

Innovative Clusters in Progress, the Example of Thermi Case: Urban planning theory and practice

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ABSTRACT

The concept of "Smart city" (or "Intelligent city") is very important nowadays, for the comprehension and rapid implementation of innovative digital services based on the Internet. This allows dealing with modern developed cities challenges, helping to achieve a better quality of life in the future. The approach of intervention planning models in suburban areas, exploring digital technologies is the alternative for a developed city to become productive, creative, and therefore "smart".

There are plenty research areas, but the main ones are: 1) Cities and regions of Innovation, 2) Creative Clusters, Areas of Expertise, Science and Technology Parks, "Technopoles", 3) Regional Innovation Systems and Strategies, 4) Areas of Digital Innovation and Smart Cities.

The interest of the research is located in the east side of the city of Thessaloniki, in Greece. There are three points of interest: 1) the Mediterranean Cosmos, commercial center / Mall, 2) the NOESIS, cultural center and 3) the small town of Thermi. The objectives of the study include; firstly, to reduce the centrality of Mediterranean Cosmos and to guide visitors to the other two poles, secondly, to redefine the nature of the region by increasing its urbanity, and finally, to make the existing digital technologies of development and planning productive.

KEYWORDS: Smart city, Innovation, Clusters, Technology Parks

1 INTRODUCTION

The main question in this study is to explore the potentialities of an additional operation and interdependence of the local center of Thermi, the cultural center NOESIS and the mall Mediterranean Cosmos, in order to strengthen the dynamism of the first two, and to allow the dispersion of visitors to the area.

Seeking for answers and suggestions to the question initially raised, we approached bibliography sources and not only the notion of "smart cities" and the methodology of urban design inside them. Briefly, we conclude that the methodology of urban planning adapted in the creation of intelligent cities includes: 1) the formulation of the problem and objectives of the project, 2) the analysis of the urban territory of reference, 3) the description of digital applications for the improvement and optimization of urban space, 4) the investigation of interface problems between the urban and digital space, and 5) the propositions for the reorganisation of urban space. Of course without the public participation and awareness towards the environment, the entire effort could not succeed. It should also be noted that, in the present case study, the exploration of urban organisation could not be taken for granted without the digital tools, which are now becoming a necessity.

2 THE STUDY AREA

As study area is considered the part of the suburban area east of Thessaloniki Urban Area, which administratively belongs to the Municipality of Thermi, and acts as a hyper-regional container for commerce, innovation, education, culture, health, housing, sports and activities from both primary and the secondary sector. The area is crossed by the main highway Thessaloniki-N. Moudania.



Figure 1: 1) the Mediterranean Cosmos, 2) the NOESIS and 3) the small town of Thermi inside the study area.

East of the highway are identified: a) the technological 'neighborhood' of Thessaloniki (the National Center for Research Technological Development and Technopole), b) the European Foundation CEDEFOP, c) the Agricultural School, d) Departments of Aristotle University of Thessaloniki, e) the Cultural Center NOESIS, f) the residential settlement Lida Maria, g) the settlement of Thermi, and area for installing non disturbing land uses.

West of the highway are identified: a) shopping center / mall (Mediterranean Cosmos, Jumbo, IKEA), b) health (Balkan Medical Center), c) education (School of War), d) sports center (PAOK Sports Arena) and e) offices, crafts and industries.



Figure 2: The panoramic view of Mediterranean Cosmos



Figure 3: NOESIS cultural center.

2.1 General characteristics of the Municipality of Thermi and Pilot Program

The area of Thermi is located southeast of the city. The Municipality of Thermi is one of the most densely populated in the region of Thessaloniki, with 16.546 habitants in 2001, a figure that is constantly increasing in recent years.



Figure 4: the Municipality of Thermi

In seventies Thermi began to grow rapidly and from a rural refugee settlement turned into a modern suburban settlement. The morphology of the area changes, as it gathers many activities like culture, education, sport, commerce, craft, production and innovation. It is becoming the administrative, cultural and sport center of the eastern region, a magnet for recreational activities for the whole region of Thessaloniki.

It is important to be mentioned the strengthening of the role of the tertiary sector with a new type of services of internationalized character. The aim of the Municipality is to provide Thermi as the center of residential development and high level tertiary activities, while strengthening the primary and secondary sectors within the principles of sustainable development.

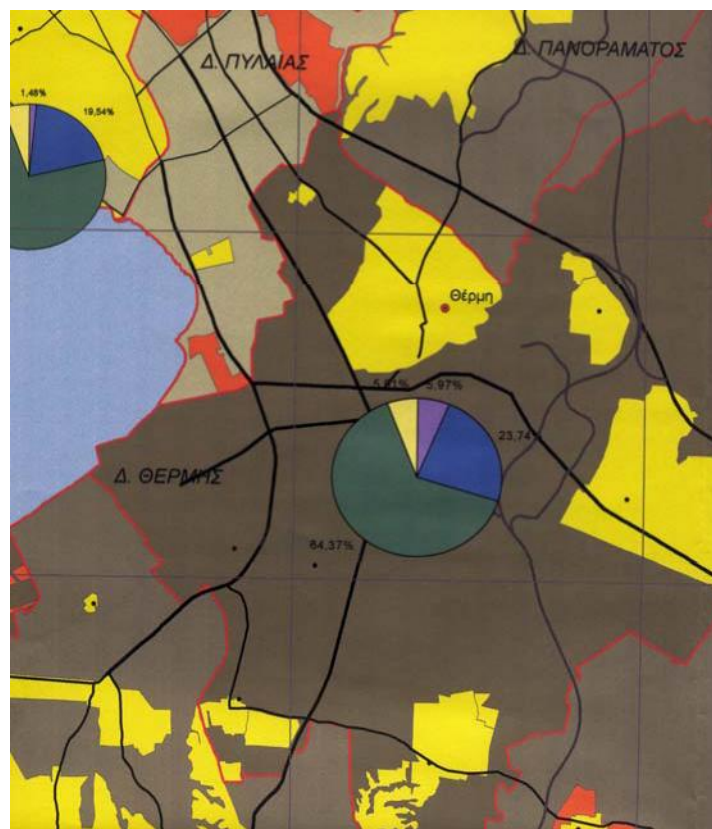


Figure 5: Settlement structure and employment (2009)

Rate of change in population: Gray > 80,01%
 Employment: Lilac, primary sector 5,97%
 Blue, secondary sector 23,74%
 Green, tertiary sector 64,37%
 Yellow, not clarified 5,81%

The Municipality offers ADSL internet, 13 Wi-Fi hotspots, and has created wireless network of wide range. The Public Services in the pilot area are not local. They are not offered online, although some information is available online on the website of the municipality. Regarding the ICT (Information and Communication Technology), they are related to mobility and commerce.

