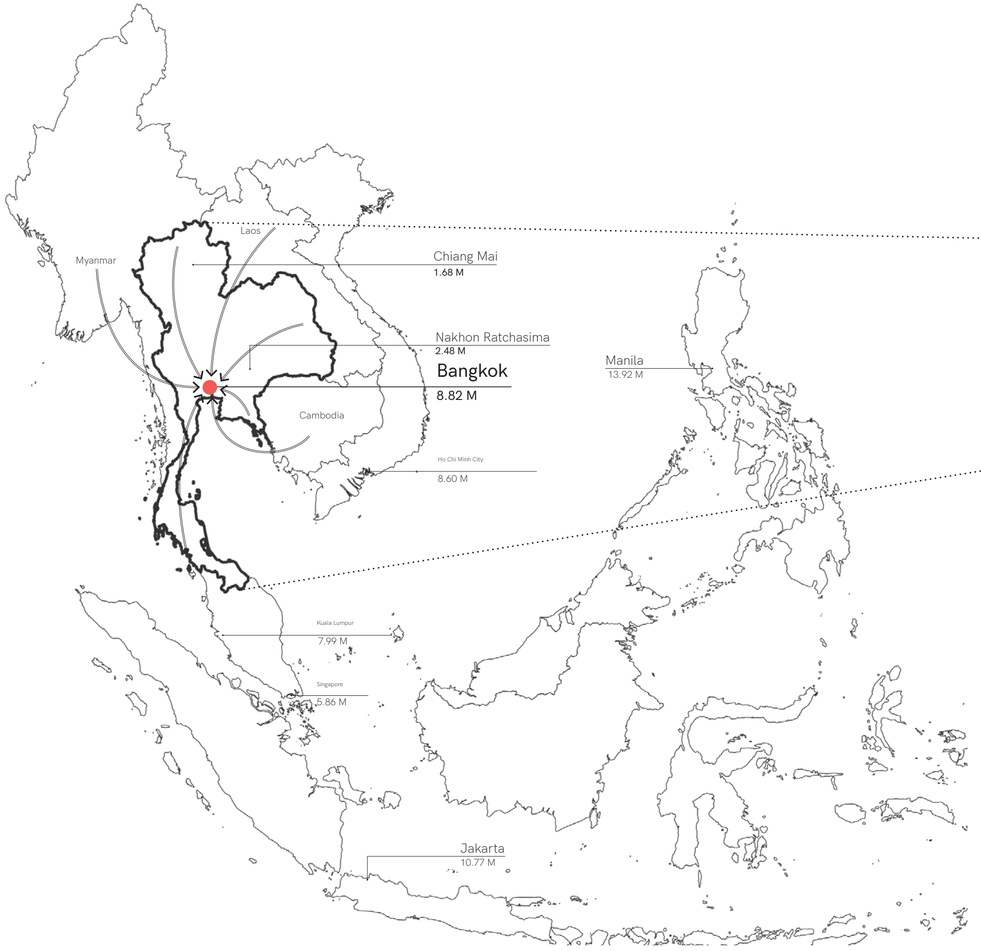
Second mentor
Dr.ir. Gregory Bracken

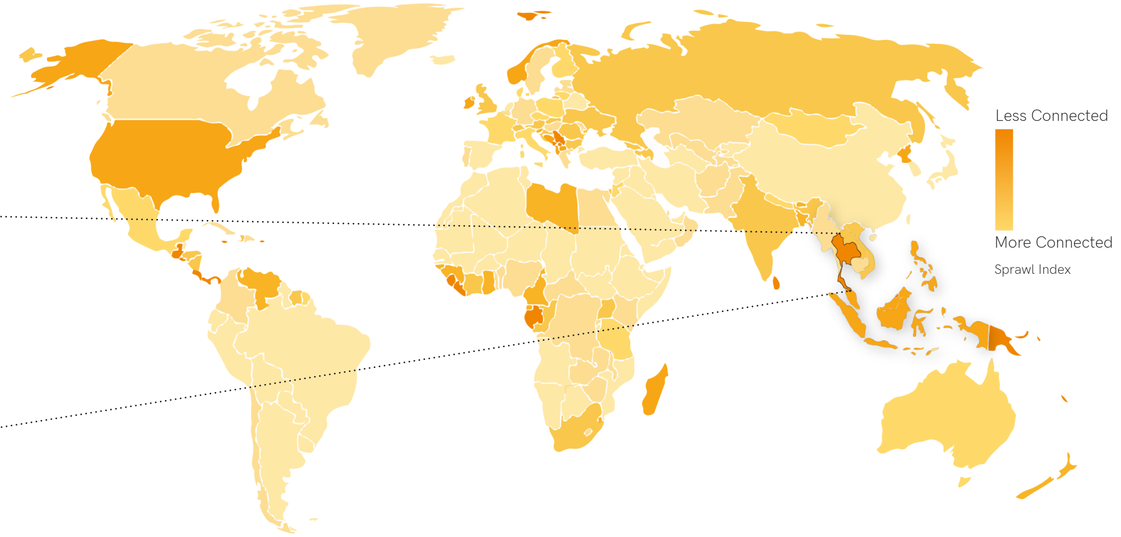
P5 Presentation
01/07/21

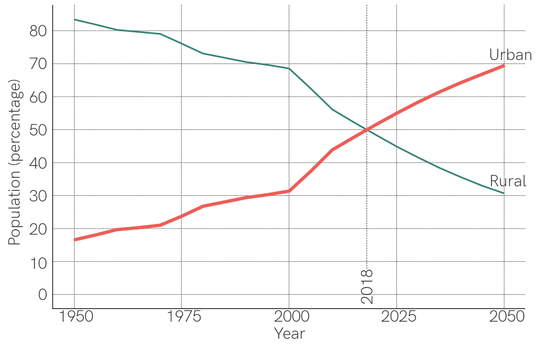
Source: author

Problem Field



Country's primary city





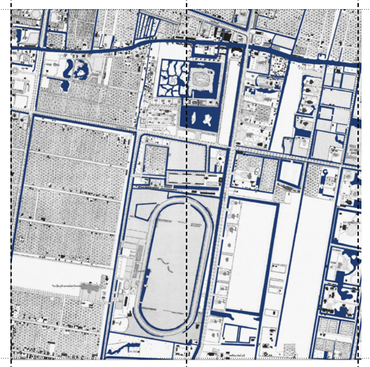
Rapid urbanization

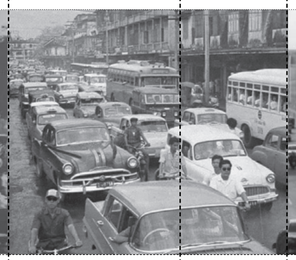
Sprawl Index (SNDi)

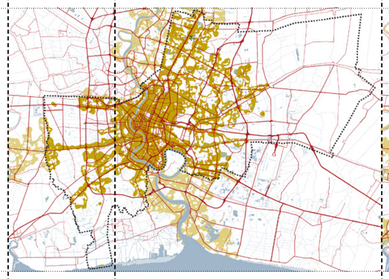
	<1990	1990 to 1999	2000 to 2013	Stock
Bangkok, Thailand	**6.8**	**7.6**	**8.1**	**7.3**
Guatemala City, Guatemala	3.8	5.6	7.5	4.5
Cebu City, Philippines	6.1	6.9	7.3	6.6
Los Angeles, CA, USA	3.6	6.2	6.3	3.9
Raleigh, NC, USA	4.8	5.4	6.3	5.6
Palembang, Indonesia	4.7	5.6	6.3	5.2
New York, NY, USA	2.9	5.2	6.3	3.1
San Salvador, El Salvador	4.4	7.1	6.1	5.0
Belgrade, Serbia	2.9	6.6	6.0	4.2
Tijuana, Mexico	4.3	3.6	6.0	4.4

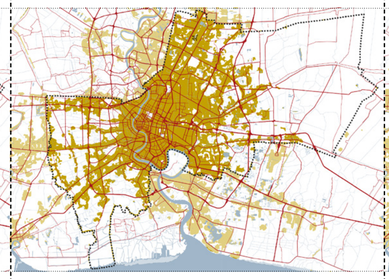
Problem Analysis

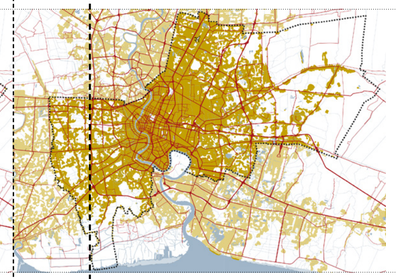
From water-based to land-based development

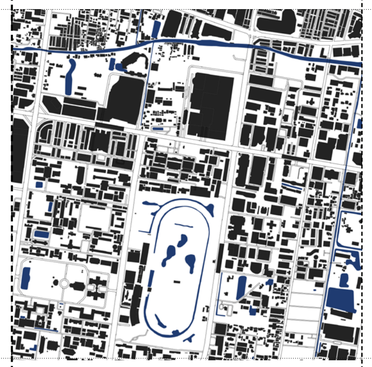










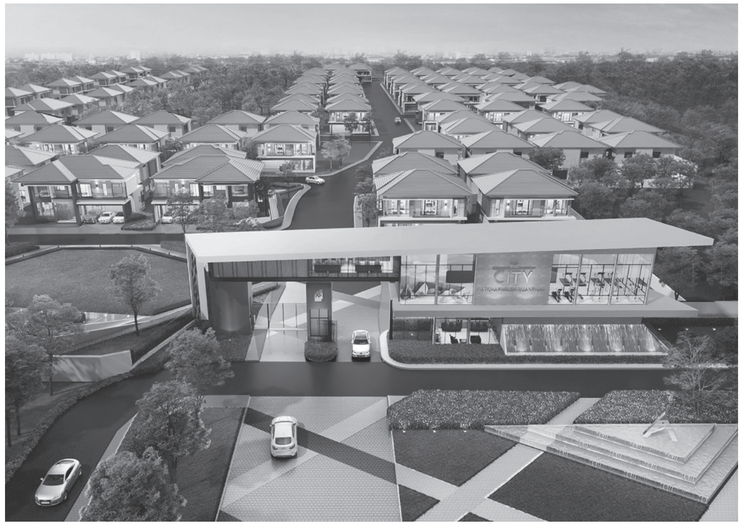


1865 1900 1932 1960 1988 1992 2002 2015 2020

Problem Analysis

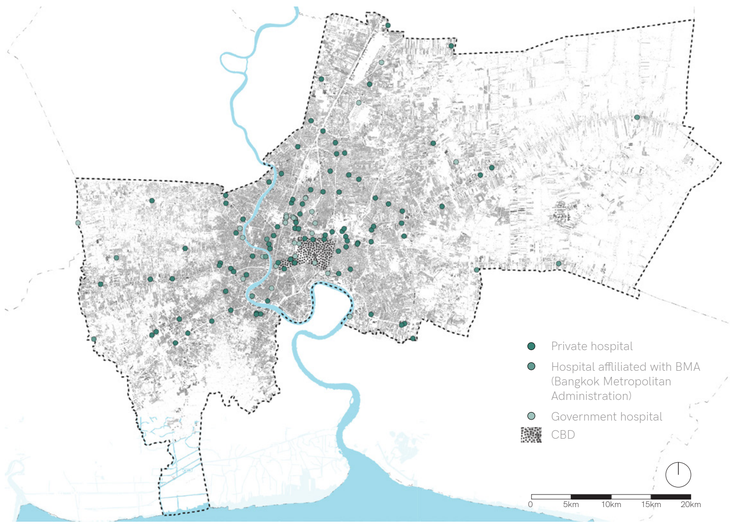
Land-based development

Metropolitan scale



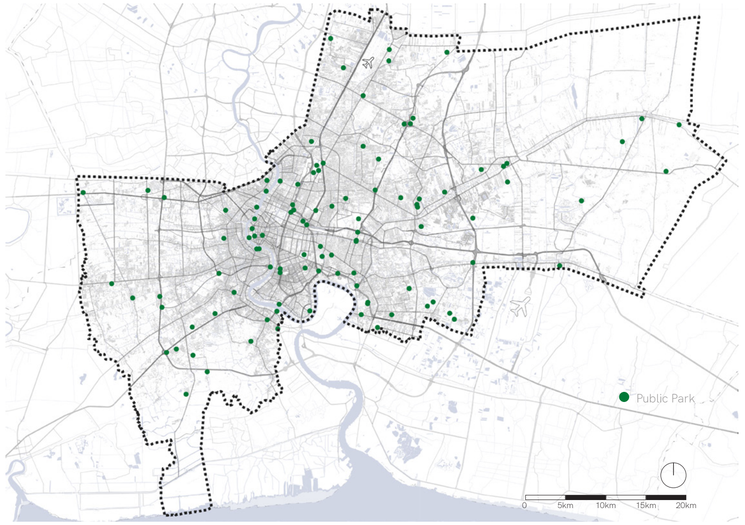
Source: AP Thai (n.d.)

Suburban gated communities



Source: Author, derived information from BMA GIS Center (2020)

Concentration of services



Source: Author, derived form The Urbanis (2020)

Green public space (m^2)

BKK	WHO	PAR	SIN	
5.23	< 9.0	< 13.2	< 56.0	Per capita

Scarcity of public space

Problem Analysis

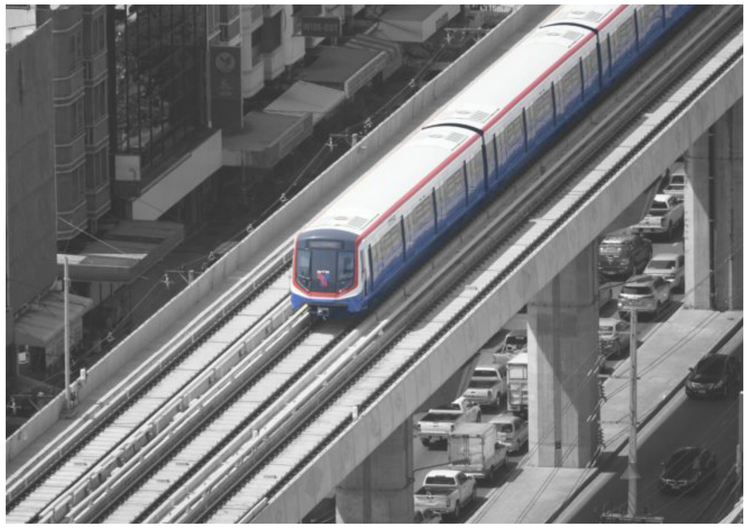
Land-based development

Metropolitan scale

Bangkok traffic jams among world's worst

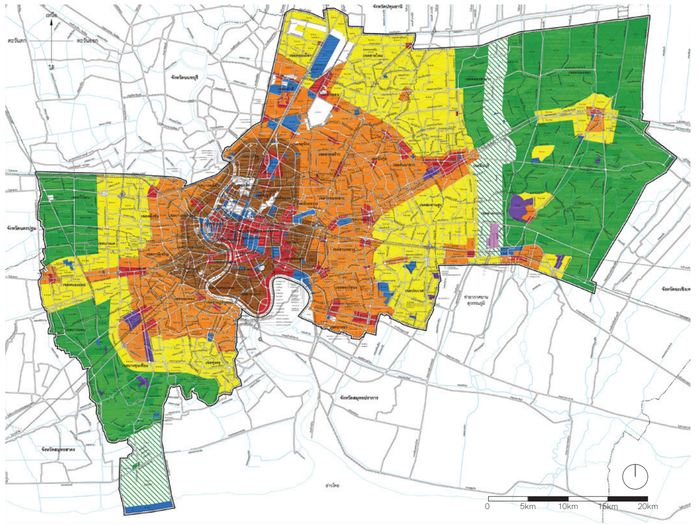
Source: Bangkok Post Public Company Limites, (2017)

Car-oriented city



Source: The Bangkok Insight (2020)

Development of rail public transport



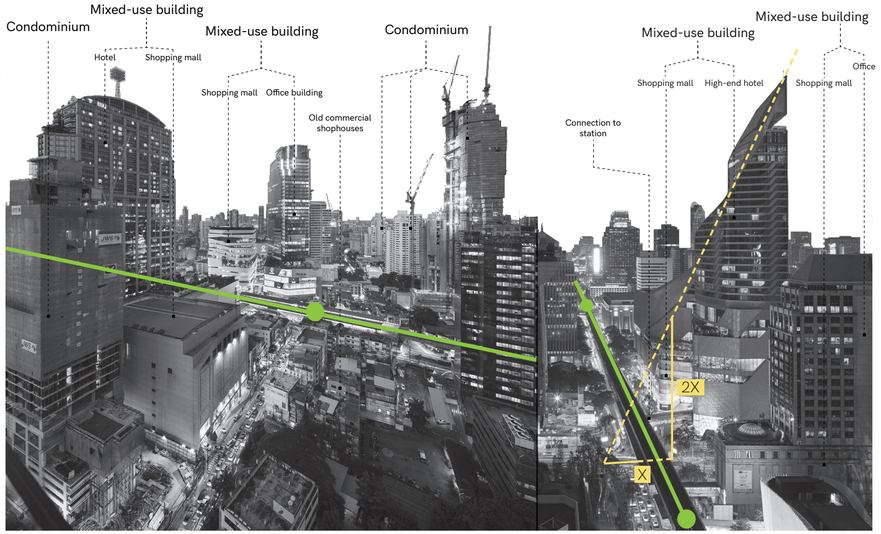
Source: Plan4Bangkok, (2020)

Readjustment of the city comprehensive land-use plan

Problem Analysis

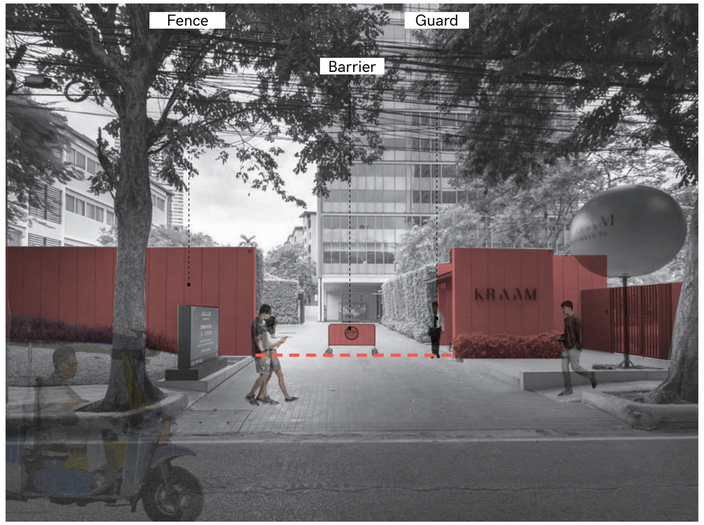
Land-based development

Micro scale



Source: Author, adapted from Architonic (n.d.), and Boiffils (n.d.)

Market-led development



Source: Author, adapted from Propholic (2019)

Urban high-rise gated communities

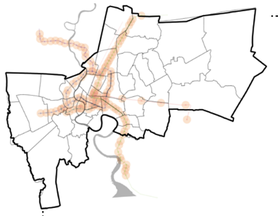
Source: Author, adapted from Limjittrakorn (2019)

Transit-induced gentrification

Problem Analysis

Water-based development

Metropolitan, district, and micro scale



Source: The Standard (2017)

Geographical context of floodplain

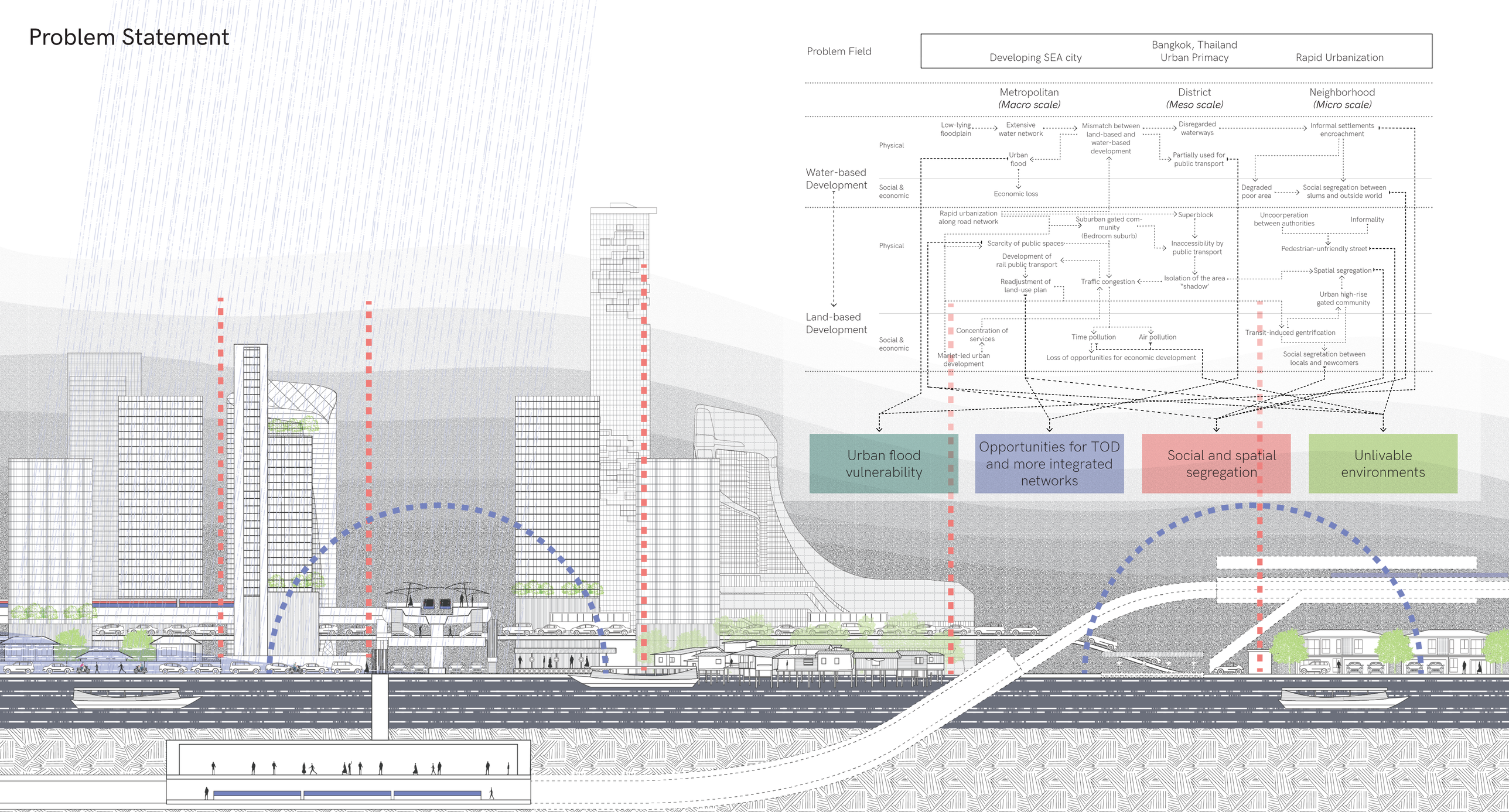
Source: ThaiHealth (2018)

