Land use and transportation planning in urban areas collective needs and investigation of possibilities for combined application.

Yfantis, Athanasios

UNIVERSITY OF THESSALY

12 June 2008

10/6/2008

Land Use and Transportation Planning in Urban Areas

Collective Needs and Investigation of Possibilities for Combined Application .

Athanasios Yfantis, Lalenis Konstantinos
UNIVERSITY OF THESSALY

Table of Contents

INTRODUCTION

The necessity of drafting this dissertation paper arises from the great differences in the approach of planning on two important issues that affect modern society: A)the city and that it expresses as a place of organized infrastructures for the development of human activities and B) transportation and movement of people and goods.

The aim is to investigate to what extent transportation planning is linked to spatial and urban planning in Greece.

This study will present the impact of transportation on the formation of the urban environment, the context in which the planning of movements - transportation planning - and urban planning in Greece, as well as the structure of the competent planning centers are exercised.

Moreover, there will be repercussions from the lack of coordinated planning in urban space, and whether the results are in line with the strategic planning guidelines.

An effort is also being made to highlight the way in which the combined implementation of urban and transportation planning policies can be carried out and to formulate the framework within which it can be achieved.

This approach is added to a more general discussion around the issue on the occasion of the basic principles of spatial planning formulated by the Ministry of environment, physical planning, which adopt as a basic development tool the development of road axes.

The basic assessment is that in the short term a single reference and planning centre for urban and transportation planning should emerge.

"Urban and Transportation Planning in an Urban Environment: Collective Needs and Investigation of Possibilities of Combined Application ".

In an attempt to approach the issue formulated with the above title, the following chapters are developed that constitute the dissertation thesis in the context of an examination for the acquisition of a degree of the Department of Spatial Planning and Regional Development Engineering.

The first chapter formulates issues related to the historical importance of travel in the creation of cities and residential networks and the evolution of cities. It also examines the relationship between land use and travel and how movements affect space and vice versa. The impact of transportation on space is examined both for the wider geographical area, i.e. a region or a prefecture, and for urban space, and the findings relate mainly to roads and railways and their impact on the structure of land use.

On the other hand, the effects of land use on transport are examined in the context of the impact on the operation of roads, the structure of movements and the identity of roads, i.e. the characteristics and importance of the road in urban space.

The second chapter examines issues related to the implementation of urban and transportation planning in countries from abroad. The cases examined are from countries of the European Union and specifically England, France, Germany, Holland and Denmark, but also from America and

China. This chapter examines the institutional framework within which planning is implemented in these countries and how the different levels of planning work. Moreover, examples of the implementation of integrated urban and transportation planning for each country are given and the principles governing planning are formulated.

The third chapter examines the context in which urban planning is implemented and how it addresses transportation planning issues. The historical development of the urban planning legislation of our country and the provisions thereof, related to transportation issues, are presented. The content of these provisions and their contribution to transportation planning are also examined.

The fourth chapter examines the structure of the decision-making centers for urban and transportation planning in Greece. This chapter presents in detail the bodies responsible for the preparation, implementation and monitoring of planning at the various administrative levels. Moreover, the question of cooperation between actors is being examined, both vertically and horizontally. This means that it is examined whether there is cooperation between the actors both between the different levels and between the bodies responsible for urban and transportation planning. The conclusions and, in particular, the problems observed by the lack of cooperation between the institutions are also drawn.

Finally, the fifth chapter presents the general conclusions from the examination of the relationship between urban and transportation planning in the urban environment, and the way in which they are applied in the Greek area. It is also attempted to formulate proposals and positions for the direction towards integrated urban and transportation planning that will lead to a sustainable development of urban space, upgrading the quality of life in cities.

Chapter 1

THE RELATIONSHIP BETWEEN LAND USE AND TRAVEL

1.1 Introduction

From prehistory, man's survival depended on his living in close proximity to someone else. This need in cooperation with the other social needs he has by nature, led him to contact and cohabitation with other people and to the creation of settlements. These settlements, over the years, became the first cities, which were in such a way that the criteria of safety, sufficiency of emergency goods (food, water, shelter), and communication were met. Thus, as the primary needs of man had been covered through his integration into a social whole, based on a rational thought, he organized the area of the settlement, carved out paths and roads, places of concentration, worship and trade, residences, and invented solutions for its residential equipment.

The city was not born on its own. Over time, it was the place where human functions were performed, while at the same time supporting their development. With the development of cities and settlements, some basic functions are also created, which later develop into key factors for the survival and role of the city. These functions are:

- Economic
- Administrative
- Spiritual
- Social
- Tourist
- Transport.

It should be noted that the above urban functions constitute the main activities developed in the urban area. At the same time, however, they create the framework within which the process of development of urban space is fed, which takes place with the population concentration brought about by the above functions, intensifying the phenomenon of urbanization. This phenomenon constitutes the central point of other processes that result in the transformation of geographical space as a whole.

Cities, large and small, are increasingly concentrated in population and activities. These large gatherings lend themselves to creating opportunities for economic growth and culture. (Aravantinos, 1997) Sources indicate that urban development in antiquity is observed in three areas where large rivers pass as well as in Mediterranean countries. The plain of the Nile, the plain of Mesopotamia, the valley of the Indus River, the peninsula of Italy and of course the Greek area, were the areas where great civilizations and an impressive residential network developed, even in different time periods. (Lambrianidis, 2005)

Trade was the main factor for the development of ancient cities and the transportation of goods was mainly done by water. Thus, the economic activities of man were the factor for the development of the city with main axis the formed networks of transport and transportation. For this reason, the most important cities were coastal or riverside.

A typical example in Mesopotamia is the city of Ur, built on the east bank of the Euphrates in the heart of Mesopotamia, and the famous Babylon, built on the Euphrates, at the crossroads of trade

routes between the present Persian Gulf and the Mediterranean. Herodotus also mentions that the structure of the urban fabric of Babylon followed a system of horizontal and vertical axes, claiming that he was a forerunner of the Hippodamian system.

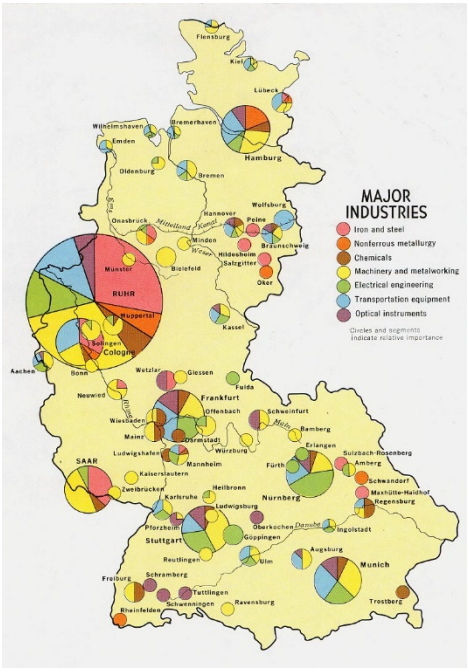
In the Plain of the Nile, excavations have revealed on its banks the city of Kahun to the west and the town of El-Amarna in the east. Moreover, in the plain of the Indian River, many cities with significant size and sophisticated technical infrastructure have been discovered.

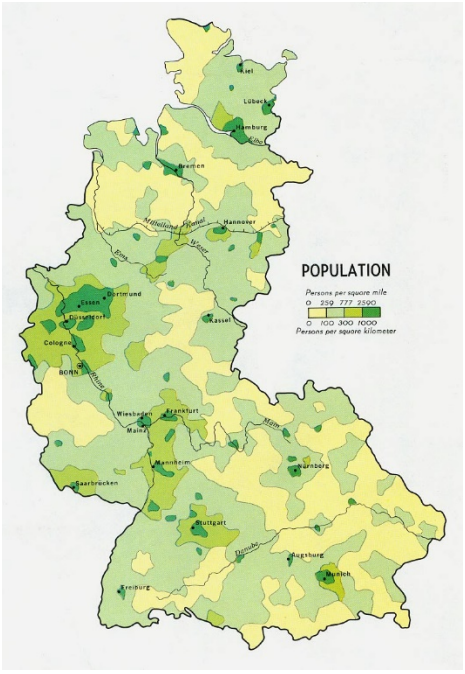
In Europe, since the 16th century, networks have been developed for the transport of goods and communication between important cities in Central Europe, the most important of which are the Rhine and Danube rivers, the role of which is still of particular importance today. (www. wikipedia. com)

The Rhine springs from the Swiss Alps and flows into the North Sea. On this route, important economic and industrial centers have developed on its banks, from the Middle Ages until today, and the most important cities are Bonn, Basel, Strasbourg, Karlsruhe, Cologne, Dysseldorf and Rotterdam.

Map 1:The areas crossed by the Rhine (Source: www. google. com)

Most of the river is located in Germany and along it the most important industrial – economic and population centers of the country have been developed.