Given that the population does not exceed 20.000 people, it is important that the number of employees and visitors of the area on a daily basis is multiple. Therefore, the Pilot Program should be addressed to the following: residents and visitors, local businesses, research institutes and organizations. Briefly the objectives of the Pilot Project are:

- Diffusion of the consumers gathered to the mall to the surrounding area and creation of motivations for an overall tour (not only a limited visit at the mall, but an extended to the center NOESIS, the Technical Museum, the center of the Municipality of Thessaloniki). Urban Sprawl.
- Decentralization of the city center of Thessaloniki.
- Improvement of the urban character of the commercial district.
- Improvement of the accessibility (improved transport).
- Use of digital applications (Digital Management Technologies).



Figure 6: Important land uses and main transport axis in Thessaloniki pilot area

The single orientated growth, which is accumulated in the mall Cosmos, must become multidimensional, with individual development centers, which will serve as poles of attraction and development activity. It concerns a strategic point because of the national roads and the airport, which is in proximity. So, it can attract individual activities of business interest. The development of mixed

activities should of course be supported by infrastructure and public transportation, for easy access to visitors and employees. Then, it should be enriched with satellite centers - poles of attraction (secondary sites of the surrounding area with potential developmental dynamics).

The partners in the research are: URENIO, the Research Unit of Urban and Regional Innovation of Aristotle University, Anova IT consulting (Bilbao Pilot Leader), Ariadna Servicios Informaticos, Université Paris XII – Val de Marne – Lissi, CityPassenger S.A., LOGOTECH S.A., Municipality of Thermi, Universitatet Bremen, Cassidian SAS (<http://www.people-project.eu/portal/>).

The study “Intelligent Thessaloniki: Design of an Innovative Pilot Project Entrepreneurship Development commissioned by the Ministry of Development to URENIO in preparation and specialization of activities for the Operational Programme of Competitiveness and Entrepreneurship 2007-2013.

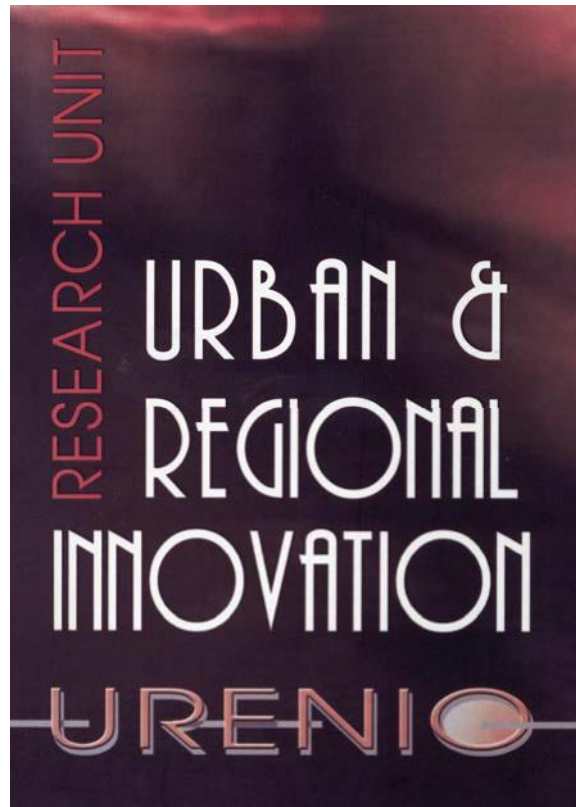


Figure 7: URENIO, the Research Unit of Urban and Regional Innovation of Aristotle University.

The scenario for implementation includes design and costing of applications, data collection, application development, suitable Hardware installation, detection and evaluation of results, based on the principles of sustainability. Referring to Planning Intelligent Cities / Districts, initially we approached the challenge (region) and problem to be solved, then the innovation ecosystem, the Digital cities-Smart environments, the concept of Spatial intelligence and we result to the measurement - assessment and new business models for sustainable services.