Partially used for public transport

Source: Urban Creature (2019)

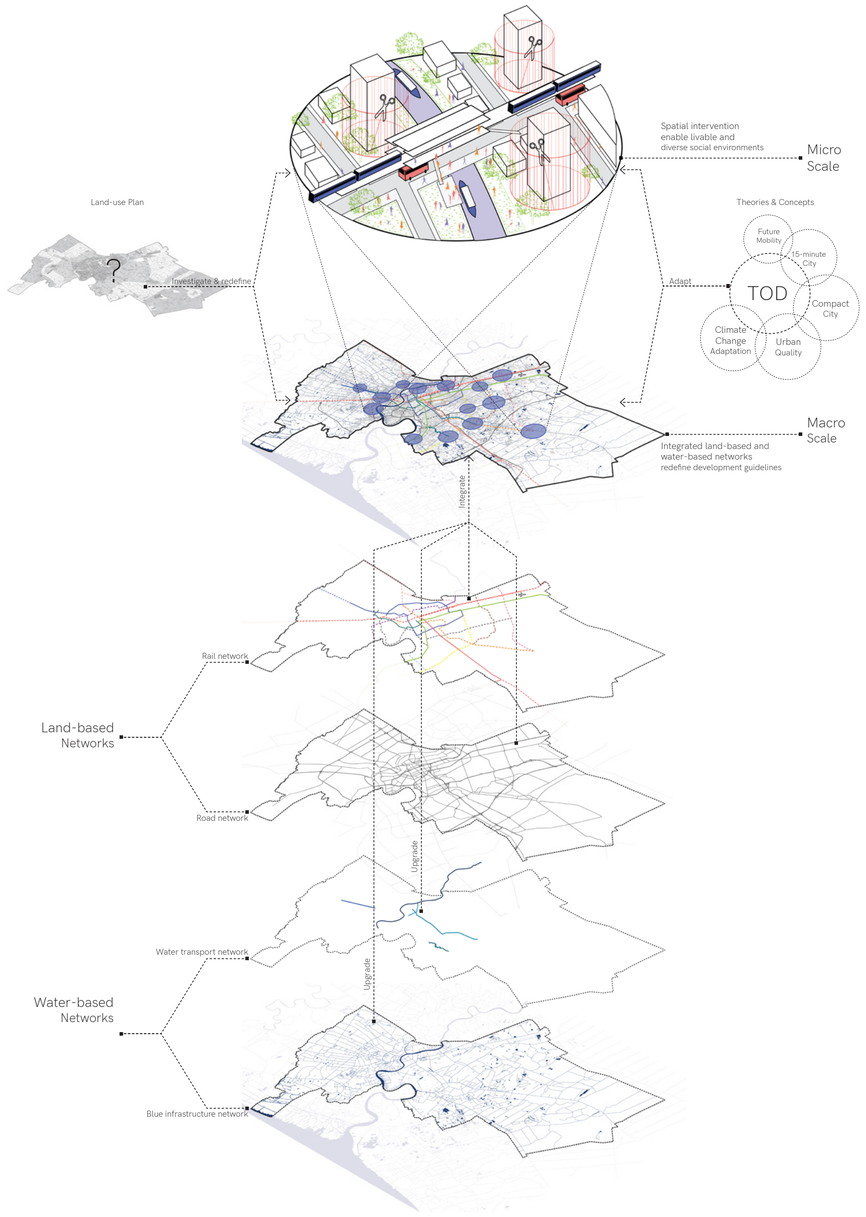
Enchroachment by informal settlements

Problem Statement



Problem focus

Research Aim



Research Question

SQ1 Which aspects of Transit-Oriented Development are specifically applicable to Bangkok?

SQ2 Which station area could serve as a pilot project?

SQ3 Which waterways have potential to be developed for daily commute transport?

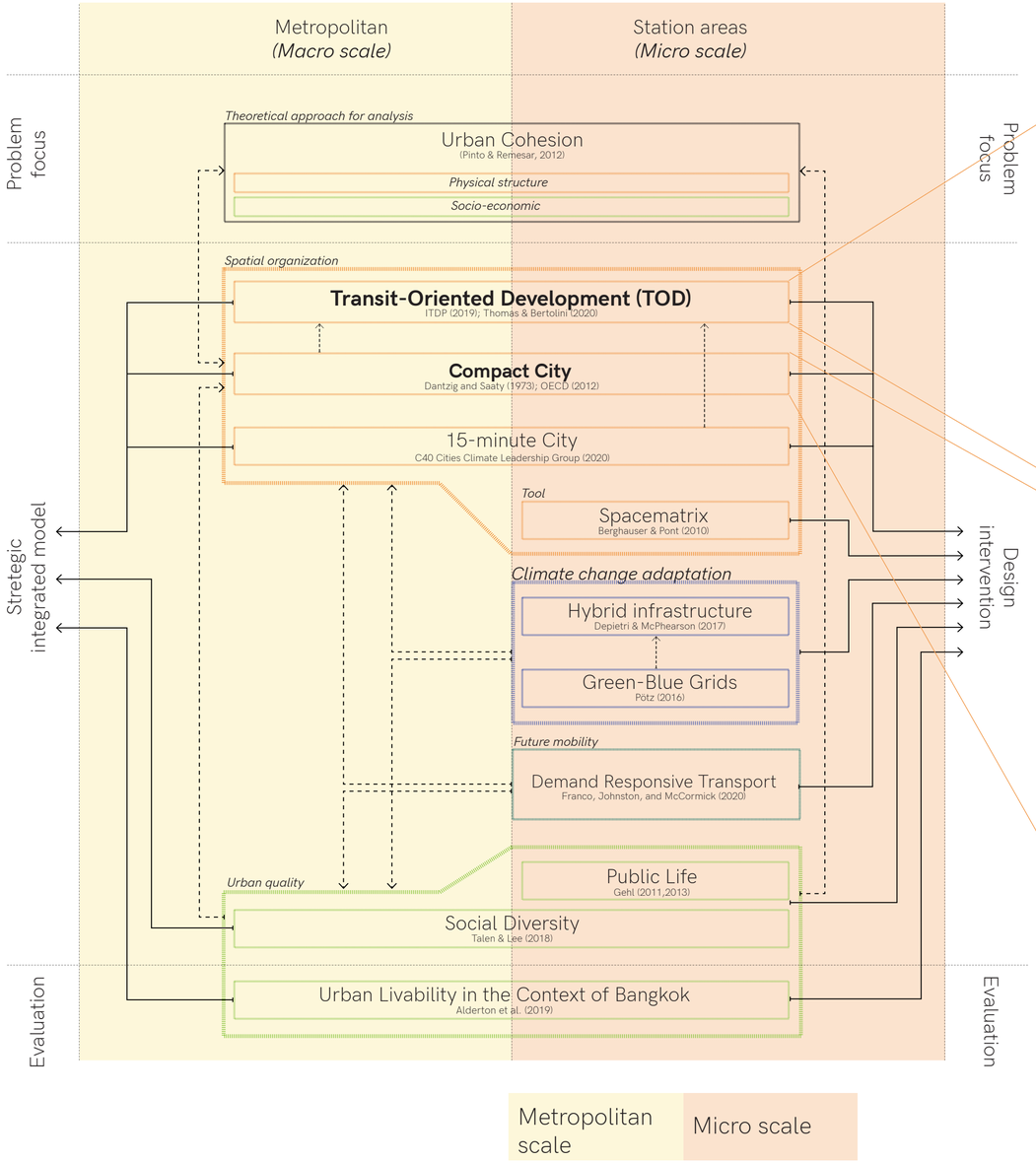
SQ4 How to revitalize the neglected water systems to mitigate flood vulnerability and integrate them with the mobility?

How can Transit-Oriented Development transform the area surrounding emerging intermodal nodes in Bangkok and **integrate with the water-based transport**, in order **to achieve the more compact city**, where **livable and socially diverse environments**, are provided?

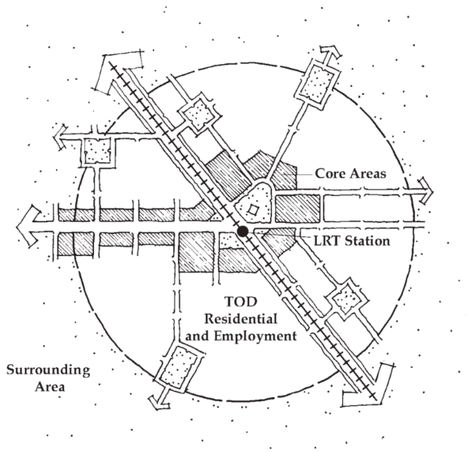
SQ5 What does the concept of compact city mean in the context of Bangkok?

SQ6 How can urban fabrics stimulate livable and socially diverse environments in Bangkok? What are the main principles?

Theoretical Framework



Transit-Oriented Development (TOD)



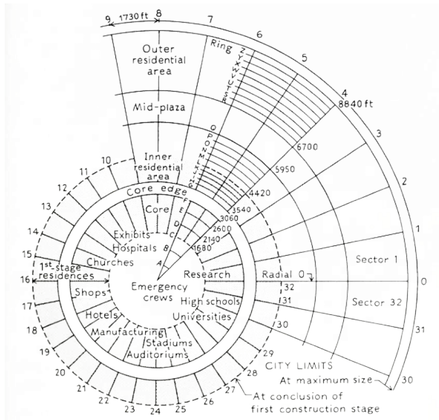
Source: Calthorpe Associates (2002)

High-density mixed-use developments

X

Public transport system

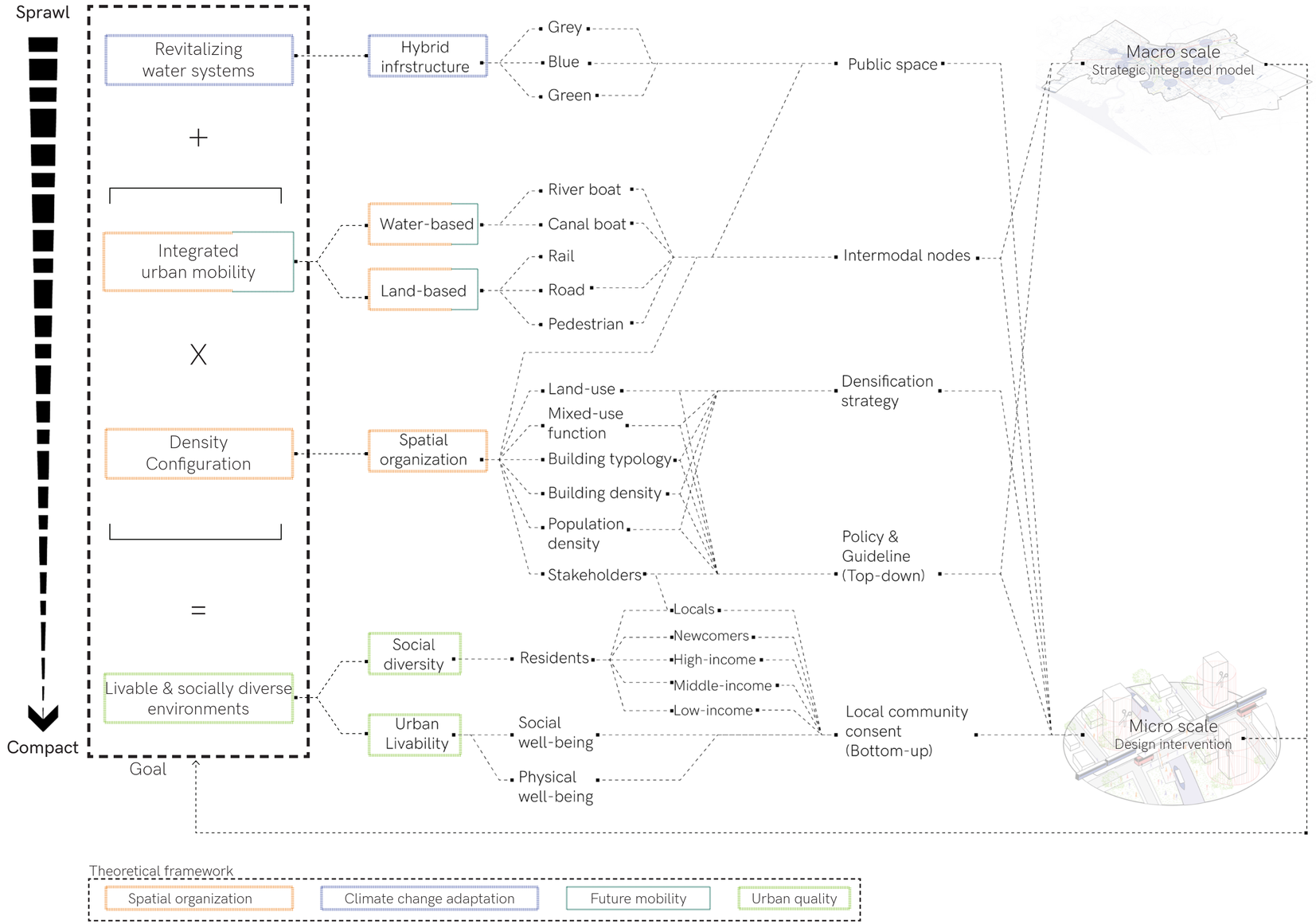
Compact City



Source: Dantzig and Saaty (1973)

Arranging out vertical urban areas to reduce travel time

Conceptual Framework

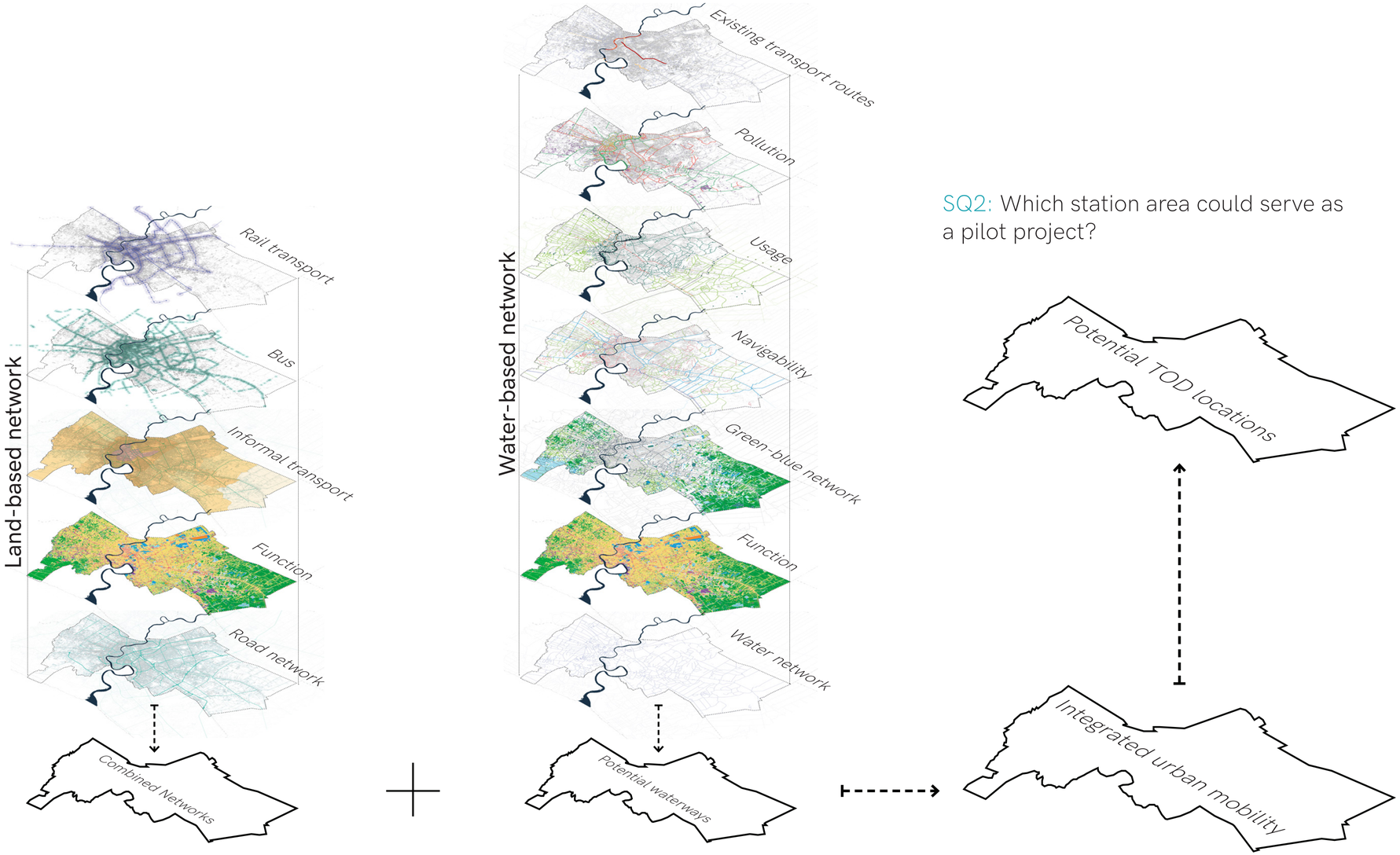


Finding potentialities

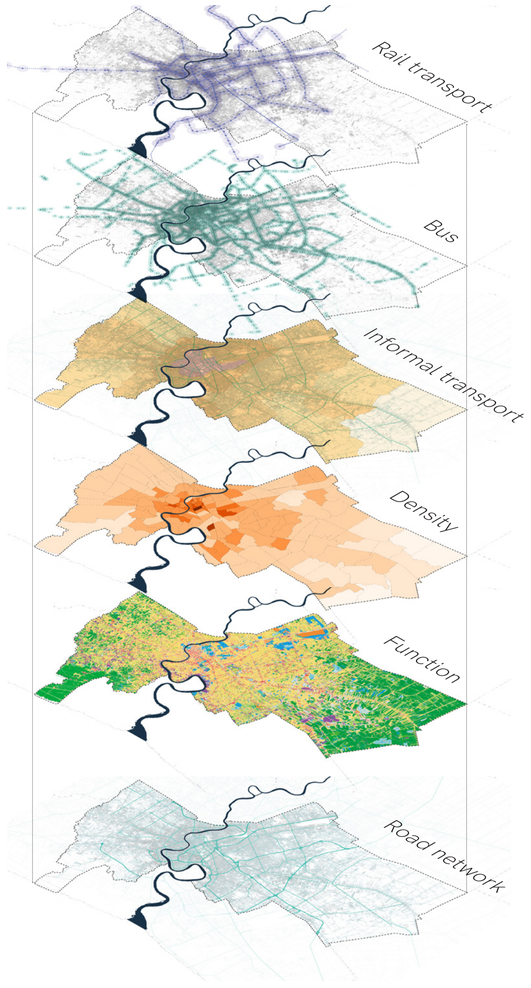
Macro-scale analysis

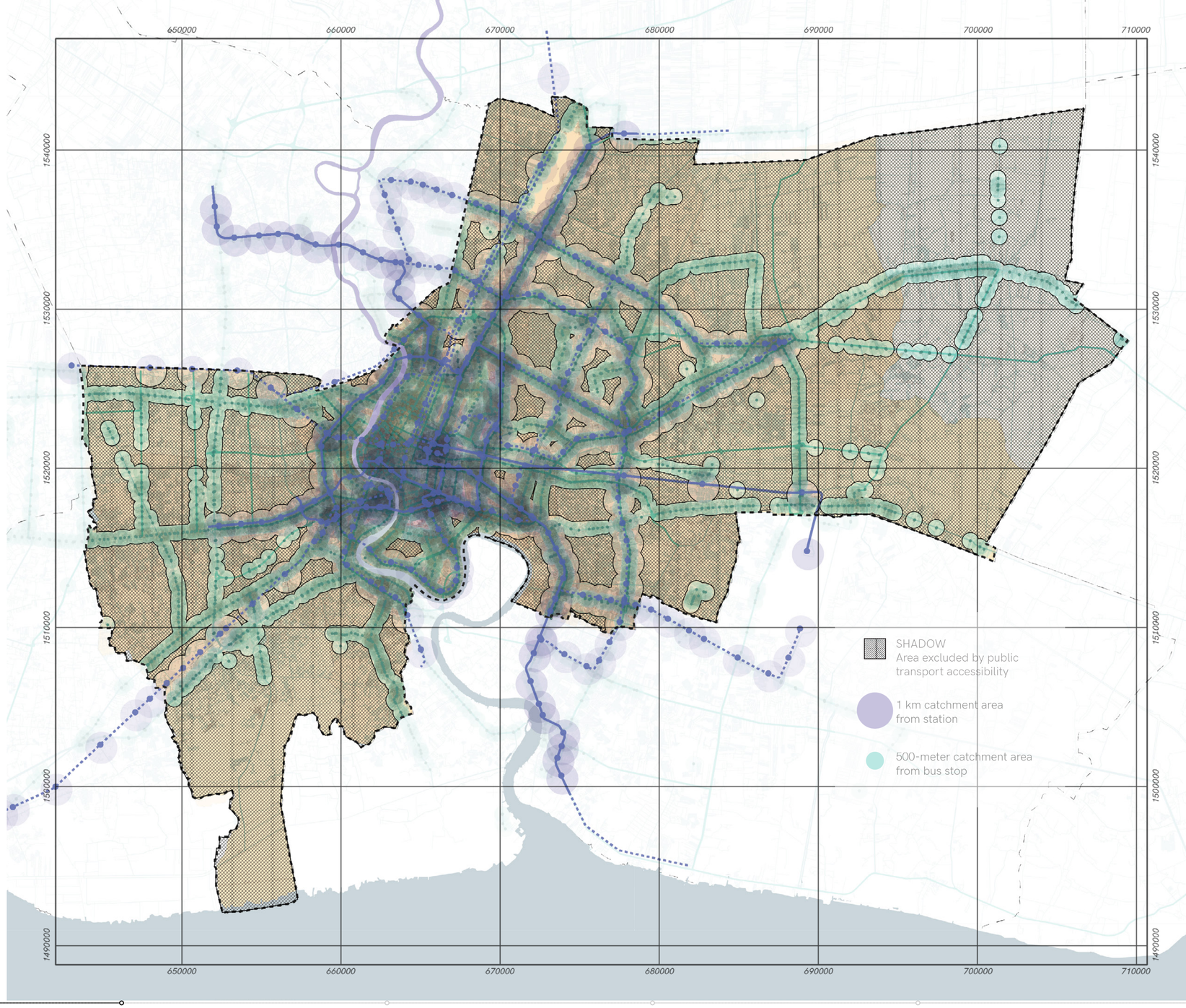
Source: hathaway_m (2019)

Roadmap

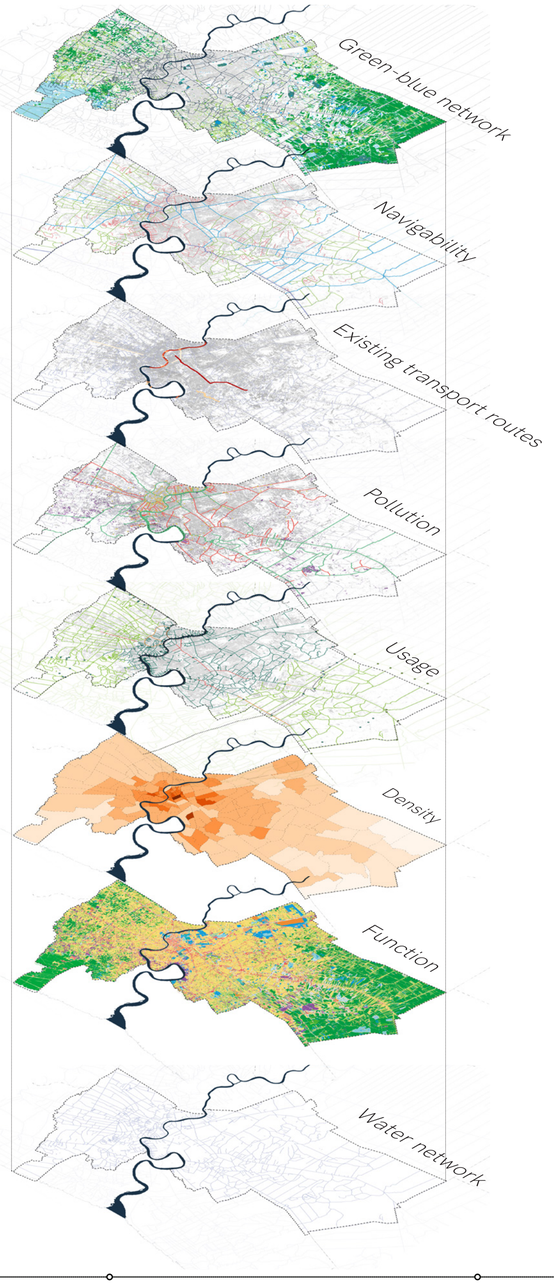

Land-based network
Rail transport
Bus
Informal transport
Function
Road network
Combined Networks
Water-based network
Existing transport routes
Pollution
Usage
Navigability
Green-blue network
Function
Water network
Potential waterways
SQ2: Which station area could serve as a pilot project?
Potential TOD locations
Integrated urban mobility
SQ3: Which waterways have potential to be developed for daily commute transport?