Map 2: Industrial Development on Map3: Population Concentration in West Germany (Source: www. google. com) West Germany(Source: www. google. com)

The Danube is long and is the second longest river in Europe. It was and still is an important waterway from the Black Sea to the interior of Europe (and vice versa), as it is navigable for the most part. In addition, with the construction in 1992 of the Rhine-Main-Danube canal, it has been united with the central European river transport network. The river connects many eastern European capitals with each other and on its banks there is a strong windfall industrial activity. It is also Axis 2850 kmVII of the Trans-European Transport Networks. (www. wikipedia. com)

Map 4: The areas crossed by the Danube (Source: www. danube-research. com)

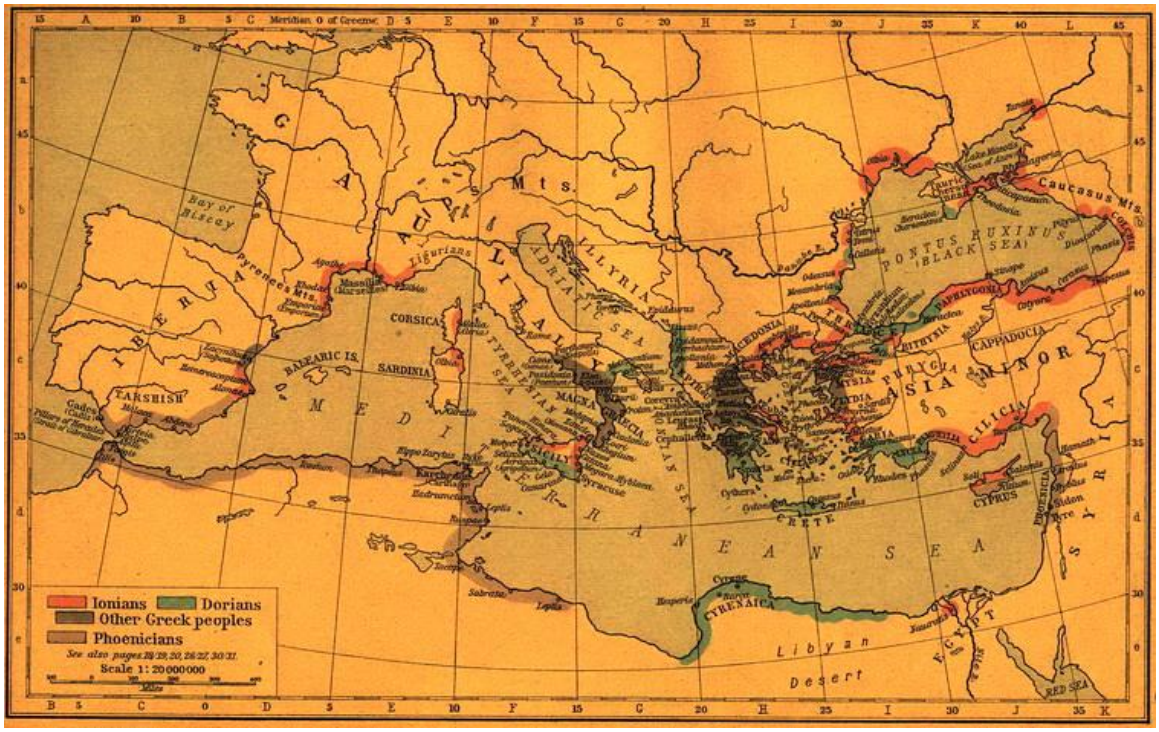
In recent years, the states concerned have worked out various plans for the union (with a canal system) of the Danube with the Rhine, with the Vistula and the Elbe. In this case, the Black Sea will be united with the Atlantic Ocean and with the Baltic. (Christoforidis, 2007)

Moreover, the countries crossed by the Danube Have organized the Danube Cooperation Process (D). C. P.), with the participation of the EU and other international organizations. At a recent conference of the institution, the important role of the river in the effort for economic development of the countries of Eastern Europe was highlighted. The Danube region should become the core of economic development and stressed that the river is a symbol of the "new and united Europe" and that the Danube's status as a Trans-European Axis should be reviewed, and in particular its relationship with AXes IV, V, and Xshould bereviewed. (Mathioudakis, 2007)

As we have mentioned in a previous paragraph, trade was carried out by transporting the goods into the water. Thus, another place where the transport of goods was the tool for the creation of cities is the Mediterranean.

A big and self-evident role in the choice of the area where the colony would be founded was played by the fertile land, the existence of natural harbors and sources of drinking water, as well as the political situation of the selected area, i.e. whether or not the development of the colony could be favored by the political and economic regime of the local populations.

The relations between Greek metropolises and colonies were not relations of ownership and subjugation, but relations of friendly, economic, religious. (Gospodine,2002)



Map 5: The colonial network of the Mediterranean in Antiquity (www. google. com)

Cities, large and small, are increasingly concentrated in population and activities. These large gatherings lend themselves to creating opportunities for economic growth and culture. The quality of life produced in cities is the issue that concerns modern societies, and the form of the city contributes significantly to this. (Vlastos, 2006)

Moreover, the form that a city takes characterizes both the structure of the movements that take place to and from it, as well as the movements that take place within it. This is also a subject on which many theorists of urban planning have puzzled and formulated interesting theories. One of the most important theorists of urban planning, the Spaniard Arturo Soria y Mata characteristically stated that "the form of a city will be perfect when the sum of the time spent by residents on movements will be minimal".

Urban movements create intense problems as in many cases they follow the layout of a medieval mast, which is not designed for car transportation. This creates many negative derivatives such as transportation, air pollution, noise and others that contribute to a significant extent to the deterioration of the quality of life of the inhabitants. (Vlastos, 2006). Urban planning is the tool in the hands of the bodies responsible for the development and operation of cities to give the form to the city that will optimize the quality of life of the inhabitants.

Commuting is one of the main activities that occur in the city. Every point in the city produces and attracts movements. The transportation planning tries to coordinate the flow of movements in such a way that the negative derivatives from the transportation of vehicles (pollution, noise, etc.) are reduced and at the same time the city becomes friendlier to the citizen. (Aravantinos, 1997)

1.2 The Role of Travel in Urban Planning

Urban planning is the mechanism that determines the use of each point in the city, the functions of the city and the organization of the urban fabric in general. The structure of the urban fabric differs from place to place and from season to season. The entire urban planning includes the functions of the city where the functions of the city include transportation. Movements are divided into three main categories: a) movements from the place of residence to the workplace, b) functional movements (movement of goods – products), and c) leisure movements (other movements).

Movements historically and until today, have operated in a decisive way in urban planning with recognized, from the first form of city organization until today, their importance for planning. The influence of forms of movements has been and is the most decisive factor for urban planning – production of a built environment. Movements are defined today in a leading field of scientific basis associated with important economic activities and therefore decisions.

Transportation serves the transportation function of the city and is one of the main activities that shape the city. Every point in the city produces and attracts movements. (Aravantinos, 1997) The movements are also divided into two major sections: the urban and the extra-urban (intersectical).

Urban movements create intense problems as in many cases they are obliged to be subject to an existing urban fabric and follow the layout of an e.g., medieval fabric that is not designed for car transportation. Thus, many negative derivatives are created such as transportation, air pollution, noise and others that contribute to a significant extent to the reduction of the quality of life of the residents and the degradation of the very value of the city. This creates the need for a continuous planning in order to deal with the problems of movements in urban planning.

The movements that we have already distinguished in the movement of goods and people are not limited to the urban space but also take place in the wider geographical area, structured or unstructured. Thus, we can argue that the examination of movements and their effects on space is divided into two scales: a broad regional space and urban space.

The wide geographical area can be a small spatial unit, a prefecture, a region or in other cases a larger spatial unit including regions of different states.

1.2.1 Transport Networks and Urban Development in the Wider Geographical Area

The transport sector is recognized as an exclusive tool – an instrument of urban planning itself, taking into account either the existing physical structure of the site (existence of a river - riparian transport) or by organizing the design guidelines based on the potential of transport (possibility of developing railways, motorways).

Looking at historical sources, the development of transport networks reflected and increased the process of urbanization, the creation of settlements and industrialization. The surplus of production that existed in the early rural societies led to the discovery of trade and the need to create routes of communication and contact with other societies. This created the meeting places of merchants and the first concentrations of populations at commercial crossroads, where they later formed the first cities. Also, as stated in a previous section, the rivers of Europe were the main axis of development of industrial centers and gave great impetus to the industrial revolution. (Lambrianidis, 2005)

According to Taaffe, Morill and Gould, there is atwo-way relationship between network evolution and residential development. This relationship is structured by a six-stage process:

The first colony, with its development, creates a network of regional, smaller settlements, which are located in the hinterland of the new region.

Roads are constructed that connect the first, coastal colony, with the centers of supply of raw materials of the hinterland.

As the economic development and prosperity of this system increases, the development of new centres along the main transport routes is assisted.

The development of these centres is changing the role of the original centres and new settlements, some of them, are being transformed into centres where transport networks tend to be concentrated.

A dominant transport network is created that connects the most important settlements with each other.

The development of these networks strengthens the economic advantages of urban centres. (Lambrianidis, 2005)

Since the creation of the first cities it was observed that an important factor in their development and in the development of the first residential networks, was trade, that is, the transfer of goods, from one city to another. The communication channels were mostly watery and that's why we observe the first major cities in valleys of large rivers, and in coastal areas. Until the time of the industrial revolution, water roads played a decisive role in the development of cities and in the formation of the residential network. Until then, coastal – riparian areas gathered the largest part of the economic activities and population of a country.

The development of technology and the discovery of steam engines created the right conditions for the parallel expansion of transport networks and cities. It allowed cities to trade at more distant distances and facilitated urban concentration and the spatial distribution of labour. Thus, the role of transport networks is upgraded to a decisive factor in regional and spatial planning. (Lambrianidis, 2005)

1.2.1.1 The Role of Transport Networks in Spatial Integration

The European Union seeks to complete a single transport system, as it recognises its importance in promoting other individual policies, crucial to its survival. An integrated transport system can promote the creation of the single market and make a decisive contribution to achieving the objective of economic cohesion.

The creation of new transport networks affects regional development, spatial planning and the environment. The EU aims to promote the interconnection and interoperability of national networks as well as access to them. (Moussis, 2005)

In general, transport networks are directly and indirectly linked to the implementation of EU objectives and in particular to the Lisbon objectives and the gothenburg priorities, and this is given due importance in the context of the NSRF and the Operational Programme "Enhancing Accessibility".

More specifically, as far as transport networks are concerned, the following is stated: "The provision of efficient, flexible and safe transport infrastructure is considered a necessary condition for economic development, because it boosts productivity and therefore the development

prospects of the regions by facilitating the movement of people and goods. Transport networks enhance opportunities for trade, while also increasing efficiency. Furthermore, the development of trans-European transport infrastructure with a focus on cross-border projects is essential in order to achieve the integration of national markets within the enlarged European Union. (Moussis, 2005)

The ESDP states that the completion of the Trans-European Transport Networks is an important factor for the spatial policy formulated and for the promotion of a sustainable and functional transport network. The implementation of the networks will address the problems that the residential space suffers from the high travel load and will help to improve the urban*environment.* It is becoming increasingly clear that the increase in transportation must be seen in the context of political spatial development and urban planning, and not just by expanding transport infrastructure. (ESDP, 1999)

1.2.1.1.1 Trans-European Transport Networks

The Treaty establishing the EU commits the Community to contribute to the establishment and extension of trans-European transport networks. The realization of the Pan-European Transport Corridors (TIM - PETrCs)took place through three Pan-European Transport Conferences, organised by the European Commission (European Commission) and the European Parliament (European Parliament)in 1991 in Prague, in 1994 in Crete and in 1997 in Helsinki. Crete.”"

At the Pan-European Transport Conference in Helsinki it was decided to include in the TIM another corridor, Corridor X, axis through Yugoslavia to Austria-Germany, with offshoots.