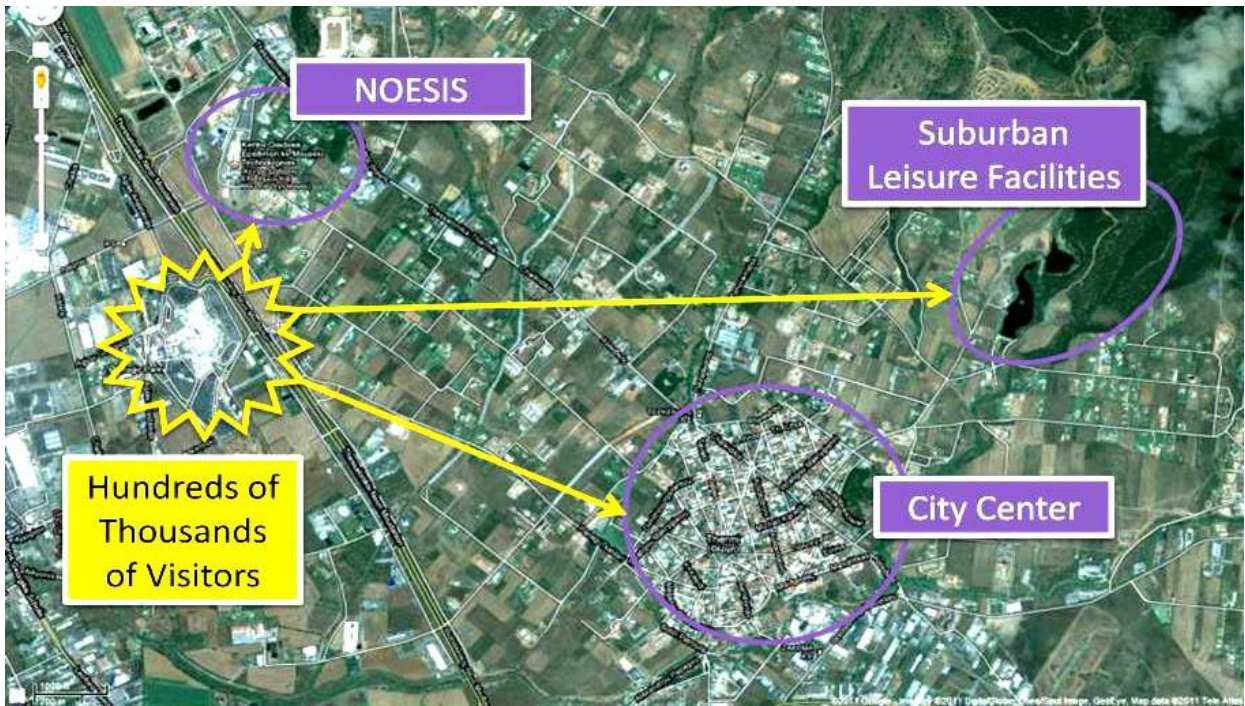


Figure 8: The challenge of Thermi pilot

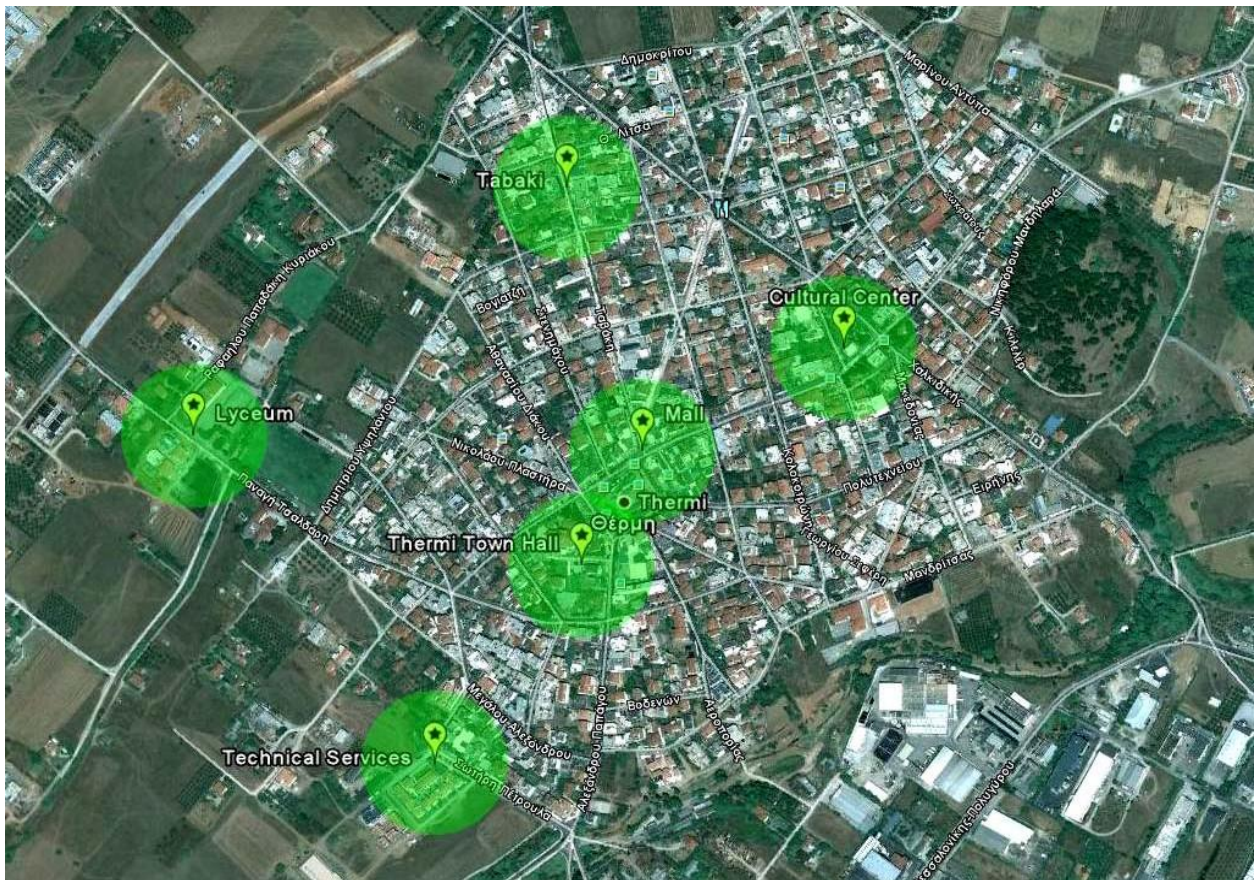


Figure 9: Wi-Fi hotspots in Thermi pilot area

2.2 Land Uses and Planning Scheme (1985-2011)

The current "Master Plan and Environmental Protection Program of Thessaloniki" of 1985, places the study area in side the suburban area and determines Thermi as one of the residential-development poles in this region. The role of these poles is defined as a receptor of Thessaloniki's dynamism, avoiding the urban fabric expansion, encouraging the urban sprawl and the decentralization.

In 1988 the General Urban Plan of the Municipality of Thermi was approved and in 1995 has changed with further expansion, defining the area as a territory for not disturbing Occupational Units installation.