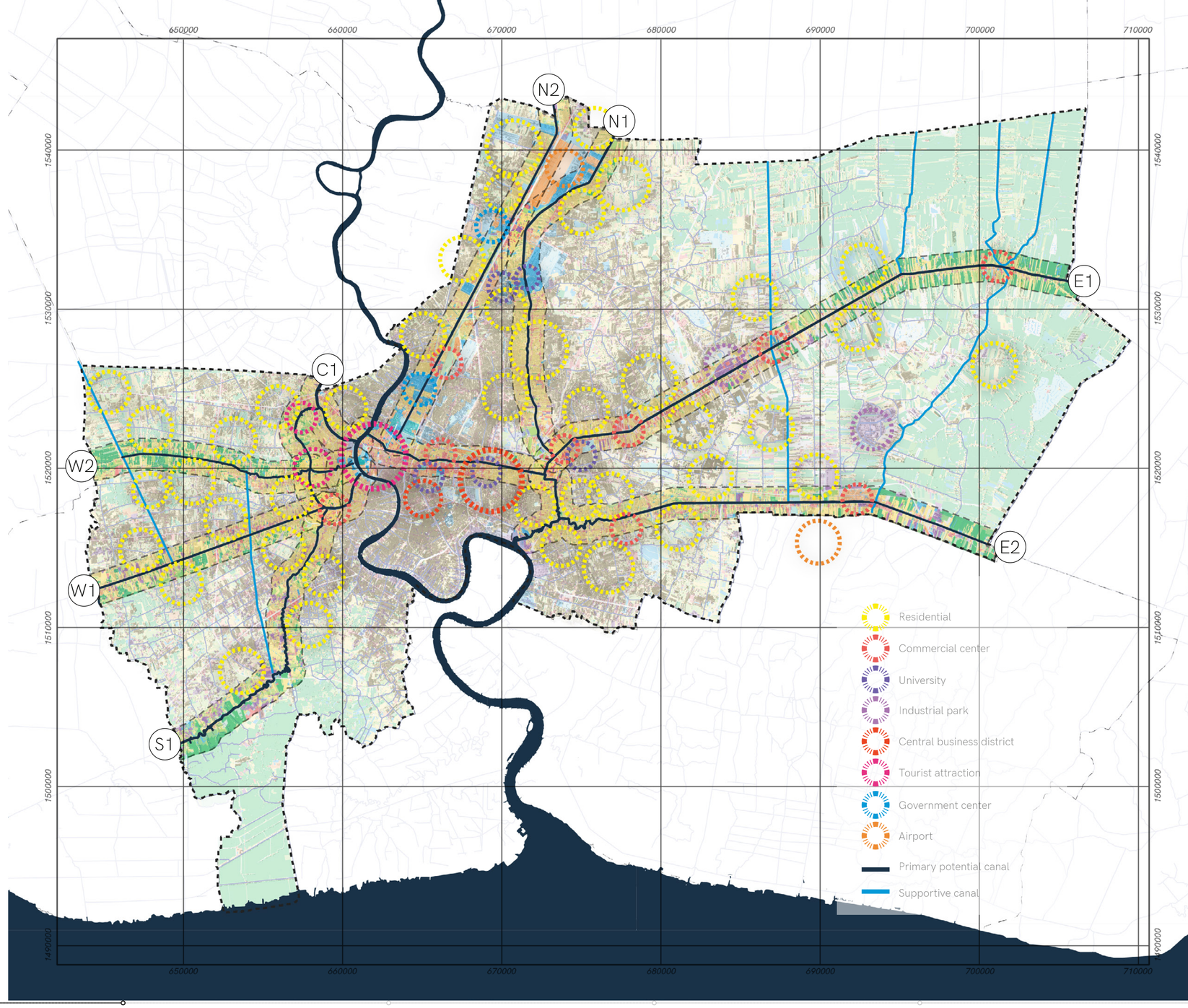
Land-based networks





Potential waterways





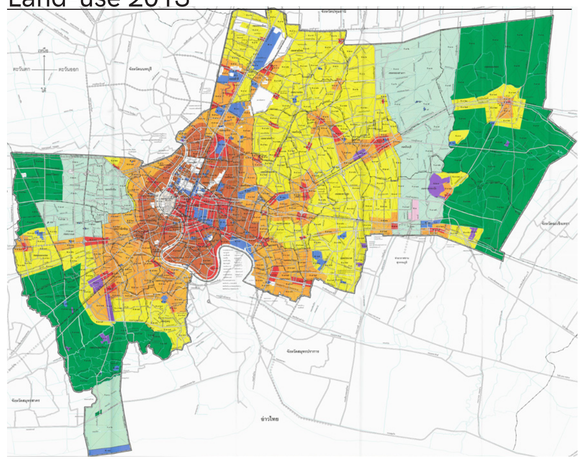
Potentialities

Pilot project and potential TOD locations

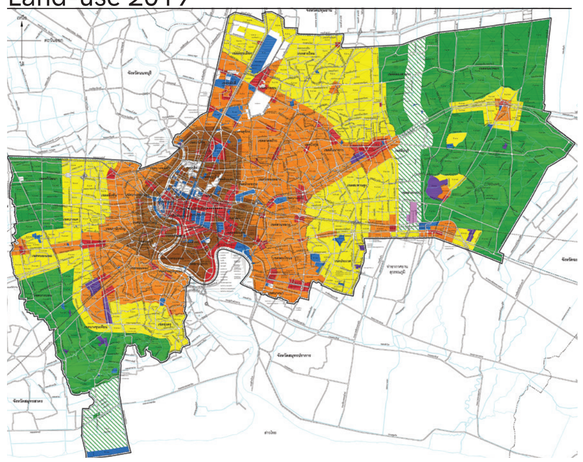
Potentialities

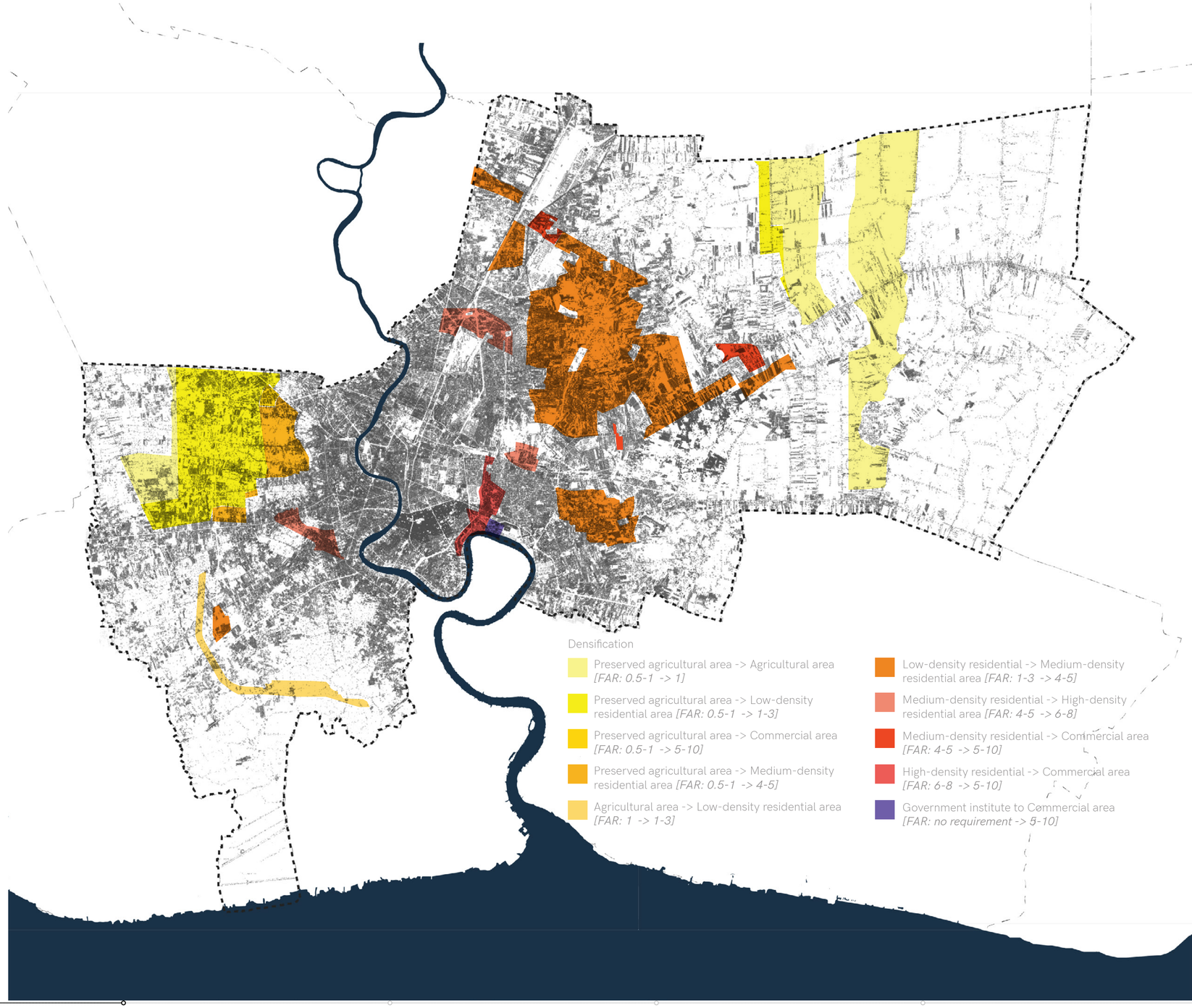
Land-use plan

Land-use 2013



Land-use 2019



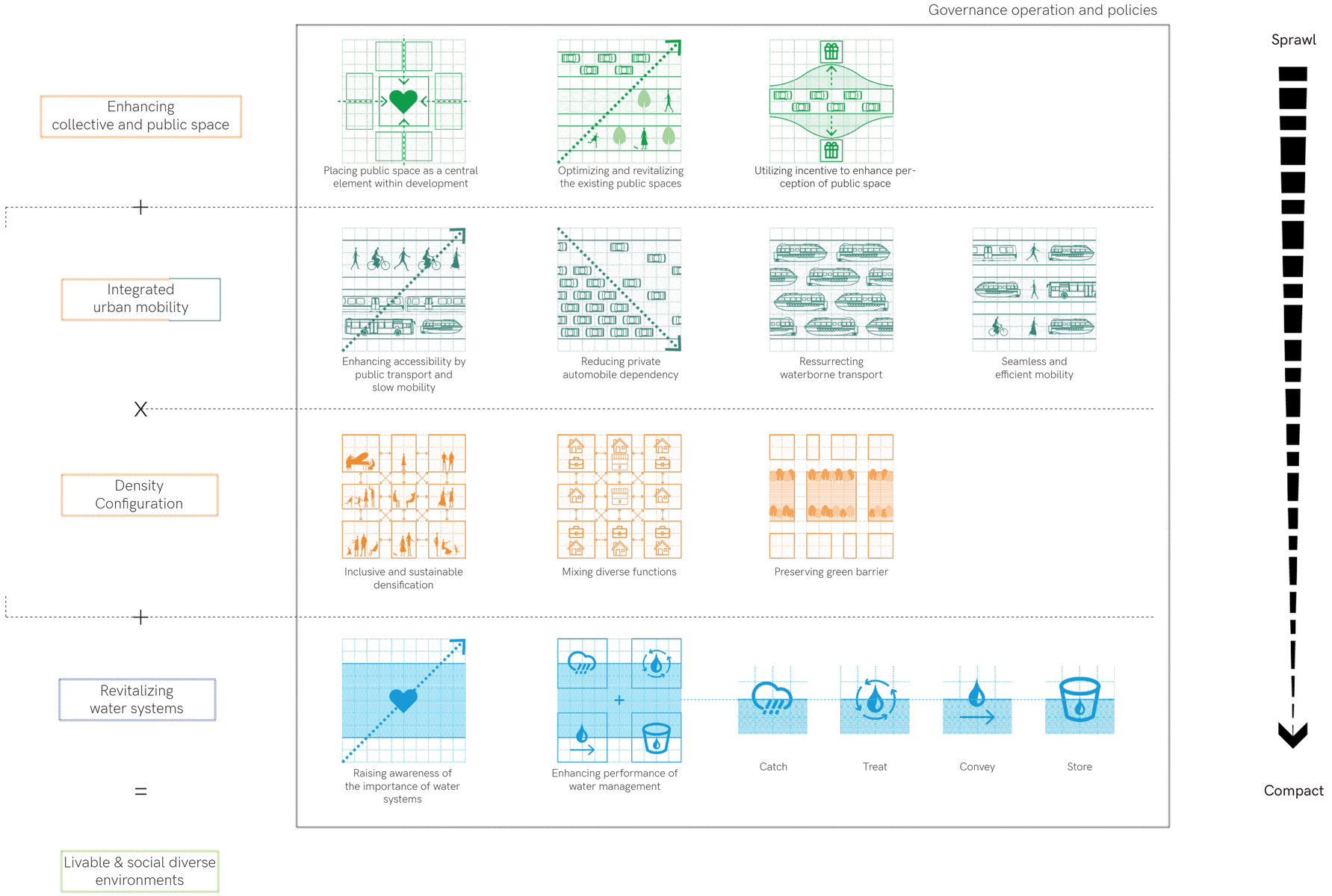


Macro-scale integrated model

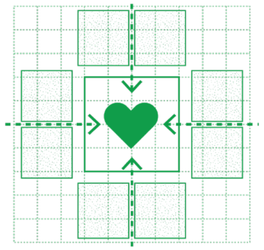
Source: NSU MON (2020)

From Sprawl to Compact Primary City, Bangkok 2050

Strategy

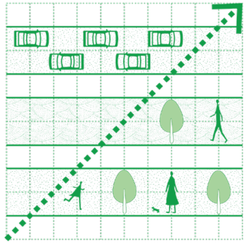


Enhancing collective and public space



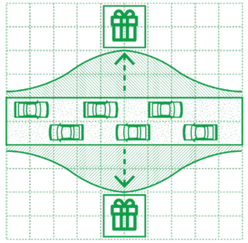
1 Placing public space as a central element within development

Transit stations, canal sides



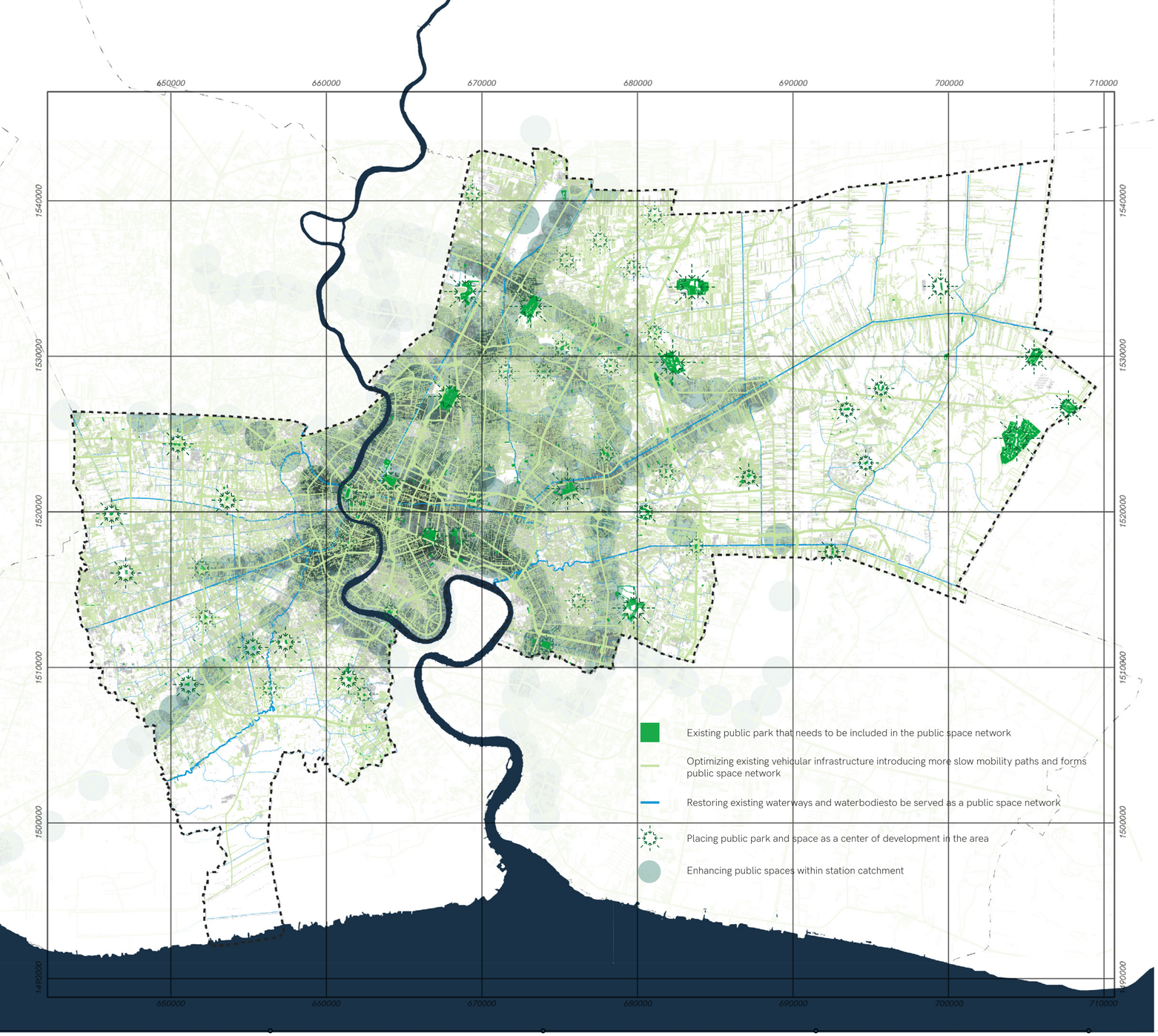
2 Optimizing and restoring existing public spaces

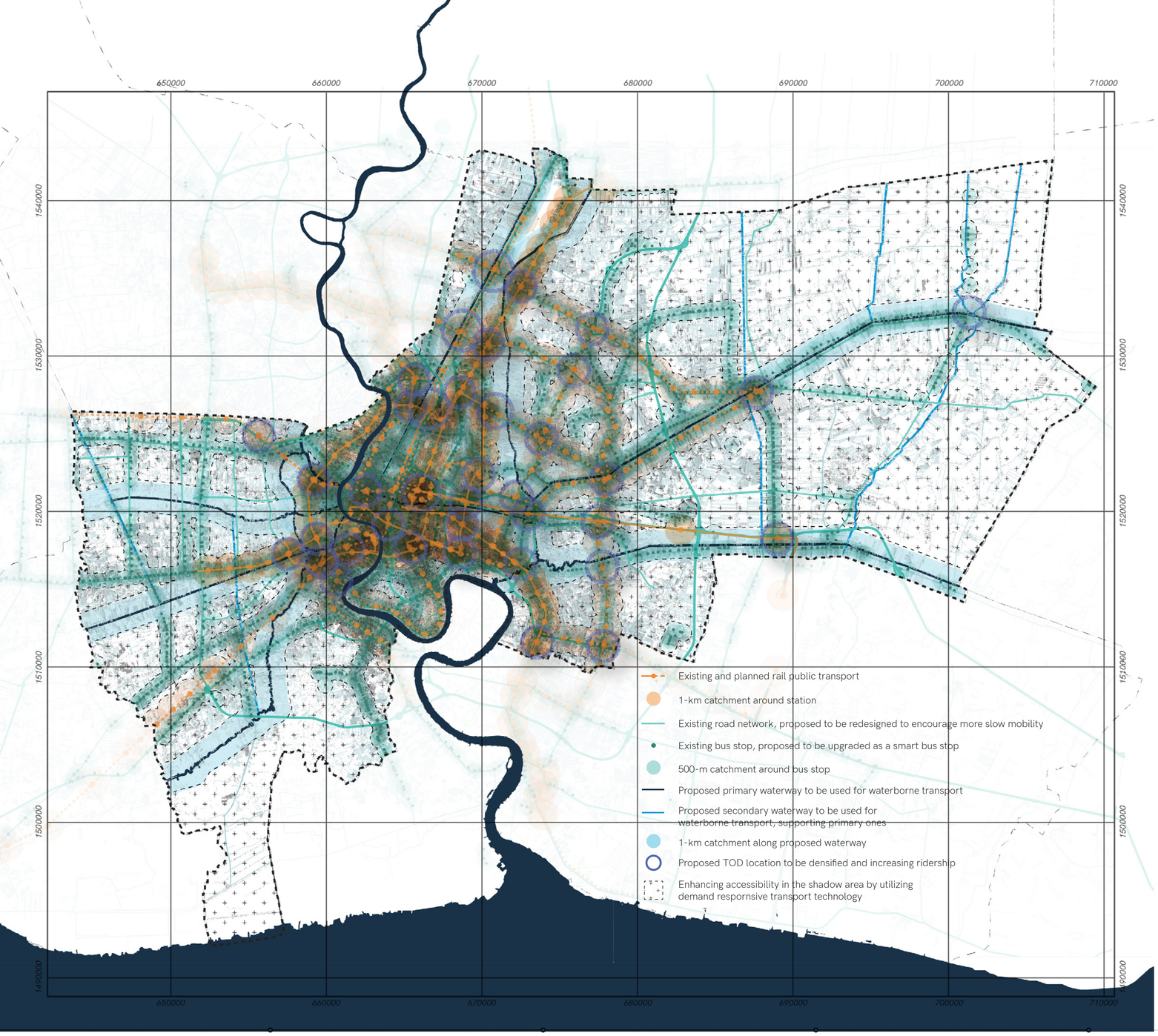
Reclaming vehicular infrastructures to allow for more active mobility



