P5 Thesis project presentation

DEFINING ISLANDS OF INNOVATION
**High-tech clusters as an urban development strategy for the suburban area of Thessaloniki**

Labis Koutsoupakis
1542028

Complex Cities Graduation Studio/TU Delft
January 2010

1. Brief introduction to project and problem statement

2. City conclusions and area analysis

3. Vision/Program definition

4. Strategic locations and structure models

5. Strategy for the area

6. Layers of intervention

7. Local scale design

8. Evaluation/Stakeholders

9. Phasing/Reflection
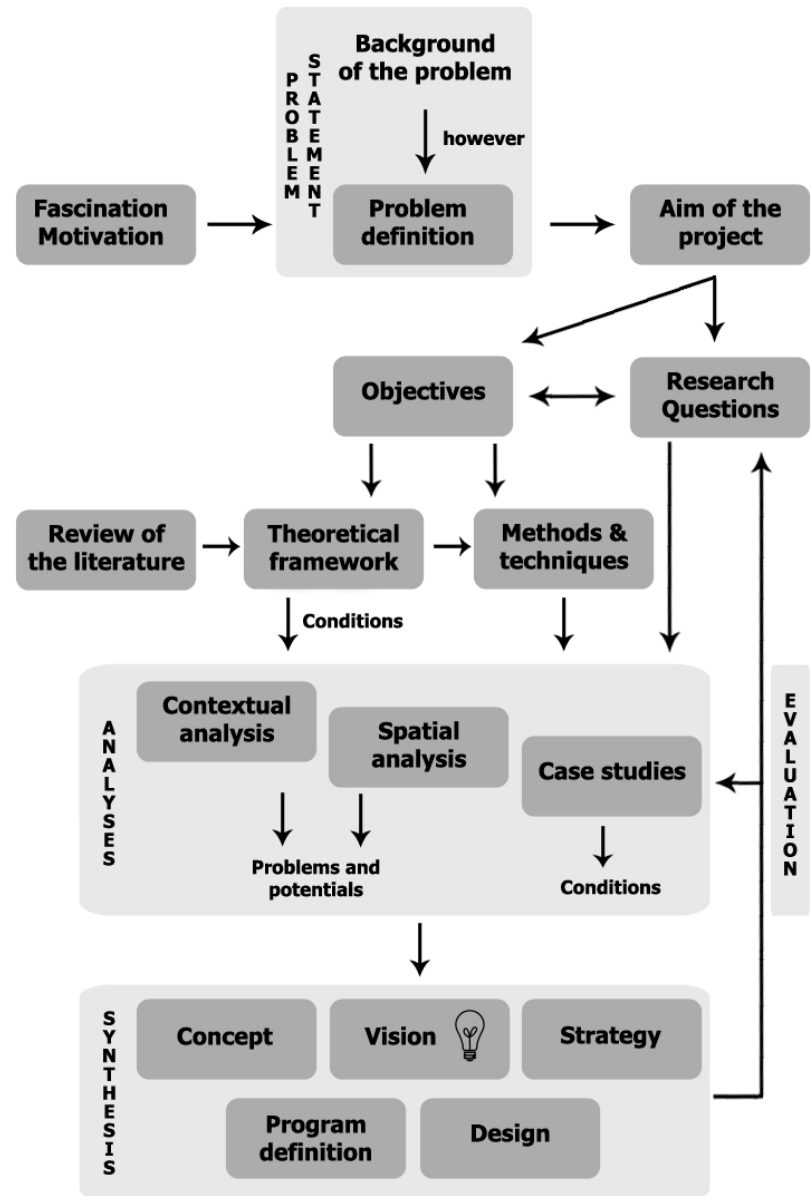
HIGH-TECH INNOVATION CLUSTERS

High-tech centers

Defined areas
Host research-based and hi-tech companies and firms

Objective
Stimulate innovation and generate economic benefits for a region

Innovation clusters

Variations in internal structure, low transaction costs, flexibility and productivity

→Adopted as a means for regional development; how can it activate a locality?

→Need to consider the interaction in all scales

Technopoles

Science parks

Microenvironments

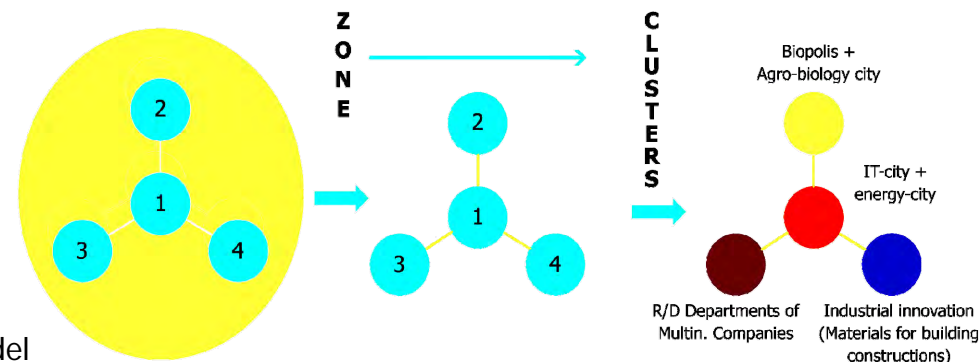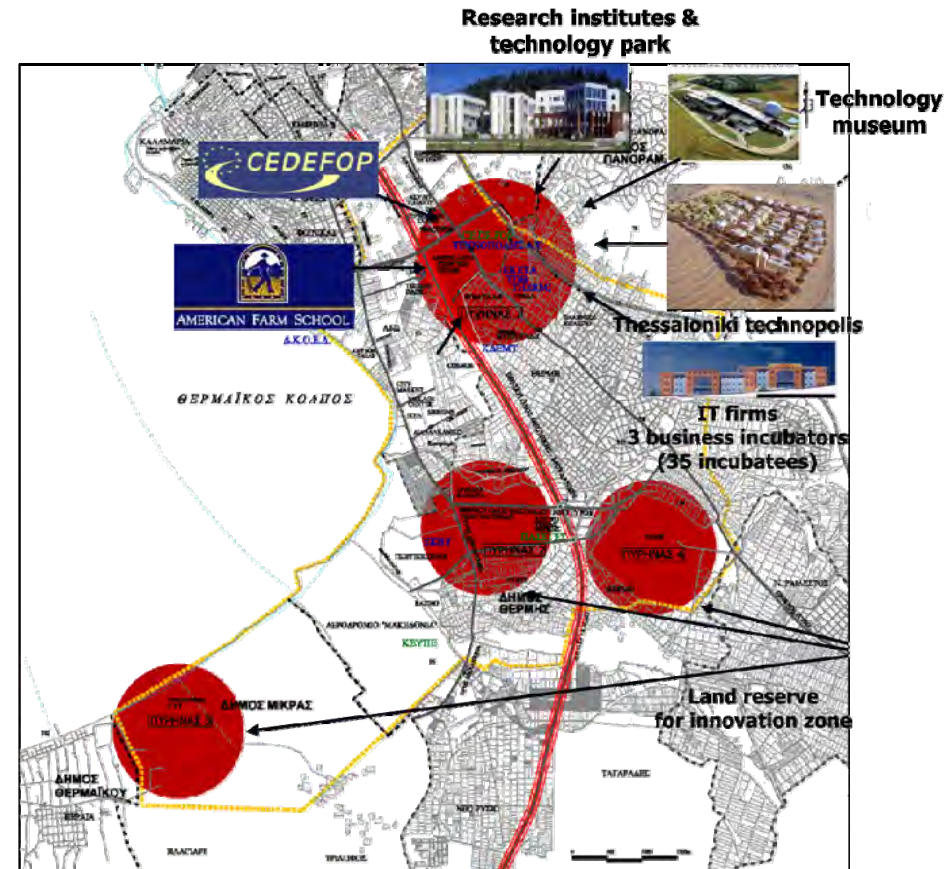# PROBLEM STATEMENT

Program: **Innovation Zone**

→Characteristics

-**attract** R&D firms

-promote **cooperation** with universities & industry

-specific **thematic**/context of 150Ha

→Criteria

-**proximity** to airport, urban areas & facilities

-concentration of an enabling **number of research units**

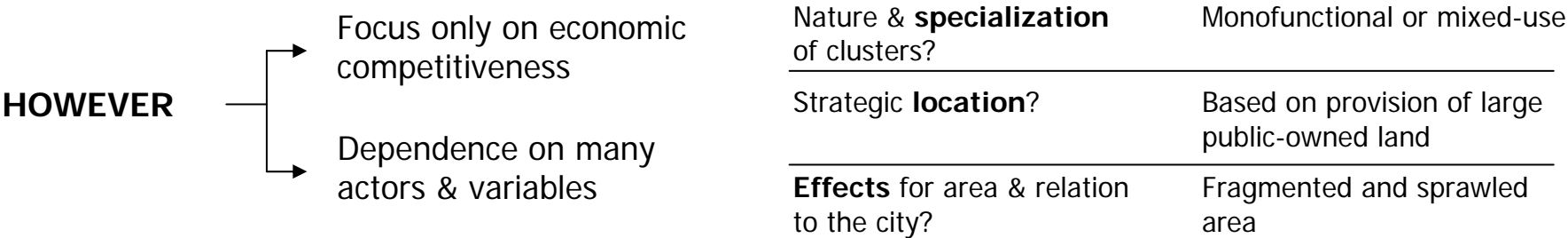-high quality **services** and a **specialized labor force**

→Goal

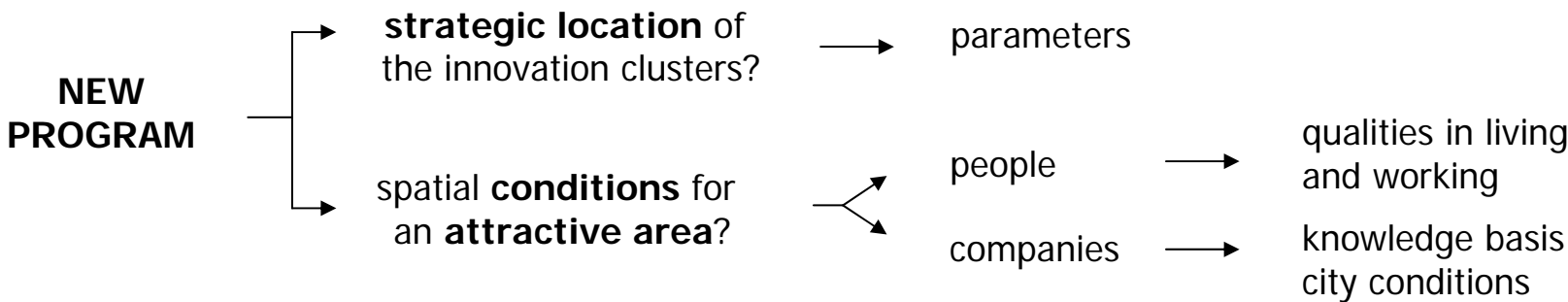Create a **free-of-regulations zone** offering a number of **incentives**

Research institutes & technology park

Technology museum

Thessaloniki technopolis

IT firms 3 business incubators (35 incubatees)

Land reserve for innovation zone

Current spatial model

ZONE

CLUSTERS

Biopolis + Agro-biology city

IT-city + energy-city

R/D Departments of Multin. Companies

Industrial innovation (Materials for building constructions)

PROBLEM STATEMENT - RESEARCH QUESTION - OBJECTIVE

HOWEVER

→ Focus only on economic competitiveness

→ Dependence on many actors & variables

Nature & **specialization** of clusters?	Monofunctional or mixed-use
Strategic **location**?	Based on provision of large public-owned land
Effects for area & relation to the city?	Fragmented and sprawled area

MAIN QUESTION ⇒ **'What spatial interventions can support the development of the south-eastern Thessaloniki suburban area as a knowledge and innovation pole?'**

NEW PROGRAM

→ **strategic location** of the innovation clusters? → parameters

→ spatial **conditions** for an **attractive area**?

  ↗ people → qualities in living and working

 ↘ companies → knowledge basis city conditions

CITY CONCLUSIONS / AREA ANALYSIS

CONTEXT OF THESSALONIKI

- **Transportation hub** for the country & southeastern Europe

- Strong **connection with** the towns of the **periphery**

- **Centralized** city with a **monocentric** structure results in daily movement to city centre and traffic

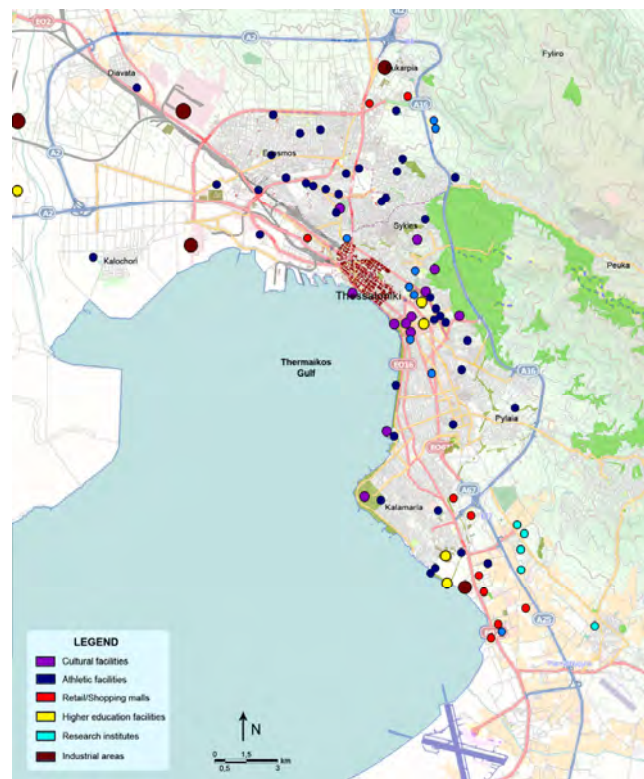- **Sprawl** of functions mainly in the **suburban area**

Location in Greece

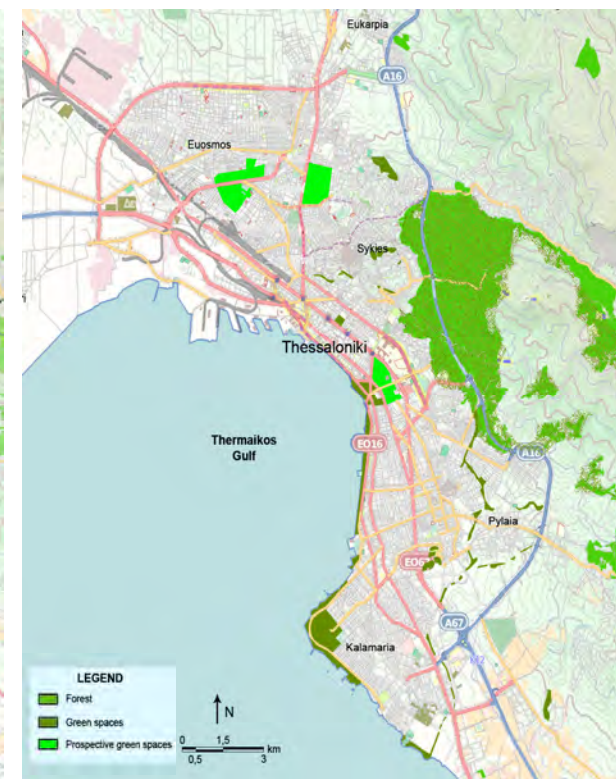The periphery of Central Macedonia
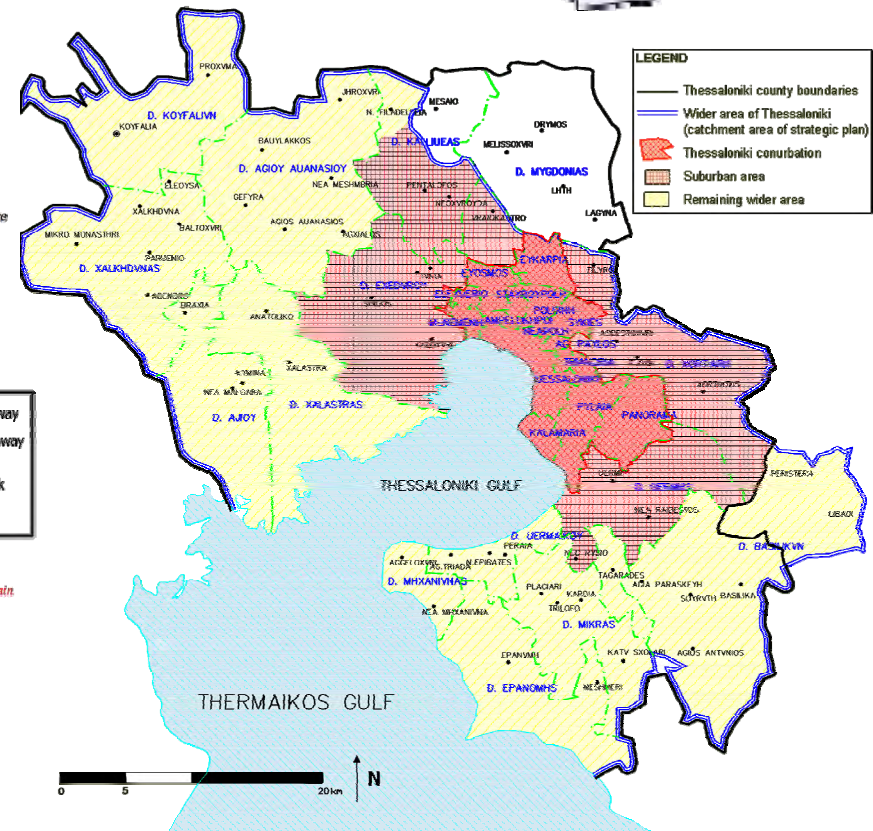
The metropolitan area of Thessaloniki