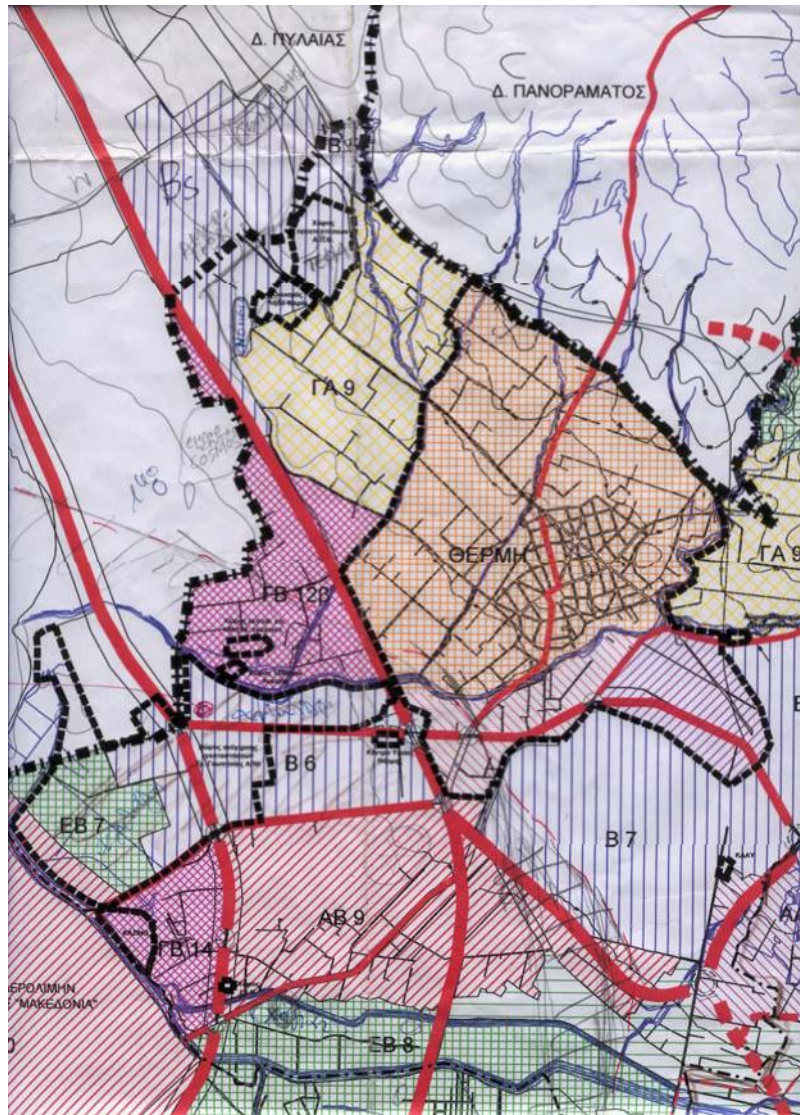


Figure 10: Land uses, in Municipality of Thermi

ΑΒ: craft and transport
Β: business and high level services
ΓΑ: housing
ΓΒ:

infrastructure and public services

Δ: activities of primary sector

EB: protection and eco-development

Hatch (red): not disturbing Occupational Units

Hatch (lilac): industry, craft and workshops

2.3 Road connections for Mediterranean Cosmos-NOESIS-Thermi

Thermi is surrounded by the continuous urban fabric of Thessaloniki urban area in the north, by Chortiatis protected region in the east, by the Macedonia Airport in the south and by Thermaikos Gulf in the west. The importance of Thermi area is due to the fact that it constitutes the best passage – gate of the city from the south. Three major highways cross the region: the National Road Thessaloniki - Moudania, the National Road Thessaloniki - N. Michaniona and the National Road Thessaloniki - Polygyros.

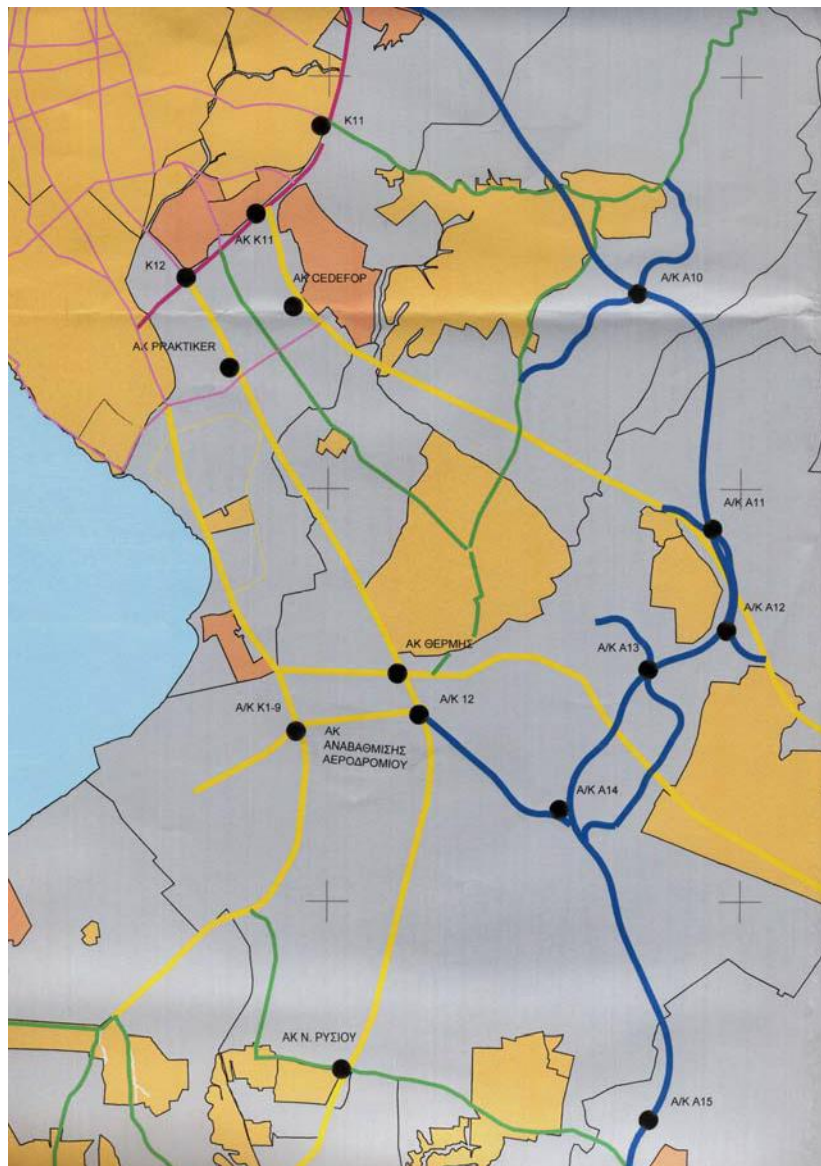


Figure 11: Depiction of Existing Planning, Proprietary Features & Infrastructure Network