3 Utilizing incentive to enhance perception of public space

Privately-owned public space

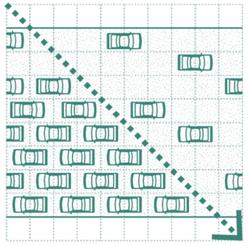




Integrated urban mobility

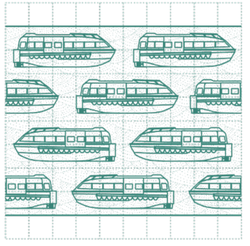
1 Enhancing accessibility by public transport and slow mobility

More extensive and affordable
Demand Responsive Transport in the hinterland



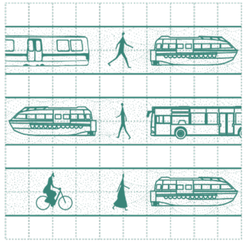
2 Reducing private automobile dependency

Electronic Road Pricing (ERP)
Green taxes



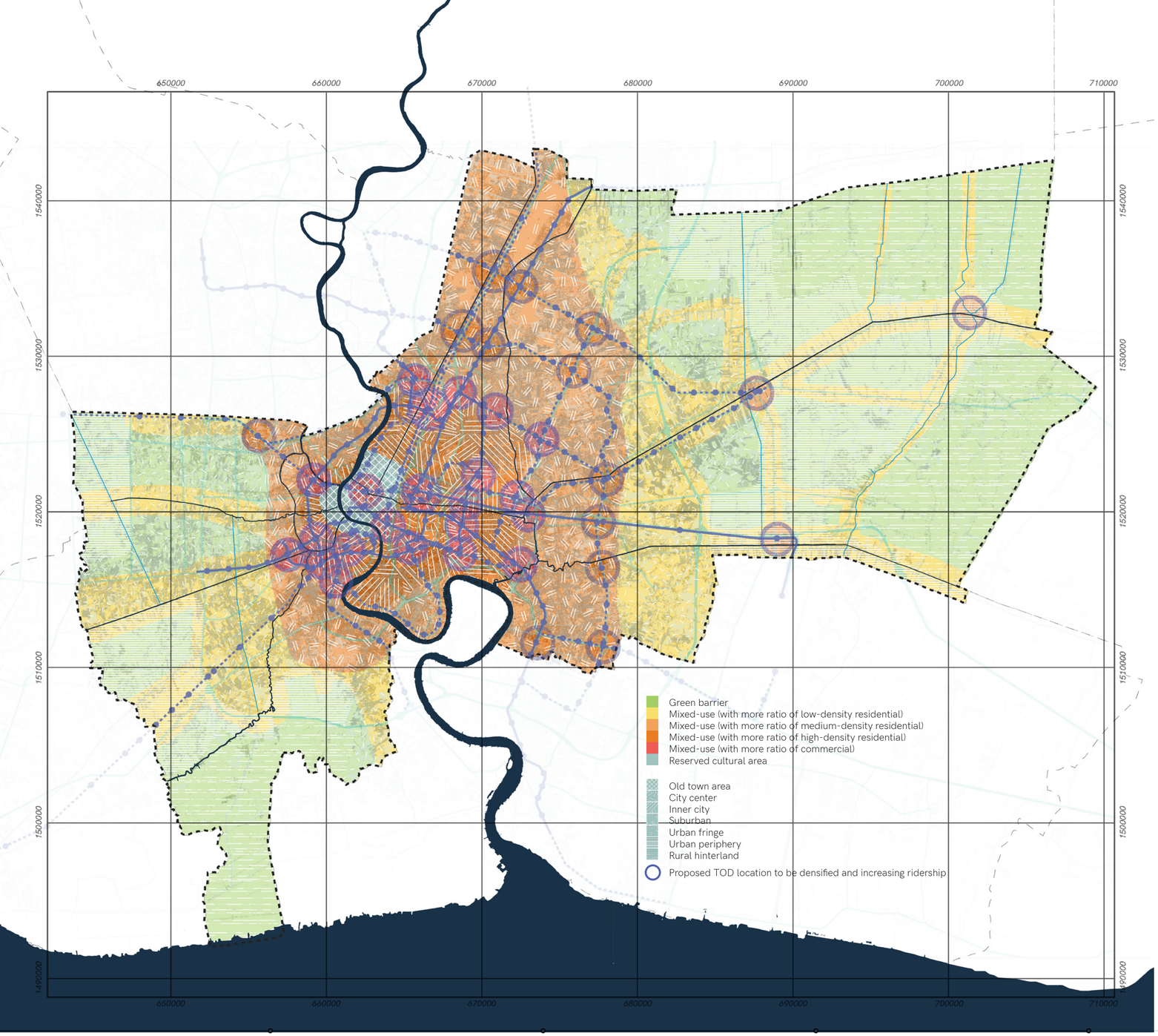
3 Resurrecting waterborne transport

Smart mobility and autonomous boat

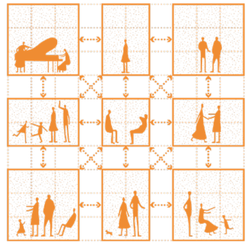


4 Seamless and efficient mobility

Facilities at the station
Real-time schedule, integrated fare collection

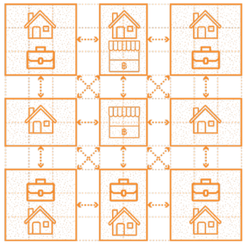


Density configuration



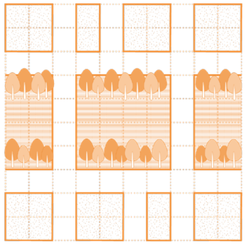
1 Inclusive and sustainable densification

Preserving local community and business
Providing more affordable housing



2 Mixing diverse functions

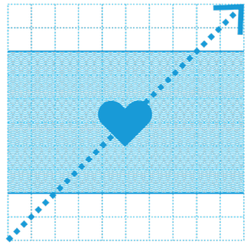
Multifunctional area around stations



3 Preserving green barrier

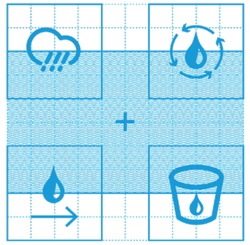
Physical territories against urban sprawl

Revitalizing water systems



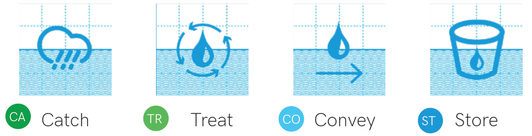
1 Raising awareness of the importance of water systems

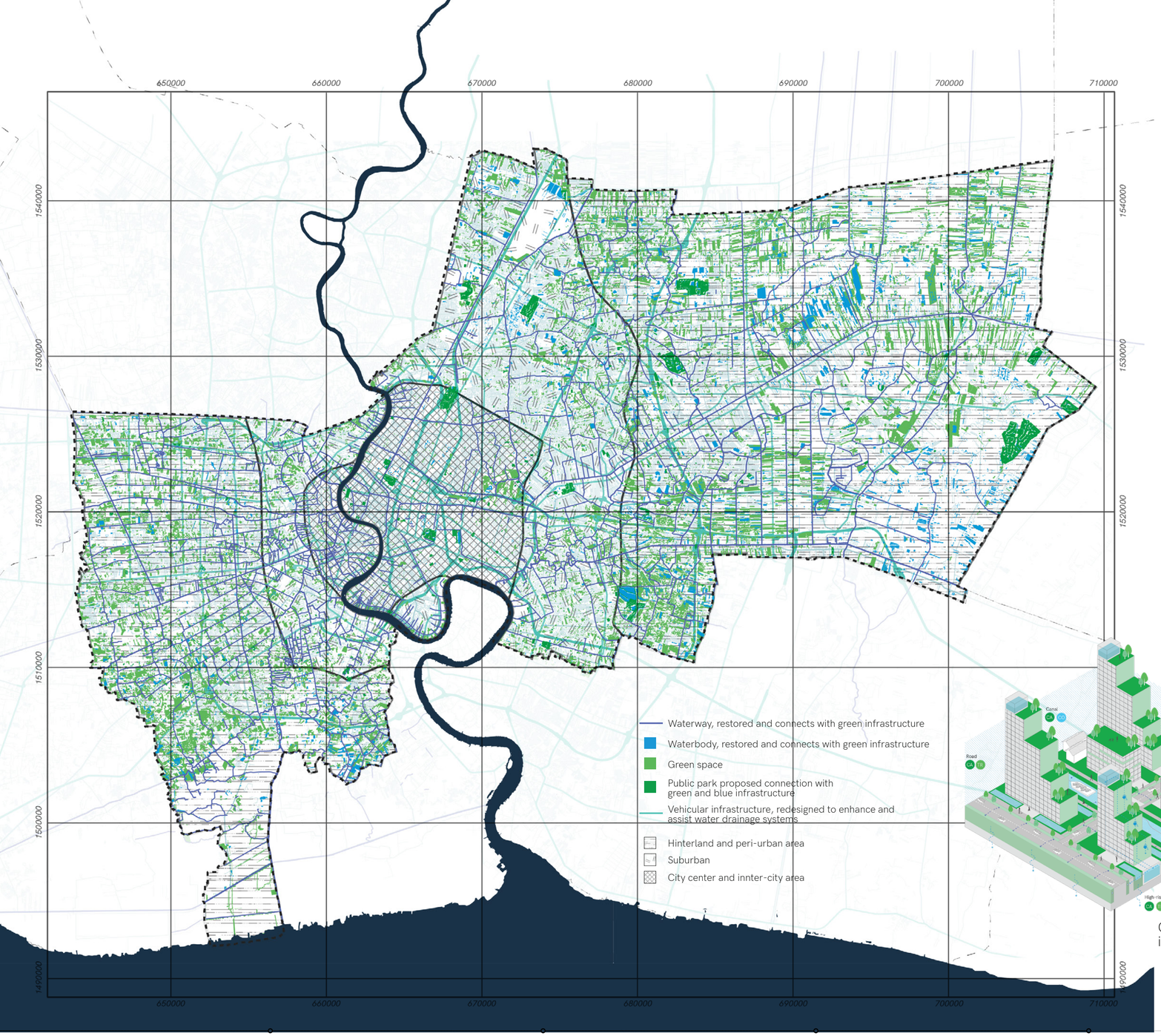
Altering people's perception towards canals from dumpster to attractive public realm



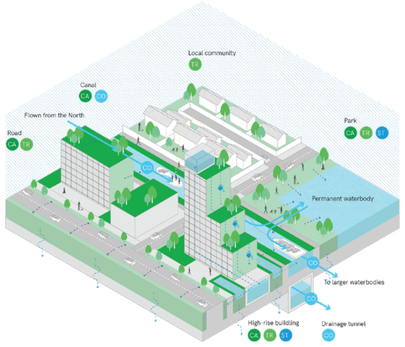
2 Enhancing performance of water management

Optimization of green-blue-grey infrastructure

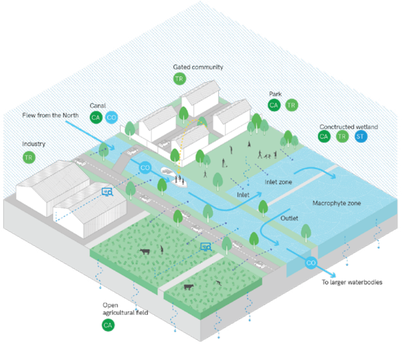




City center and inner-city area

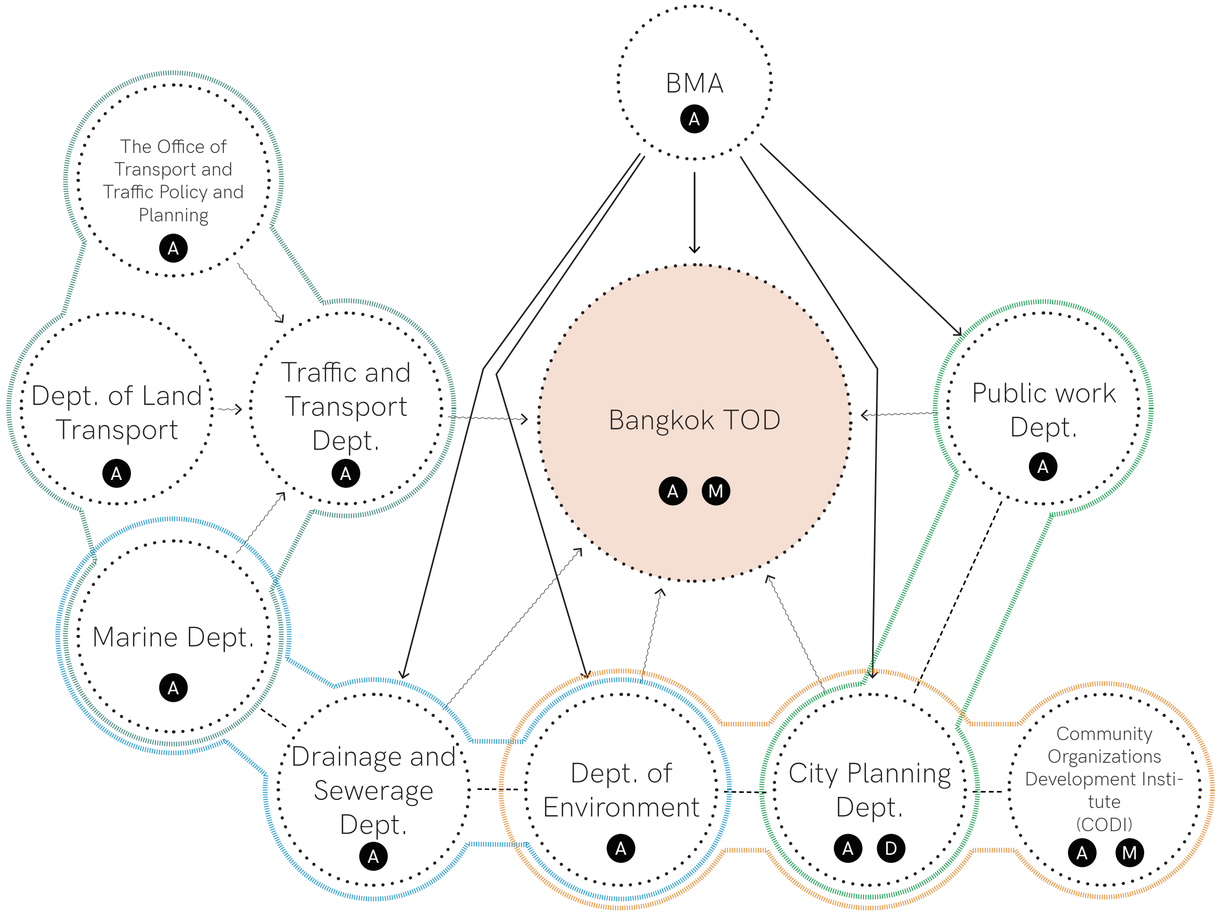


Suburban



Hinterland and peri-urban area

Operation



Legend

Role

A Authority
DV Developer
M Management
O Owner
D Designer
R Residents / Residents association
B Retailers / F&B / Business association
OA Other association
V Visitor

Impact

High impact

Low impact

Sector

Public sector

Private sector

Public & private sector

Proposed sector

Cooperation

Found

Strongly connected

Target

Support

Layer

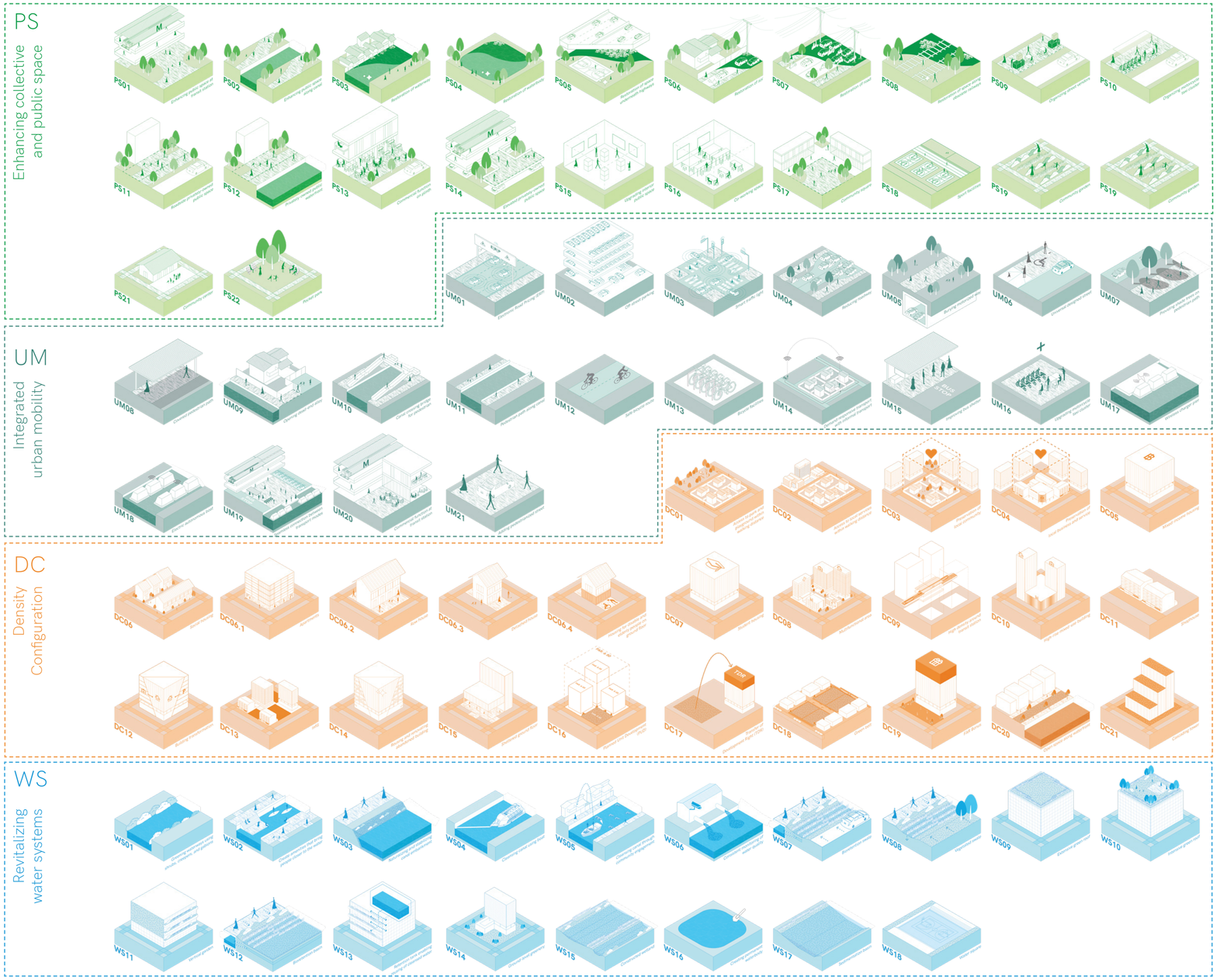
Enhancing collective and public space

Integrated urban mobility

Density configuration

Revitalizing water systems

Toolbox

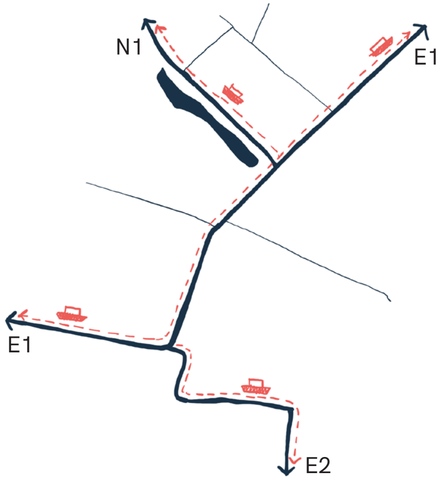

PS
Enhancing collective and public space
UM
Integrated urban mobility
DC
Density Configuration
WS
Revitalizing water systems


Micro-scale design intervention
Pilot project: Ramkhamhaeng

Vision

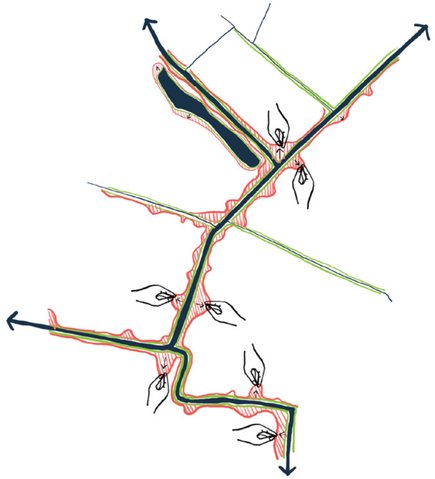
Ramkhamhaeng,
the new urban center of Bangkok