CONTEXT OF THESSALONIKI

Main Infrastructure

Main functions

Open space & landscape

Key elements

- Most **facilities concentrated** in city centre

- **Accessibility** in terms of main road network

- Future **transportation system**

- **Linear open space** along coastline

CONCLUSIONS OF THE ANALYSIS OF THESSALONIKI

Criteria for successful high-tech centers

What the city offers

Location criteria

Existing knowledge basis

Business Infrastructure

Human Resources

Quality of services

Attractiveness

people

Inadequate city conditions to attract target group

firms

Incentives reducing cost of business offered but a strategic location is important
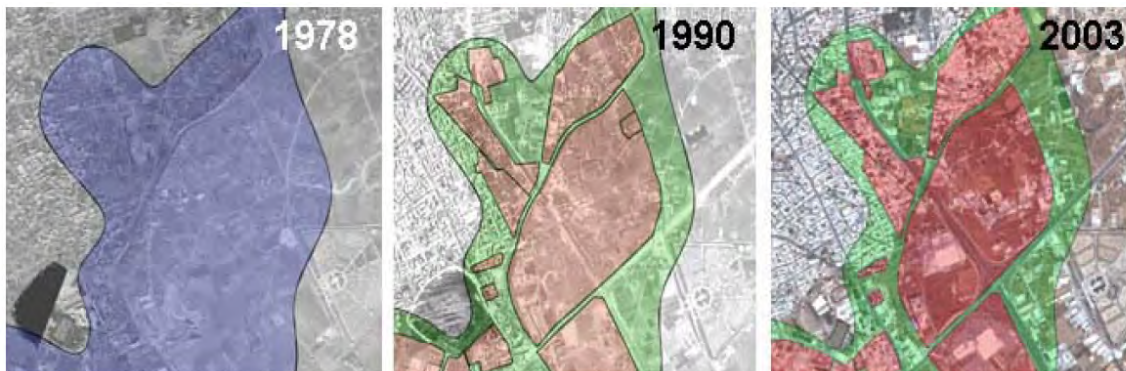
South-eastern suburban area

-Existing/actual development

-Possibility to combine knowledge related with regional functions

-Attractiveness potential in the landscape; possible evaluating tool
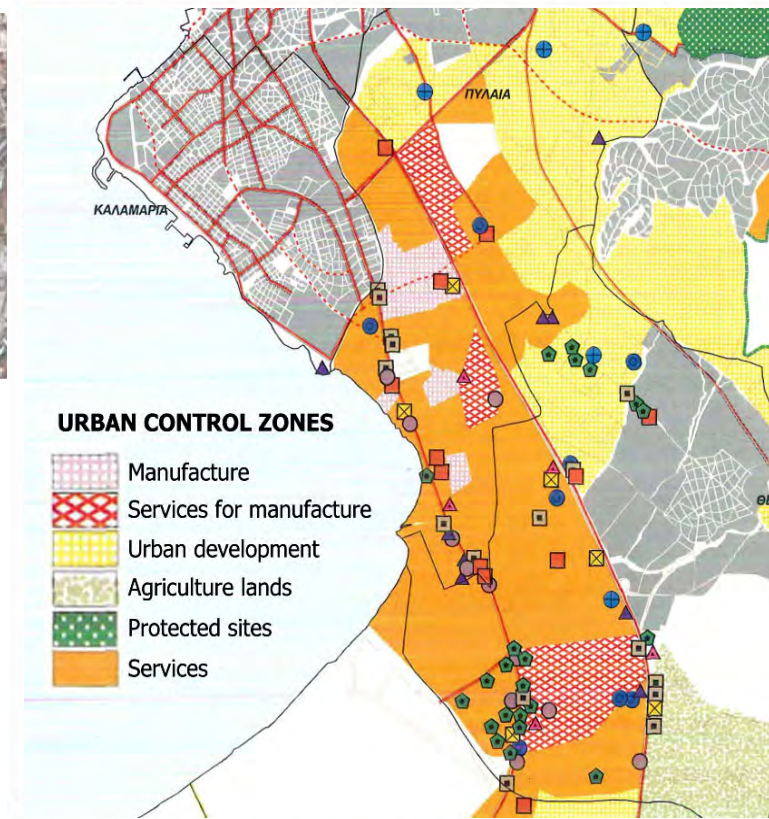
-Proximity to airport and public transport node

BRIEF ANALYSIS/AREA LEVEL

From agricultural land to urbanizing area

Transformation of the suburban area

-Area 'divided' in 4 municipalities, difficult to manage

-Still a large number of vacant areas available

-Urban control zones plan attributed areas with specific land use but is still neglected

URBAN CONTROL ZONES

- Manufacture
- Services for manufacture
- Urban development
- Agriculture lands
- Protected sites
- Services

1 City-like pattern

2 Suburban-villa type

3 Suburban-social housing type

4 Agriculture pattern

5 Peri-urban development
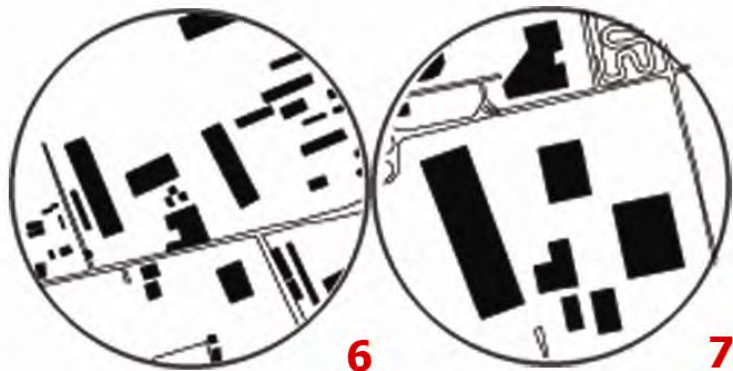
6 Businesses and institutions

7 Shopping malls & industries

Scale 1:50.000
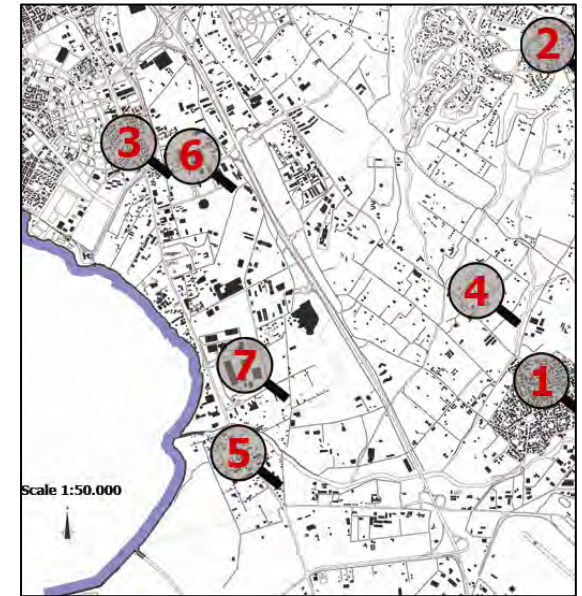
Diverse urban patterns

- **Road network:** Sparse mainly wider roads to channel cars quickly

- **Scale of plot:** very large parcels subdivided by minimal street system

- Scale affects the distance between major roads, size of blocks, size of buildings

-**Disengagement of street, lot, building**

Lack of order, haphazard/random relationship between buildings and streets

Peripheral stream

Streams' estuaries

LEGEND

Streams

Height difference 0-190m
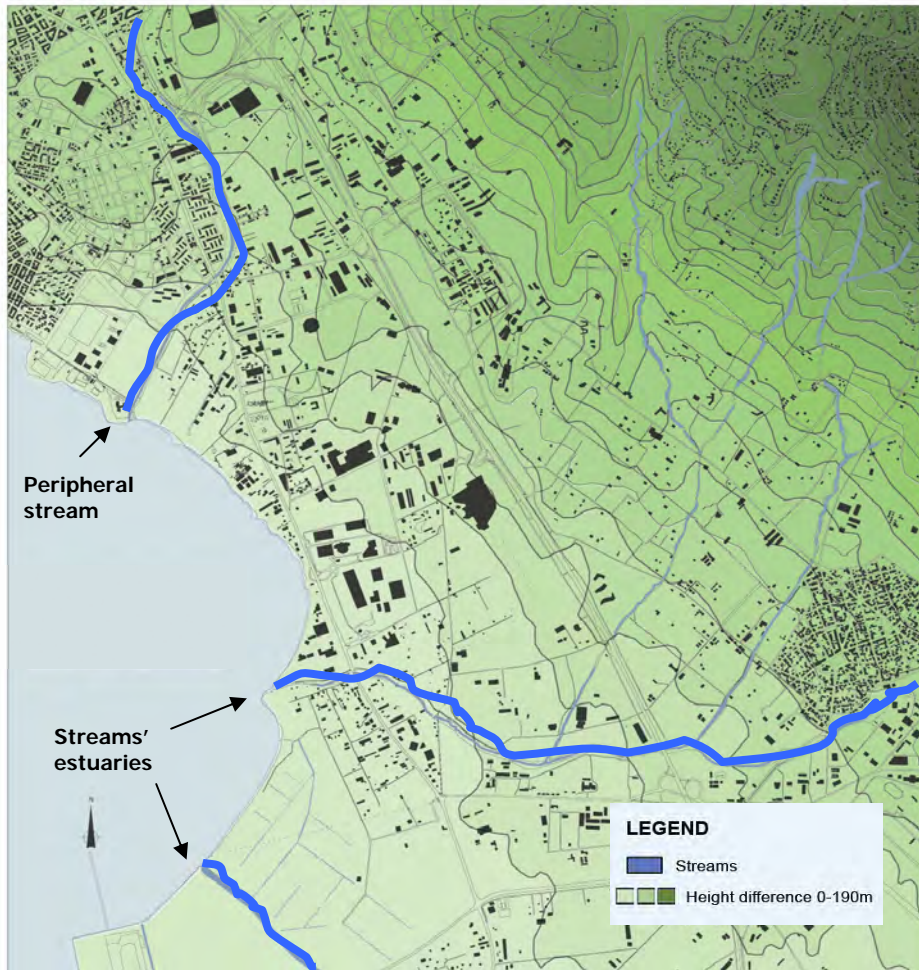
Landscape/Coastline

-**City** development **halts** on the peripheral stream estuaries

-Two more **undeveloped streams** complete the water body of the area

-**Hilly landscape** (190m) – Mountains and sea provide sense of uniqueness and many attractive views

BRIEF ANALYSIS/AREA LEVEL

Infrastructure

-Transportation **nodes**

-Future **connections** by metro & highway

-Highways make **coast inaccessible**

-Traffic lights, tunnels & bridges make **vertical connections possible**

LEGEND
- Cultural facilities
- Athletic facilities
- Retail/Shopping malls
- Education facilities
- Research institutes
- Industries/Storehouses
- Offices/Administration
- Recreation facilities
- Health facilities
- Other services
- Residential areas
- P Parking spaces

Main functions

-Sprawl of diverse functions occurring **along main infrastructure**

-Edge city effects

-Shopping malls have become recreational regional centers and **attract people** but work as individual entities

CONCLUSIONS OF THE AREA ANALYSIS

Results

Fragmented & **disconnected** from the coast

Very **car-oriented** area with **huge parking spaces**

Roads serve only regional functions

Insufficient public transportation system

Potentials

Space available for new development

Neglected **public space** may become a potential
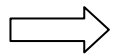
⇨ How to combine existing functions with the new program to create an active locality?
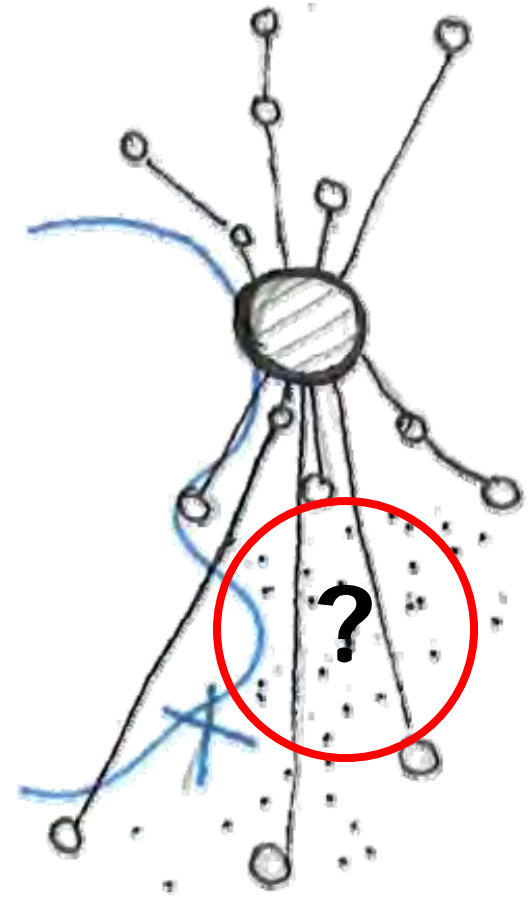
VISION &
PROGRAM DEFINITION

Present

→ **Monocentric** city structure

→ Small **neighborhood centers**

→ Suburban **settlements dependent** on Thessaloniki city center

→ **Sprawl** of functions in the periphery

The area requires a new **system of organization**

- to host the functions required for the clusters

- to be attractive for the people
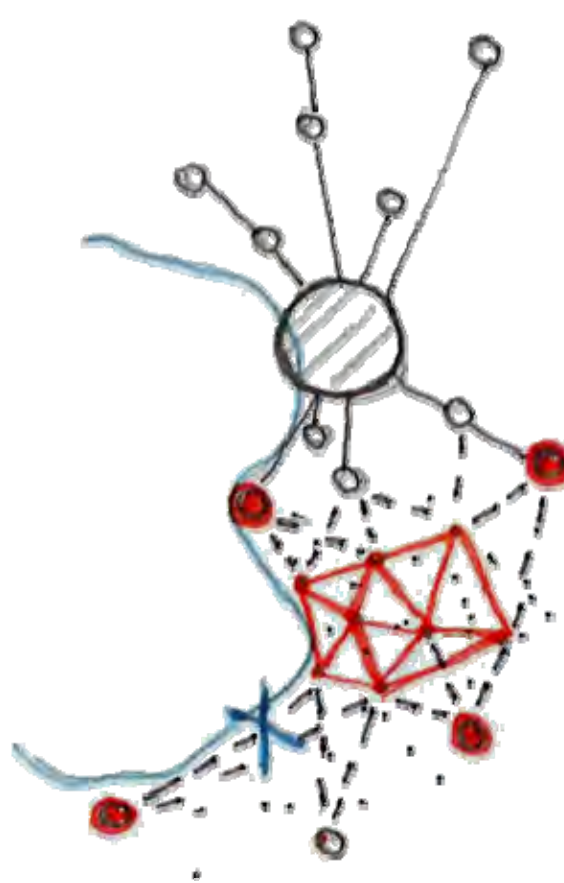
- to become part of the metropolitan mechanism

A tertiary sector **pole** with **emphasis** on research and technology

→ **Activate** the localities

→ **Connect** regional to the local level physically and functionally

→**Promote** poly-nuclear development

→ **Interaction** with city and surrounding settlements

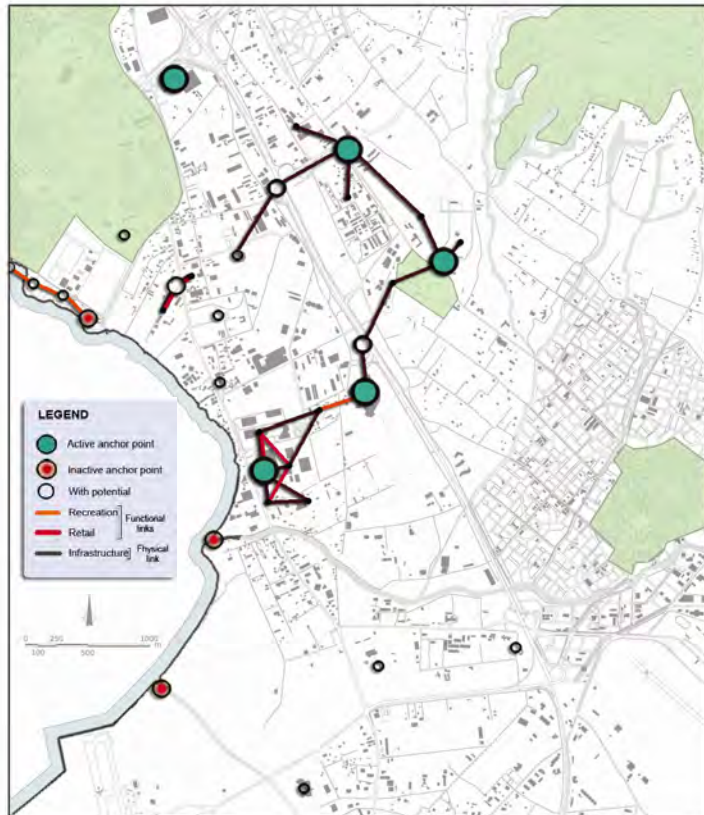Internal network will
strengthen periphery
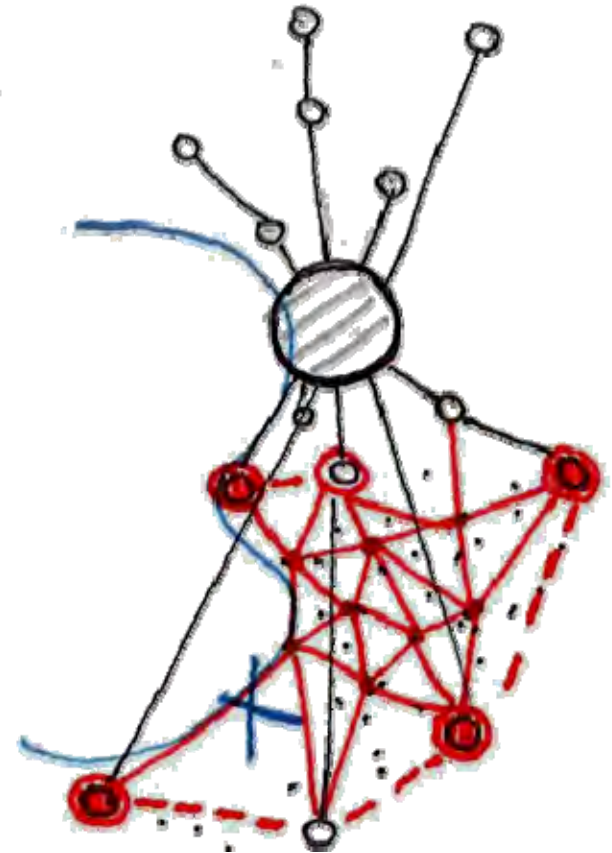
Peripheral settlements able
to **diversify their centers**
and complement in synergy