Another important decision of the Helsinki Conference was the identification, for the first time, of the so-called "European Transport Areas». These are areas which surround seas and are characterized by them from the point of view of transport. The rationale of the decision states that this definition is necessary, as the transport requirements in these areas are more complex and not fully covered by the logic of pan-European corridors. Four PETrAs have been identified:

- the Euro-Arctic region
- the Black Sea basin area
- the Mediterranean basin region
- the region of the Adriatic and Ionian Seas

It is understandable that for these regions, specific policies will soon be implemented in the direction of the unification and development of transport systems, with particular emphasis on maritime transport - something that is certainly of great interest to Greece.

The 10 Pan-European Corridors:

- Corridor I :Helsinki- Talinn- Piga-Kaunas- Warszawa - Length about 1000 km
- Corridor II : Berlin- Warszawa- Minsk-Moskva - Length approximately 1830 χλμ.
- Corridor III : Berlin/ Dresden- Wroclaw- Katovice- Krakow- Kievo - Length approximately1640 χλμ.
- Corridor IV : Dresden- Praha- Wien- Bratislava- Gyor- Budapest- Arad- Constanta- Sofia - Thessaloniki-Istanbul - Length about 3285 km,
- Corridor V: Venezia- Trieste- Ljubljana- Maribor - Slovenian /Hungarian border - Uzgorod-Lvov-Kiev -Hungarian/Ukrainianborderbranch 1: Rijeka- Zagreb - Croatian/Hungarian border,Budapest, branch 2: Bratislava- Zilina- Kosice- Uzgorod Length approximately1600 χλμ.

- Corridor VI : Gdansk- Katowice- Zilina Length approximately 800 χλμ.
- Corridor VII : The Danube River, which passes through Germany, Austria, Slovakia, Hungary, Croatia, Yugoslavia, Romania, Bulgaria, Moldova, Ukraine. - Approximately length2300 χλμ.
- Corridor VIII : Duress- Tirana- Skopje- Sofia- Plovdiv- Burgas- Varna - Length approximately 905 km
- Corridor IX : Helsinki- st. Petersburg- Moskva-Kiev-Lyubasevka- Chisinau- Bucuresti- Dimitrograv-Alexandroupolis - Length approximately3550 χλμ.
- Corridor X : Salzburg- Ljubljana- Zagreb- Beograd-Nis- Skopje- Veles- Thessaloniki - Length approximately(Skyrgiannis, 2003)3135 χλμ.

Map 6: The Trans-European Transport Corridors(www. europa. eu)

1.2.1.2 Greek Strategy in The Design of Transport Networks

1.2.1.2.1 National Strategic Reference Framework (E.S.P.A.)

In the new programming period 2007-2013, Greece has drawn up the National Strategic Reference Framework (E.S.P.A.). The main priorities of the country's development strategy for the period 2007-2013 are the investment in the productive sector of the economy, the promotion of the knowledge society and innovation, the enhancement of employment and social cohesion, the improvement of the institutional environment and the enhancement of the country's attractiveness as a place of investment in work and living. The last priority includes the development and modernization of the physical infrastructure and related services of the country's transport system, which is implemented to a large extent by the Operational Programme "ENHANCING ACCESSIBILITY" (EQC).

With this program, in addition to directly serving the priority to improve the attractiveness of the country, through the development of natural infrastructure indirectly serves the priority of improving the institutional environment with interventions of an institutional nature for the transport sector.

Moreover, in conjunction with the Regional Operational Programmes and the Territorial Cooperation Programmes of the NSRF, the Operational Programme also serves the regional dimension of the strategic priorities of the NSRF by integrating the basic transport and environmental infrastructure that promotes regional competitiveness and sustainable development respectively at local level.

In relation to national transport policy, the main priority is to complete the development of the national transport system to ensure the rapid and safe movement of persons and the efficient transport of goods, which will contribute to enhancing competitiveness, regional development and improving accessibility and services of general economic interest. (E.S.P.A., 2007)

In particular, ensuring efficient, flexible and safe transport infrastructure is one of the necessary conditions for economic growth, as it improves productivity and development prospects in the areas served. Adequate transport networks increase the potential of trade as well as the efficiency of business activities. At the same time, the development of trans-European transport infrastructure and, in particular, of cross-border projects is important for achieving greater integration of national markets, especially in the context of the enlarged Union.

In this context, the structure of the Operational Programme "ENHANCING ACCESSIBILITY" was formed, which consists mainly of actions for the development of transport infrastructure, but also actions to improve transport safety and improve transport services. These actions concern the implementation and improvement of road and rail axes, ports, airports, suburban and metropolitan railway infrastructure (METRO) and the promotion of other clean urban transport.

The development strategy of the Transport sector is implemented by the Operational Programme "ENHANCING ACCESSIBILITY" based on two main strategic objectives:

1. The improvement of the accessibility and accessibility of the country's regions through the development of trans-European Transport Networks as a matter of priority, as well as through the development of transport infrastructure at national / regional level (road, rail, sea, air and urban transport infrastructure), with a view to the sustainable development and sustainability of the transport system.

2. Enhancing the competitiveness and productivity of the transport system by improving the quality of the transport services provided, with emphasis on reducing travel time and costs, by improving transport safety and by increasing the level of service and the overall added value of the system. (E.S.P.A.2007)

1.2.1.2.2 General Framework for Spatial Planning and Sustainable Development

The concept of spatial planning in our country is enshrined for the first time by article 24 para. 2 of the 1975 Constitution, together with the provisions relating to the natural and cultural environment. In implementation of the above constitutional provisions, Law 360/76 "On Spatial Planning and the Environment" was issued, which defined for the first time the concepts of spatial planning and program, the use of space, the levels of spatial planning and established bodies and procedures for the approval of the above. (Kokkosis,2005)

In 1982 he began a plan of spatial development planning per Prefecture, and resulted in the drafting of "Proposals for Spatial Organization" for all the prefectures of the country (1984). The above efforts, however, did not yield the desired results as they were not institutionalized and updated.

Then, in 1988, the program of elaboration of "Special Spatial Studies" began, with the aim of dealing with problems in particularly sensitive areas of the country.

The above programs and plans did not manage to create a single framework of spatial planning for the whole country, and so there were never the general, strategic directions for the spatial structure and development policy of the country. (Kokkosis,2005)

The next milestone in the institutionalization of spatial planning in Greece is the adoption of Law 2742/99 "Spatial Planning and Sustainable Development and otherprovisions" (Government Gazette 207 A'). the aim of this law is to establish fundamental principles and modern bodies, procedures and means of exercising spatial planning that promote sustainable and balanced development, ensure the protection of the environment throughout the national area and strengthen the country's position in the international and European area. frame. This law is the basic legislative framework for the preparation of the National Spatial Plan.

It is common knowledge that the absence of spatial planning is a hugely important deficit of many decades with a negative impact on the rational development and organization of the country as well as on the environment. For this reason, the state, knowing the mishandle of the issue so far, has set in recent years as its primary goal to finally acquire the country spatial planning at a national level and even integrated. (Y.PE.CHO.D.E., 2008)

The promotion of the General Framework for Spatial Planning and Sustainable Development (National Spatial Plan) was part of a more comprehensive program of the Ministry of Environment, Planning and Social Planning and Public Health. for the Spatial Planning that included the drafting of a number of Special Spatial Plans that are necessary for the environment and the development of the place, such as the Special Spatial Plan for Renewable Energy Sources, Tourism, Industry, as well as the updating and final configuration of these for the Coastal and Mountainous Area.

The National Spatial Plan is the synthetic view in the area of individual policies, programs and projects, ensuring internal coherence, the complementarity of instruments and political interventions, the greater effectiveness and synergy of the implemented projects and programs

with a developmental character, within the framework of a vision for the development of the national space. For this reason, from the very first moment, the greatest possible cooperation with co-competent Ministries and organizations of the wider public sector was sought, as well as the utilization of the time period related to the parallel elaboration of the National Strategic Reference Framework 2007-2013. (Y.PE.CHO.D.E., 2008)

Finally, it aspires to be the reference base for the coordination and harmonization of individual policies, programmes and investment plans of the State, public legal entities and local government bodies of the first and second degree that have a significant impact on the cohesion and development of the national area. Therefore, after its institutionalization, it will have the characteristics of a broad programmatic political, social and economic agreement.

The basic strategic choice of the General Framework is the adoption of a model of sustainable spatial development, based on the establishment of a network of poles and axes of development, which will strengthen the country's competitive presence in the international environment and promote social and economic cohesion, with diffusion of development throughout the national area, as well as the protection of the environment.

This grid, adapted to the constraints of the geographical terrain, includes the main urban centres, is inter-articulated with the areas of development of productive activities and is supported by an integrated transport, communications and energy network.

In order to promote social and economic cohesion throughout the national area and to strengthen its competitiveness in the international environment, its multicenter organization is sought by creating an integrated network of urban poles and development axes.

The development poles are classified into four hierarchical categories of urban centres as follows:

1. Metropolitan centres: They include the urban centres of Athens and Thessaloniki, which are the main urban gateway poles at international level. For each of these centres, the following shall be aimed in particular at:

Athens: The strengthening and consolidation of the role of Athens as a "city-gate" and as a regional metropolitan pole of the EU and the emergence of the role of Athens as a national metropolitan center and as a pole of diffusion of the developmental dynamics throughout the national space, in the context of balanced and polycentric regional development, etc.

Thessaloniki: The strengthening of Thessaloniki's role as a "gateway city" and as a regional metropolitan pole of the EU, the strengthening of its role as a business/commercial association of the EU with the Balkans and the Black Sea countries, the improvement of its attractiveness by acquiring a high quality environment, the gradual balance with Athens.

2. Primary national poles: These are Patras, the dipole Larissa-Volos, Ioannina, the dipole Heraklion-Chania and the dipole Komotini-Alexandroupolis.

3. Secondary national poles: This category includes the following particularly dynamic urban centers: Corfu, Kozani, Lamia, Kavala, the Tripoli-Kalamata dipole and Chalkida. In the above urban centers, the upgrading of the technical and social infrastructure and services of the cities and innovation is promoted, aiming at the development and improvement of the competitiveness of their productive potential.