Canal as an urban activator



1

Re-establising its importance as a route

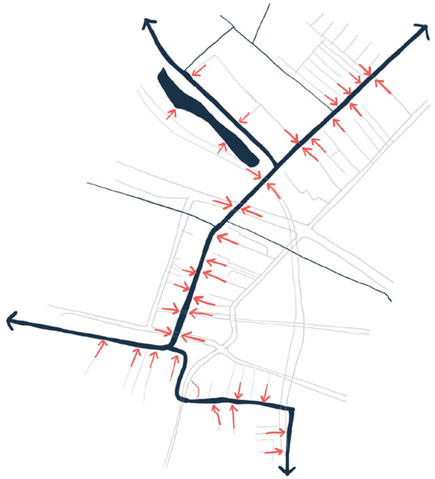


2

Expanding the perceived waterfront

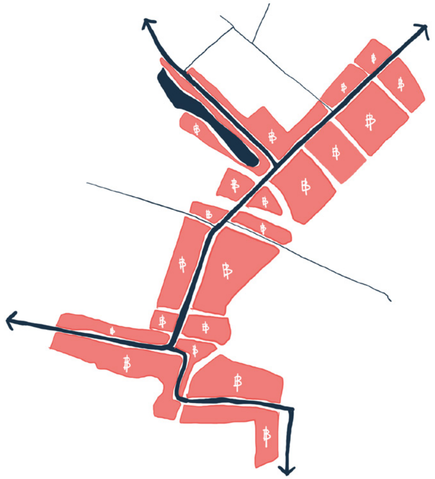
3

Forming loops that enable healthy lifestyles



4

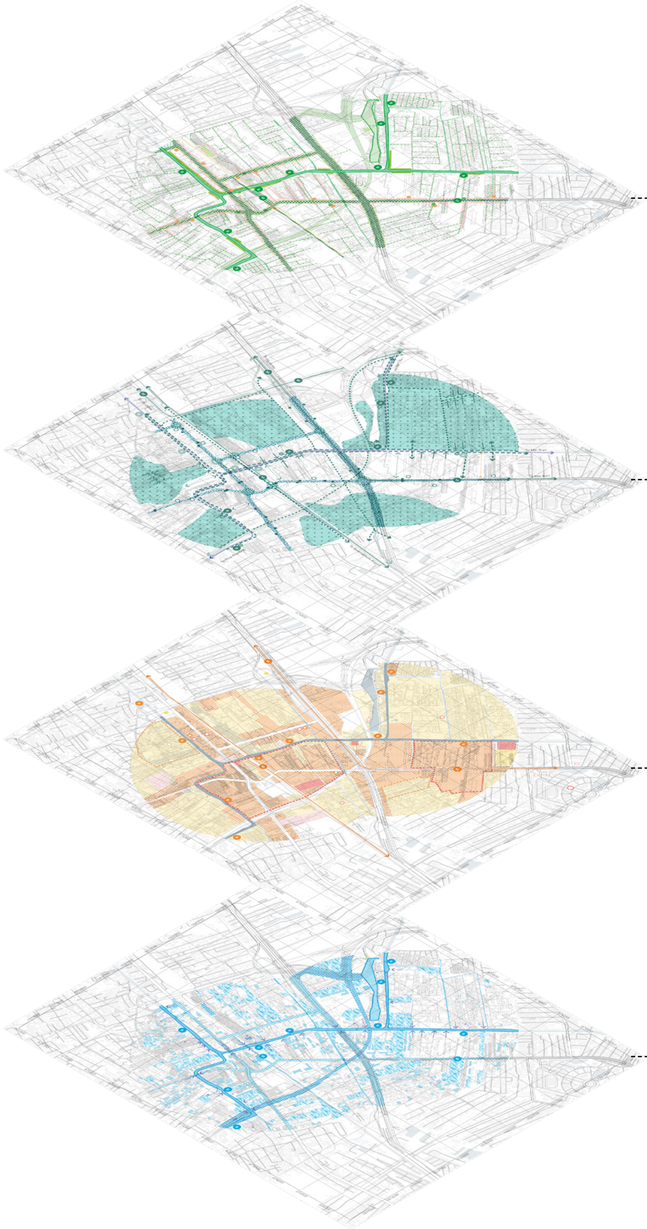
Bringing people closer to canals



5

Stimulating local economy

Design approach: Layer-based

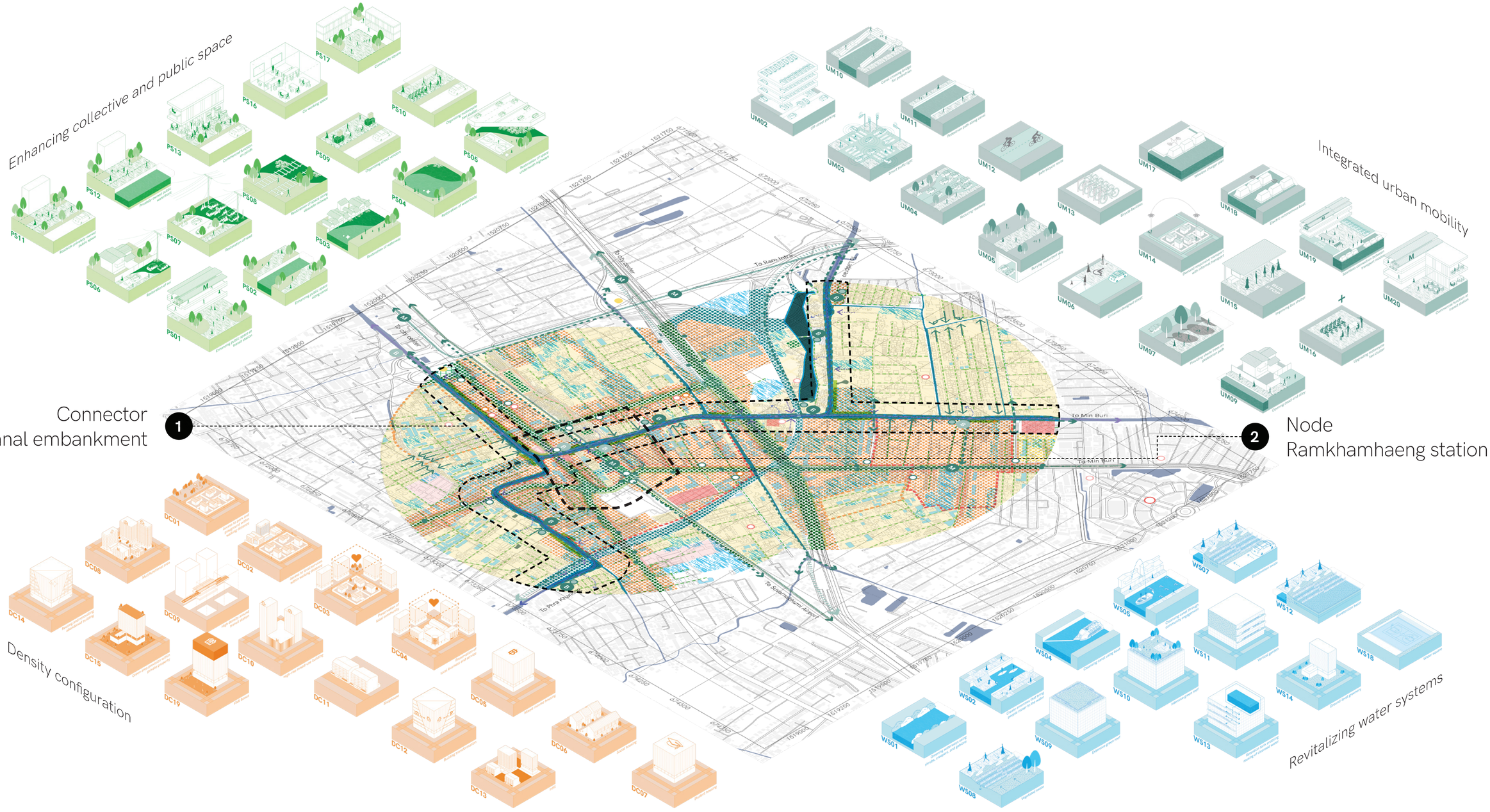


Enhancing collective and public space

Integrated urban mobility

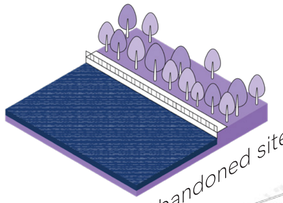
Density configuration

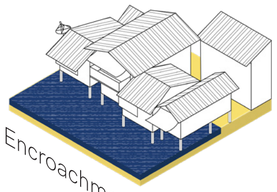
Revitalizing water systems

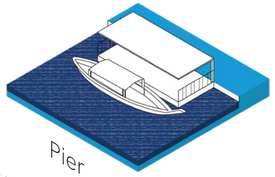

Enhancing collective and public space
Integrated urban mobility
Connector
canal embankment
1
2
Node
Ramkhamhaeng station
Density configuration
Revitalizing water systems

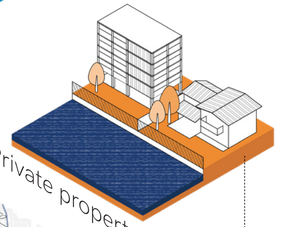
Connector: Canal embankment

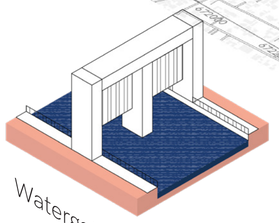
Existing situation

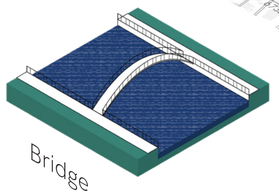


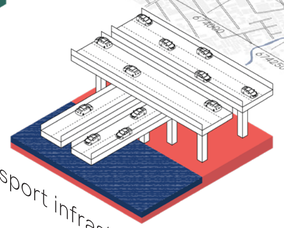


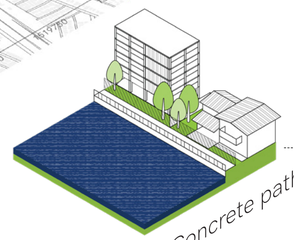






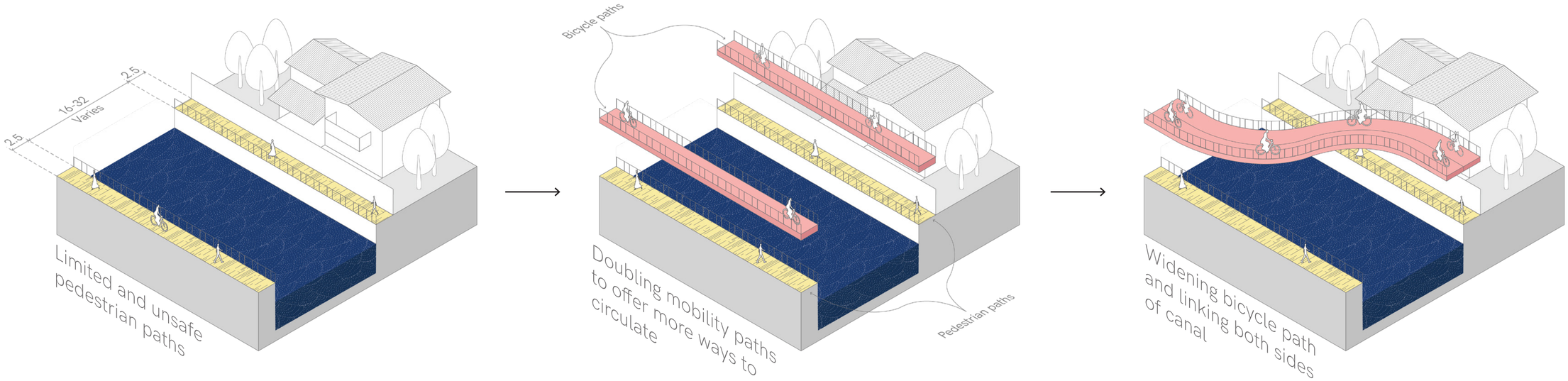






Connector: Canal embankment

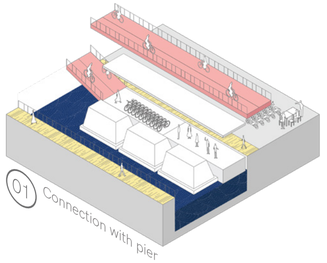
Main idea

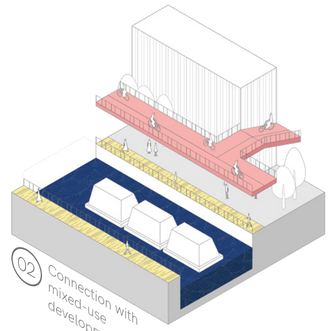


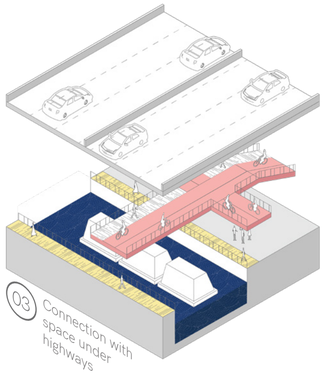
Connector: Canal embankment

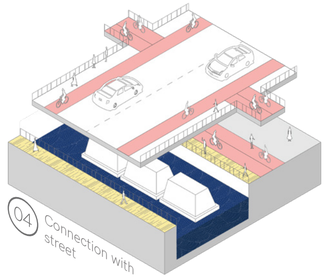
Connection with surroundings

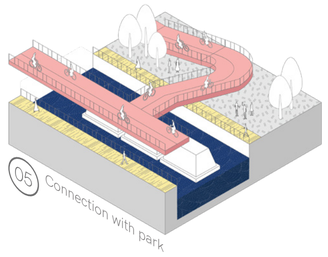
Node: Ramkhamhaeng Station

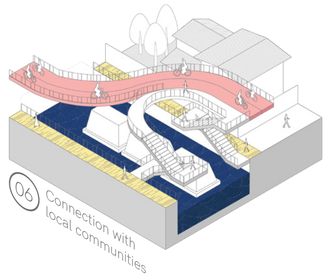






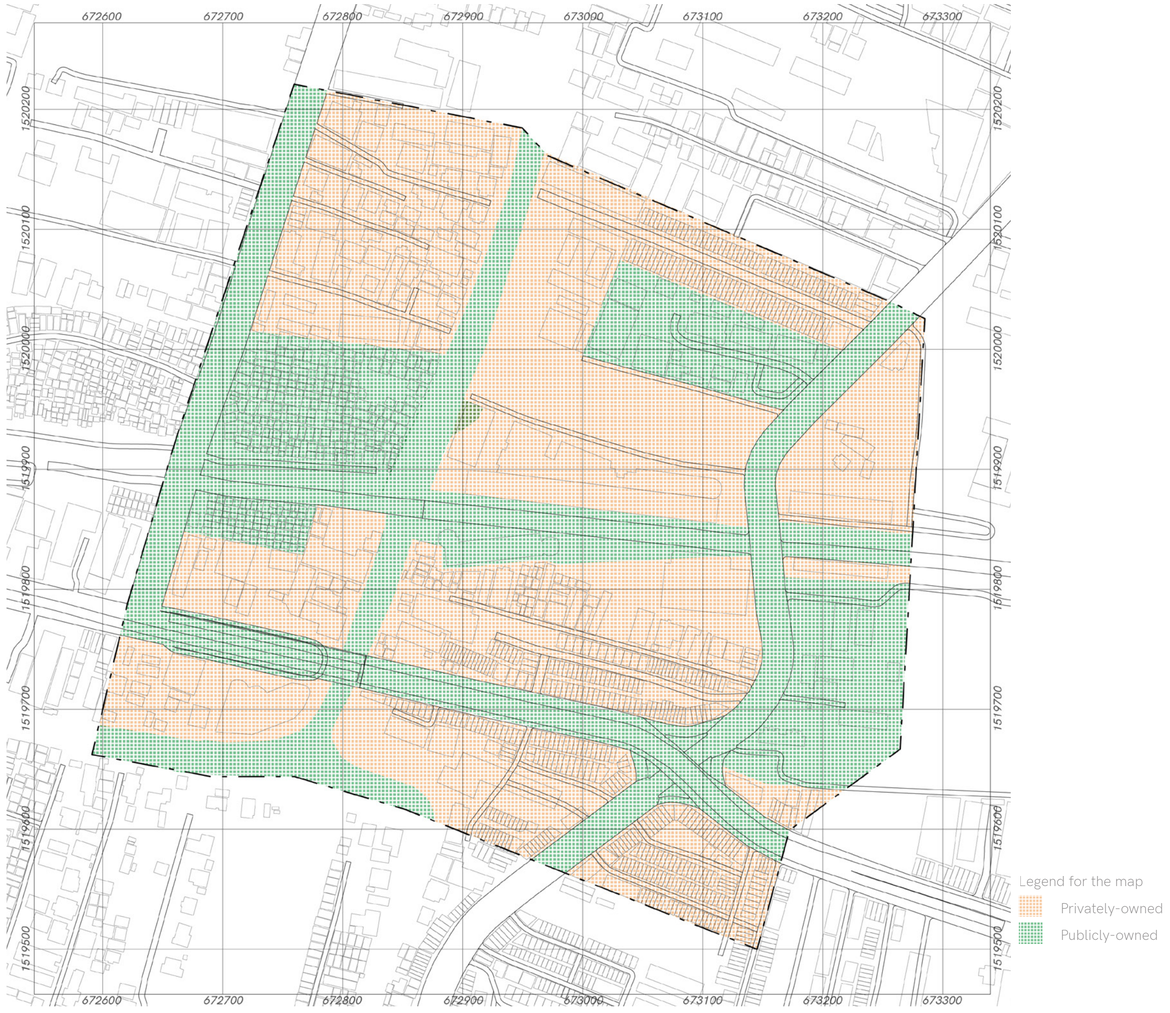




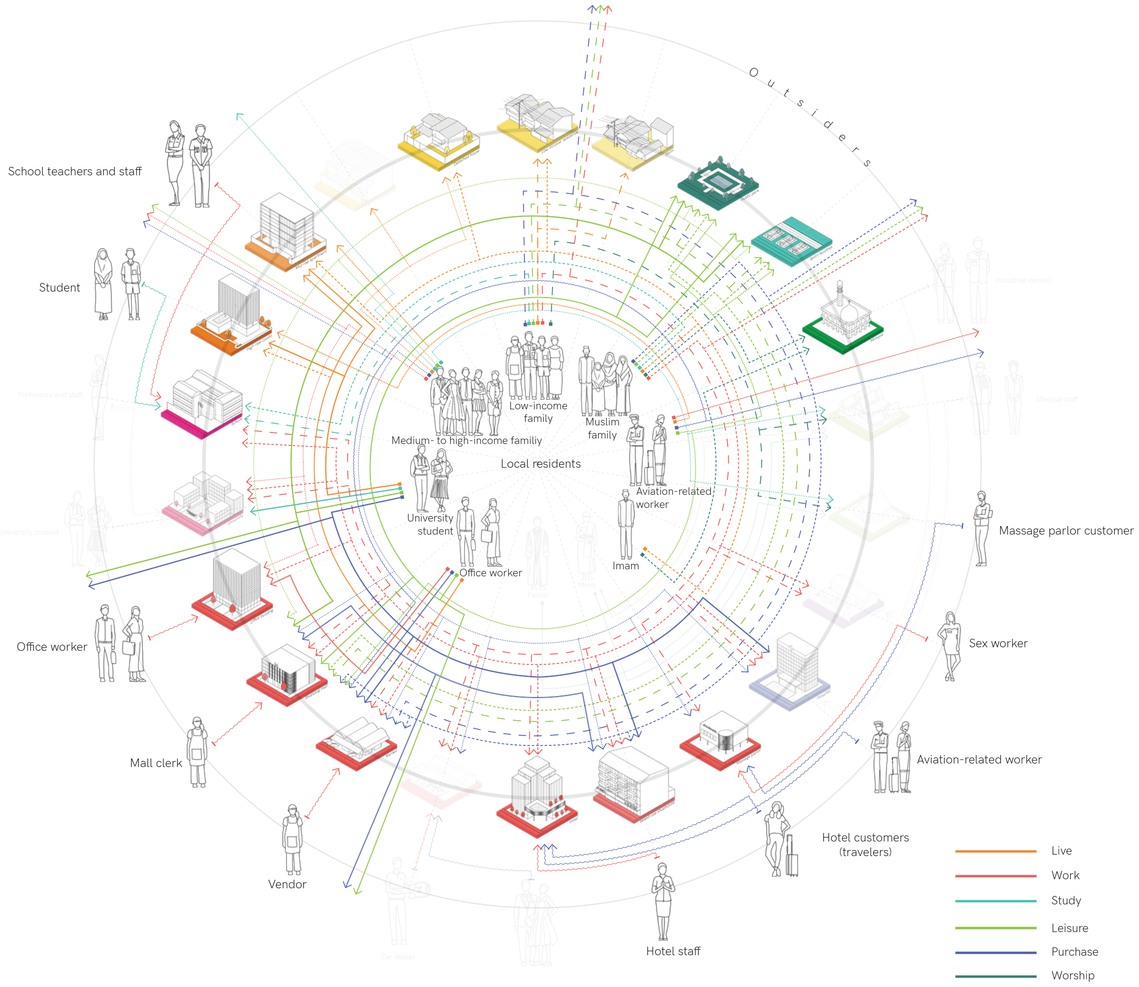


Node: Ramkhamhaeng Station

Plot ownership



Socio-economic study



Node: Ramkhamhaeng Station

Elements to be preserved and developed

Local community

Shophouses

Massage parlor

Mosque

Chinese family association

Local community

Decayed shophouses

Unsafe overpass

Node: Ramkhamhaeng Station

Enhancing collective and public space

Legend for the map

- Pedestrian connection
- Outdoor commercial area (al-fresco dining)
- Multipurpose square
- Sport field
- Playground
- Community center
- Existing fresh market
- Preserved religious site