Road network

Yellow line: national road network

Green line: provincial road network

Blue line: external Ring Road

Thermi obviously has a strong bond with Thessaloniki acting as a suburb but not only. It is a growing and economically viable zone that originally evolved in suburban housing territory, and has turned into a pole for installation of activities, especially tertiary services highly skilled, maintaining the features of a developed suburban rural economy. Within the area of interest, there is a large dispersion of production activities (of the secondary and tertiary sector). The presence of the tertiary sector gives the dominant character of the region in general.

Specifically, the road connection between the three centers of interest, in which the pilot project focuses spatially, can be done either via the National Road Thessaloniki-N. Moudania in conjunction with the provincial road network, or solely via the provincial road network.



Figure 12: Road connection NOESIS – Cosmos – Thermi via the National Road



Figure 13: Road connection of Thermi with NOESIS and Cosmos via the National Road



Figure 15: Overall representation of all road connections between Cosmos-NOESIS-Thermi through both National and Provincial Road Network.



Figure 16: Multilevel passage under the highway at ground level

As far as the public transport is concerned, the area of the pilot program is served by busses of the Urban Transport Organization of Thessaloniki. The indicative bus lines are: No. 36 "Boulgari-Innovation Zone", No. 66 "Harilaou-Thermi" and No. 45 "Bus Station Macedonia – Bus Station Chalkidiki - Cosmos". None of these routes connects the three points Cosmos – NOESIS – Thermi in any order.

3 THE PROBLEM TO BE SOLVED

Thermi's local market is in decline because of the competition with the mall Mediterranean Cosmos. Since the creation of the latter, consumers (visitors to the area and residents of Thermi) are directed there for their services (commercial and recreational activities), thus neglecting the local shops. So the site is developed fragmentally focusing on the mall. In long term, we might face the risk of a halt of the trading activity of Thermi's local center and its viability threat.

Furthermore, most of the visitors - consumers do not even know the existence of the cultural center NOESIS and so, they do not think to combine shopping with an entertaining visit. In conclusion, there is insufficient information about the potentialities of this region, the road network do not help, the bus lines are not enough, so access is not at all easy without a car.

4 TARGETS

First of all, the local market should be supported and strengthened by residents and visitors of the Cosmos. They should be encouraged to buy from local shops, instead of the mall. Additionally, if people are informed about the cultural center NOESIS and its recreational activities, it will attract more visitors.

The visitor attraction will be enhanced concerning: a) the availability of parking, b) the improved roads to

facilitate mobility and traffic, c) frequent public transport and larger number of buses for easy access without a car.

Furthermore, improving the digital infrastructure in the region, can achieve active participation of residents and visitors (sending e-mail and posting suggestions, complaints and requirements according to their needs) in order to create an improved environment that satisfies them and revitalizes the whole area. Thus, public will become aware of its responsibility towards the environment and their fellow men. In particular, citizens can contribute to environmental protection or denouncing incidents of pollution, either by taking into account the impact that their actions have in it, either by informing about a traffic accident that they would witness.

Finally, the capacity and flexibility of neighboring businesses and services should be improved, so as to ensure balance, sustainability and continuous growth in the future, and therefore for the entire surrounding area.

4.1 Connecting the community with the internet

Having free and immediate access to digital services on line, the citizens will have the opportunity to receive local information and be informed about what is happening in their area. With low-cost wireless broadband internet access, services and news concerning them will be provided to users. Also, users -residents or visitors- by registering their needs and demands to websites, will serve their demands with innovative solutions and improved flexible applications.

4.2 Aim and Vision

The main goal for the region is to become a district that meets conditions of sustainability and competitiveness. Thus, sections that need strengthening are directly linked with the best service, entrepreneurship and innovation.

According to Manuel Castells each pole of innovation includes research institutes, technological districts, clusters of new economy and innovation development agencies etc. It transfers new standards based on e-applications, networks for optimal governance activities, services e-consulting, e-learning, e-training, e-business, e-technology and e-innovation.

At this point it is necessary to refer to three notions (tools) investigated during the study: a) e-business, b) view of the city through virtual tours, and c) Information and Communication Technologies (ICT). Referring to the first one, we mean e-marketplace and on line shopping. With e-commerce and interactive commercial online communities, customers and suppliers communicate directly on an electronic platform for online shopping and transactions. That tool achieves decongestion of the market as people are facilitated to make their purchases without having to move to individual stores in the city center.

As far as the second one is concerned, using that application citizens are becoming 'visitors of digital cities'. In that way they can experience the city from distance (ex. before their visit), having the opportunity to plan their future visit. In addition, they will have the chance to get familiar with the territory (museums, monuments, parks, squares) with images, aerial photographs, three-dimensional representations of space (models) and interactive map browser with points of interest and suggested routes.

Finally, by the promotion of e-government, e-health, e-education, e-market, the range of use of ICT is broadening and the offered public services are upgraded. The ICT modernize telecommunications infrastructure and networks and provide electronic service centers.