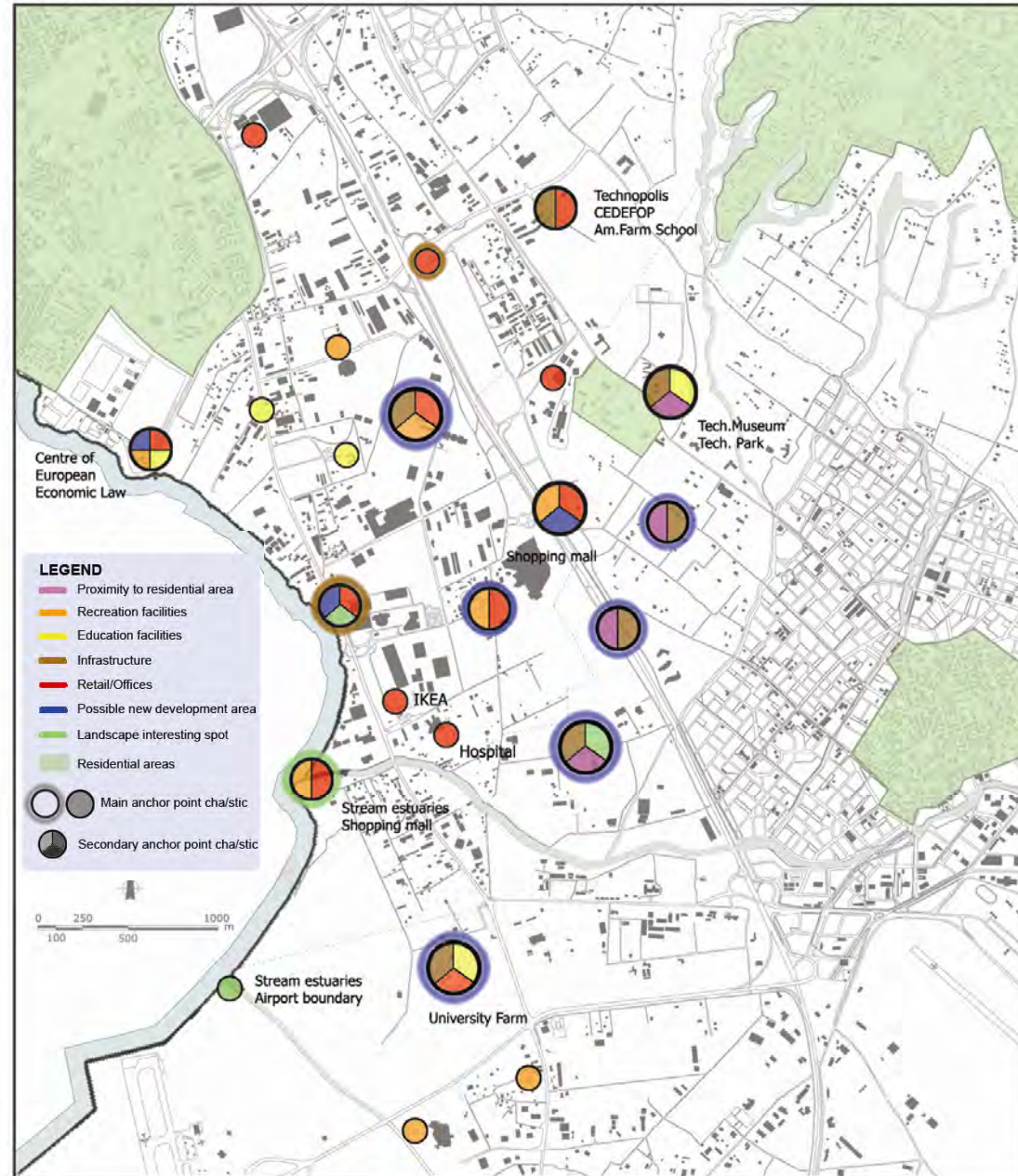**Identify existing** anchor points and **define** possible future ones

Existing points are **sparse** and **loosely connected** in terms of **functional, physical or natural** links

LEGEND
- Active anchor point
- Inactive anchor point
- With potential
- Recreation — Functional links
- Retail
- Infrastructure — Physical link

Technopolis
CEDEFOP
Am.Farm School

Tech.Museum
Tech. Park

Centre of
European
Economic Law

Shopping mall

IKEA

Hospital

Stream estuaries
Shopping mall

University Farm

Stream estuaries
Airport boundary

LEGEND
- Proximity to residential area
- Recreation facilities
- Education facilities
- Infrastructure
- Retail/Offices
- Possible new development area
- Landscape interesting spot
- Residential areas
- Main anchor point cha/stic
- Secondary anchor point cha/stic

Position

→ **Utilize existing** points, **activate** and **create new** ones

→ **Integrate** them in a new relation structure

LEGEND
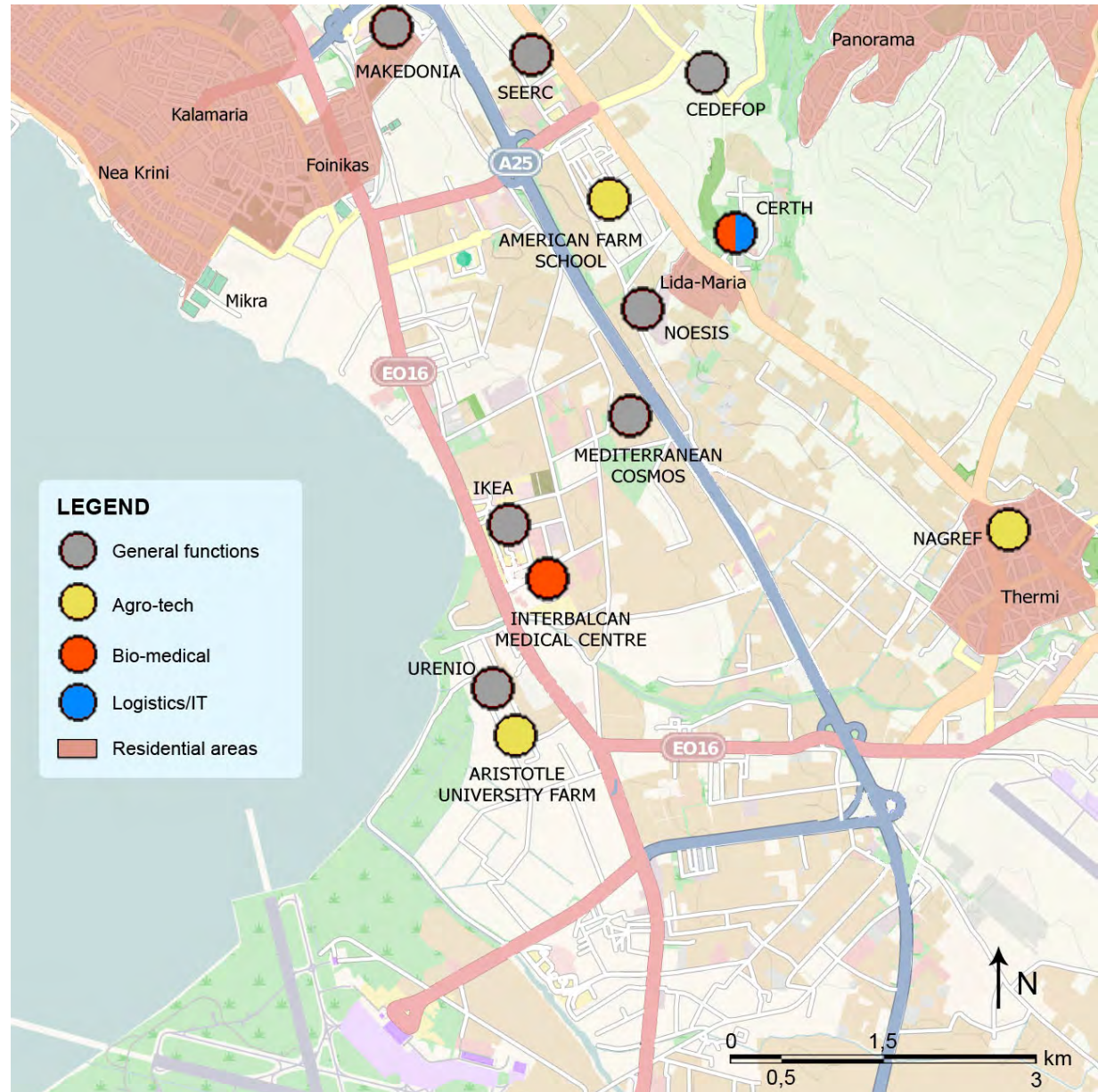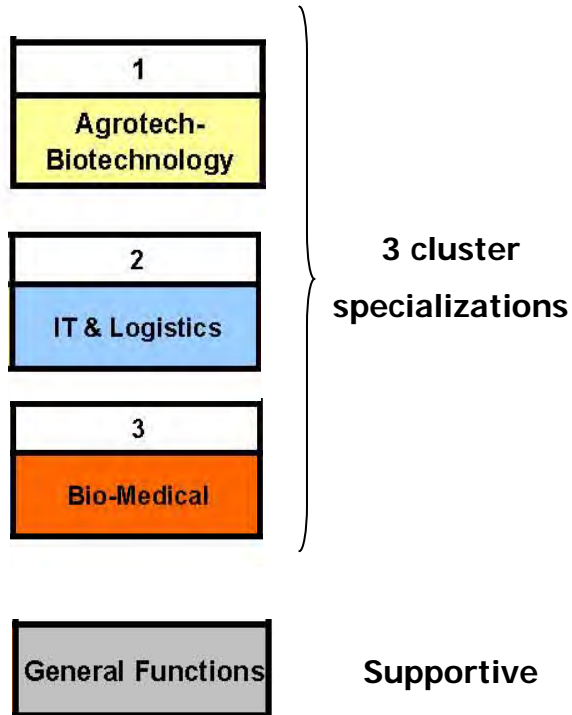- Utilize existing points
- Create new anchor points
- Enable inactive anchor points
- Use potential
- Recreation] Functional links
- Retail
- Infrastructure] Physical link
- Landscape] Physical link
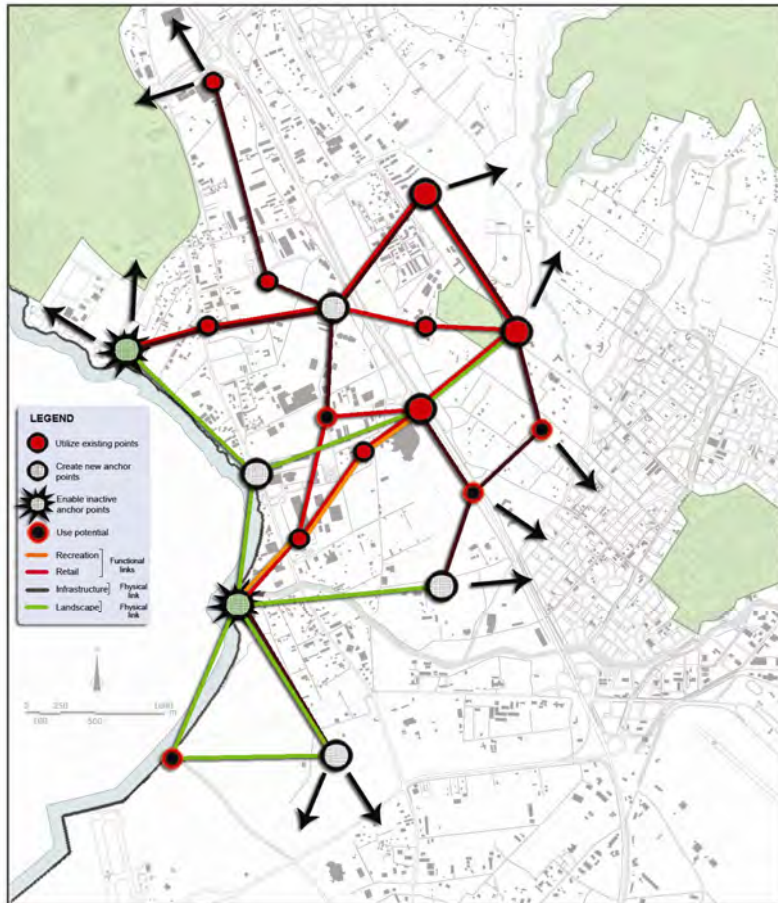
Model conditions

→ Need of **character definition of industries**

→ Development of **strategic areas**

→ Attention on **infrastructure**

→ **Focus on landscape,** especially the **coastline**

Focus on existing types of industry

Tracing and **mapping** of research, education and development firms & institutions

RESULT

1
Agrotech-Biotechnology

2
IT & Logistics

3
Bio-Medical

3 cluster specializations

General Functions

Supportive

LEGEND

- General functions
- Agro-tech
- Bio-medical
- Logistics/IT
- Residential areas

STRATEGIC LOCATION

Mapping of vacant areas in the region and evaluation

CRITERIA

Infrastructure (accessibility, connectivity)

Landscape quality

Proximity to coast/functions/settlements

Size of the plot

LEGEND
- Cultural facilities
- Athletic facilities
- Retail/Shopping malls
- Education facilities
- Research institutes
- Residential areas
- Offices/Administration
- Recreation facilities
- Health facilities
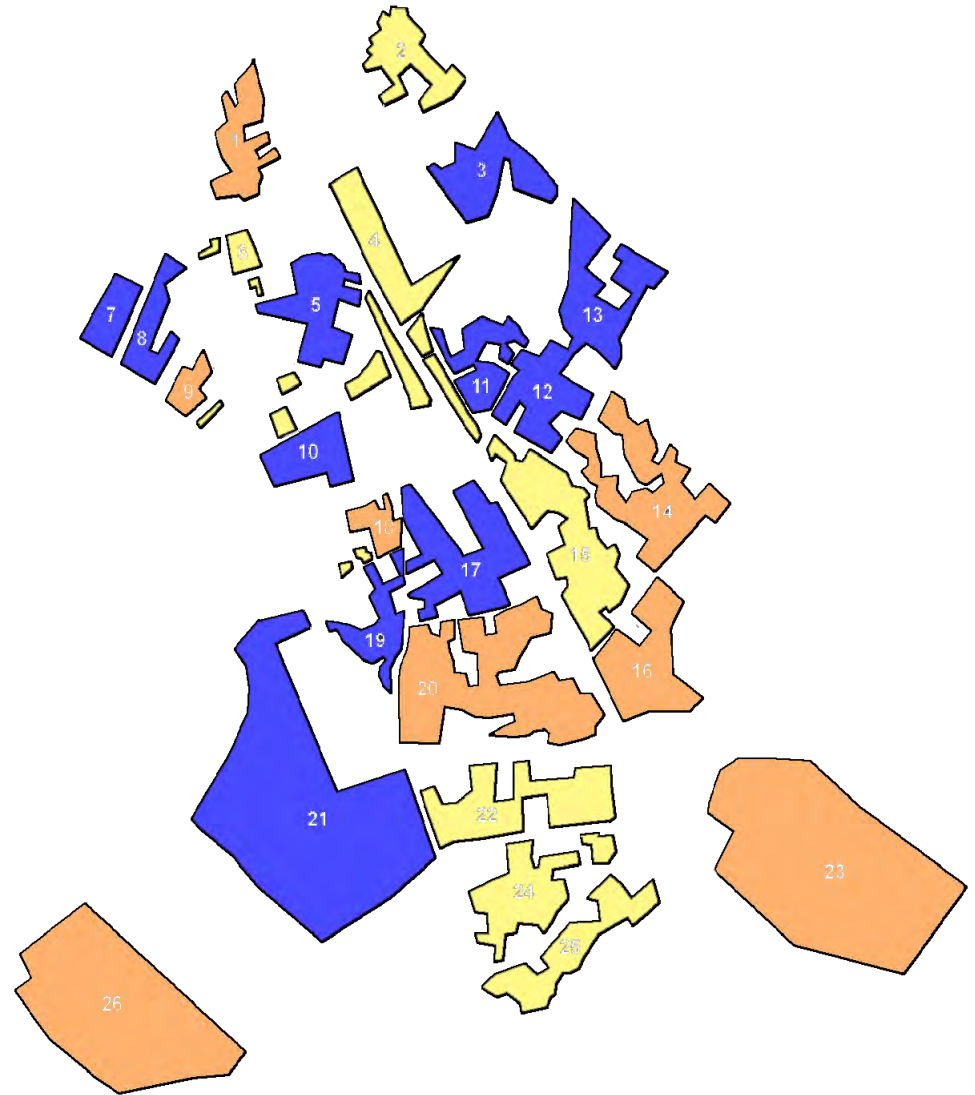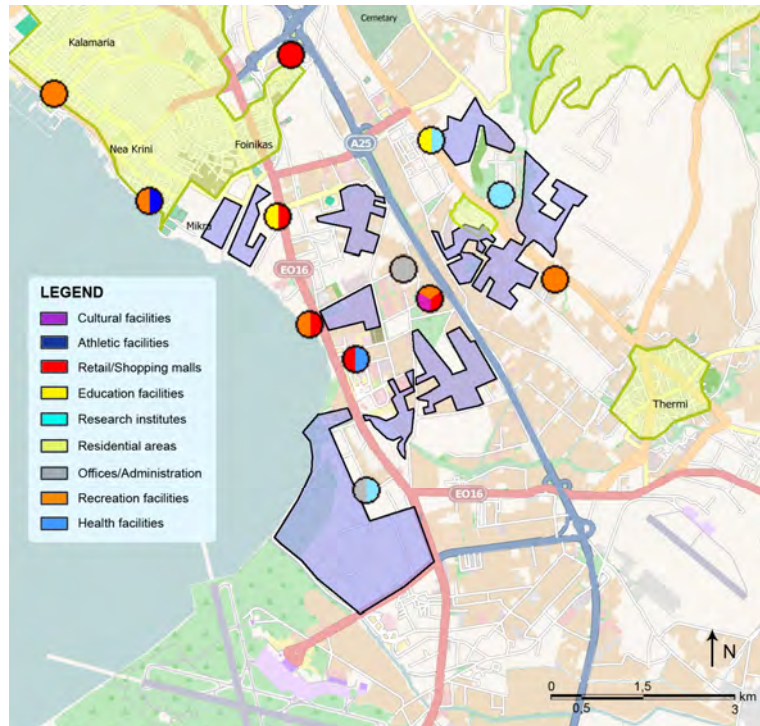
CASE STUDIES