Node: Ramkhamhaeng Station

Integrated urban mobility

Node: Ramkhamhaeng Station

Density configuration

Configuration 1

FAR	GSI	OSR
7.00	0.23	0.11

Node: Ramkhamhaeng Station

Density configuration

Configuration 2

FAR	GSI	OSR
7.00	0.42	0.08

Node: Ramkhamhaeng Station

Density configuration

Configuration 3

FAR	GSI	OSR
5.50	0.23	0.14

Node: Ramkhamhaeng Station

Density configuration

Configuration 4

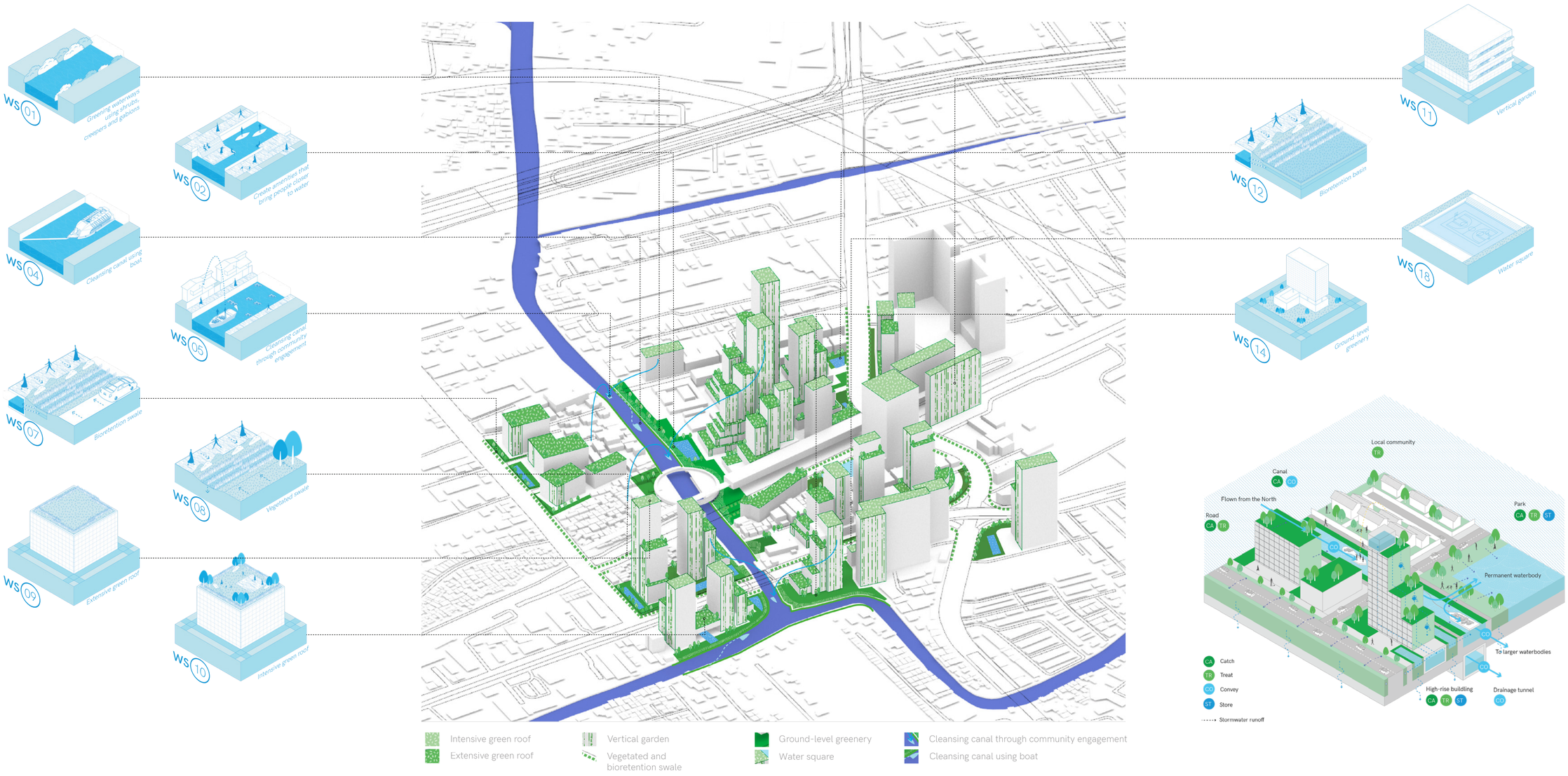
FAR	GSI	OSR
5.50	0.42	0.11

Node: Ramkhamhaeng Station

Density configuration

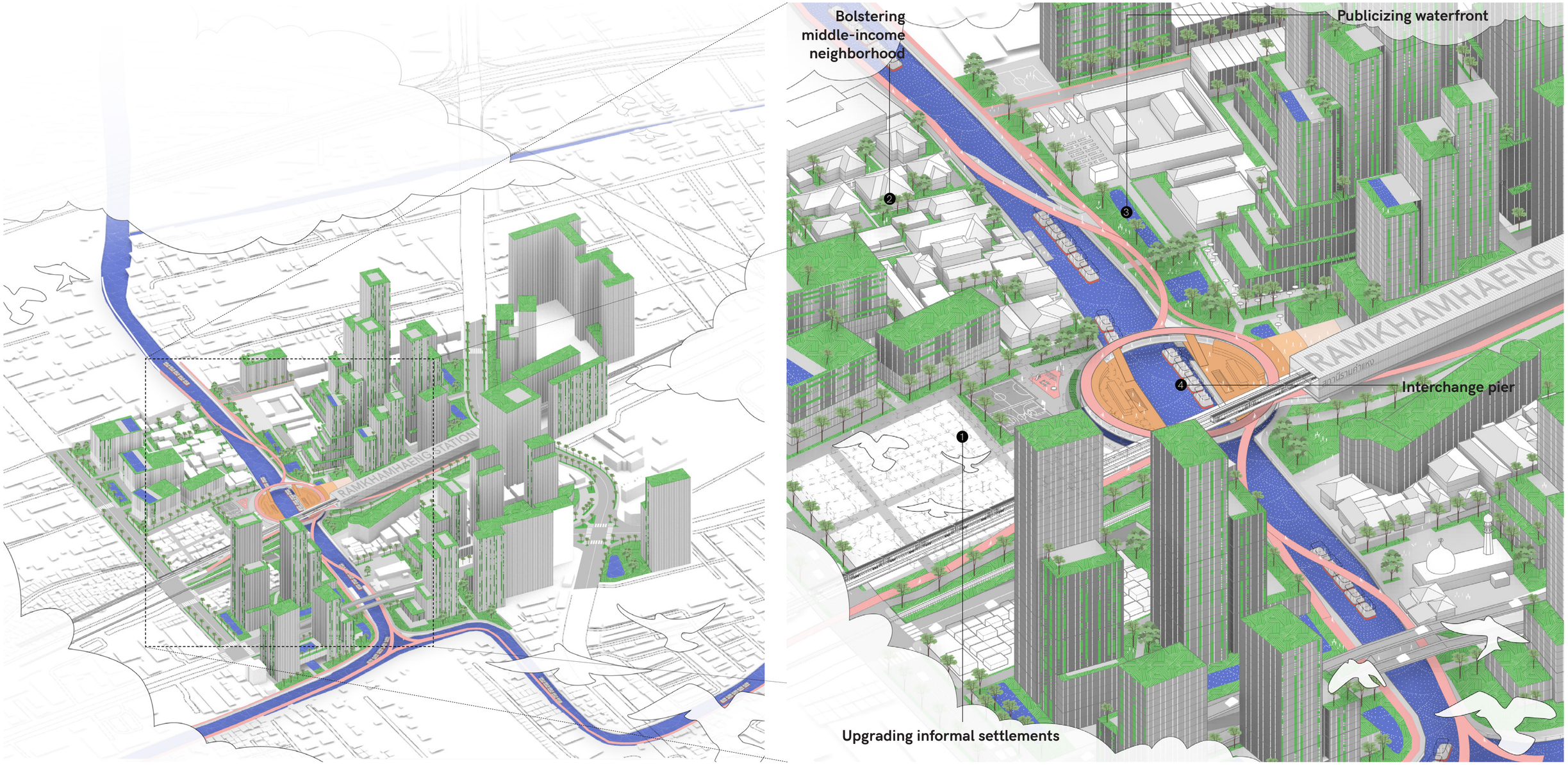
Node: Ramkhamhaeng Station

Revitalizing water systems



Node: Ramkhamhaeng Station

The Convergence of Connector and Node

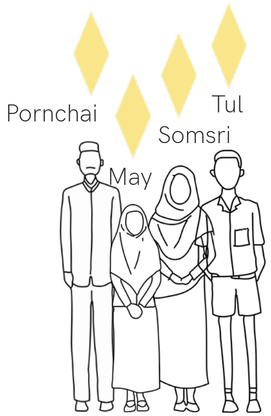


The Convergence of Connector and Node

Personas

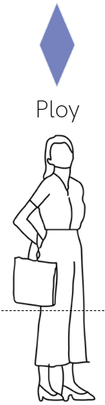
Middle-income family

Tourists



Informal settlers

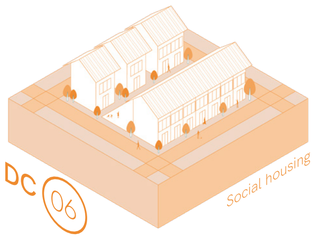
Condominium residents



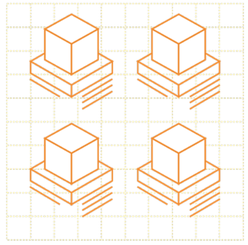
Office worker

The Convergence of Connector and Node

Upgrading informal settlements

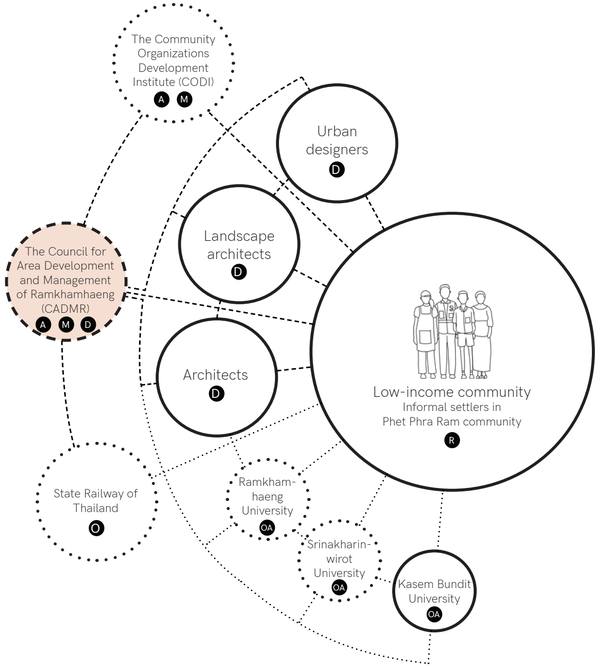


Design workshop



Design toolbox as a tool for communication

Establising initiative for community engagement



Legend

Role
A Authority
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Public sector
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Found
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High impact
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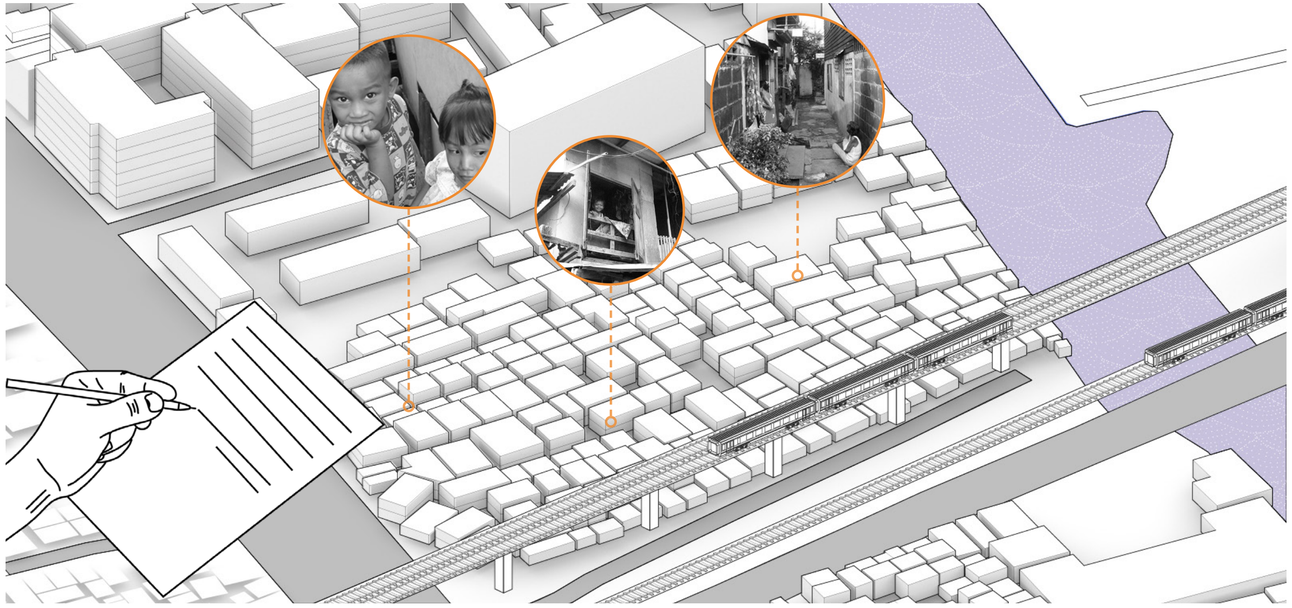
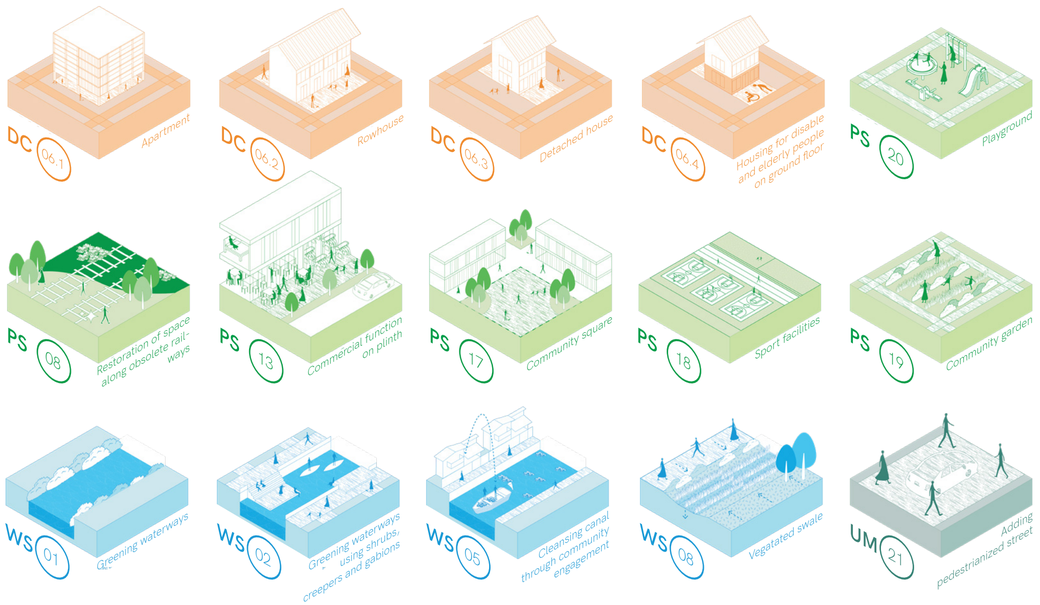
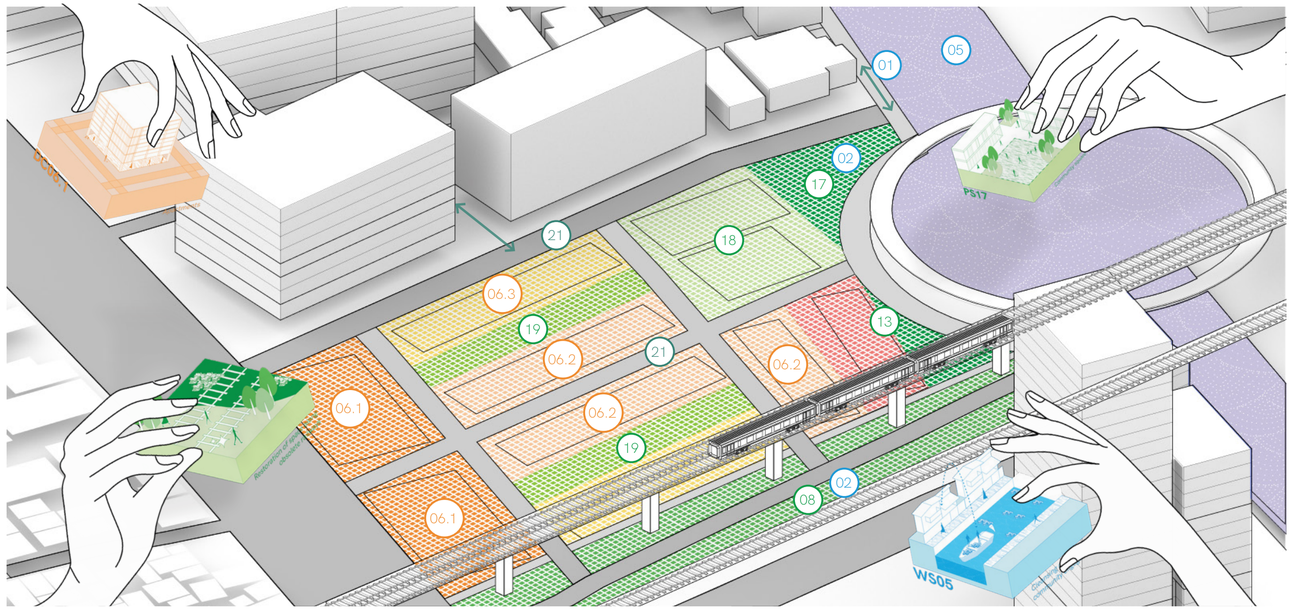