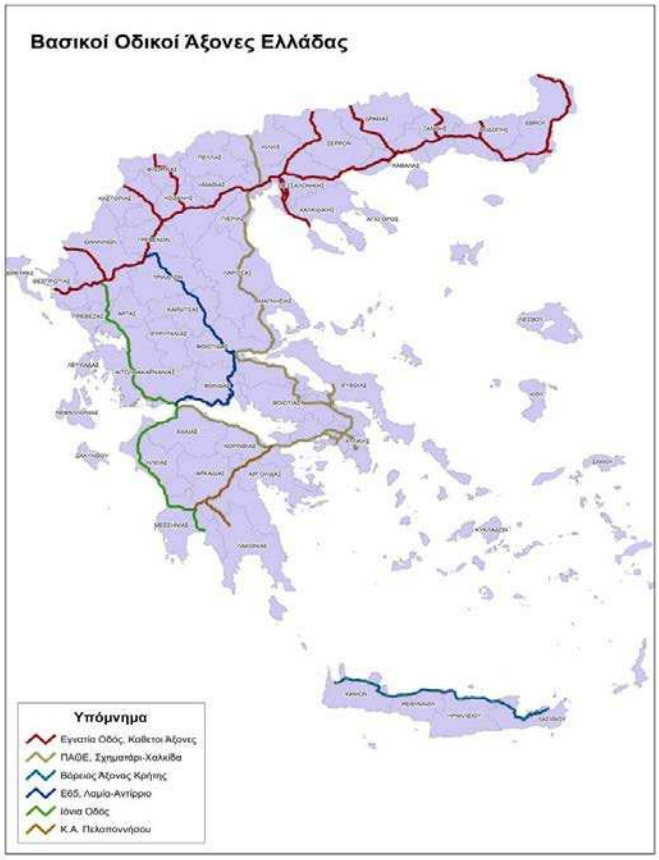
*4. Other national*poles: The following dynamic urban centers are included: Agrinio, Drama, Karditsa, Katerini, Xanthi, Serres and Trikala. At the above poles, their special character

(productive, cultural) is strengthened and the urban environment is upgraded, aiming at improving the quality of life.

It is observed that the poles of development are identical to the hierarchy of the residential network of Greece, according to the distribution of the population. Moreover, in the national spatial planning, the following are presented as the main axes of development:

- Eastern land axis – P.A.TH.E.
- Northern Axis – Egnatia Odos
- Western Axis – Ionia Odos
- Central hinterland axis – E65
- Diagonal Axis - It is developed along the road axis Lamia-Itea / Amfissa - Antirrio - Patras. It directly connects the international port of Patras with central Greece, through Lamia
- Central Peloponnese Axis: It is developed along the road axis Corinth – Tripoli – Kalamata / Sparta – Gythio, including the nearby islands
- Axis of Crete: It is developed along the northern road axis of the island. (Y.PE.CHO.D.E., 2008)

Map 7: Development Poles of the country(Source: Y.PE.CHO.D.E., 2008)



Map 8: The main road axes of the country's development (Source: Y.PE.X.O.D.E., 2008)

Moreover, new directions regarding the spatial structure of the transport infrastructure, the urban network and the reconstruction of the country are mentioned in the national spatial planning.

The General Guidelines for transport are divided into guidelines for transport as a whole and for urban transport. Thus, the first category states:

The integration of the country into the international networks, the smooth operation of the proposed network of settlements and the implementation of the developmental axes depend to a large extent on the optimal arrangement of the strategic infrastructure networks and especially those of transport / transport, communications and energy.

The main objective is to improve the quality of existing transport infrastructure and related services throughout the country, with a view to increasing the degree of accessibility and accessibility,

The main objective of the spatial structure of the strategic networks is to support the international role of the country and to disseminate development throughout the country.

In order to make the maximum possible use of the efficiency of means and services, it is necessary to develop, in the transport and transport sector, integrated systems of combined transport, etc. (Ministry of Environment, Physical Development and Public Works, 2008)

In moreover, the guidelines for urban transport state that it is necessary to:

The reduction of inequalities in the level of urban transport between Attica and Thessaloniki and the rest of the country's regions.

To facilitate the use of the bicycle with measures that will be specified on a case-by-case basis at the local level

the introduction of mechanisms for the management, monitoring, evaluation and evaluation of a series of transport figures related to urban transport in the country's major cities.

increasing the overall transportation capacity of the urban road network and promoting works to bypass the main urban centres;

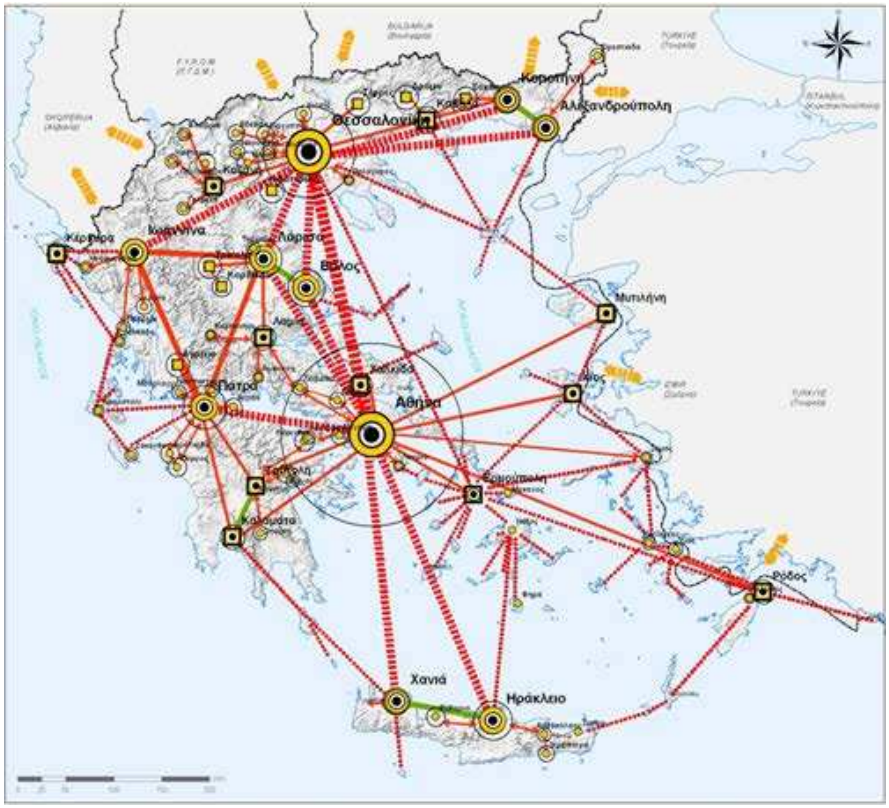
the promotion of measures and projects that enhance the attractiveness and quality of Public Transport (MEDIA), the reduction of road accidents and the reduction of negative environmental impacts (pollution, noise).

the restriction of the use of private vehicles, at least along railway axes (combined use of railway – private vehicle).

the introduction of incentives for vehicles equipped with environmentally friendly engines. (Y.PE.CHO.D.E., 2008)

For the two metropolitan centers of the country (Athens, Thessaloniki), the following special directions are adopted:

- Reducing their population growth by directing the labour market to selected sectors (in particular research and innovation, high technology, financial system, shipping, tourism, culture) and by developing urban satellite centres.
- Promotion of the institution of metropolitan self-government.
- Reduction of urban movements, with the polycentric organization of the city and the enhancement of internet services and The Discouragement of travel by private car while strengthening the means of public transport, especially the means of fixed track
- Planning of the development of land use in urban and peri-urban space and strict restriction of scattered building in areas outside the plan.



Map 9: The structure of the country's residential network (Source: Y.PE.CHO.D.E., 2008)

1.2.1.2.3 Conclusions

The national spatial plan proposes as a general development model the reinforcement of the model of two metropolitan centers (Athens and Thessaloniki) and as axes of development basically the roads that will be reconstructed by a concession contract. (daily, 18/04/2008)

Moreover, many scientific bodies and social organizations have been highly critical of the proposals of the national spatial planning. It is considered that the national spatial plan violates the constitutional principle of sustainability and promotes an outdated development model (www. skai. gr, 18/04/2008). It also adds that the development model lacks vision, and that the proposed spatial planning policy does not refer to integrated guidelines for the underlying levels of spatial organisation. (SEPOCH, TEE, 2007).

Engineers' bodies, as well as other representatives of the productive classes in the national planning council, call the new plan "anti-development" and "anachronistic" and point out that if the new plan is implemented there will be unconstitutional changes in land use. (www. skai. gr). Moreover, the lack of policy for off-plan construction and the lack of environmental content are highlighted, making the concept of sustainable development problematic (SEPOX, TEE, 2007).

1.2.1.3 Transport projects with Spatial Implications in Greece

1.2.1.3.1 Road axes

The PATHE axis is of particular importance because along it the development potential of the country is concentrated, thus forming the so-called developmental S,and includes the urban centers of Patras, Athens, the dipole Larissa - Volos, Thessaloniki and Kavala. The result of the creation of these cities along THE UNIVERSITY of Thessaloniki is the developmental inequalities between the western and the eastern mainland. Also, This axis gathersabout 70% of the country's population as well as the main economic and administrative centers of the country. (Kokkosis, 2005)

Another important road axis with spatial implications, both at state and European level, is the Egnatia Road under construction. The feasibility and importance of this axis for Greece emerges from the discussion on the prospects and possibilities for the development of major roads. This axis will upgrade the strategic importance and development prospects of Epirus, Macedonia and Thrace. Moreover, this axis constitutes for the European Union an essential road axis that completes the Trans-European Transport Networks and contributes to the achievement of the objectives of Community policy.

Also, the Via Egnatia will contribute to the connection of the EU. with the Middle East through its complementarity with PATHE. In this way, Greece acquires a special role, in relation to the transport that will be carried out from Europe to the East. (www. egnatia. gr)

The construction of the Egnatia Road, and its perdicular axes, connects the three geographical regions mentioned above with the metropolitan center of Thessaloniki, thus creating a polycentric urban network, including the main urban centers of northern Greece.

In the new polycentric urban network that was to be created, there are some spatial changes in land use. In particular, the following are observed:

- Change of land use: i.e. changes from agricultural to non-agricultural use as a result of the pressures that are expected to arise at points of the axis (particularly close to settlements,

industrial areas, etc.) and in particular the degree of conversion of (a) agricultural land (cultivated areas) to urban land (b) natural areas on urban land and (c) natural areas into agricultural land.