Conditions based on case studies

Flexibility
Emphasis on a variety of space and plot sizes

Spatial qualities
Use of landscape elements, public space

Accessibility by an organized road network

Connectivity through an integrated public transportation system

Tagus Park, 180Ha Lisbon

Andalucia TechPark, 240Ha, Malaga

Bioscience Park, 130Ha, Leiden

CONDITIONS FOR THE CLUSTERS

-Different program per cluster

-Common elements depending on the needs of each specialization:

-Good accessibility

-Public transport

-Parking spaces and

-Link with existing functions

Possible mixing program

1	COMPACT			
2	MIXED CLUSTERING		INTERMEDIATE	
3	I+L	A+B		
4	A	B	I+L	ZONED DEVELOPMENT

-Mixed program and services: **office & research spaces,** infrastructure & open/public spaces

Unique characteristics for **agro-tech and logistics**

-larger parcels for farmlands and warehouses

MODELS OF DEVELOPMENT

Campus structure	Strip structure	Grid structure

Relatively loose and flexible

Agro- technology
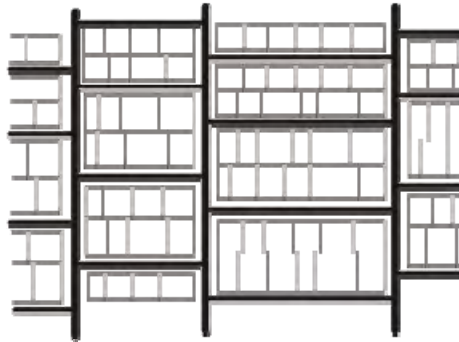
Organized development

ICT	Bio-medical

Standardized environment

Logistics

Apply proposed structure to existing one combined with principles:

- apply a system of **road grid** to **connect parcels**
- **utilize** the **landscape/** provide **public space**
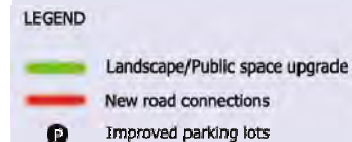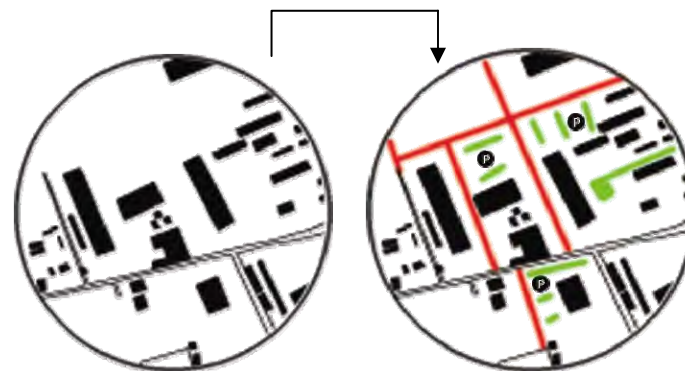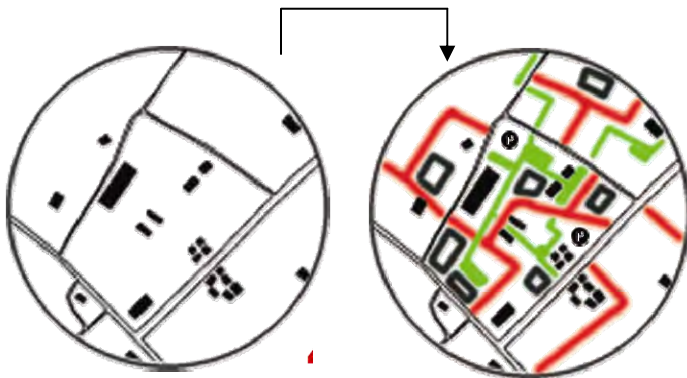
LEGEND
- Landscape/Public space upgrade
- New road connections
- Improved parking lots

Re-evaluate which **areas** are better suited **for specific functions/ clusters**

Keep **hypothesis of 150Ha**

Target group ⟶ Middle class

Initial estimate: 80-100 companies
4.500-5.000 labor force

Characters	1 Agrotech-Biotechnology	2 IT & Logistics	3 Bio-Medical	General Functions
Area	65 Ha	35 Ha	30 Ha	20 Ha
Office	30%	25%	40%	-
Production	50%	15%	30%	-
Support	20%	60%	30%	-
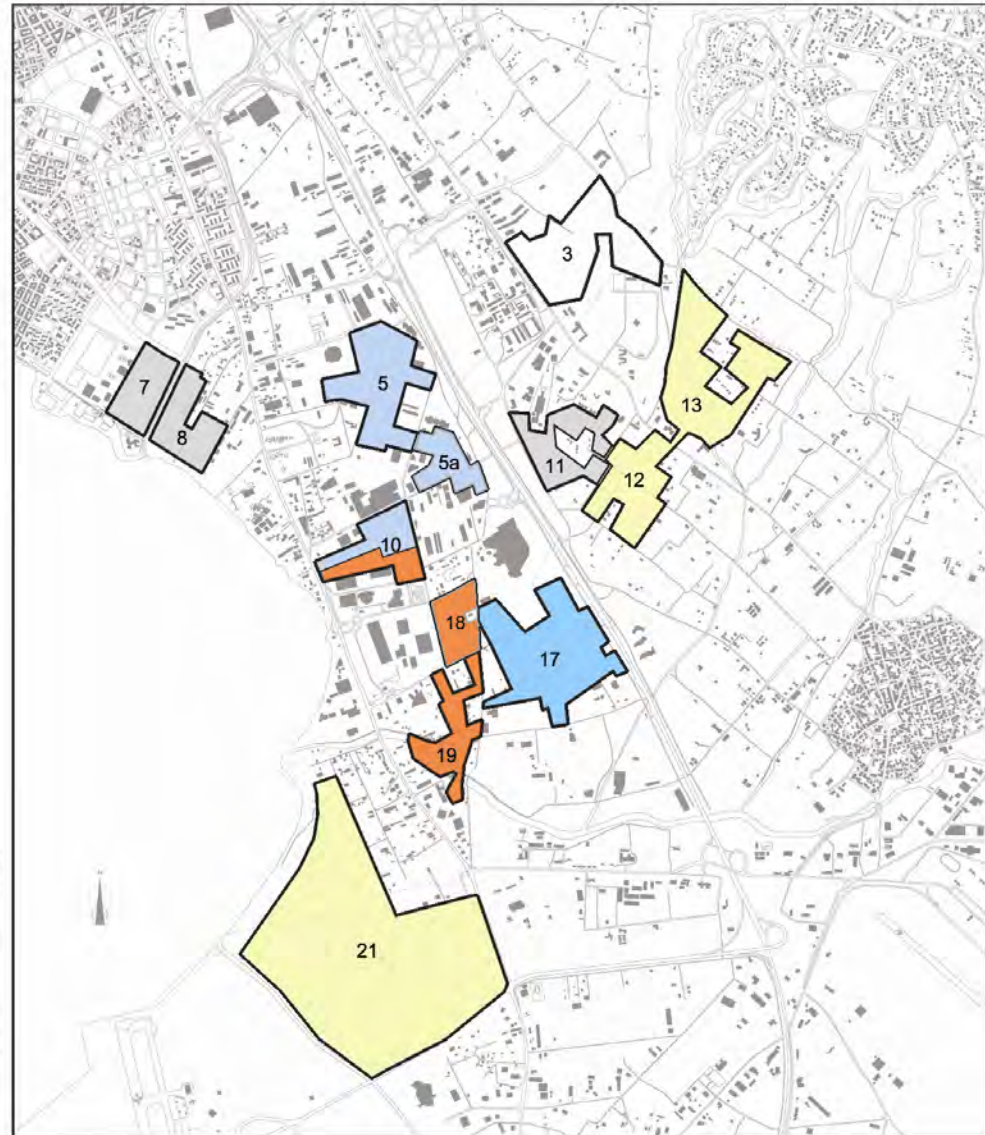
STRATEGY

Main principles

-Develop an **open structure** to accommodate more program → **flexibility**

-Relate coast with inner area and city & **settlements** with existing **functions** and airport

-Focus on landscape elements and **continue structures** coming from the city

LEGEND

Transportation
- Marina
- Future metro terminal
- Bus terminal
- Airport
- Roads

Existing facilities
- Residential areas & extensions
- Sports field
- Education facility

Recreation and culture facilities
1. PAOK Sports arena
2. Mikra Athletic center
3. NOESIS - Technology Museum of Thessaloniki
4. Jockey Club of N.Greece
5. Magic Park amusement park
6. Hayat regency casino
7. Hotel Nicopolis Thessaloniki

Retail facilities
8. Mediterranean Cosmos
9. Florida I retail park
10. Florida III shopping center
11. IKEA
12. Shopping center Makedonia
13. Mega Outlet

High-tech, R&D facilities and institutes
14. Technopolis
15. Thessaloniki Technology Park
16. American Farm School
17. URENIO Research Unit
18. CEDEFOP
19. Aristotle University Farm
20. National Agricultural Research Foundation
21. Eurocons. & I4G incubators

Health & education facilities
22. Thermi health center
23. Interbalkan Medical Center
24. International Hellenic Univ.
25. Center of International and European Economic Law
26. Superior Military Academy
27. Department of Forestry and Natural Environment AUTH
28. AUTH Departments of Fine Arts, Music Studies, Tefaa

Strategy principle: Fill-in vacant areas & adapt sprawl to contemporary conditions

Goals

- **Re-organize** the area

- **Connect** the **coast with hinterlands**

- Take **advantage of landscape and** of existing **functions**

- Provide **coherence** in functions & **protect** from more **fragmentation**
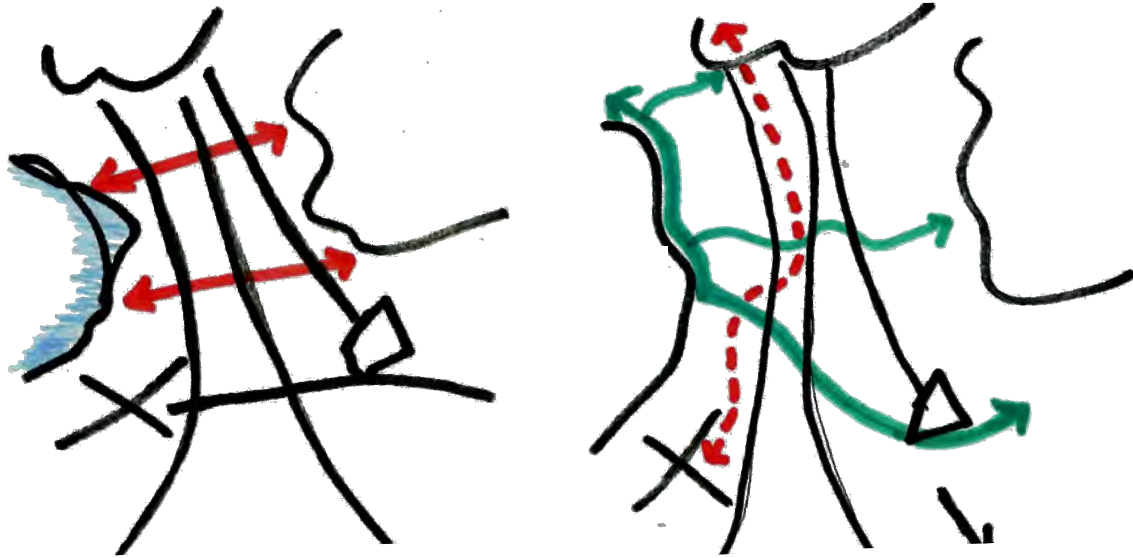
3 Layers of intervention

→**Landscape** (streams, coast, green corridors)

→**Infrastructure** (roads, new grid system, public transportation)

Interventions for the area → Quality of public space, connectivity & accessibility

→**New structure** of the program (new organization for urban block, transformation of parking lots)

Interventions for the program/ → Urban form

LAYERS: LANDSCAPE & INFRASTRUCTURE
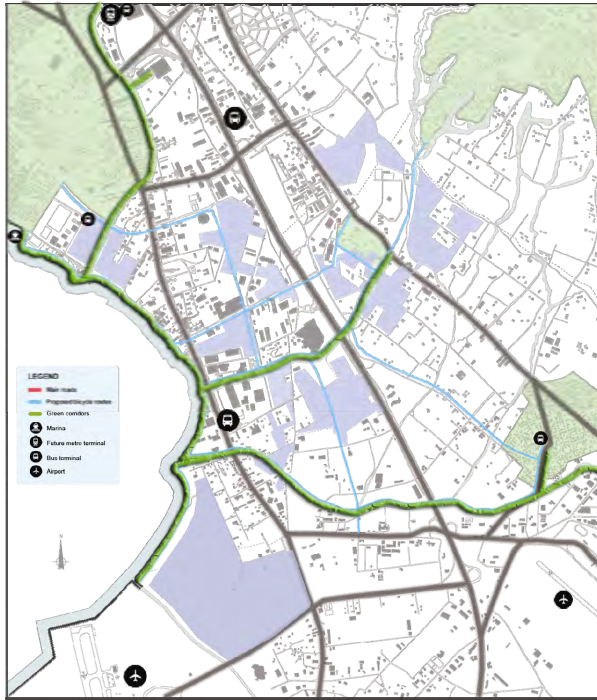
Pedestrian/Bicycle friendly
Focus on water/environment
Openness to the coast
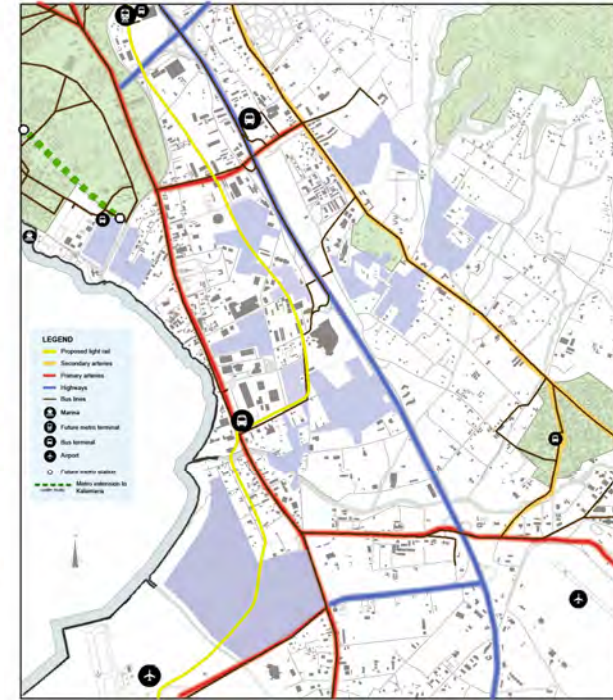
→**Linear green corridors**

→**Bicycle routes** provide an
intermediate level of mobility
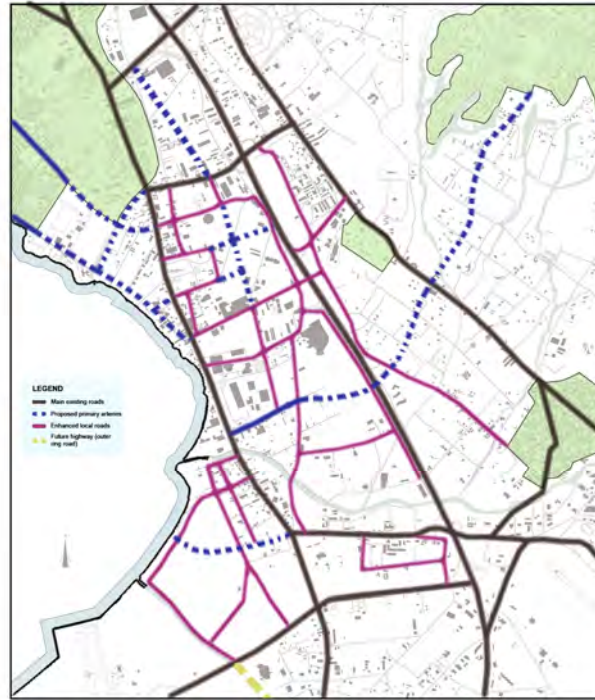
Improve accessibility