The Convergence of Connector and Node

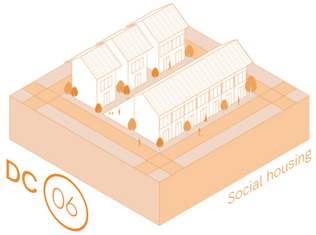
Upgrading informal settlements



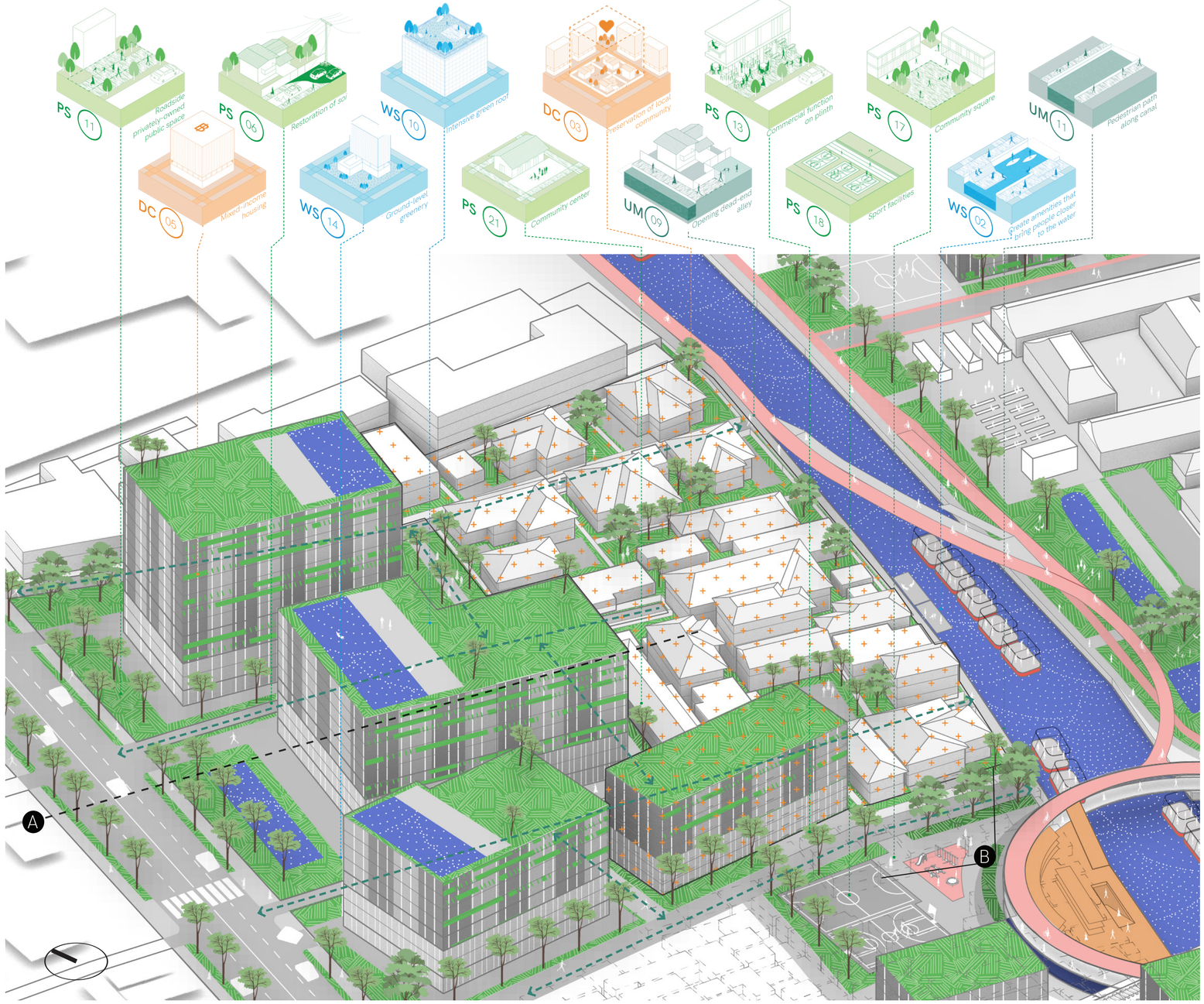


The Convergence of Connector and Node

Bolstering middle-income neighborhood



Establising initiative for community engagement



The Convergence of Connector and Node

Bolstering middle-income neighborhood

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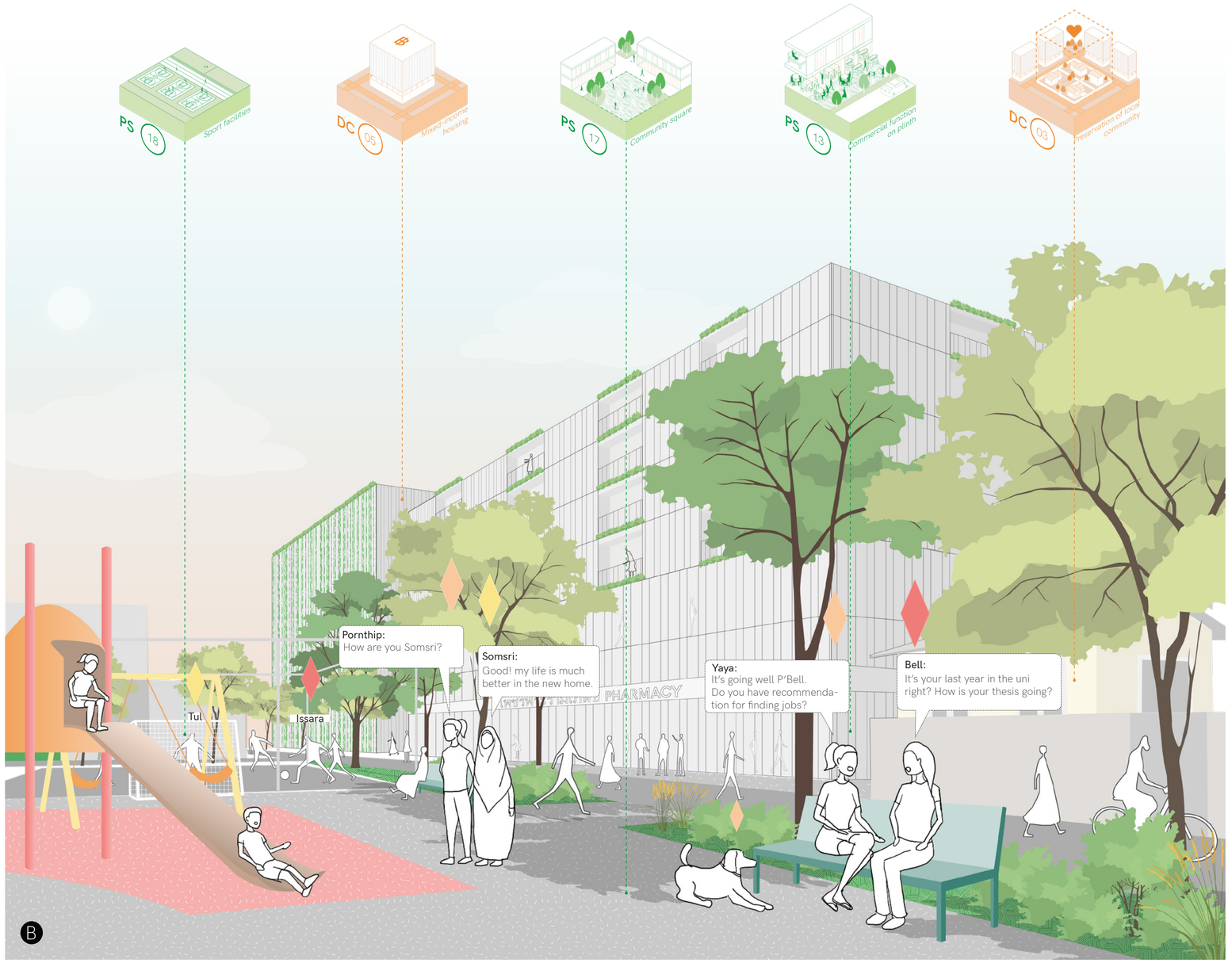
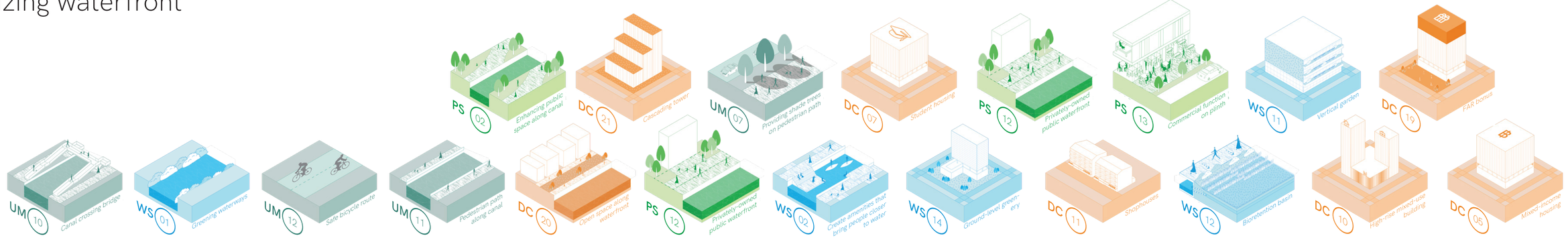
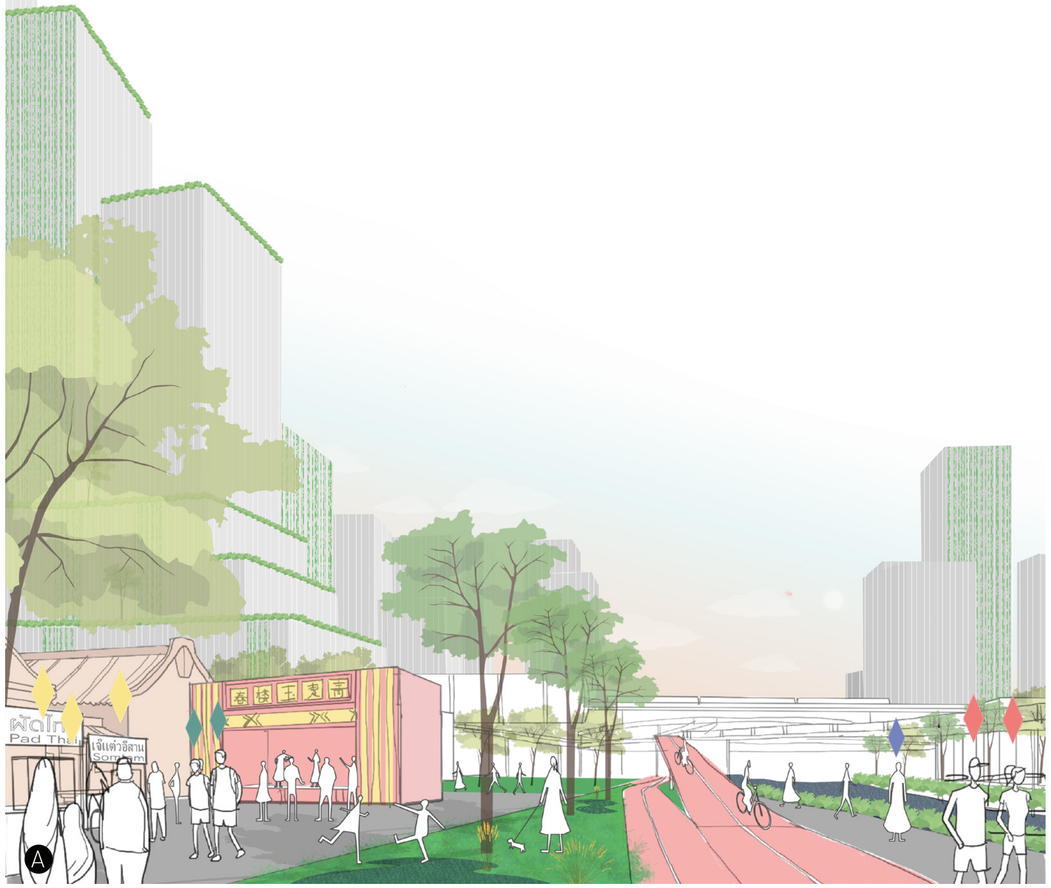
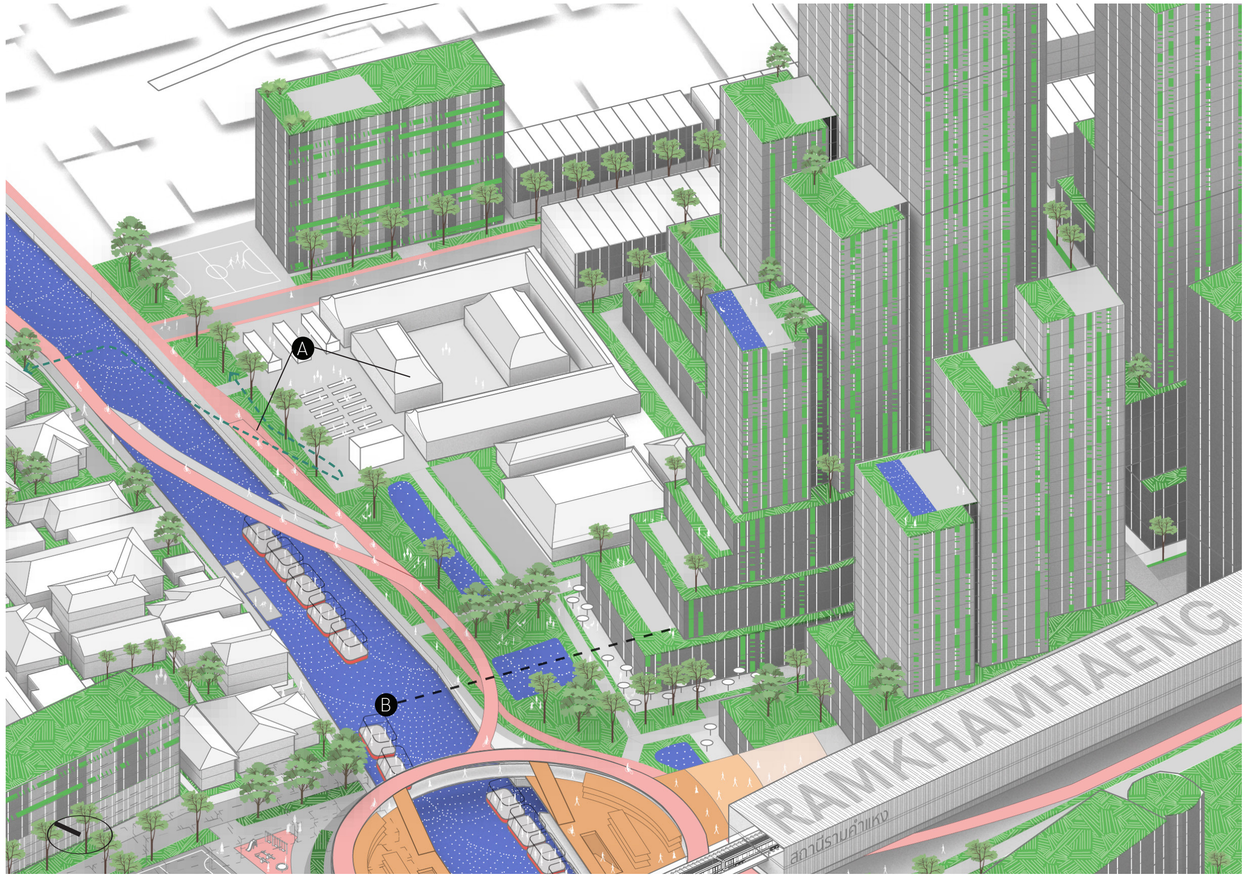


The Convergence of Connector and Node

Publicizing waterfront







The Convergence of Connector and Node

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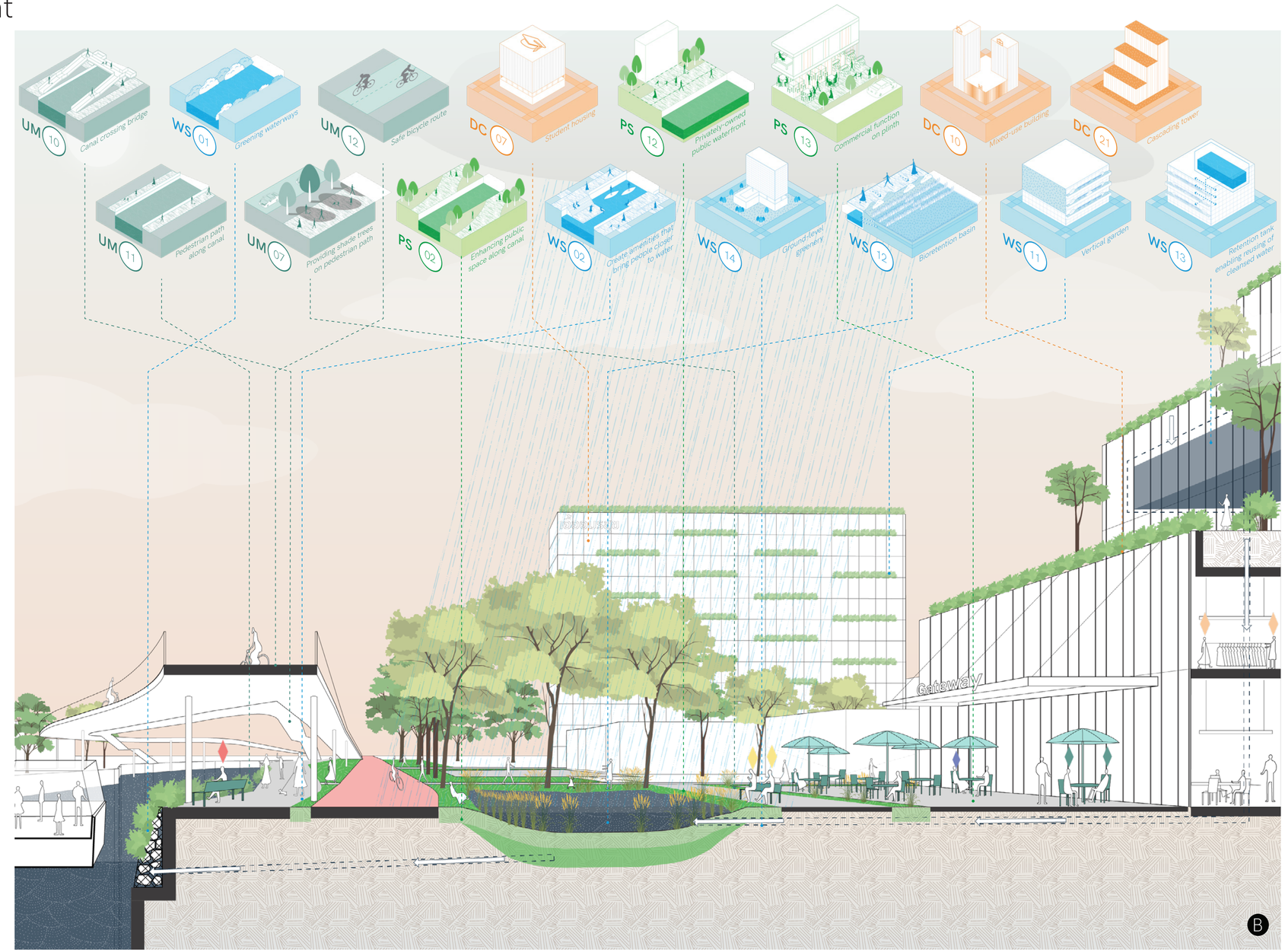
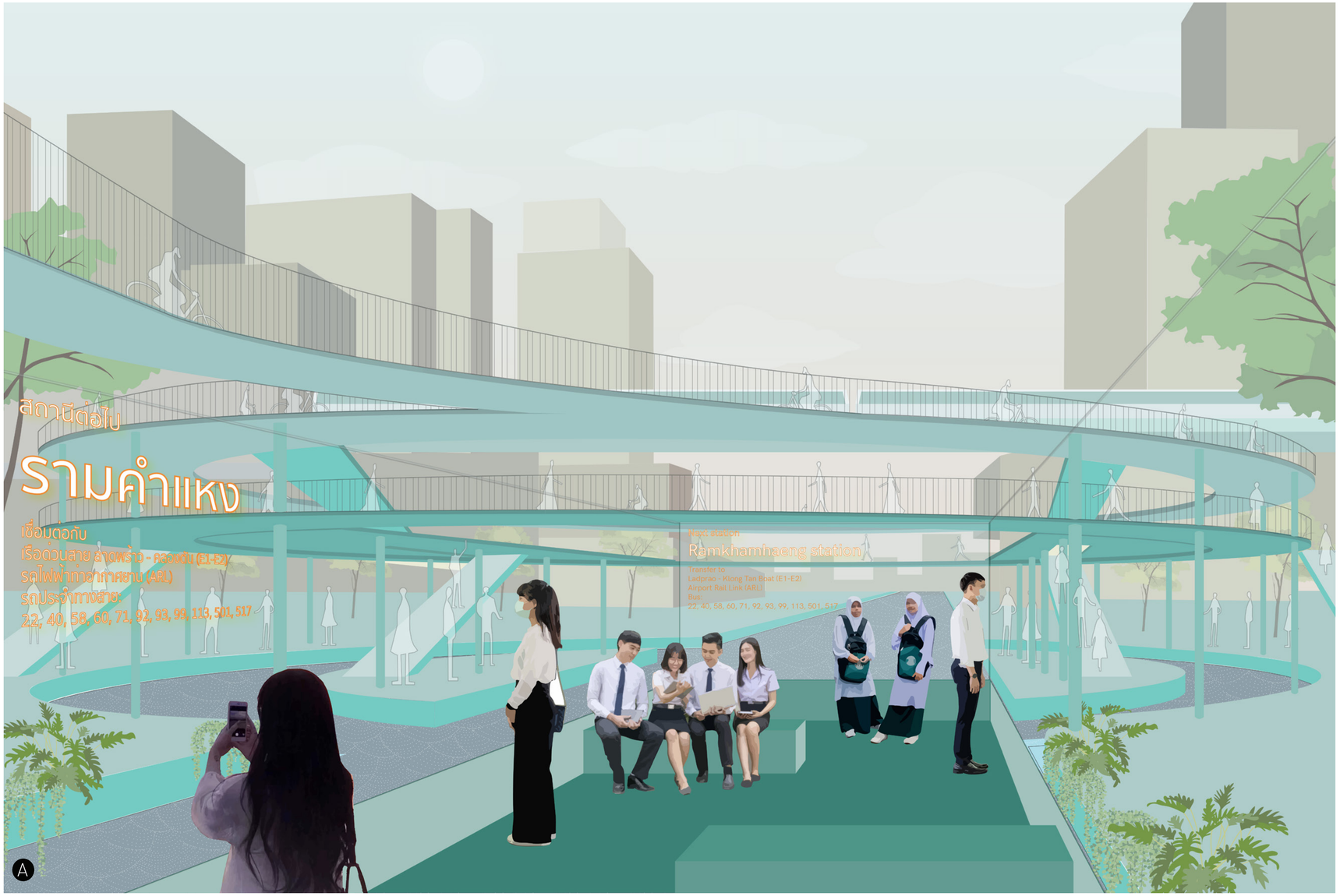


The Convergence of Connector and Node

Interchange pier



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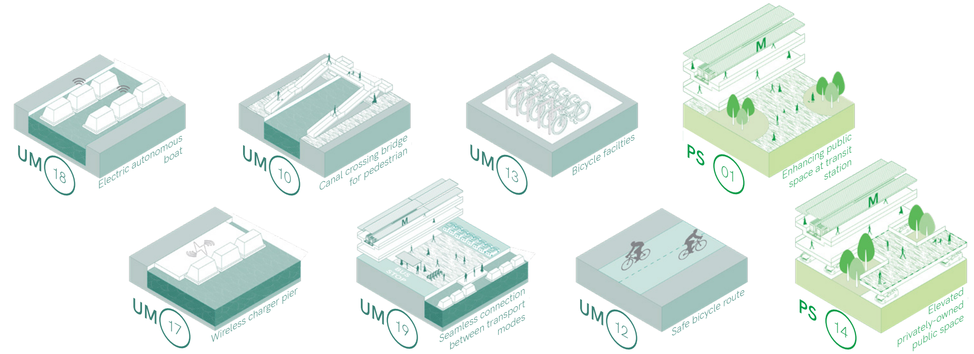