- Change of urban land in the direct zone of influence of the axis, based on three categories of classification of urban land: continuous urban construction, linear urban construction and discontinuous urban construction.
- Change of industrial and commercial land in the axis zone: i.e. change of industrial and commercial land in the direct area of influence of the axis based on the following categories of uses: industrial areas, commercial areas, public and private service areas, areas of public transport facilities.
- Establishment of enterprises: Number, type and size of new enterprises established in the direct area of influence of the axis as a result of the importance of the axis in the spatial behaviour of the enterprises. (Egnatia Odos Observatory, 2008)

More specifically, below, there is a presentation of the changes observed in three areas which are in direct proximity to the junctions of Egnatia Odos and these areas are in Thessaloniki, Ioannina and Komotini. The study defined zones of 5X5 Km centered on the node in each area.

Change in Land Use

During the period 1998-2007 in the zone area of Thessaloniki and specifically, in the area of Eukarpia there was a significant absolute and percentage increase in the area occupied by urban land. Specifically, urban land increased by 21.8%, while non-urban land decreased by 19.5%.

Significant parts of agricultural and natural land were transformed at the expense mainly of agricultural land, which shows a large decrease of 30.2%, while the total natural land shows an increase of 28.5%.

As a result of the above changes in the area of Eukarpia, the urban land that covered 47% of the area in 1998 reached 58% of the area in 2007. By contrast, the proportion covered by agricultural land fell from 43% in 1998 to 30% in 2007. The area covered by the natural land shows an increase from 10% in 1998 to 12% in 2007.

TABLE 1: SURFACE BY CATEGORY OF LAND USE AND RATE OF CHANGE, 1998-2007 IN THE EUKARPIA CONVOS

Land use category	Area (m^2)		Change in area (%) 1998-2007
	1998	2007	
Urban land	11.805.234	14.376.967	21,8%
Total physical and agricultural land	13.194.766	10.623.034	-19,5%
Natural land	2.403.695	3.089.468	28,5%
Agricultural land	10.791.071	7.533.566	-30,2%

Source: Observatory of Egnatia, 2007

In the area of the Ioannina junction, there was an increase in the area occupied by urban land at a rate of 12.2%. The total of natural and agricultural land decreased to 3.5%, which is due to the decrease in agricultural land (by 6.1%) since natural land shows an increase of 5.5%.

The increase of urban land in the area of the Ioannina junction comes mainly from the change of agricultural land to urban land. About 18.4% of agricultural land (of the total land recorded as agricultural in 1998) was converted into urban land.

As a result of the above changes, in the area studied in the area of Ioannina junction, in 1998 urban land covered 22% while in 2007 this percentage reached 25%. On the contrary, the percentage covered by agricultural land

TABLE 2: SURFACE BY LAND USE CATEGORY AND RATE OF CHANGE, 1998-2007IN THE EUKARPIA KOMVOS			
Land use category	Area (m^2)		Change in area (%) 1998-2007
	1998	2007	
Urban land	5.606.790	6.290.843	12,2%
Total physical and agricultural land	19.393.210	18.709.158	-3,5%
Natural land	15.116.895	14.195.540	-6,1%
Agricultural land	4.276.314	4.513.618	5,5%

Source: Observatory of Egnatia, 2007

During the period 1998-2007, in the area of Komotini junction, there was an increase in the area occupied by urban land by 8%, while agricultural land showed a slight decrease by 1.3%. It should be noted that in the area studied in Komotini, no natural land is recorded.

The increase of urban land in the area of komotini junction, comes exclusively from the change of agricultural land to urban. Approximately, 4.6% of the area's agricultural land, from the area recorded in 1998, was converted to urban and this was the only change in land use observed in the area for the period 1998-2007.

As a result of the above change in the area studied in the area of Komotini Node, urban land increased by 1%, from 14% in 1998 to 15% in 2007.

TABLE 3: SURFACE BY LAND USE CATEGORY AND RATE OF CHANGE, 1998-2007 IN THE EUKARPIA CONVOS		
Land use category	Area (m^2)	Change in area (%)

	1998	2007	1998-2007
Urban land	3.549.536	3.834.275	8,0%
Total physical and agricultural land	21.450.464	21.450.464	0,0%
Natural land	21.450.464	21.165.725	-1,3%
Agricultural land	0	0	0%

Source: Observatory of Egnatia, 2007

Change of Urban Land

In relation to the change in continuous construction, i.e. the area of urban land located within the boundaries of the settlements of the study area, the largest change was measured in the komotini zone (19.5%) and in the zone of Thessaloniki (18.2%).

In the ioannina zone, the largest increase (30.27%) in linear construction is recorded, i.e. the area of urban land located within the zones 500m wide along the main road axes of the area studied. Significant (23%) is the increase of linear construction in the zone along the Egnatia Odos in the area of Thessaloniki, while in the area of Komotini it is very small (3%).

1Figure 1: The area of Egnatia I/C in Efkarpia, Thessaloniki (Source: Egnatia Odos Observatory, 2008

Figure 2: The area of Egnatia I/C in Ioannina (Source: Egnatia Odos Observatory, 2008)

In Komotini, the largest increase of 160% of the continuous construction was measured, i.e. the area of urban land located in the area outside the area of continuous and linear urban construction, compared to 59% in the area of Thessaloniki and 11% in the area of Ioannina. (Egnatia Observatory, 2007)

Figure 3: The area of Egnatia I/C in Komotini (Source: Egnatia Odos Observatory, 2008)

Change of Industrial and Commercial Land

The largest increase in land occupied by industrial commercial uses, transport facilities and other services was generally observed in the region of Ioannina. More specifically:

As far as industrial land is concerned, in the region of Ioannina it increased by 31%, in the area of Thessaloniki by 5.4% while in the area of Komotini there was a decrease of 14%.

In the region of Ioannina, the largest increase in land use related to trade was also measured (50.3%), while the increase in the areas of Komotini and Thessaloniki is smaller (18.6% and 13.9% respectively).

In relation to the land use of transport facilities, the region of Ioannina shows an increase of 100%, while the area of Thessaloniki also increases, but clearly smaller (12.7%) and in the area of Komotini there is a decrease of 14.5%. (Egnatia Odos Observatory, 2008)

Establishment of businesses

The region of Ioannina shows the largest increase (26%) in the number of new enterprises, i.e. enterprises established in the study areas after 1998, which are located mainly along the vertical national road that intersects with the Egnatia Highway.

It is followed by the region of Komotini with an increase rate of 14% and finally the area of Thessaloniki with an increase rate of 11%. The majority of them are enterprises belonging to the trade sector (retail and wholesale), while the largest number of employees in new enterprises is located respectively in the wholesale and retail sectors. (Egnatia Odos Observatory, 2008)

TABLE 4: NUMBER OF NEW ENTERPRISES AND RATE OF CHANGE FOR THE PERIOD 1998-2007

Region	Number of New Businesses	Total Enterprises	% change
Eukarpia Node	73	676	10,8
Ioannina Node	66	252	26,2

Komotini Junction	19	74	14,1
TOTAL	158	1.002	15,8

Source: Egnatia Observatory, 2008

1.2.1.3.2 The Suburban Railway and Spatial Changes in Attica

The issue of the suburban and the impact of its operation on land use in the area where it passes is considered very important and needs to be considered. The construction of the Suburban Railway aims to reduce car travel to and from Athens, while already after the first years of its operation, there are spatial changes in the neighboring municipalities of the Urban Complex of Proteusa.

It is considered that the Suburban is a relatively new means for the operation of Greek cities and specifically for the residential complex of Attica. A question that arises is whether it will work in a complementary way or competitively with other means of transport, for travel in Attica. (Trademco, 1998)

Although the Suburban has been in operation for only a few years, the design for its construction begins in the 60s. Many studies concerning transportation and transportation planning in the Urban Complex of the Capital, and studies for the development and reorganization of the Greek railway suggested the need for the creation of a suburban railway network, connecting Athens with the neighboring urban centers (Megara, Kinetta, Corinth, Elefsina, Loutraki) and with industrial zones (Thriassio Pedio, Oinofyta, etc.).

Also, by providing for the creation of the main airport of Athens in Spata and the socio-economic development in the area of Mesogeia, the need to connect these areas with the Suburban Gulf was formulated. (Technical Chronicles, 1994)

For the above reasons, the development of the Suburban Railway in Attica on the existing axes of OSE, towards Corinthia and Chalkida, as well as towards the mesogeia area, was established within the framework of the Athens Master Plan in 1985 and 1991, with the location of the lines on the middle islets of the new motorways that were planned (see Attiki Odos). With this in mind, all further interventions, planning and constructions of transport projects, as well as urban planning regulations, were subsequently harmonized. (Technical Chronicles, 1994)

1.2.1.3.3 Effects of the Suburban Railway in Western and Eastern Attica

1.2.1.3.3.1 Impact on Western Attica

The operation of the Suburban Railway has brought about changes in the residential development of the areas of Western and Eastern Attica as it brought to the surface several "forgotten" areas of Attica and made them more attractive both for housing and for business premises.

A study carried out on behalf of the Ministry of the Environment, Physical Planning and Public Works by the Institute of Regional Development of Panteion University states that by 2008 there will have been significant population upheavals in Attica and its neighboring prefectures. There will be two currents of exit from the Basin. The first and most immediate time concerns the movement of population to the Mesogeia, while the second "removals" to the neighboring cities that will be connected to Athens through the suburban railway.

This will bring about, as estimated by real estate agents, significant changes in the map of the real estate market in Attica. (Siomopoulos, 2003)

The demand for new homes will come from two sources. The first of those who will rush directly to seek opportunities that present themselves today to take advantage of an impending price increase. This particular category of investors, according to Mr. Giannoulelis, will earn double both in upgrading the quality of their lives, but also in capital gains from the properties they will buy. The second source of demand, which will be greater and ever-increasing, will be from employees of companies that have already begun to be placed along this segment, at an ever-increasing rate. (Siomopoulos, 2003)

The creation of the suburban railway is expected to be the springboard for new urban areas in places that until recently were only for holiday homes and become a lever for upgrading these areas.