→**New** primary **arteries**

→ System of **secondary and
local roads** to increase
organization in the area

Upgrade connectivity level

→**Light rail system**

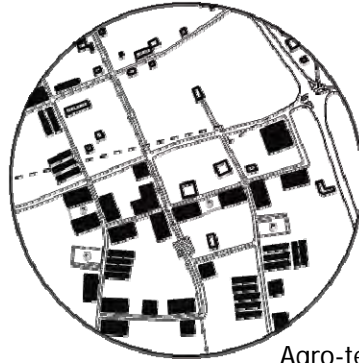→**Improve bus system**

→Public transport brings **new
opportunities**

Principles for designing the clusters

→**Flexibility** in plot division

→**In-between space** becomes **functional**

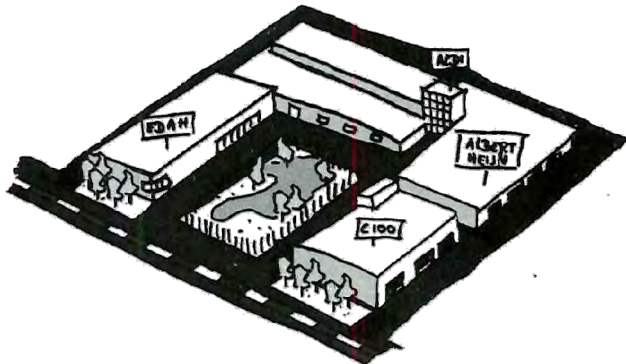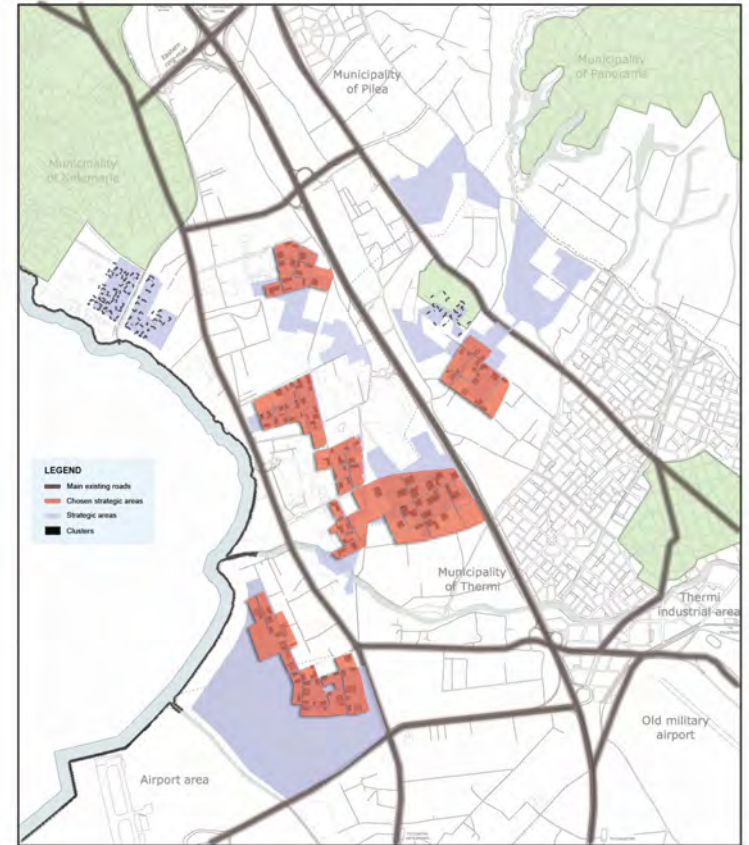→**Mixing** of **common functions** and services
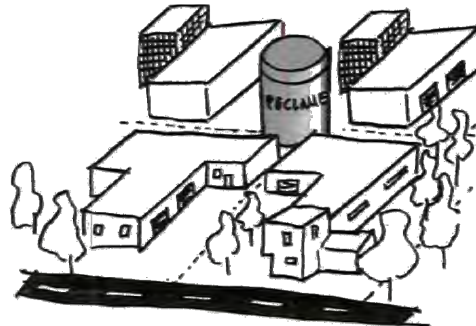
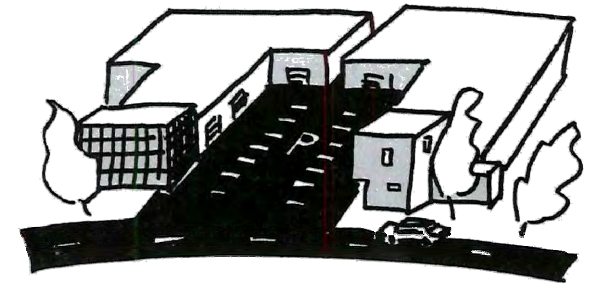→**Variety** and **diversity** of types and sizes

Agro-tech

Logistics
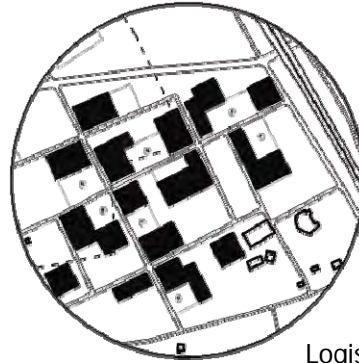
LEGEND
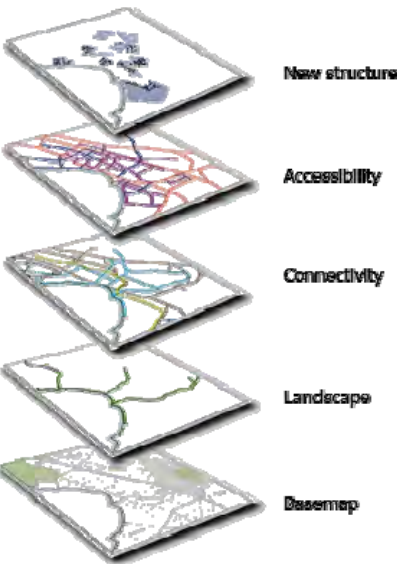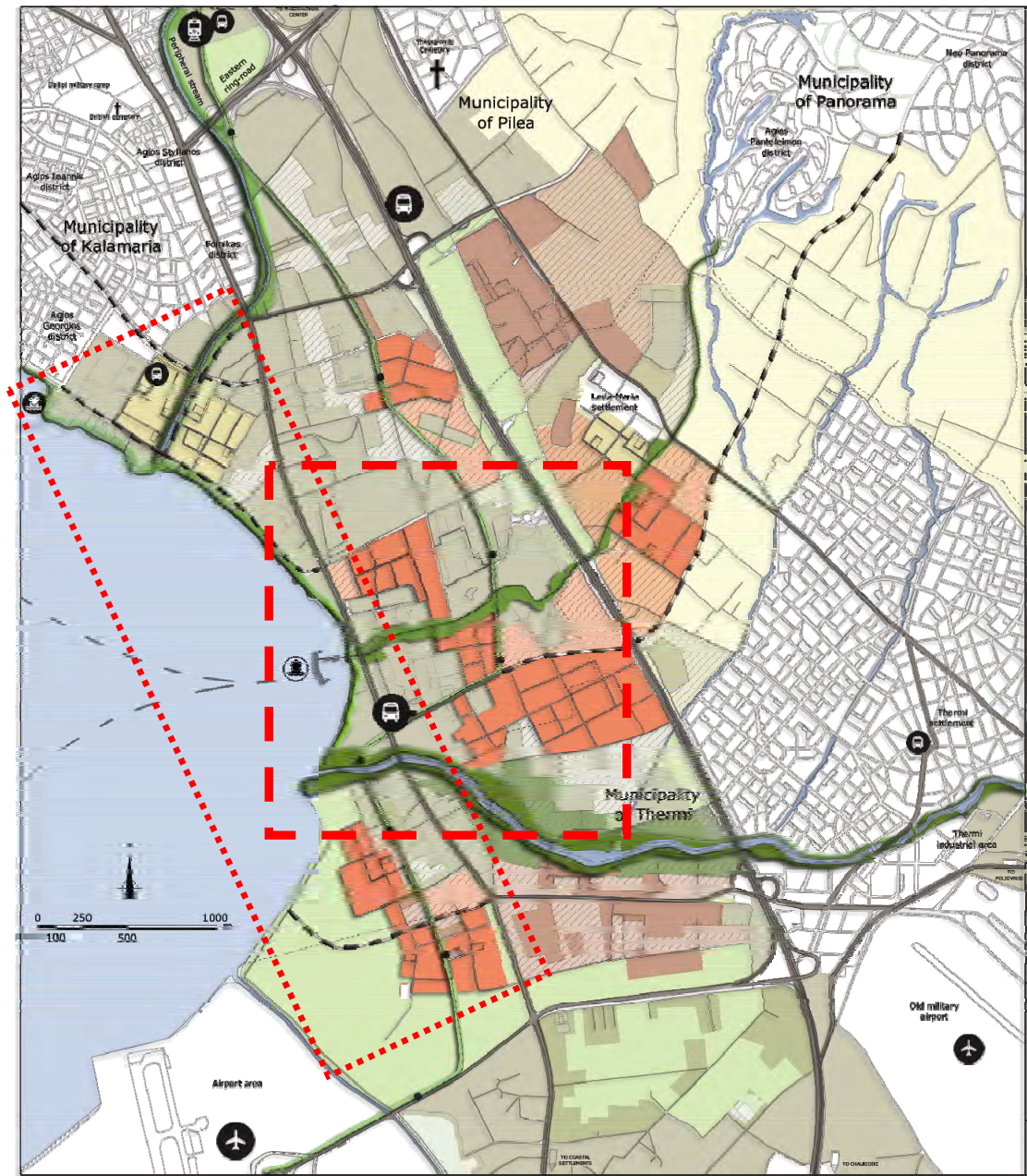Main existing roads
Chosen strategic areas
Strategic areas
Clusters

Thematic clustering

Shared facilities

Shared parking space

MASTERPLAN
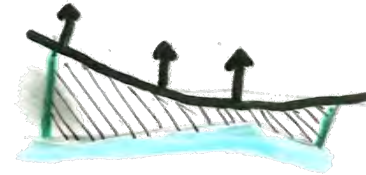

New structure

Accessibility

Connectivity

Landscape

Basemap

LEGEND

Proposed   Existing

Marina
Future metro terminal
Bus terminal
Airport
Tram line & stops
} Transportation

Biomedical
ICT & Logistics
Agro-tech
} Clusters

Walk & bicycle routes
Roads
} Routes

Knowledge related facilities
Developed areas
Undeveloped areas
Agricultural lands
Residential areas
Future land use
} Land use

LEGEND

Bus terminal		Transportation
Airport		
Roads		
Developed areas		Existing facilities
Sports field		
Education facility		
2 Mikra Athletic center		Recreation and culture facilities
4 Jockey Club of N.Greece		
9 Florida I retail park		Retail facilities
10 Florida III shopping center		
11 IKEA		
13 Mega Outlet		
17 URENIO Research Unit		High-tech, R&D facilities and institutes
19 Aristotle University Farm		
23 Interbalkan Medical Center		Health & education facilities
25 Center of International and European Economic Law		
26 Superior Military Academy		
27 Department of Forestry and Natural Environment AUTH		

-Coastal part **highly urbanized** in specific spots

-Recreational, retail and educational **facilities**

-**Vertical** road connections are important to link the coast with the hinterlands

-Areas where **coast meets** local **streams** can become **attractive** spots

Kalamaria district

Schools

Shipyards

Peripheral stream estuaries

Stream estuaries

Airport area
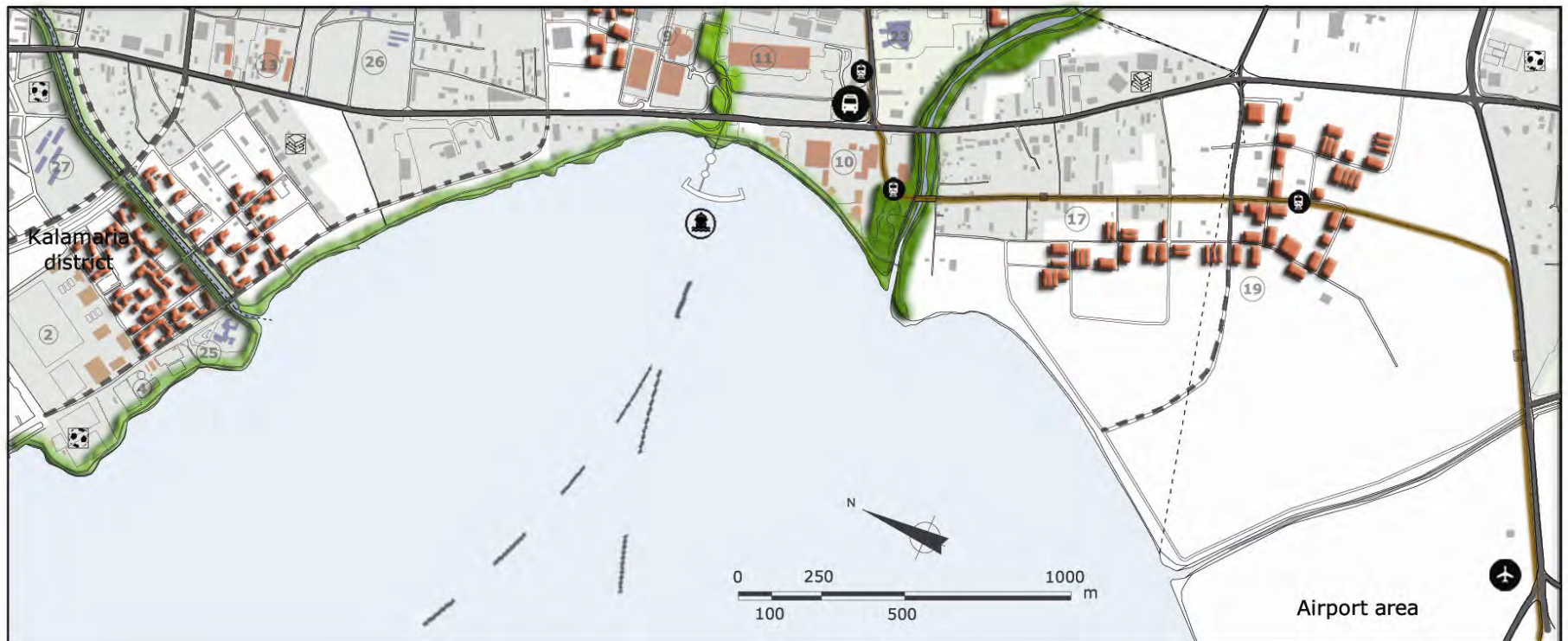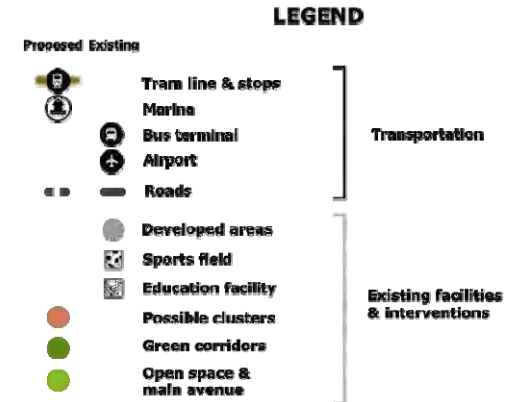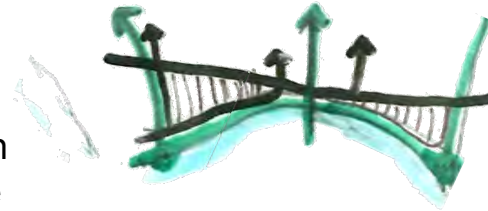
0 250 1000 m
100 500
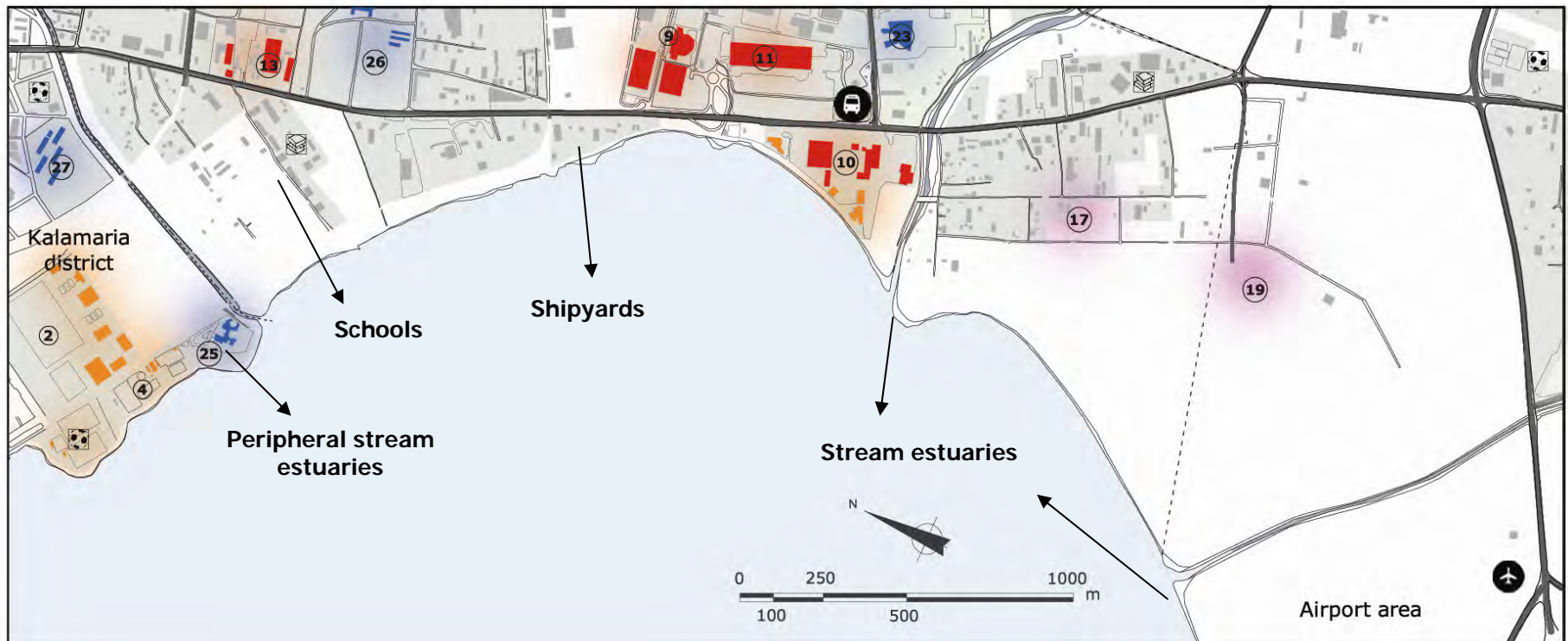
TRANSFORMATION OF THE COASTLINE

-**Extend** the coastal linear **boulevard integrating** it as part of a **public space network**

-Coastal road **defines** the **boundaries** of the coast

-**Connect** the recreational & residential areas in terms of **road system** & **pedestrian/ bicycle paths**