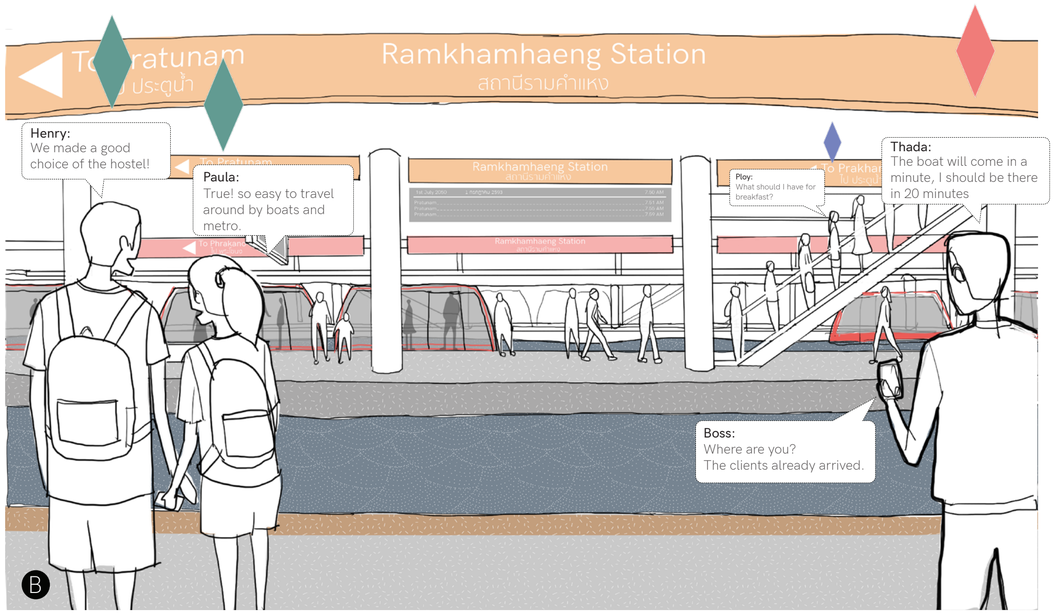

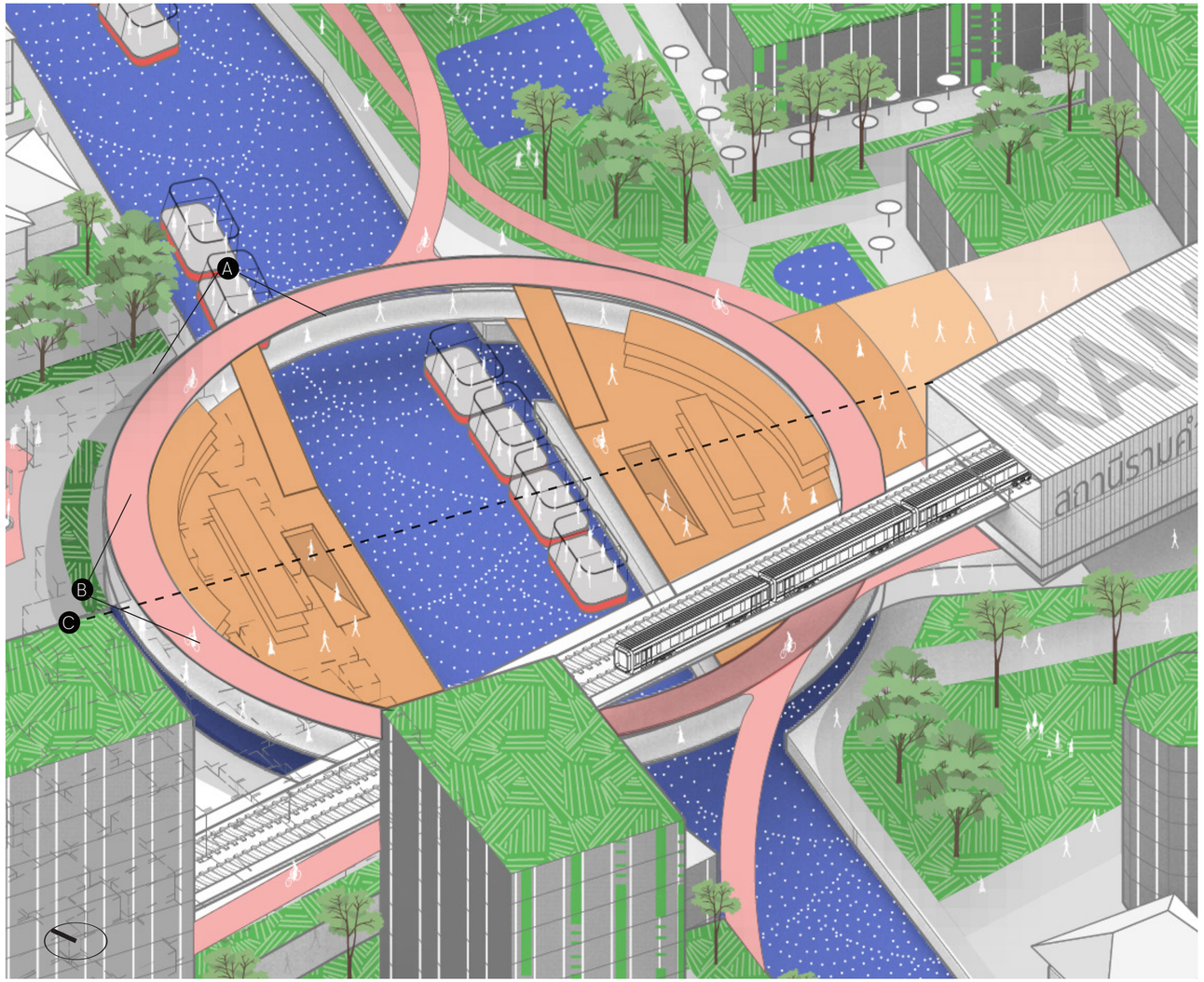

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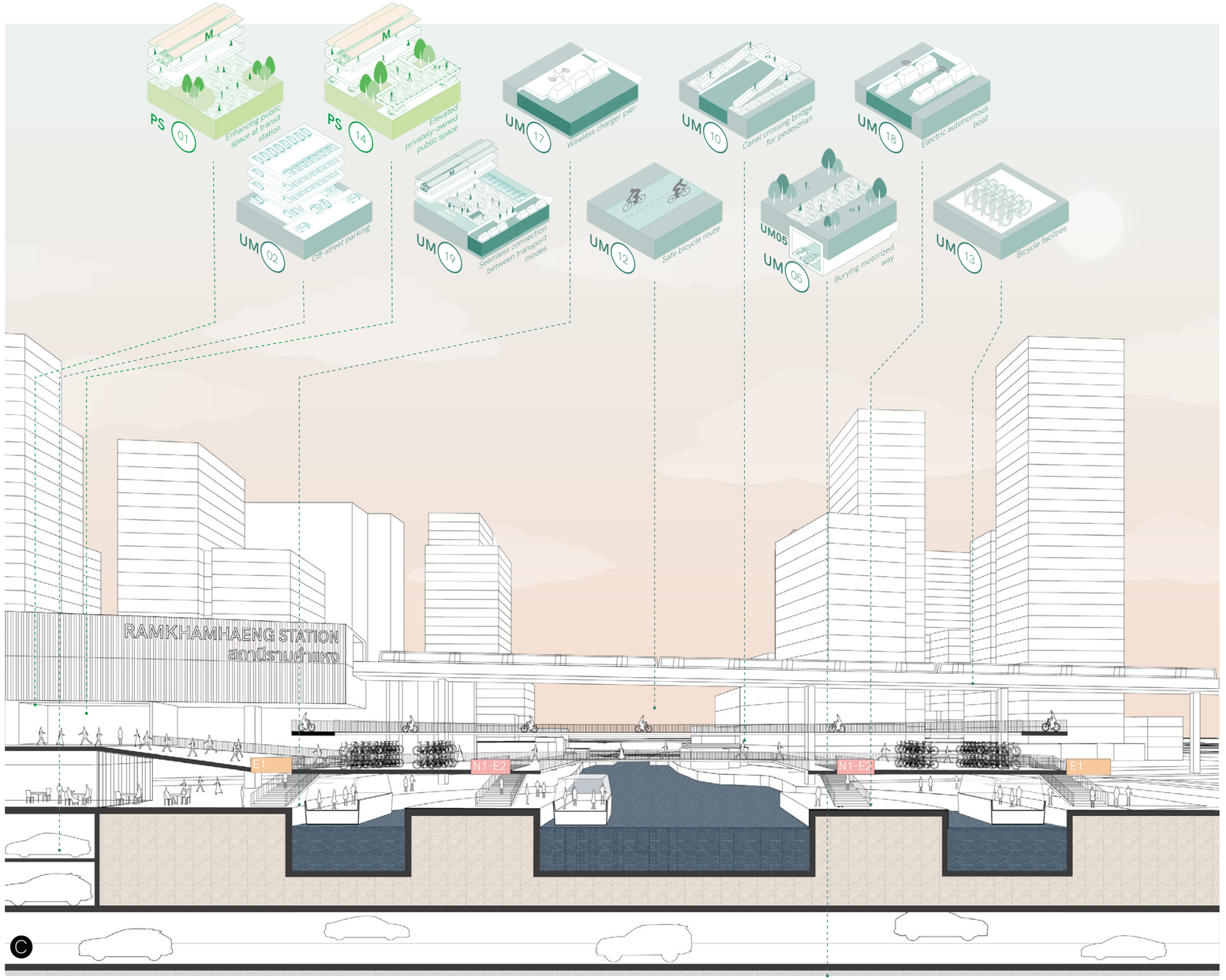
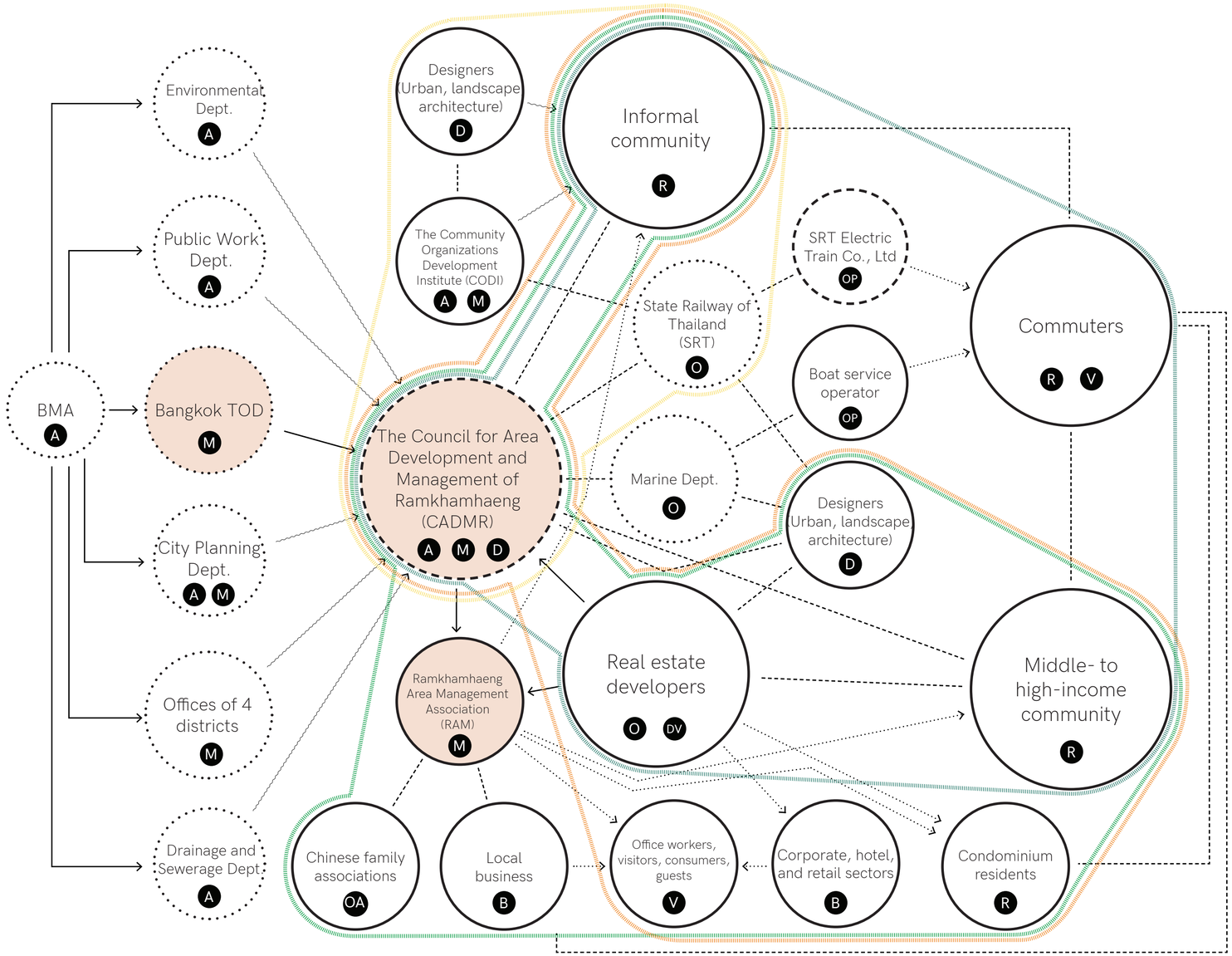


Realization

Stakeholders and power relations



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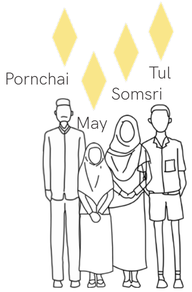

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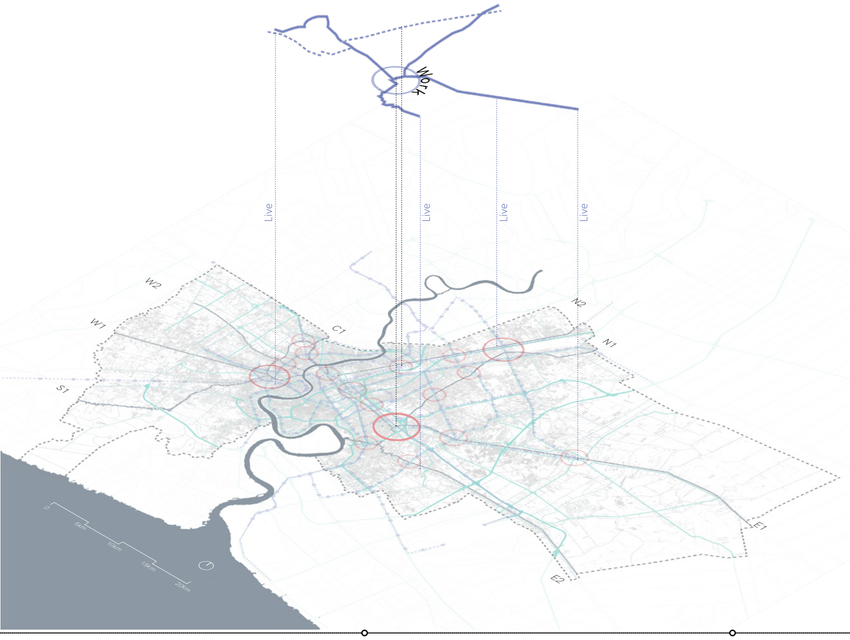
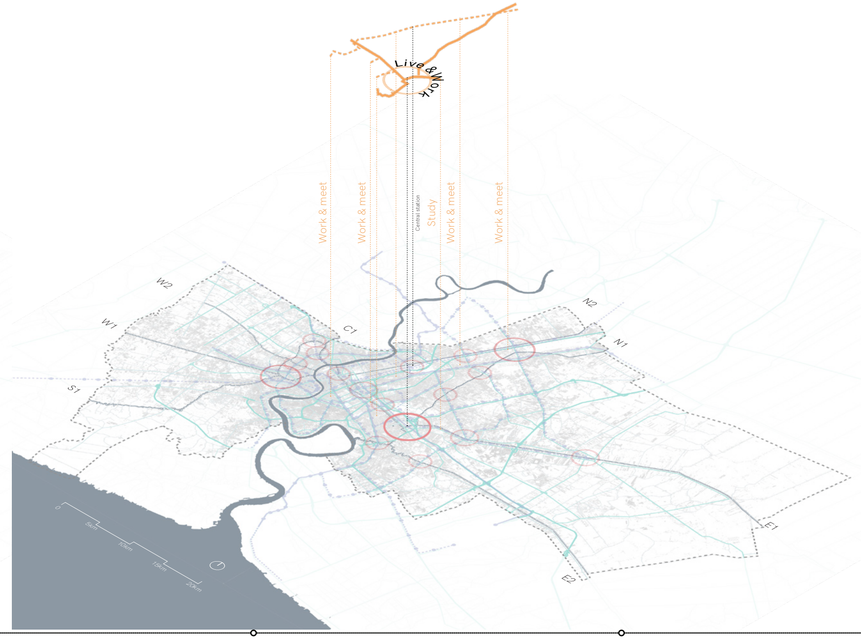
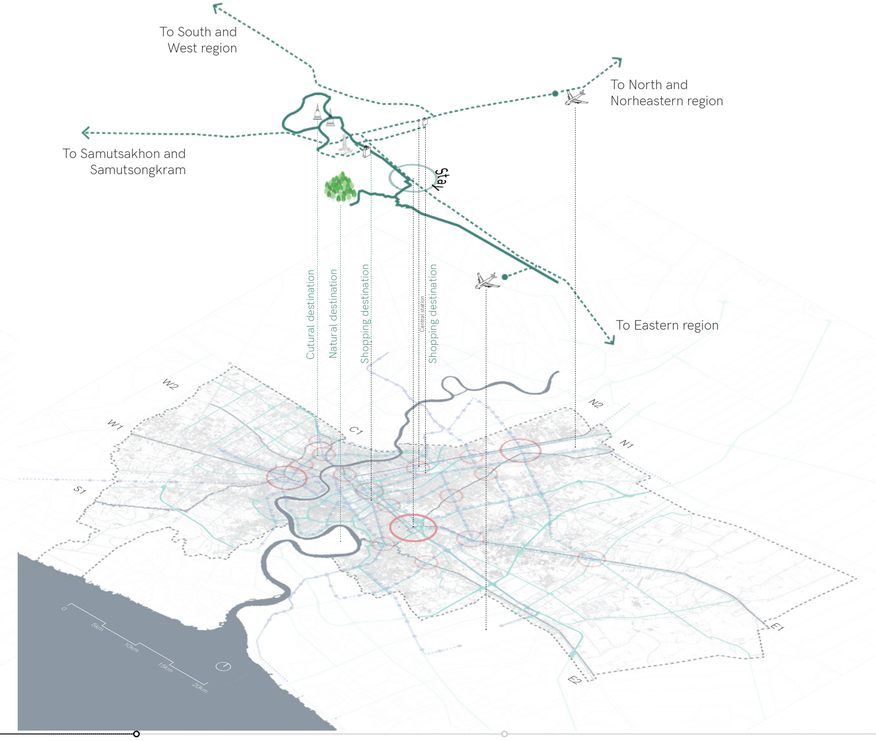
Condominium residents

Tourists





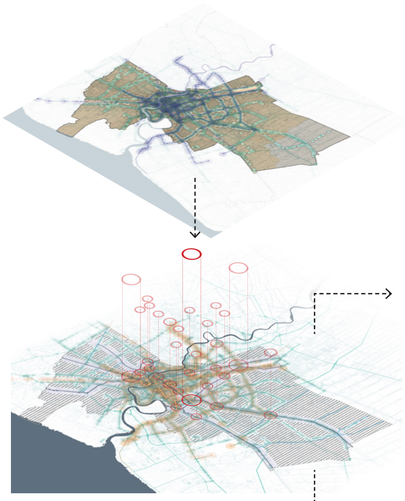


Conclusion

How can Transit-Oriented Development transform the area surrounding emerging intermodal nodes in Bangkok and integrate with the water-based transport, in order to achieve the more compact city, where livable and socially diverse environments, are provided?

SQ3
Which waterways have potential to be developed for daily commute transport?

SQ2
Which station area could serve as a pilot project?

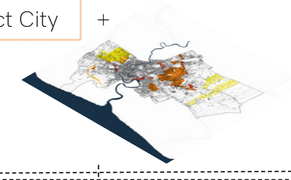


SQ1
Which aspects of Transit-Oriented Development are specifically applicable to Bangkok?

TOD + Case study / Theory essay (AR3U023)

SQ5
What does the concept of compact city mean in the context of Bangkok?

Compact City +

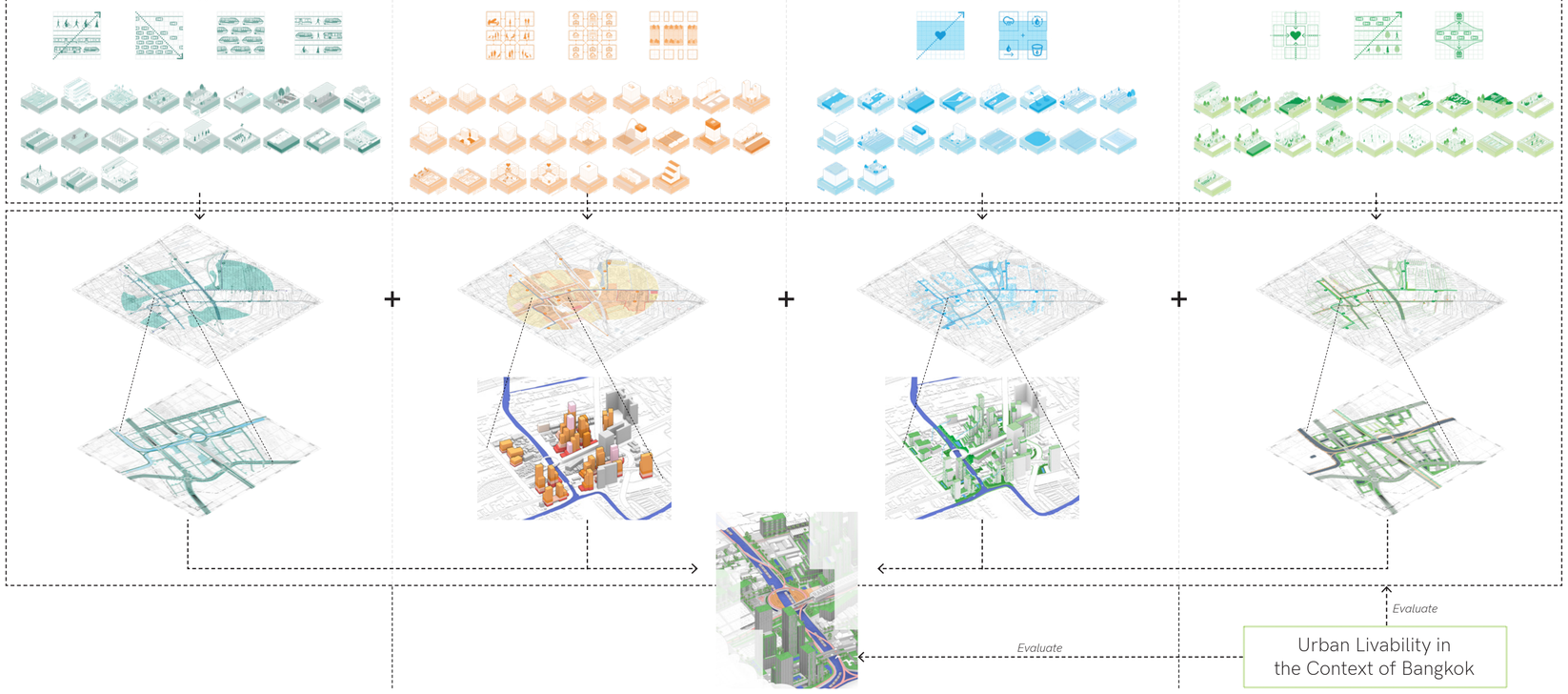


SQ4
How to revitalize the neglected water systems to mitigate flood vulnerability and integrate them with the mobility?

Hybrid infrastructure
Green-Blue Grids
Demand Responsive Transport

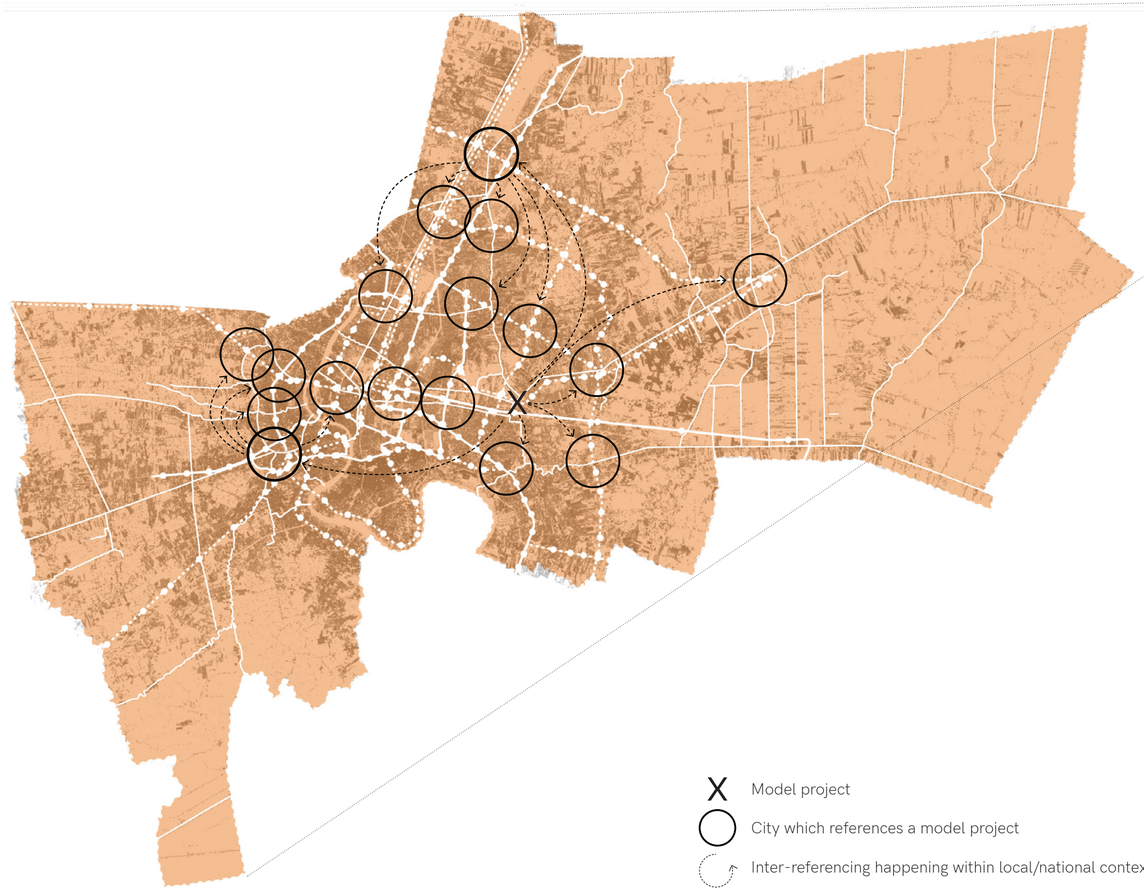
SQ6
How can urban fabrics stimulate livable and diverse social environments in Bangkok? What are the main principles?

Public Life
Social Diversity



Reflection

Transferability



Metropolitan scale

National scale and ASEAN

Global scale

Model project

City which references a model project

Inter-referencing happening within local/national context

High transferability

Moderate transferability

Low transferability

Global North

Global South

Scan here

to experience the project through resident's perspectives

https://www.youtube.com/watch?v=BgyTHWZdZr8