Already a significant number of mayors of cities through which the suburban railway passes have begun to review the existing urban plans of the cities and are considering expanding their boundaries. This is expected to bring about an upgrade of Real Estate. (Siomopoulos, 2003)

Areas such as Mandra, Magoula and Fyli were considered more "provincial" than within Attica, since the time required to "travel" to the Attica basin was longer than the time it took to come from Chalkida and Thebes. According to sources, however, the development will not stop in these areas, as the suburban railway in combination with the National Road Athens - Corinth and the Attiki Odos, ensures huge transportation facilitation on all the coasts of Attica from Eleusis to Corinth. Development is therefore also foreseen for the areas of Megalo Pefkos, Megara, Kineta, Agioi Theodoroi and Corinth. It is therefore obvious that, when the benefits that the Suburban Railway will offer in the areas through which it passes become apparent, there will be a significant development of the real estate market.

Western Attica and several areas that until today are known as holidaymakers (e.g. Kineta, Agios Theodoroi, N. Peramos, Megara, Loutraki, Corinth, etc.) are expected to accept the interest of property buyers for permanent residence with the full operation of the Attiki Odos, but also the construction of the suburban railway. (Siomopoulos, 2003)

Moreover, the "heart" of the suburban railway will beat in the area of Acharnes (near Attiki Odos), which is expected to be significantly upgraded, as it is planned to build modern commercial complexes there. (Siomopoulos, 2003)

1.2.1.3.3.2 Impact on landlocked

The area of Mesogeia, which essentially owes its rapid development to the creation of the new International Airport "Eleftherios Venizelos" and to the construction of the Attiki Odos and the Suburban Railway, has stimulated the buying interest of large investment schemes, but also of simple manufacturers who have proceeded to hundreds of developments in recent years, creating in many cases new neighborhoods in the place of which 10-15 years ago there were olive trees and Vines. (Siomopoulos, 2001)

According to the research of the denaro company, after the completion of "Eleftherios Venizelos" the first wave of "migration" of population to Eastern Attica took place. But while the existing studies were talking about moving more than 1 million people, they were not in the right direction. of residents in the area, to date have not exceeded 200,000. The relocation has been delayed, according to her,mainly because theexisting city plans are not enough to cover a massive simultaneous movement of population and the process of new accessions has been delayed

considerably. More than 100,000 acres in the wider area of Eastern Attica are in the process of joining the city plan and for various reasons the whole process has been "hampered". (www. atticaeast. gr)

The signing of the presidential decree on land use is expected to significantly clarify the landscape in Mesogeia, while the next necessary steps are the correct and rapid urbanization of these areas through studies and implementation acts and most importantly the effective safeguarding of compliance with the building conditions. (Siomopoulos, 2008)

The Mesogeia will be transformed from sparsely built suburbs to a city, like the central municipalities of the capital. The southern coast, from Varkiza to Sounio, will experience a new, unprecedented, residential expansion and will be permanently transformed from holiday areas to areas of first residence. Experts predict - cauterizing this prospect - that a new Basin is going to be built within the next 15 years, due to the new conditions that are being created. A development similar to the unprecedented but also without logical "development" experienced by entire regions and municipalities, about ten years after the operation of Attiki Odos. A "development" without elementary infrastructure and plan, which further giganticizes Athens and gradually transforms an entire prefecture into a single, anarchic and suffocating urban plan. (Siomopoulos, 2008)

The above changes in the residential structure of the areas and local authorities of Attica will create a new network of movements to and from these areas and the aim of the competent bodies is for most movements to be carried out with the suburban railway network. The following tables show the travel forecasts for each local authorities in the Basin. (Trademco,1998)

ΔΗΜΟΣ	2001		2004		2010		2020	
	Παραγωγές	Έλξεις	Παραγωγές	Έλξεις	Παραγωγές	Έλξεις	Παραγωγές	Έλξεις
Νέο Αεροδρόμιο Αθηνών	0	76000	0	88000	0	125000	0	180000
Αγ. Ανάργυροι	61101	37424	62473	38125	66769	40510	75493	49916
Αγ. Βαρβάρα	56710	18788	57820	18276	61445	17547	67535	19145
Αγ. Δημήτριος	122613	68248	127482	71940	140827	81672	166787	99830
Αγ. Ιωάννης Ρέντης	27966	98783	27663	96270	27555	92842	25332	88292
Αγ. Παρασκευή	119630	111545	128397	111877	150375	115071	2068894	144444
Αγ. Στέφανος	21622	13897	26353	15989	37345	20956	74355	31522
Αγ. Θεόδωροι	14731	23974	16444	25976	21050	31525	29302	41969
Αθήνα	1584798	2650300	1612749	2708076	1707180	2895182	1842372	3068828
Αιγάλεω	156192	225488	159250	219217	169235	210201	186008	216634
Άλιμος	70424	68983	73221	72758	80885	82689	95796	100982
Ανθούσα	14165	3359	16431	3597	21773	4201	36139	6053
Άνοιξη	11545	16418	14071	18672	19940	24055	39702	38855
Άνω Λιόσια	48074	23836	50045	23062	55146	21862	63973	25810
Αργυρούπολη	69370	50364	72125	53171	79675	60536	94362	73818
Άρτεμις	29918	6617	32563	6716	39069	7081	52553	8370
Ασπρόπυργος	30141	67317	30753	75479	32727	95152	36709	121177
Αυλώνα	19917	9095	16268	9865	8530	9876	9585	9696
Αφίδναι	13603	18217	10403	18437	3540	19327	4076	29688
Αχαρνές	156634	89958	169187	92810	200360	101144	264338	119865
Βαθύ	20721	31316	23513	35068	29591	44740	40390	63611
Βάρη	25452	9011	27724	10401	33308	13696	48509	22735
Βαρυμπόμπη	85	0	89	0	99	0	120	0
Βίλια	7473	13088	8177	12842	9898	12582	10826	14042
Βούλα	52198	28208	56859	33436	68312	45711	99487	79134
Βουλιαγμένη	9200	19498	10021	23121	12040	31625	17535	54781
Βριλλήσια	47923	16649	50386	17582	56857	20026	71119	25502
Βύρωνας	115912	45062	117956	46050	124862	49242	134750	52270
Γαλάτσι	119446	54443	121553	55656	128670	59568	138860	63562
Γέρακας	19881	14306	20993	14549	23876	15405	29179	16489
Γλυκά Νερά	15082	13649	15925	13891	18112	14729	22135	15815
Γλυφάδα	164797	125362	179511	147809	215669	200600	314093	344534
Δάφνη	49979	35392	50860	36171	53838	38687	58101	41115
Διόνυσος	323	1156	394	1341	558	1779	1111	2540
Δραπετσώνα	26551	34123	26939	34810	28340	37094	31017	40892
Δροσιά	12248	4243	14927	4845	21153	6282	42117	9889
Εκάλη	16883	1569	20578	1818	29160	2407	58059	3465
Ελευσίνα	47428	39737	48112	63044	50597	33906	55466	35522
Ελληνικό	35949	38529	39159	45315	47047	61287	68517	104864
Ζεφύρι	23246	3047	24199	2948	26796	2794	30934	3300
Ζωγράφου	158915	91502	161718	93492	171187	99942	184743	105871
Ηλιούπολη	158177	63044	164458	66565	181673	75799	215163	92415
Ηράκλειο	93346	50304	97305	52888	108025	59756	129822	78866
Θρακομακεδόνες	10351	683	11180	680	13240	689	17468	688
Καισαριανή	54074	24773	55028	25313	58250	27060	62863	28672
Κάλαμος	23000	17875	20862	19789	16558	24448	18752	26464
Καλλιθέα	227980	249430	234661	262249	254181	296310	290242	346347
Καλύβια	15117	19018	13182	20472	9172	24130	12320	34445
Καματερό	35944	12520	36751	12696	39278	13363	44411	16374
Κερατέα	24988	13835	24291	14780	23241	17190	27565	20756
Κερατσίνι	140890	49552	142976	46543	150482	40926	165168	41543
Κηφισιά	88786	117555	92613	121348	102947	132389	125517	155038
Κορυδαλλός	127627	42611	130827	41611	140549	40318	158357	45783
Κορωπί	3921	42563	4220	47767	4968	60303	6673	84497
Κρυονέρι	4528	25111	5519	28310	7821	35993	15572	61269
Λυκόβρυση	13995	21558	14589	22350	16196	24588	19464	31197

Table 5:Evolution of production and attraction of movements in local authorities in Attica (Source: Trademco,1998)

ΔΗΜΟΣ	2001		2004		2010		2020	
	Παραγωγές	Έλξεις	Παραγωγές	Έλξεις	Παραγωγές	Έλξεις	Παραγωγές	Έλξεις
Μαγούλα	6185	8367	6274	8266	6598	8225	7233	9257
Μαλακάσα	11517	6589	8675	5765	2569	4072	2957	6276
Μάνδρα	23059	22637	23462	23756	24828	26749	27156	29571
Μαραθώνας	45783	23264	41661	22824	33391	22356	45030	30918
Μαρκόπυλο Μεσ.	21886	12970	26696	16979	37869	26199	50865	36863
Μαρκόπουλο Ωρωπού	17264	14998	19222	14160	23939	12622	26902	13737
Μαρούσι	155227	277992	165109	324656	190295	434781	239624	635793
Μέγαρα	34481	15886	43007	17837	62725	22534	47226	27459
Μελίσσια	39314	31785	42747	34201	51202	40285	73695	59284
Μεταμόρφωση	46099	70404	48054	72962	53348	80212	64113	101659
Μοσχάτο	45455	66157	46764	66832	50606	69793	57884	80276
Νέα Ερυθραία	29507	19777	30779	20294	34213	21882	41714	23945
Ν.Ιωνία	119734	87123	121519	81319	127925	70298	140706	74331
Ν. Λιόσια	161975	79276	165611	80873	177001	86177	200128	106363
Ν. Πεντέλη	12376	2155	13457	2318	16118	2729	23199	4013
Ν. Σμύρνη	141525	83070	145673	7353	157590	98727	180176	115353
Ν. Φιλαδέλφεια	50662	32890	51417	30606	54128	26239	59536	27498
Ν. Χαλκηδόνα	20073	10103	20427	10328	21623	11052	23335	11787
Ν. Ψυχικό	25306	23399	26330	22760	29125	21849	34065	24846
Νέα Μάκρη	14479	8899	22371	13538	40271	24073	54310	38627
Νέα Πέραμος	10653	9224	12642	8112	17296	5855	20467	7157
Νίκαια	173737	98088	178093	95681	191327	92476	215568	104662
Οινόη	55731	92660	64258	102101	82047	125340	114108	164576
Παιανία	22647	10826	23322	11857	25286	14391	29033	17422
Παλαιά Φωκαία	10121	9101	14685	9804	25071	11571	34248	15049
Παλαιο Φάληρο	130894	75706	134730	79626	145937	90028	166641	105134
Παλλήνη	15939	38513	18489	41312	24499	48398	40665	70345
Παπάγου	30101	3240	30860	3068	33161	2755	37594	2686
Πειραιάς	357673	530611	362889	541486	381767	577402	417822	636911
Πεντέλη	1536	6353	1670	6837	2001	8057	2879	11862
Πέραμα	47993	22755	48703	21575	51260	19445	56263	20438
Περιστέρι	270990	205683	276890	205313	295537	209014	328746	233980
Πετρούπολη	86338	27059	88276	27820	94347	30111	106675	37499
Πεύκη	46605	11722	49572	13829	57134	18785	71944	27972
Ραφήνα	14867	12415	18670	14049	27456	17962	36932	21052
Σαλαμίνα	115496	22477	121951	21998	137693	21426	172846	25003
Σπάτα	17670	17231	18196	19189	19729	23932	22652	29875
Σταμάτα	6699	1654	8165	1872	11570	2395	23037	3983
Ταύρος	29417	63795	29099	62181	28985	59986	26646	57124
Υμηττός	23620	9932	24037	10154	25444	10868	27459	11603
Φιλοθέη	18886	4272	19650	4155	21737	3987	25423	4543
Φυλή	7770	2898	8089	2807	8957	2666	10340	3127
Χαϊδάρι	81711	39499	83311	38278	88534	36427	97308	36785
Χαλάνδρι	150070	122950	157790	129984	178049	148368	222708	188765
Χολαργός	69092	37778	70833	35873	76116	32459	86290	32162
Ψυχικό	21667	14126	22544	13737	24937	13181	29167	15030
ΣΥΝΟΛΟ	**4623571**	**5048933**	**4773757**	**5245863**	**5201987**	**5721793**	**8001756**	**6639181**