LEGEND

Proposed Existing

Tram line & stops	
Marina	
Bus terminal	
Airport	Transportation
Roads	

Developed areas	
Sports field	
Education facility	
Possible clusters	Existing facilities & interventions
Green corridors	
Open space & main avenue	

Kalamaria district

N

0   250   1000
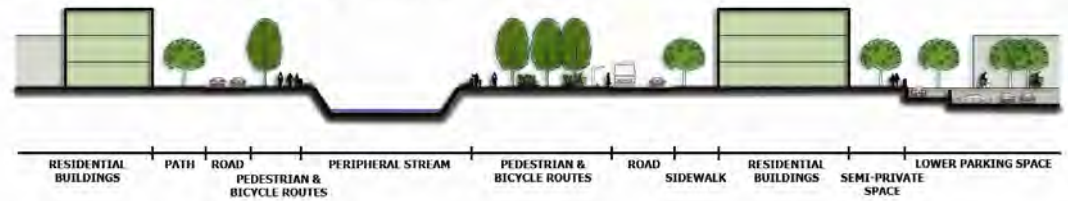m
100   500

Airport area

Peripheral stream

- **Boxed banks** of the peripheral stream

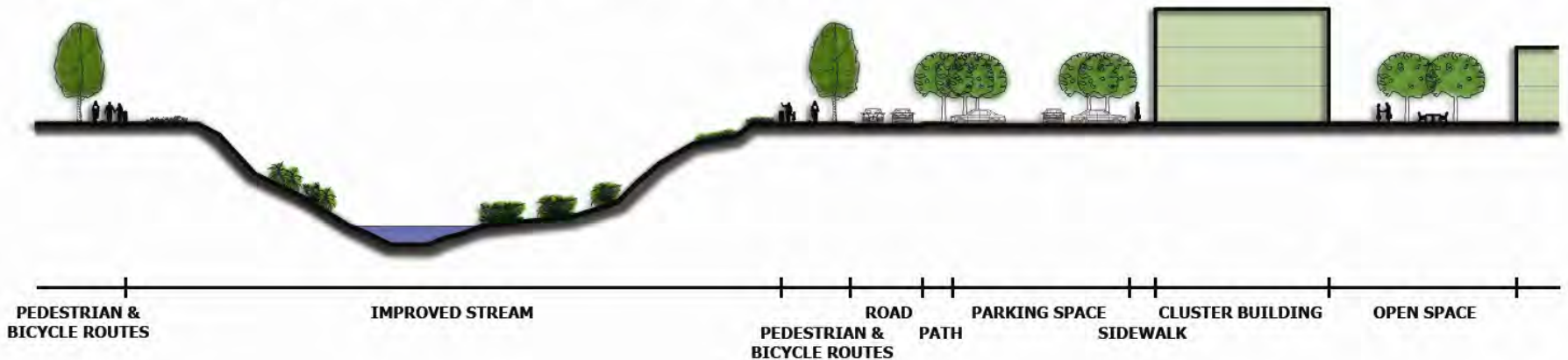- Possibility to **serve** as a green corridor a **larger urban area**

Riverbanks project

- **Soft banks**/ focus on the landscape

- **Connection** with larger structures and **relation** with adjacent facilities

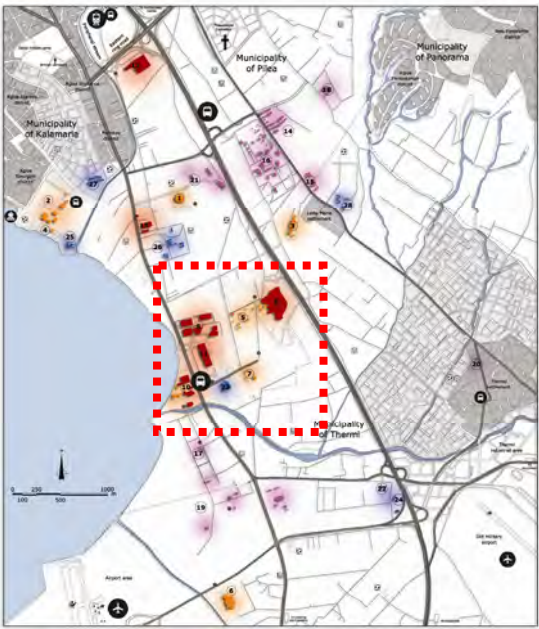Residential areas, relationship with peripheral stream

| RESIDENTIAL BUILDINGS | PATH | ROAD PEDESTRIAN & BICYCLE ROUTES | PERIPHERAL STREAM | PEDESTRIAN & BICYCLE ROUTES | ROAD SIDEWALK | RESIDENTIAL BUILDINGS | SEMI-PRIVATE SPACE | LOWER PARKING SPACE |

Green corridors along stream and connection with bio-medical cluster

| PEDESTRIAN & BICYCLE ROUTES | IMPROVED STREAM | ROAD PEDESTRIAN & BICYCLE ROUTES | PATH | PARKING SPACE SIDEWALK | CLUSTER BUILDING | OPEN SPACE |

DESIGN

LEGEND

|		
5	Magic Park amusement park	Recreation and culture facilities
7	Hotel Nicopolis Thessaloniki	
8	Mediterranean Cosmos	Retail facilities
9	Florida I retail park	
10	Florida III shopping center	
11	IKEA	
23	Interbalkan Medical Center	Health & education facilities
26	Superior Military Academy	

CURRENT SITUATION/LOCAL LEVEL

Car-oriented environment

Lack of order/**Random relationship** between buildings and streets
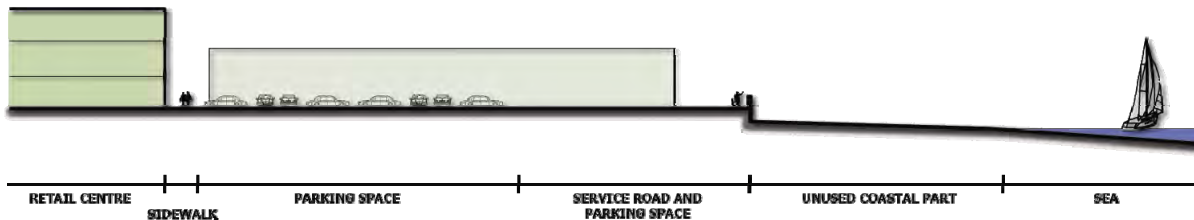
Insufficient public transport

Functions work **individually**

Road network **serve only** these regional **attractors**

Large parking spaces

| SHOPPING MALL | SIDEWALK | PARKING SPACE | SERVICE ROAD | ACCESS PATH | PARKING SPACE |
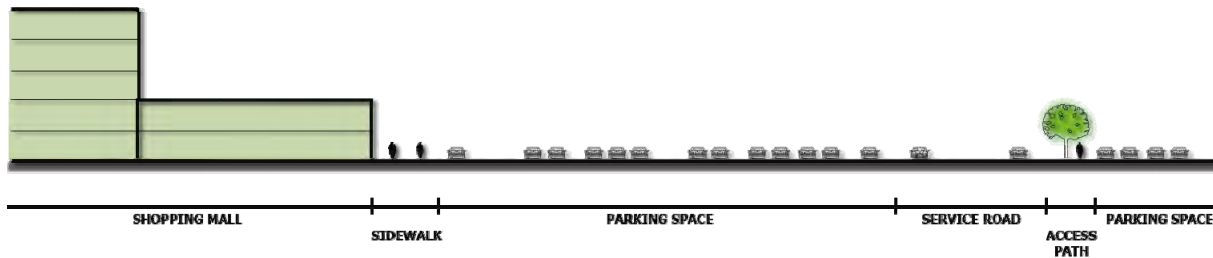
Parking space facing the unused coastal part

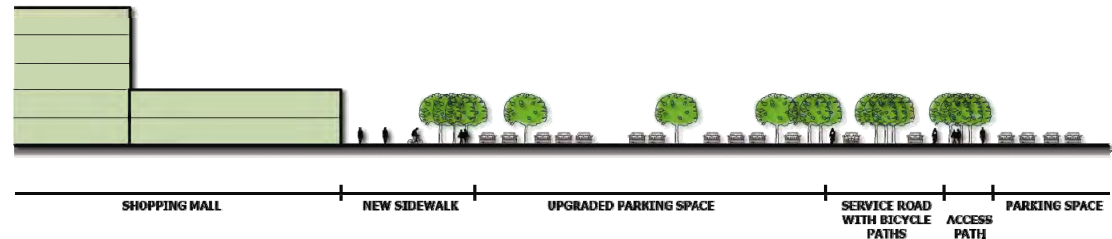| RETAIL CENTRE | SIDEWALK | PARKING SPACE | SERVICE ROAD AND PARKING SPACE | UNUSED COASTAL PART | SEA |

CONCEPT PLAN

Principles

- Define a **pattern**

- **Activate** the locality spatially and functionally

- Public transport to **integrate** the area
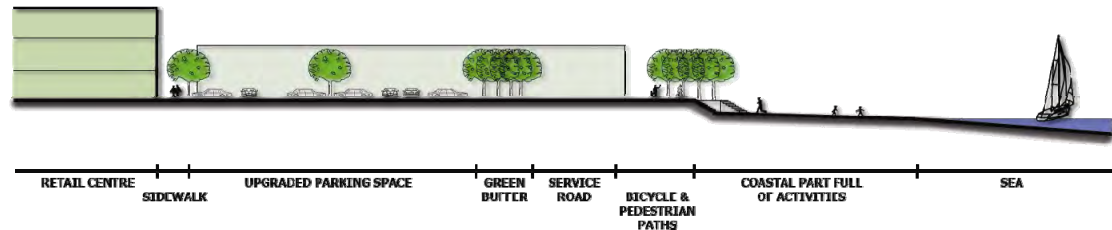
Interventions in the local scale

- **Main avenue** works as a connector with **places** interest along it

- **Utilize** the variety of **attractors** for the locality

- **Mix** common spaces & functions
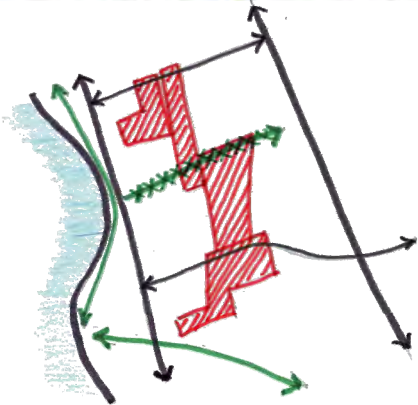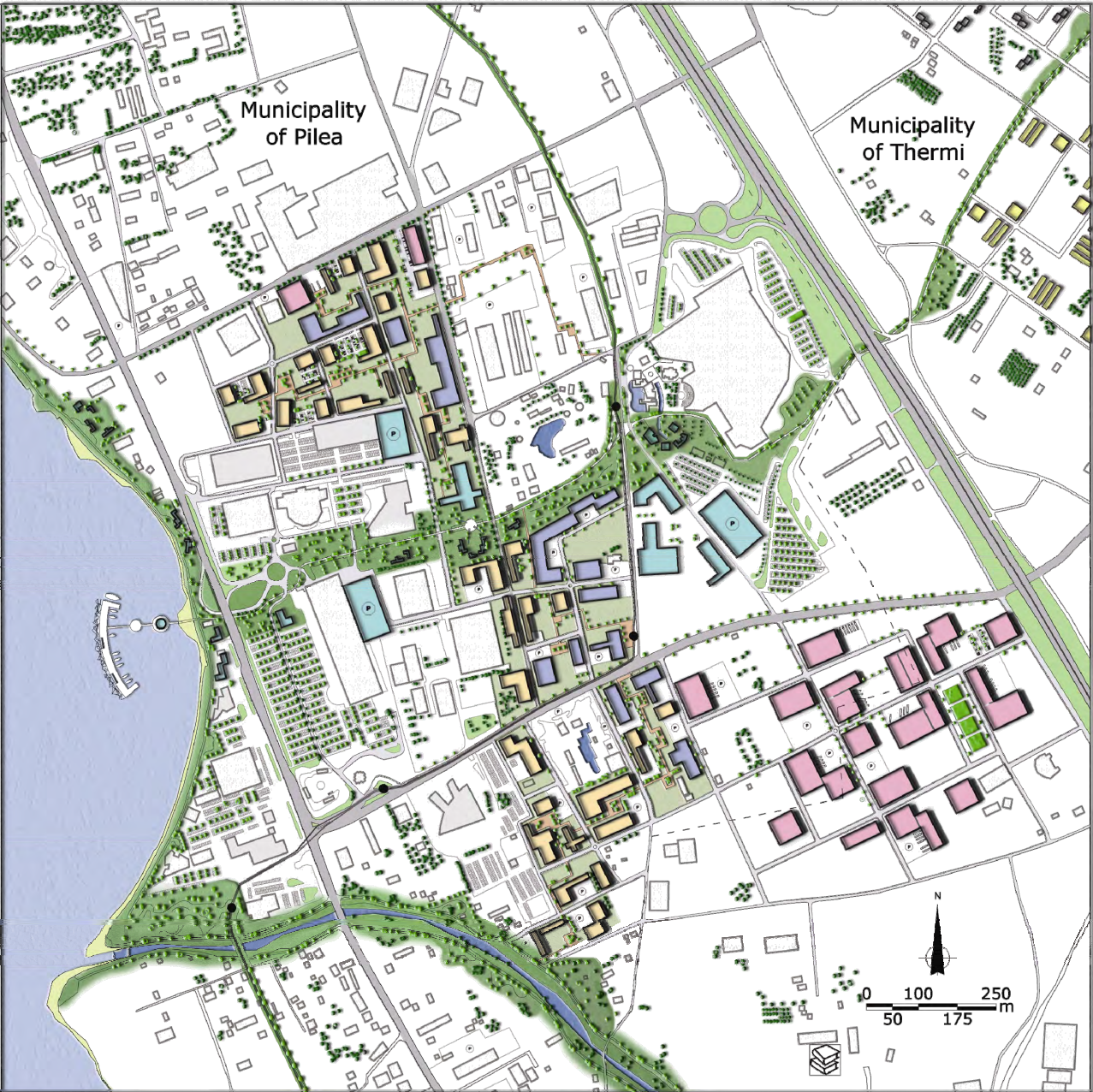
- **Re-organize** parking lots
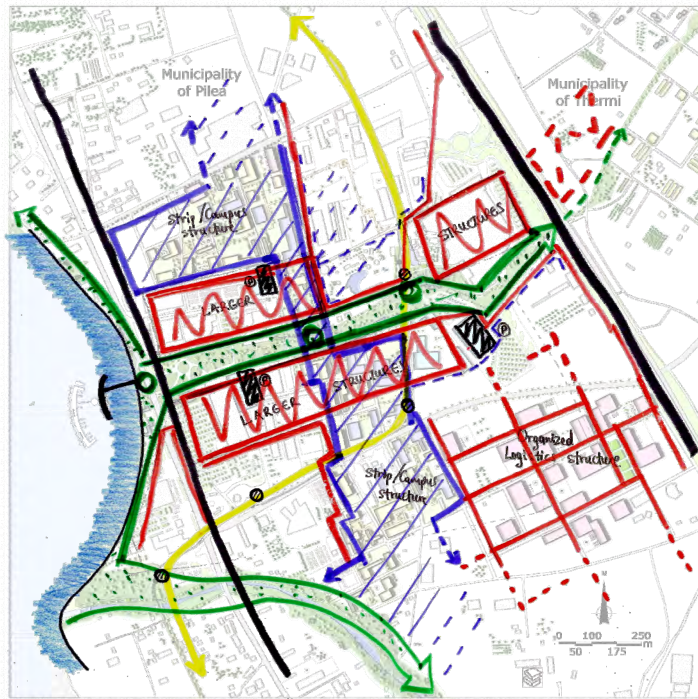
Re-organized and upgraded parking lots, more space for pedestrians

SHOPPING MALL | NEW SIDEWALK | UPGRADED PARKING SPACE | SERVICE ROAD WITH BICYCLE PATHS | ACCESS PATH | PARKING SPACE

Coastal part used, pedestian & bicycle paths along it

RETAIL CENTRE | SIDEWALK | UPGRADED PARKING SPACE | GREEN BUFFER | SERVICE ROAD | BICYCLE & PEDESTRIAN PATHS | COASTAL PART FULL OF ACTIVITIES | SEA

MASTERPLAN

LEGEND

Proposed	Existing		
○		Biomedical	Clusters
○		ICT	
○		Logistics	
○		Agro-tech	
○		Other program	
—		Walk & bicycle routes	Routes
○		Light rail line & stops	
Ⓟ		Parking space/building	
—		Internal walk routes	

Municipality of Pilea

Municipality of Thermi

0 100 250
50 175
m

# BLOCK ORGANIZATION IN THE CLUSTERS

Flexibility in plot division and functional in-between space

Buildings organized in a way that they allow future interventions:

- internal **roads**

- in-between space becomes **open space**

- possibility of **extensions** of **functions**
and parking lots

- **re-organized** parking lots

- functions **share** common **space**
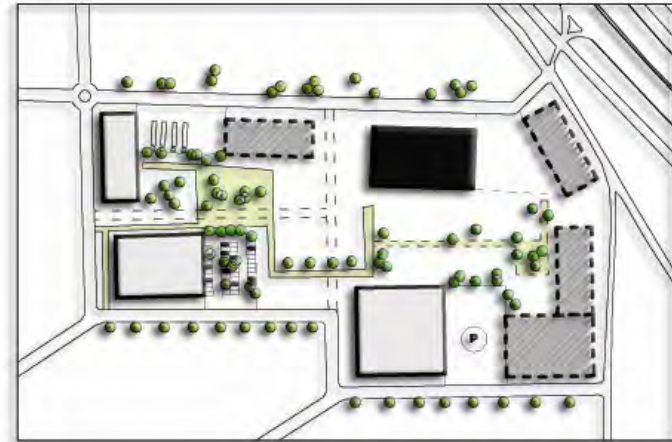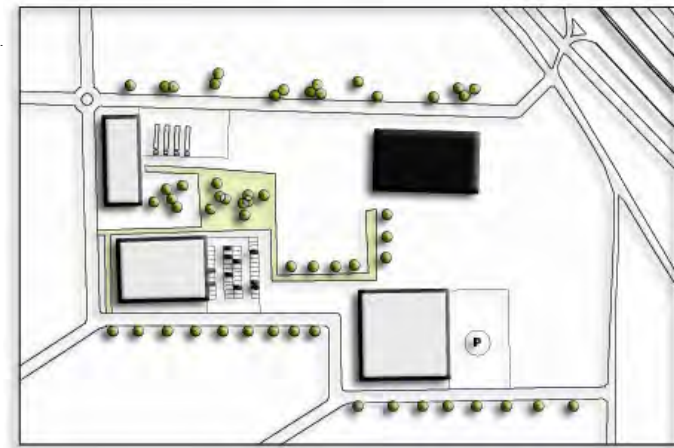
Local road, relation between buildings, parking and open space
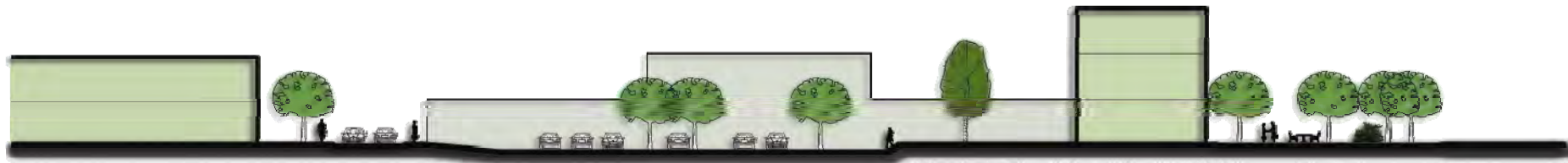
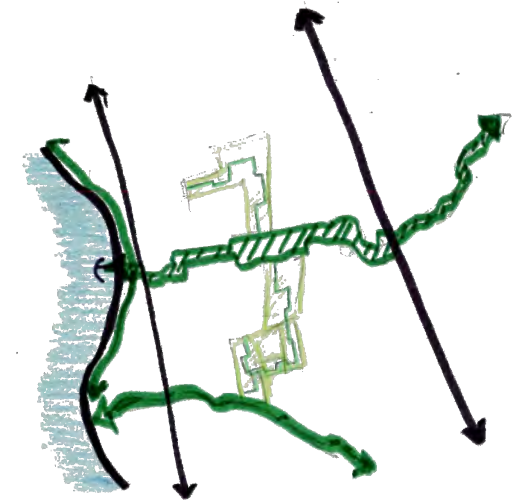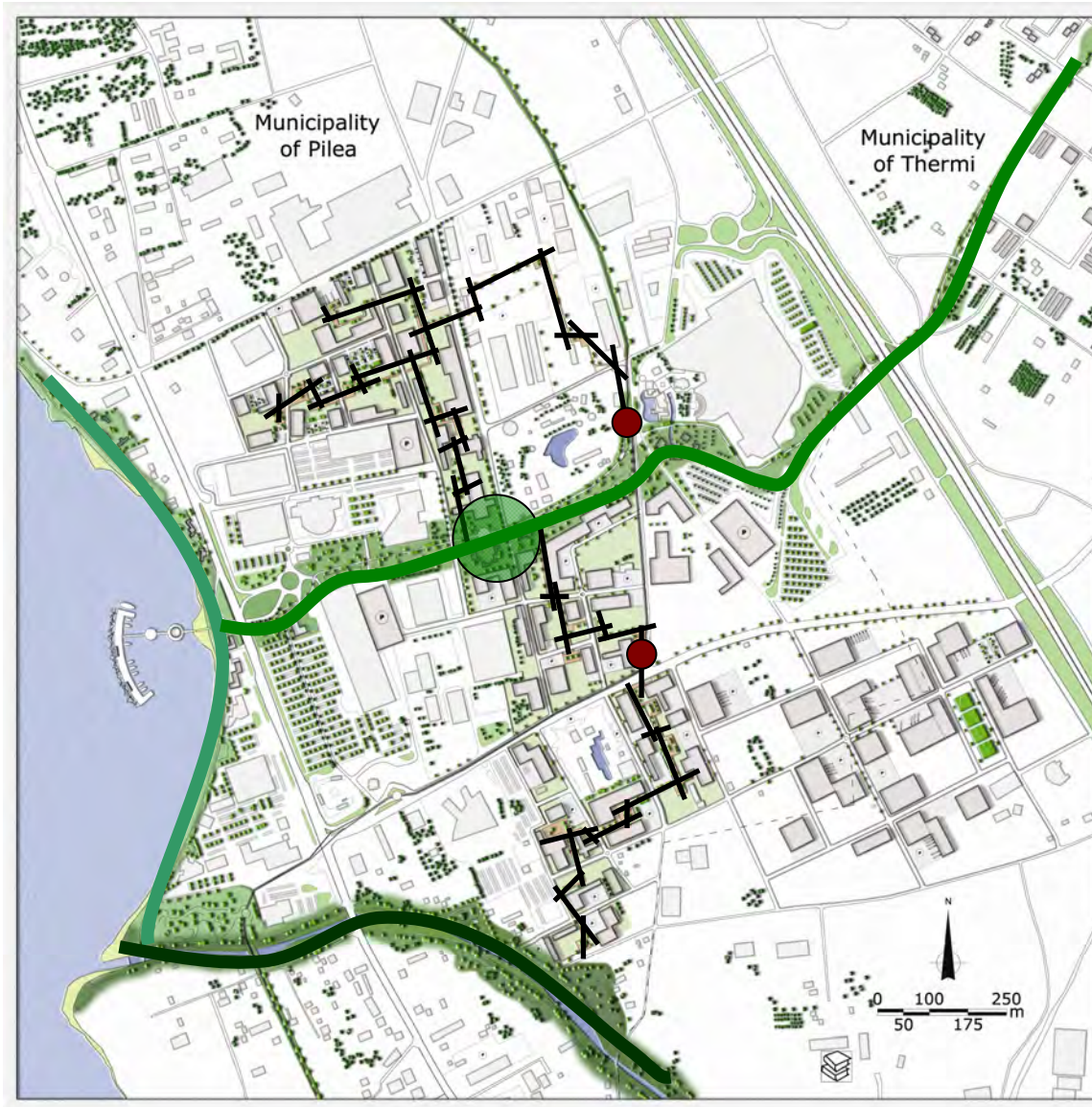| CLUSTER BUILDING	SIDEWALK	PATH	LOWER PARKING SPACE	TRANSITIONAL SPACE & PATH	CLUSTER BUILDING	OPEN SPACE BETWEEN CLUSTER BUILDINGS
		LOCAL ROAD				

LANDSCAPE-OPEN SPACE PLAN

→Central avenue connects regional functions
→Park where coastal boulevard and green corridor meet

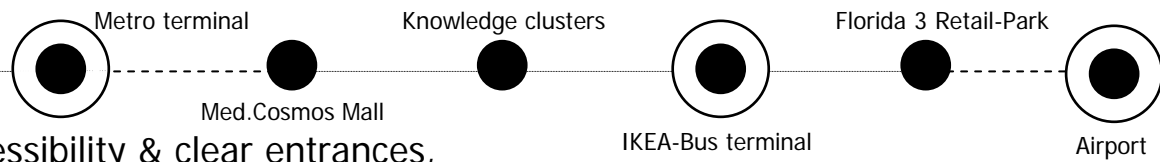→Internal system of pedestrian routes connect functions with larger structures
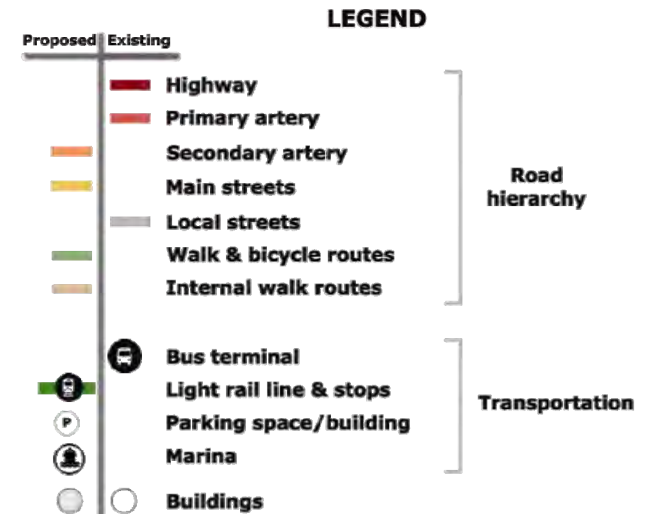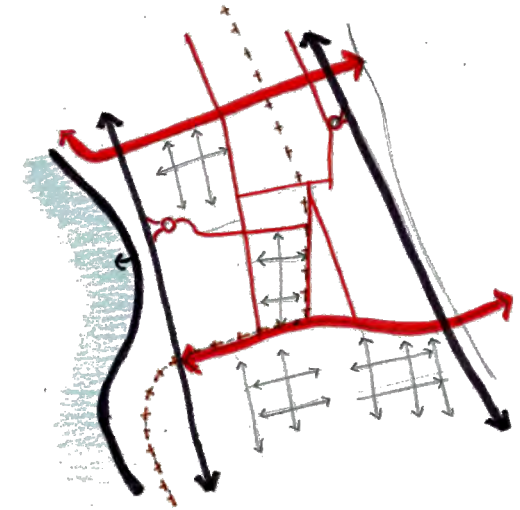

LEGEND

Proposed	Existing		
●		Central avenue	
●		Coastal open space	
●		Stream green corridor	
●		Greenery along main roads	Green hierarchy
●	●	Trees	
▬		Walk & bicycle routes	
▬		Internal walk routes	
—o—		Light rail line & stops	Transportation
Ⓟ		Parking space/building	
●	○	Buildings	

INFRASTRUCTURE PLAN

→New vertical roads provide better accessibility & clear entrances, while an internal system of local streets service the functions

→Tram-line/stops serve both workers and shoppers

LEGEND

| Proposed	Existing		
		Highway	
		Primary artery	
		Secondary artery	Road hierarchy
		Main streets	
		Local streets	
		Walk & bicycle routes	
		Internal walk routes	
		Bus terminal	
		Light rail line & stops	Transportation
		Parking space/building	
		Marina	
		Buildings	

Main **structural element** in the area

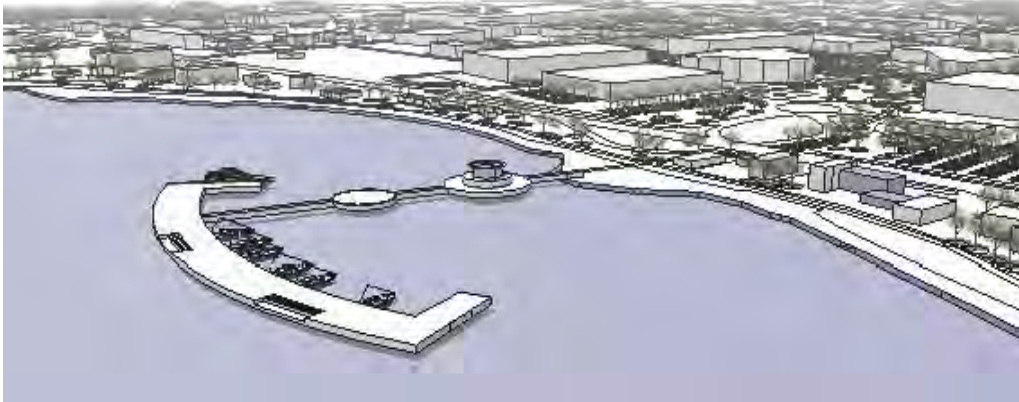**Connects** retail facilities **linearly** and reaches the marina by utilizing an existing tunnel

Small **pavilions** along the avenue and near the marina provide with additional **recreation** facilities

Large parts of the existing **parking** lots were **transformed** while a number was **relocated** in parking buildings
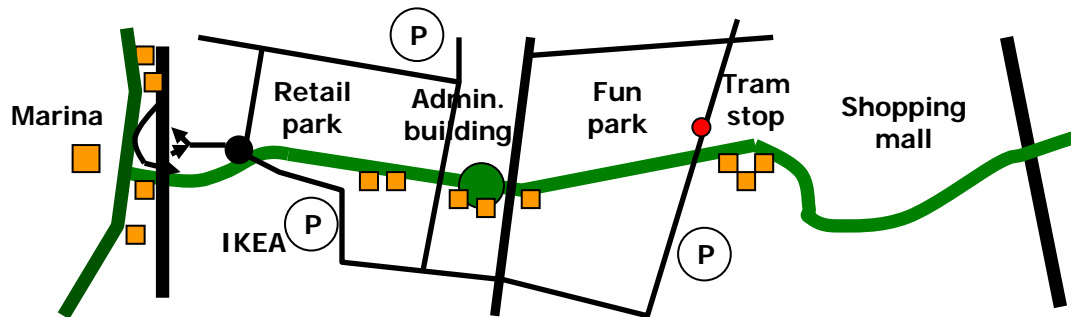
→**Attraction** with recreation facilities embracing it

→Possibility for ferries to harbor; mainly smaller marina facilities

Coastal routes and connection with vertical pedestrian path towards shopping malls

| SEA | BEACH | PEDESTRIAN & BICYCLE ROUTES | SERVICE ROAD, PEDESTRIAN & BICYCLE ROUTES | HIGHWAY & SERVICE TUNNEL | SER. ROAD, PED. & BIC. ROUTES |

→Main **administration building** along main avenue works as a **landmark**

→**Meeting point** between structures

Central avenue, square with recreation facilities

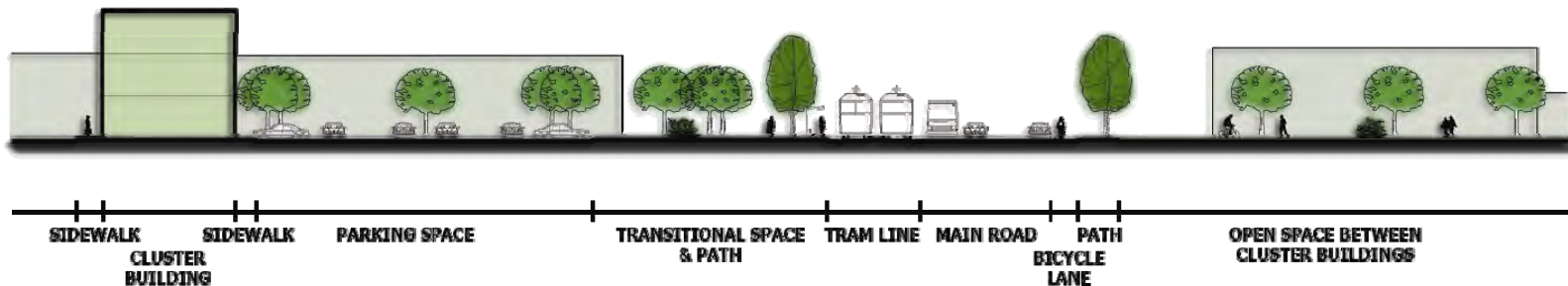| ADMIN. BUILDING | PUBLIC SPACE | SQUARE | CENTRAL AVENUE | SQUARE | PUBLIC SPACE | RECR. FAC. |
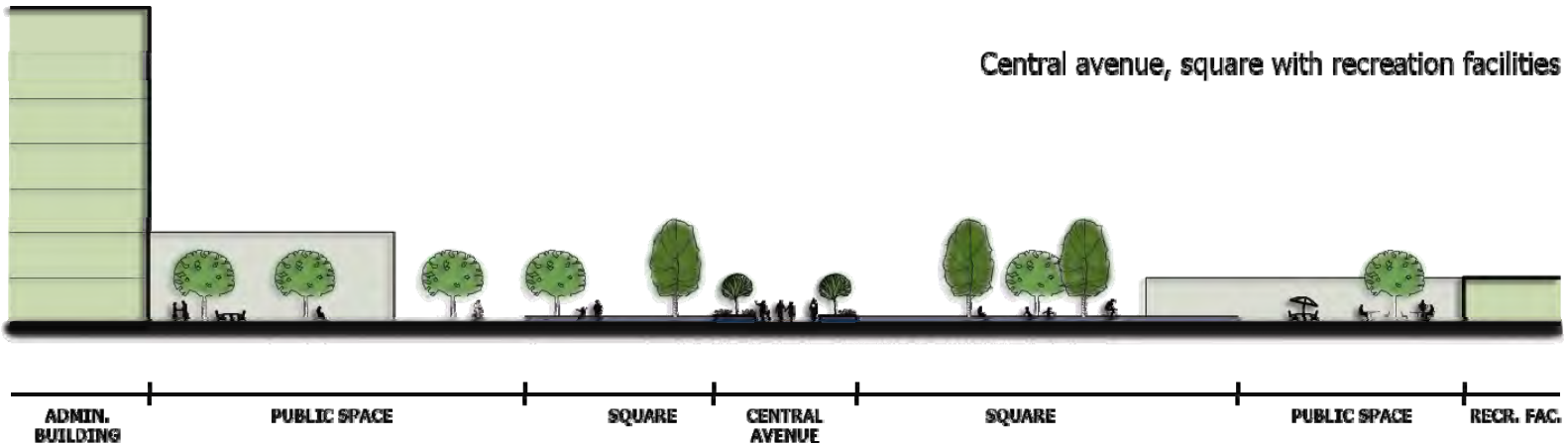
→**Tram stops** work as **entrances** to facilities or to open-space structures connecting facilities
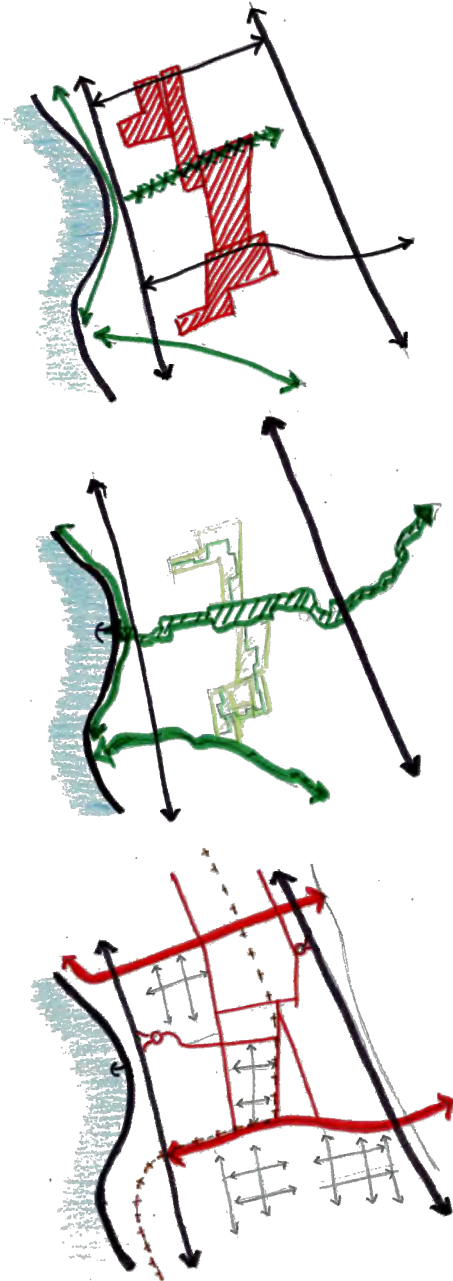
→**Activates** the pedestrian flows