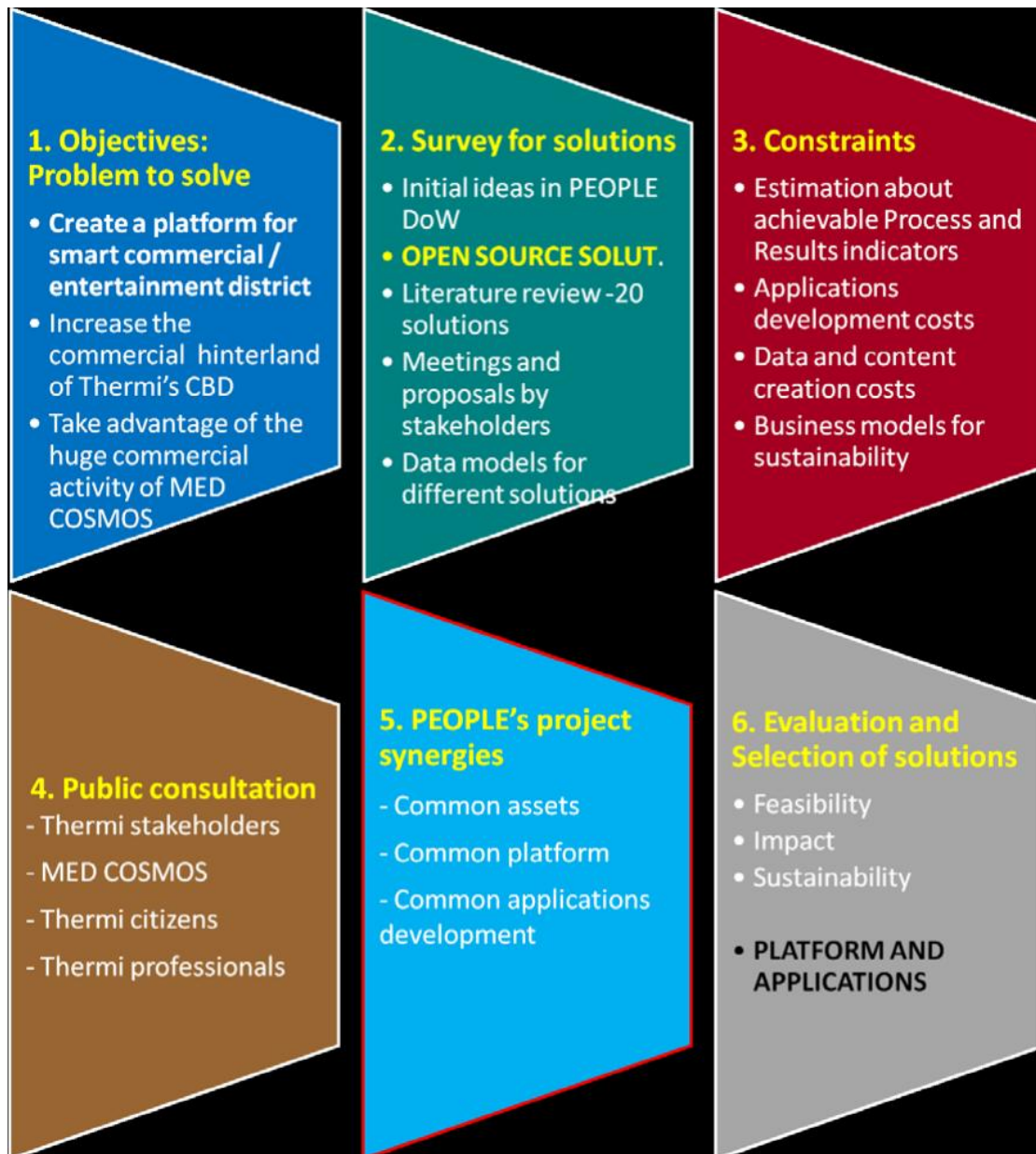


Figure 17: Thermi's pilot scenario building roadmap

http://www.people-project.eu/portal/index.php?option=com_content&view=article&id=60&Itemid=18

Examples of respective applications are registered below: Google transit, Parking finder tool, Bicycle sharing system, Local shopping offers & discounts, Social shopping, Virtual city tour, Mobile museum tool, Mobile city guides, Sensor network for environment protection.

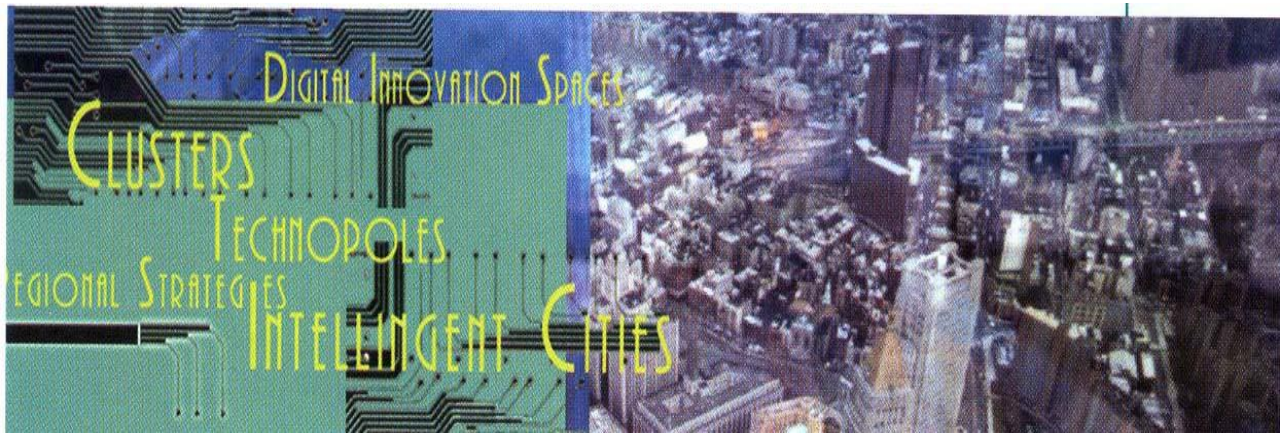


Figure 18: Clusters - Tehcnopoles

5 PROPOSALS

To make a proposal covering the study area is considered useful to investigate firstly the causes that led to the current situation and secondly the tools- mechanisms for the intervention.

The picture of the area today is summarized schematically below: a) in the west of the axis Thessaloniki-N. Moudania, tertiary activities with an emphasis on malls, b) in the Northeast, tertiary activities focusing on education and innovation, c) in the Southeast, urban development and spatial expansion of Thermi' settlement.