Table 6: Evolution of production and attraction of movements in local authorities in Attica (Source: Trademco,1998)

1.2.1.3.3.3 Effects in Urban Centres outside Attica

According to the planning, in 2006 the suburban will arrive in Chalkida. The new transport networks help to create a new class of professionals who use public transport to go to work and choose their homes based on the financial gain and quality of life they earn by staying out of town. In this context, cities such as Corinth, Kiato and Chalkida are offered as ideal solutions, since, among other things, they offer investment opportunities for land acquisition. (Manolas, 2003)

The suburban railway is the catalyst for these population movements that are predicted to occur. According to the transport ministry's operational plan, at least 100,000 drivers will leave their cars

and be served by suburban routes. OSE estimates that with the suburban, in 2004 there will be 120,000 passengers per day and in 2010 about 250,000. By 2006 it is expected that the electrified trains of OSE will operate the suburban routes both to Chalkida and to Loutraki and Corinth. (Manolas, 2003)

Table 7: Population and Employment Forecasts for areas outside Attica (Source:Trademco,1998)

MUNICIPALITY	2001		2004		2010		2020	
	Population	Employment	Population	Employment	Population	Employment	Population	Employment
St. Theodoroi	7753	4186	8433	4432	10024	4992	12740	5996
Deep	10906	5468	12058	5983	14091	7084	17561	9083
Thebes	24557	8837	25568	9181	26620	9696	28523	10262
Isthmia	2597	1213	2657	1241	2851	1317	3180	1460
Corinth	35557	12080	36813	12505	40322	13611	46302	15530
Loutraki	14036	4255	14695	4462	16412	4977	19341	5849
Oinoi	29332	16180	32953	17421	93070	19847	49612	23501
Chalcis	75234	24985	79429	26465	85870	28905	96989	33198
TOTAL	199972	77204	212606	81690	289260	90429	274248	104879

MUNICIPALITY	2001		2004		2010		2020	
	Productions	Attractions	Productions	Attractions	Productions	Attractions	Productions	Attractions
St. Theodoroi	14731	23974	16444	25976	21050	31525	29302	41969
Deep	20721	31316	23513	35068	29591	44740	40390	63611
Thebes	46658	50612	49858	53812	55902	60662	65603	71865
Isthmia	4934	6946	5181	7274	5987	8319	7314	10223
Corinth	67558	69183	71785	73290	84676	89953	106495	108755
Loutraki	26668	24370	28655	26150	34465	31420	41484	40960
Oinoi	55731	92660	64258	102101	82047	125340	114108	164576
Chalcis	142945	143091	154887	155100	180327	182538	222865	232495
TOTAL	379946	442152	414581	478771	494045	574497	627561	734454

Table 8: Evolution of production and attraction of movements in municipalities within the boundaries of the Attica (Source: Trademco,1998)

It should be noted that the spatial framework does not reflect the combination that will potentially be formed in the man-made environment in the coming years of the suburban's operation and what will happen with the urban centers of Corinth, Chalkida, and their relationship with Athens and the role of the scale of a metropolitan center. (Manolas, 2003)

1.2.1.3.4 The Suburban And Its Relationship with High Intensity Uses in Attica

1.2.1.3.4.1 Athens International Airport

The new airport in Spata, according to its evaluation study, was expected to serve approximately passengers in 2005 and passengers in 2010. Still, it was estimated that the employees at the airport would be 22,000, on a 24-hour basis and that the visitors would be about 8,000 a day. 15 εκ.17,5 εκ.

In 2007, passenger transportation at Athens International Airport increased by 10%, with 16.5 million passengers. passengers from 15.1 million. passengers in 2006. The number of flights also increased by 8%, surpassing 200,000 flights for the first time.

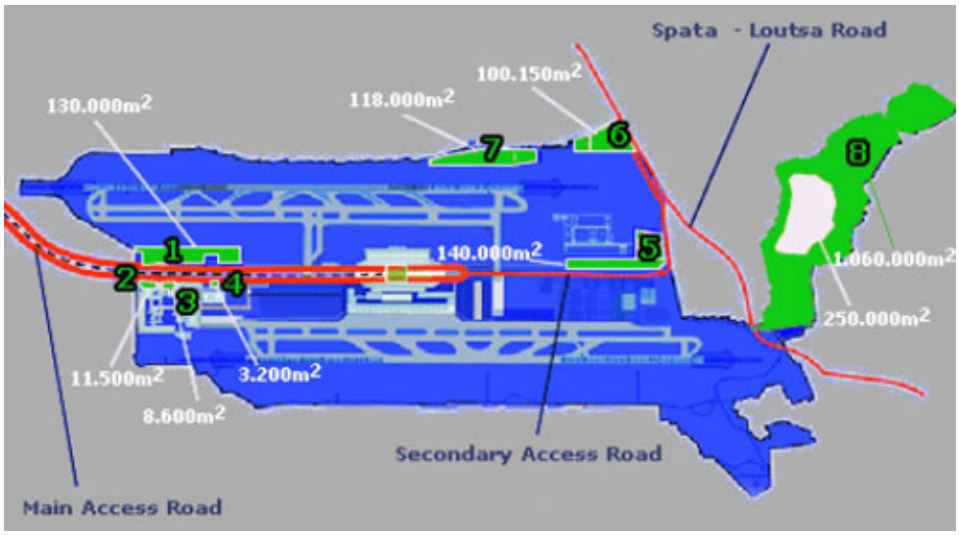
More specifically, per domestic and foreign market, the domestic market, with 6 million euros, is the same as the domestic market. passengers in 2007, recorded an increase of 9% breaking record passenger transportation. International passenger transportation also increased by 10%, surpassing 10 million for the first time. Passengers. (http://www.greekinsight.com/)

This transportation creates new needs for transportation to and from the airport and even, at the level of travel that is created, we must add the transportation requested by commercial and professional activities in the airport area, by additional activities developed around the airport (commercial, IKEA) and by the support activities that serve the operation of the above.

Moreover, Athens International Airport, in the context of real estate development, is planning the creation of an Airport City, which will transform the image of the airport from a conventional transport hub to a business destination in its ownty. (www. aia. gr)

Given the current demand, which is based on market studies in the wider area of Athens, and given the practice at other European airports regarding the development of real estate, the combination of uses may consist - indicatively - of:

- Shopping Center (retail, services,complex cinemas, dining areas)
- Commercial Park (see IKEA-Mega-Kotsovolos)
- Business Park(office buildings)
- Warehouses & Distribution Centers
- Exhibition/ Conference Center
- Hotel / Hospitality Services
- Entertainment/Sports/Entertainment & Entertainment (golf, car track, theme park) combined with complementary commercial and hospitality services
- Service station and car workshop(www. aia. gr)



Map 10: The Airport City Plan (Source: www. aia. gr, same processing)

The creation of the Airport city will use spaces that belong to the D.A.A. and the location of the uses will be done as shown on the above map:

In the area of the airport located at the entrance and exit of Attiki Odos from the airport, and in the area in the northern part of the airport, the facilities of the Commercial Park of the Airport City are to be created.

More specifically, in Plot 1, the Shopping Center will be created and will include commercial department stores. The size of the commercial will be quite large (130,000m$^{2)}$, as will its total surface (), while 2,700 parking spaces are foreseen. Moreover, in Plots 2- 3 - 4, the construction of Office Buildings is planned, with a total area and 460 parking spaces. 58.000 m^{2}17.000 m^2

In Plot 5, a use is to be created with the greatest potential to attract travel. In this area is planned the construction of an Exhibition Center, with a total area, and about 3,500 parking spaces. Finally, in Plot 6 the proposed use planned is Office Buildings & Retail-Entertainment, with surface area, and 1,250 parking spaces. (50.000 m^{2}40.000 m^{2}www.aia.gr)

Figure 4: Commercial Park (Source: www. aia. gr, same processing)

In Plot 7 it is proposed to create Warehouses and Distribution Centers, capacity, and create 500 parking spaces. This use, combined with the creation of the Commercial Park, aims at creating the right conditions for the D.A.A. to become in the future a center of high-intensity business activities, with an important role in the global economy. (118.000 m^2www.aia.gr)

Figure 5: The warehouses (Source: www. aia. gr, same processing)

Finally, in Plot 8 on Zagani Hill, the construction of Entertainment & Entertainment areas is planned and specifically the creation of a Golf, Water Park,Cycling &Trekkingcourts, Bungalows,Hotel, Restaurants-Caféof a totalarea. (1.160.000 m^2www.aia.gr)

Figure 6: The Entertainment Center (Source: www. aia. gr, same processing)

These new uses that take place at Athens airport will create increased needs for transportation. The service of the D.A.A. by the suburban railway is estimated to cover a large part of these movements. However, another part of the transportation will be done by car, namely from Attiki Odos. This is very likely to create transportation problems as already, during peak hours at major transport junctions (junction 8- Athens - Lamia, junction 11 - Kifissias Avenue) there are significant delays in transportation. (www. aia. gr)

Thus, while already from the first years of its operation Attiki Odos presents problems in the ability to serve transportation, uses are planned that will have a direct adverse impact on the operation of Attiki Odos, something that was not foreseen in the planning.