→**Public space** with recreation facilities, where parking space used to be, add to **attractiveness**

Main road with tram line and relation with adjacent space

SIDEWALK	SIDEWALK	PARKING SPACE	TRANSITIONAL SPACE & PATH	TRAM LINE	MAIN ROAD	PATH	OPEN SPACE BETWEEN CLUSTER BUILDINGS
CLUSTER BUILDING						BICYCLE LANE	

DESING OUTCOME

-Physical and functional **links integrate** the area creating a network

-**Regional** commercial and recreational **functions** set in a broader context making the area **attractive**

-A **hierarchy of connections** in road network, public transportation, landscape elements offers **urbanity** to the existing sprawl

-**Mix of** innovation **activities**, regional and local functions open potentialities for future developments

Model conditions achieved

- **internal organization**

- **strategic areas** developed

- **connectivity & accessibility** upgraded

- **zoning** and **mixing** where appropriate

Areas built based on:

-previous **evaluations** & **existing functions**

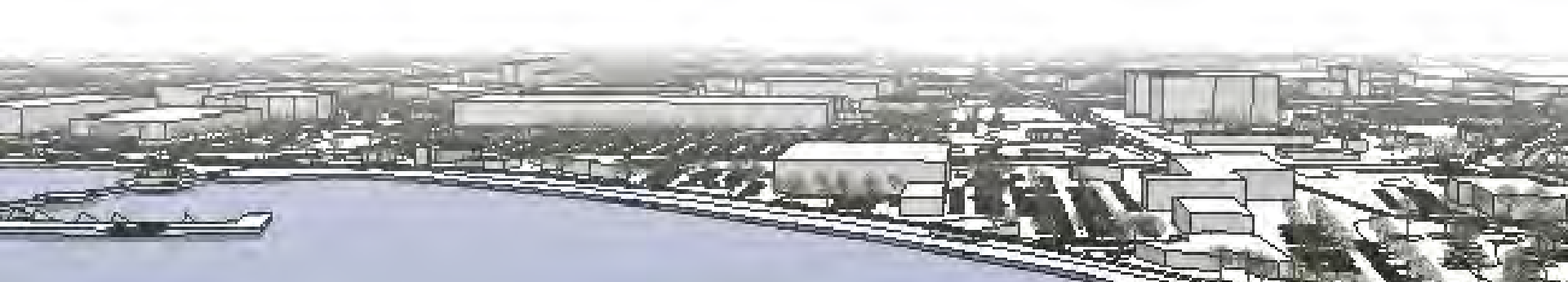-new **opportunities created** by the infrastructure and landscape interventions
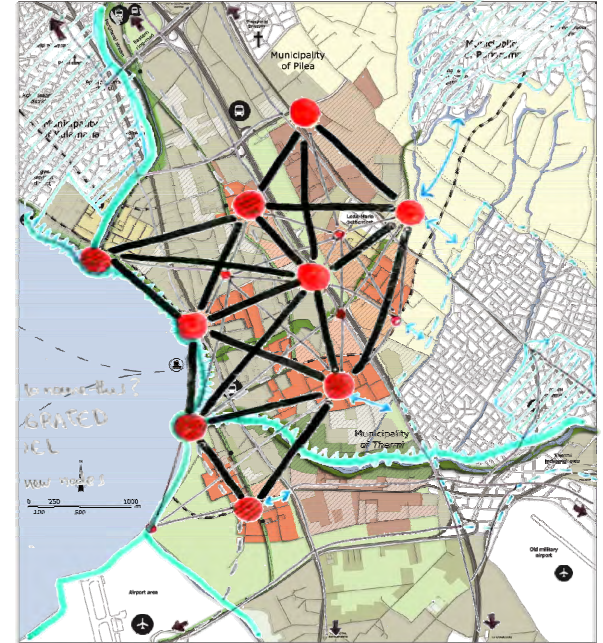
- Strong regional level

→ **In-between scale (area level)** ⟶ Creation of **poles** that interact & promote **poly-nuclear development**

- Localities through existing functions
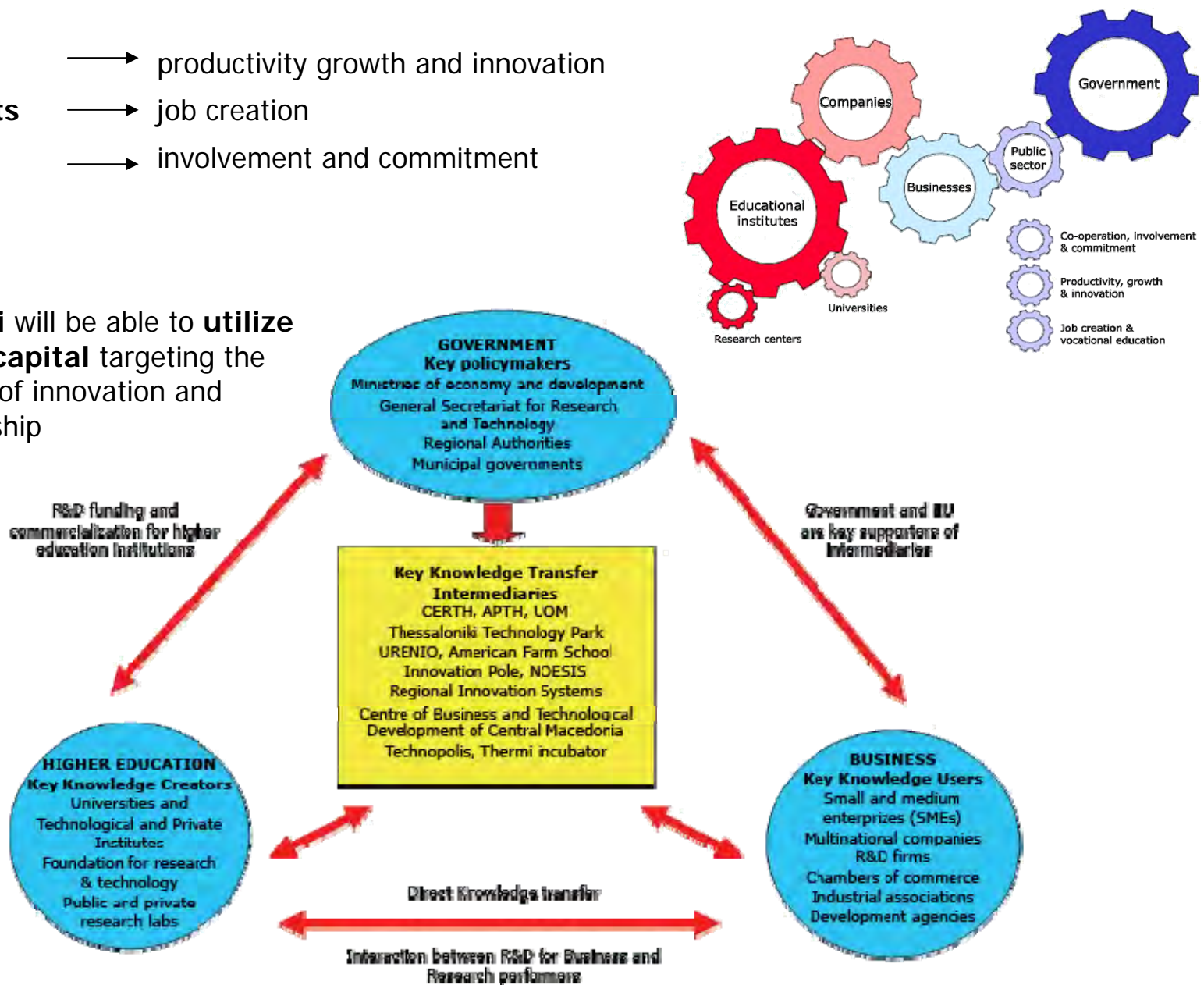
EVALUATION

STAKEHOLDERS

Companies → productivity growth and innovation

Governments → job creation

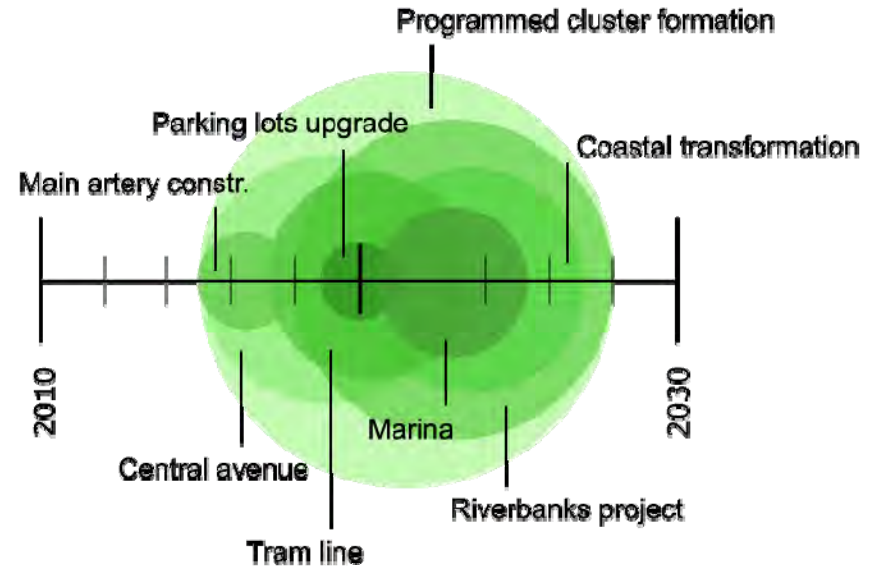**Educational institutes** → involvement and commitment

Outcome

Thessaloniki will be able to **utilize knowledge capital** targeting the development of innovation and entrepreneurship

PHASING

-**Public space** and **landscape** interventions together **with** the formation of the **clusters**

-**Balance** between investments and expenditures (cost and benefit)

-**Main avenue** and **tram line crucial** as opening potentials to improve attractiveness and connectivity
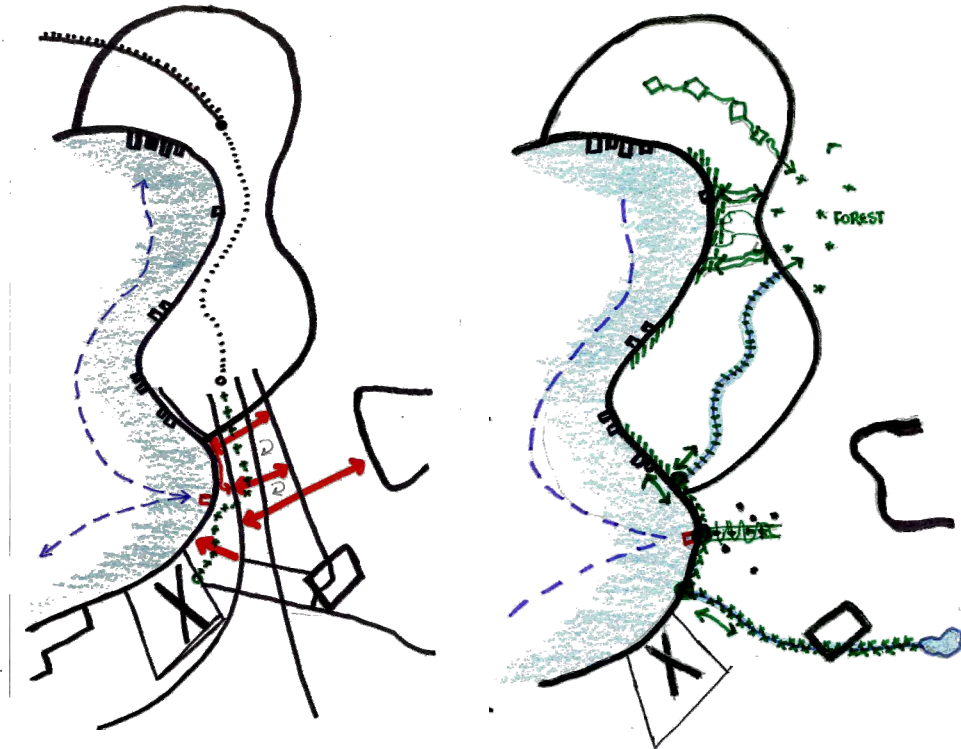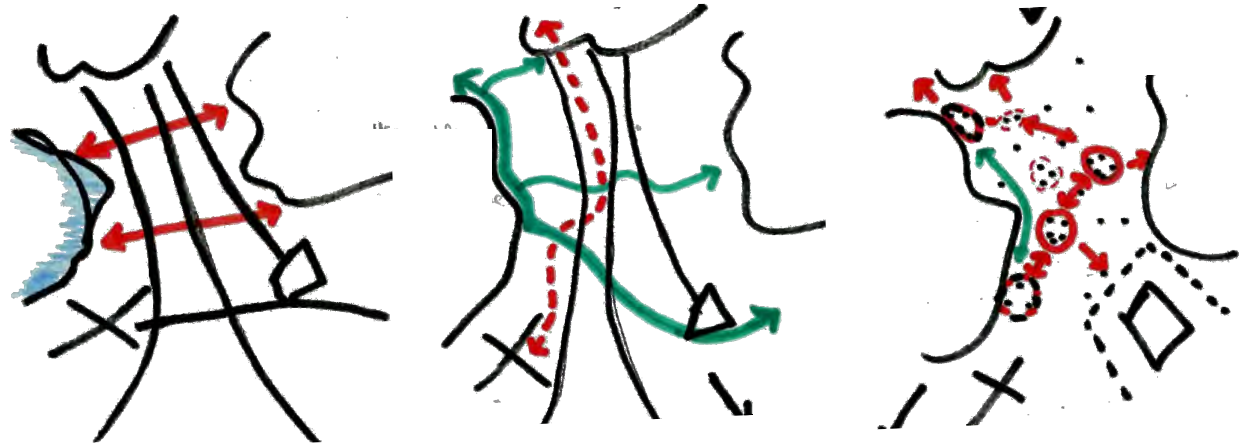
Goals achieved

-**Area integrated** spatially and **coherent functionally**

-**Halting** of continuing **fragmentation**

-**Open space quality** brings working standards to a higher level

-**Landscape** and existing **functions** in key positions

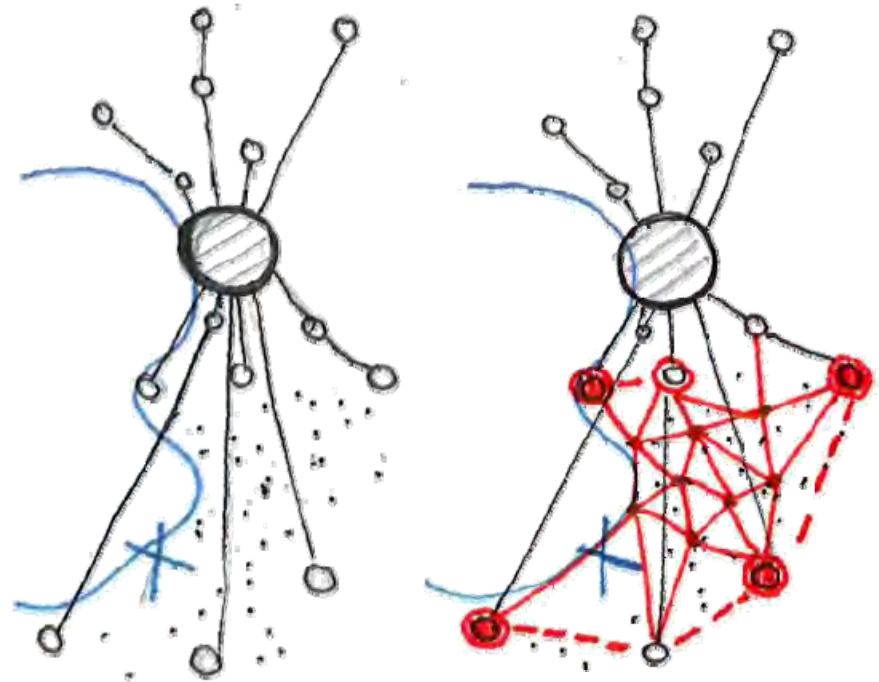-**Continuation of structures** coming from the Thessaloniki

Strategically situated nucleuses of specialized and innovative firms and institutions in a **buffer** zone between city/airport and city/settlements

Attractiveness and **flexibility,** main qualities offered

Mono-functional **sprawl** condition is **re-organized** by **connecting structures** physically, naturally or functionally & **encouraging interactions**

Promotion of **poly-nuclear development** through an expanding **network** of relations

THANK YOU!