5.1 Urban planning mechanism

The urban planning mechanisms and especially their apparent weaknesses amplified the lack of substantial intervention in the regulation of space. The proposition that follows can only be based on land use, conditions and restrictions on building and road connections.

5.2 Land use proposition

The present proposition moves towards the direction of a greater mix of land uses, and a specialization – enrichment of activities to avoid the absolute separation of conventional zoning.

Concerning the first parameter, integration of housing is proposed for the area and especially the Northwest and Southeast parts. Through that, permanent population is going to install and consequently devastation, that prevails, will be eliminated gradually with constant human presence and reduction of transportations. The zone of manufacturing activities will be displaced almost in the downtown area. Finally, innovation, educational and recreational activities are remaining at the University Campus.

Generally, the territories selected for housing provide not only important unbuilt land but also large properties that through contributions of land will attribute sufficient land for social equipment in the future.

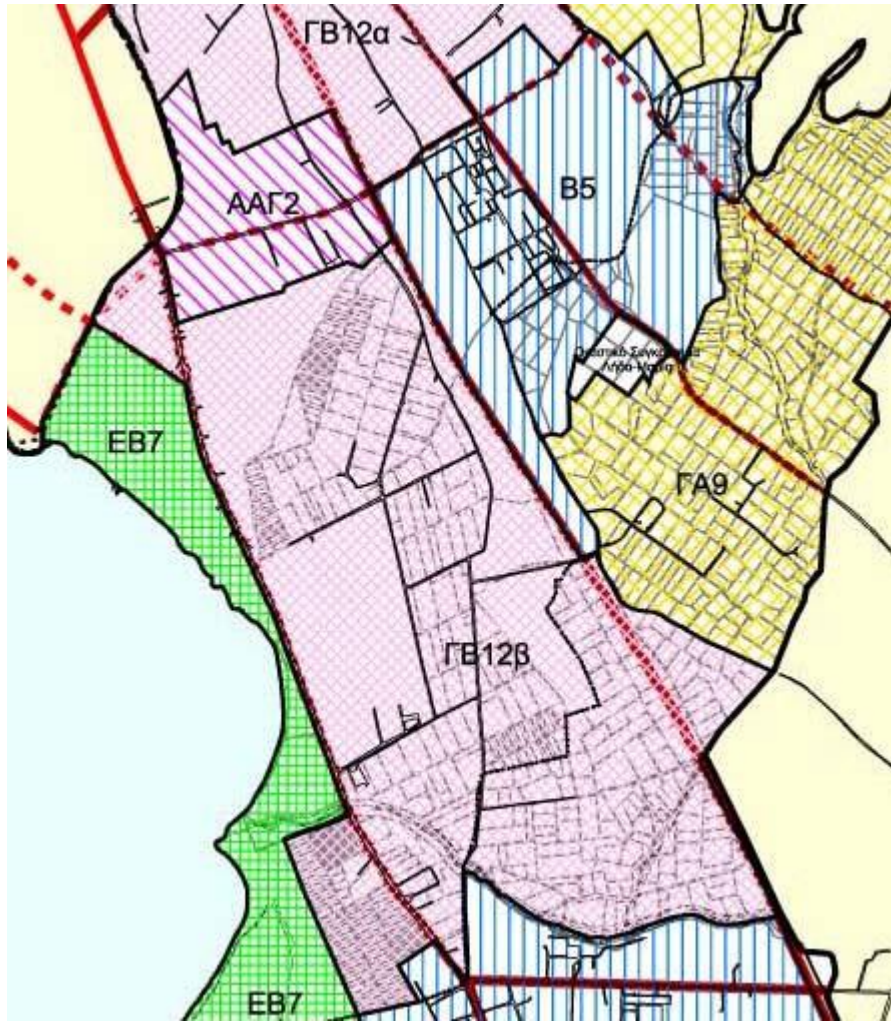


Figure 19: Zones of Land use, conditions and restrictions on building.

AA: secondary sector

B: business and high level services

ΓA: housing

ΓB: infrastructure and public services

EB: protection and eco-development

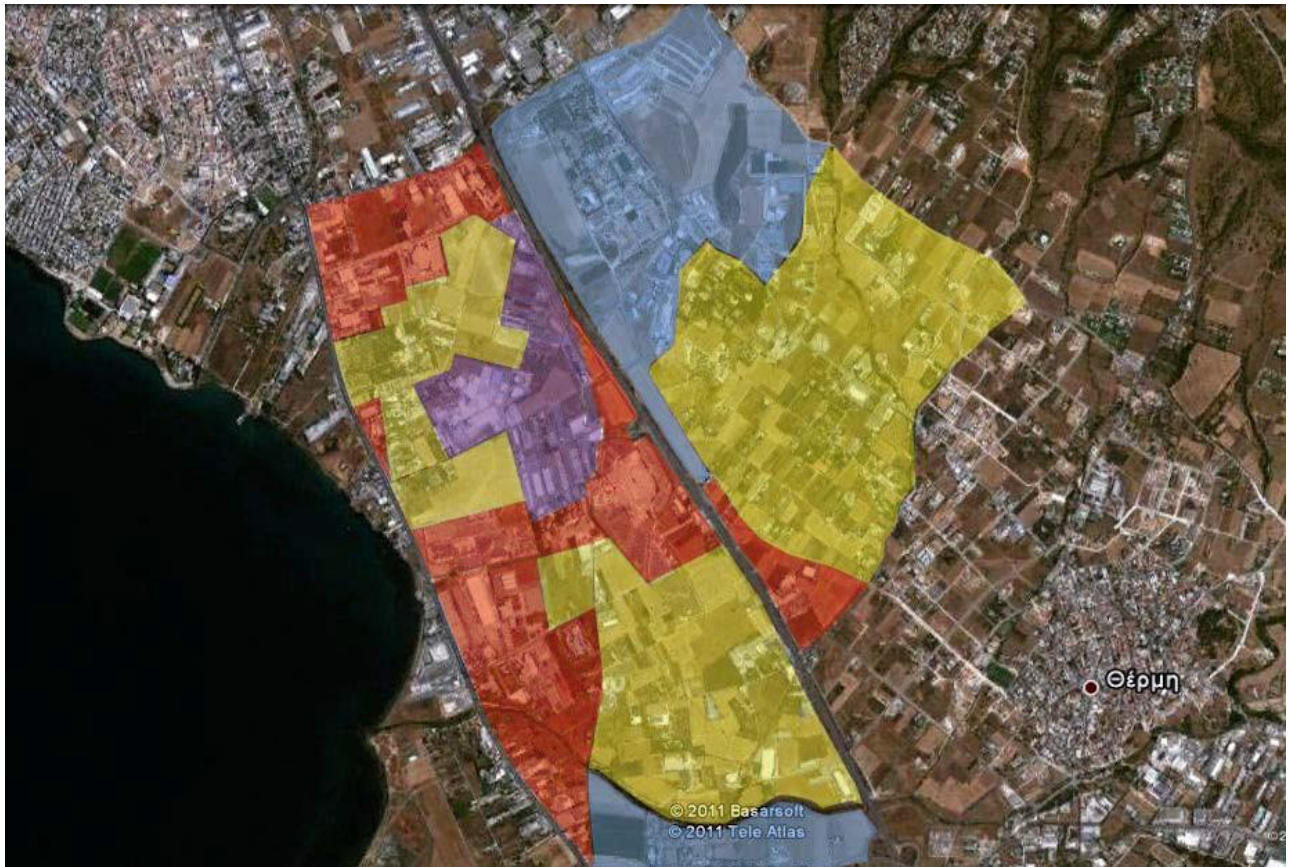


Figure 20: Land Use Proposition

Yellow: housing

Red: infrastructure and public services

Blue: business and high level services (innovation)

Lilac: secondary sector (not disturbing)

5.3 Road connection proposition

Exploring all road networks and connections, the aim of the proposition is to establish the best possible connection between Cosmos- NOESIS - Thermi. As main interceptor routes are selected the two lateral sides of National Road Thessaloniki - N. Moudania and the route that diagonally crosses the area in the east of the external Ring Road joining the Eastern part of the extension of the National Road Thessaloniki – Polygyros with the street M. Antipas. As collector routes are proposed: a) to the East of Highway Thessaloniki - N. Moudania, the provincial road Thessaloniki-Thermi and the road that passes in front of the CEDEFOP directing to Thermi, and b) to the West of Highway the three perpendicular roads. As local routes are proposed, all the other roads presented in the picture above.



Figure 21: Network Connection Proposition

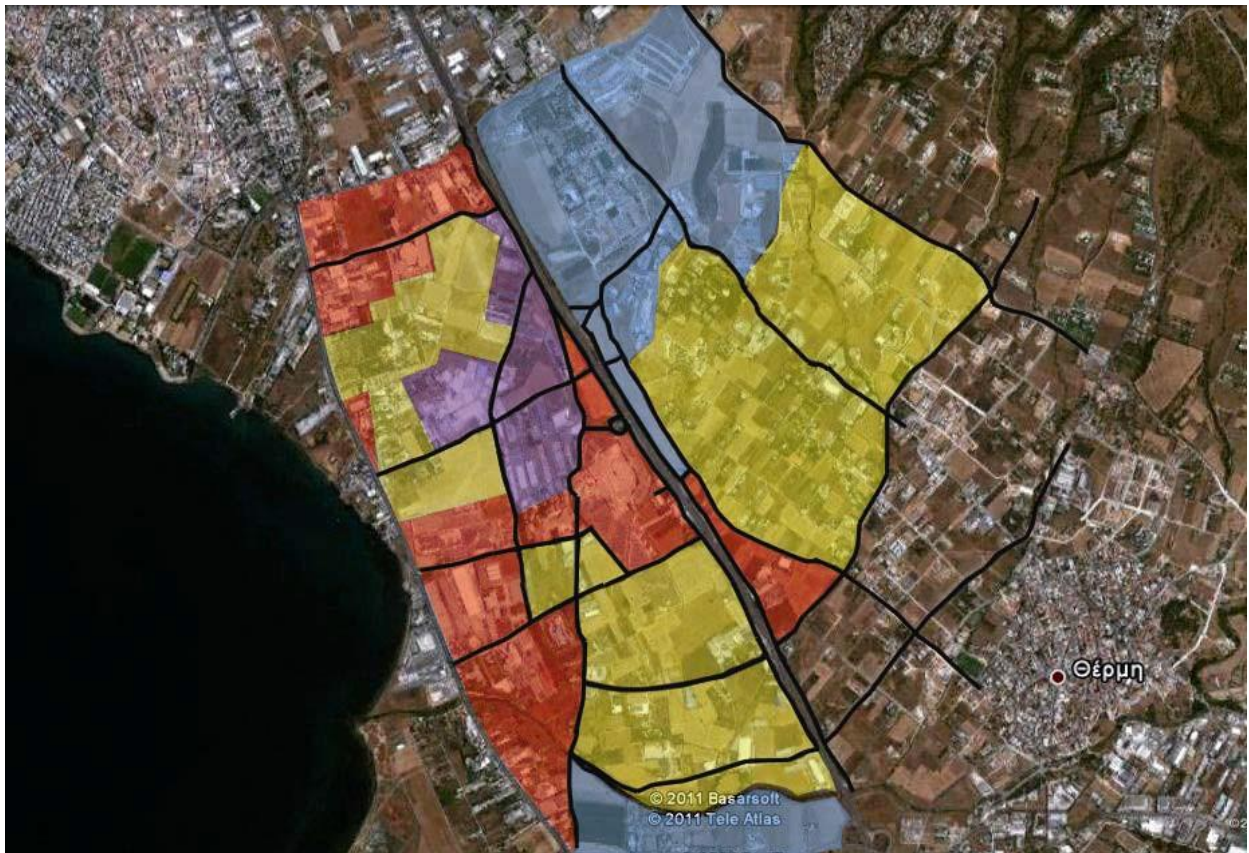


Figure 22: Final Proposition “Land use and Network Connection”

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Links:

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