Figure 7: The suburban station and attiki Odos at the Airport (Source: www. aia. gr, same processing)

1.2.1.3.4.2 Piraeus Port

The port of Piraeus was connected to the suburban railway network, with the completion of its construction works. The suburban is expected to cover the part of the travel of the travelling public and not the freight transport. The passenger transportation of the port, as shown in the table below, shows an increasing trend. (www. olp. gr)

NUMBER OF PASSENGERS	2005	2006	ANNUAL CHANGE (%)	2007	ANNUAL CHANGE (%)
DOMESTIC					
COASTAL SHIPPING	7.820.450	7.797.766	-0,29	7.752.825	-0,58
ARGOSARONIC	3.664.313	3.870.881	5,64	3.819.853	-1,32
TOTAL Domestic (A)	11.484.763	11.668.647	1,6	11.572.678	-0,82
ABROAD					
LINE	105.929	97	-99,91	0	
CRUISE	184.763	340.389	84,23	417.811	22,75
PASSERS-BY	635.090	861.704	35,68	1.136.936	31,94
TOTAL International (B)	925.782	1.202.190	29,86	1.554.747	29,33
TOTAL (A)+(B)	12.410.545	12.870.837	3,71	13.127.425	1,99
FERRY MOVEMENT (C)	7.977.880	7.636.426	-4,28	8.395.492	9,94
TOTAL PASSENGER TRANSPORTATION (A)+(B)+(C)	20.388.425	20.507.263	0,58	21.522.917	4,95

Table 9: Domestic-international passenger transportation (Source: www. olp. gr)

In the above table it is observed that passenger transportation at the port has an growth rate of almost 5%, and it is estimated that this pace will continue in the future. Moreover, the Port of Piraeus serves, under today's standards, 83% of the total passenger transportation of the ports of Attica.

From the above, it is concluded that these uses, located on the periphery of the Metropolitan Complex of Athens, are important poles of passenger transportation production located within walking distance from the center of Athens. The development of the appropriate rail network for the operation of suburban trains is the most appropriate solution for serving these solutions and the sustainable development of Athens. (www.olp.gr)

1.2.2 The Role of Mobility in the Formation of Urban Space

As we have in a previous paragraph, movements are divided into urban and extra-urban, while their effects can be examined on a different scale: on the scale of the wider geographical space, which we examined above, and on the scale of urban space.

Urban space is the subject of urban planning, while the movements performed are mainly examined by transport scientists. Above we mentioned the diachronic relationship that travel has with the creation of residential networks and new cities, on a large scale, but transportation also has an impact on the urban fabric, shaping many of its characteristics.

1.2.2.1 Transport Networks and Urban Form

Transport networks, and in particular road networks within the urban fabric, have a particular dynamic which has an impact on the formation of urban space. Since antiquity, the importance of commercial streets and their influence on the creation of the first cities and the form of these cities has been encountered. Below are the characteristic examples of the creation of the Agora of the ancient Greek city and the Roman Forum,and their importance for urban life. Examples from modern times are also presented and how large land transport axes affect the form of urban space.

1.2.2.1.1 The Role of the Ancient Agora in the Formation of urban space

The first cities that were formed had some basic characteristics in common, which shaped the form of urban space and some of them retain their role even today. These characteristics were: a) the relatively large area and population density, b) the monumental architecture, which was expressed in the construction of temples, citadels, public buildings, etc., c) the existence of boundaries, and especially walls, in the settlement and d) the operation of a market. (Gospodine, 2002).

The market usually operated outside the settlement, in an outdoor area and in places where there was a junction of roads, where the commercial, land-based, transactions of the early civilizations were served. The agora, as an element of urban space now, was established by the Greek city, and was the place where various functions of the city were performed. In homeric texts, the term "agora" meant a concentration of citizens, while later, the market space acquired a multidimensional character.

The main dimension of the Agora area was as a trade area, a dimension that contributed to its creation. With the development of trade, the Agora also acquired commercial activities that were

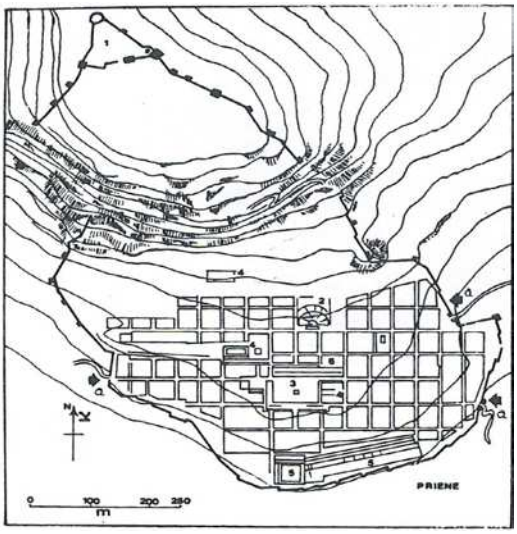
housed in arcades that were constructed next to the Agora, and connected the public buildings with each other. (Gospodine, 2002)

The Agora served the political function of the city as, there the politicians found a platform for their speeches, to "speak", and there were the gatherings of the citizens. Moreover, this area had a religious character, as in the ancient Greek city, most temples and alta were located around the Agora.

Finally, another dimension of the Agora is its cultural and recreational character. In the Agora, people gathered not only to discuss political issues or exchange products with other traders, but also to spend the time meeting their fellow citizens and discussing various common issues. Also, the space of the Agora, in the Classical Era, hosted dramatic performances and later the theaters appeared. (Gospodine, 2002). The ancient Greek cities were divided into two major categories in terms of morphology of the urban fabric. The first category was cities with organic growth and the second were cities with a Hippodamian system. In cities with organic urban development, the urban fabric did not follow any geometric structure and the roads had irregular width and direction. The only geometric element of the urban fabric was the central courtyard of the palaces, which had a rectangular shape and was a kind of public square. In this area converged the main streets of the settlement, in a radial form, thus creating the Agora of the settlement, and the core of the urban fabric.

In cities with a Hippodamian system, the urban fabric followed a geometric grid, which drew up a system of horizontal and vertical transport axes. The streets were the same width and created similar building blocks of rectangular shape. The Agora was located in the geometric center of the settlement, while the two largest axes of the urban fabric ended in it. (Gospodine, 2002)

2Figure 8: The Agora in Ancient Athens (Source: Gospodini, 2002)



3Figure 9: The Agora in Ancient Priene (Source: Gospodini, 2002)

1.2.2.1.2 The Role of the Roman Forum in the Formation of urban space

The structure of the Roman city also contributed to the formation of the urban area and the urban planning. The differences with the ancient Greek city were few and were not limited only to the morphology of the urban fabric but extended to the other functions of the city.

The structure of the Roman city was an evolution of the form of the camps, followed by a square shape. The internal organization of the settlement followed a rectangular system of horizontal and vertical axes and the larger axes of them connected the entrance - exit gates of the settlement. At the intersection of these axes there was an open-air area, which functioned as a gathering place and served the operation of the market. This area was named"Forum"and is the evolution of the ancient Greek market. (Gospodine,2002)

The Forum was located in the geographical center of the settlement, taking into account the perimeter shape of the settlement and the arrangement of the axes, and was an integral part of the Roman city. As in the case of the Greek Agora, the Forum had a multidimensional character, serving the economic, political, administrative, and recreational function of the city. (Gospodine,2002)

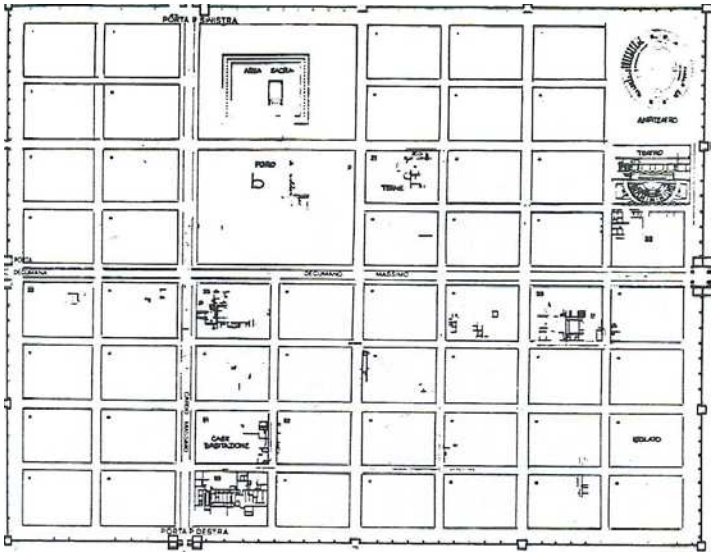


Figure 10: The Forum in Aosta (Source: Gospin, 2002)

It is therefore observed that as far as the creation of cities in antiquity is concerned, the commercial streets and its intersections played a decisive role. The point where the streets intersected, evolved into the most important element in the structure of the ancient city. The Greeks called it agora and the Romans Forum.This area was the center of the settlement and served the functions that are crucial for the survival of the city.

1.2.2.1.3 The contribution of the Renaissance to the Formation of Urban Space

Another characteristic example in the historical development of the city where the streets determined the form of the city is in the Renaissance period the construction of large axes of monumental character. The most notable examples are the Avenue des Champes Elysees in Paris and the Unter den Linten in Berlin.

Champes Elysees was the axis where new outdoor gathering places of cultural and recreational character were created – in correspondence with the Greek Agora and the Roman Forum – while at the same time it was the pole of residential development of Paris to the west. (Gospodine, 2002)

Unter den Linten in Berlin also brought together a multitude of cultural and administrative activities along its length, such as army buildings and universities, and was the main axis of the city's development to the place where it ended up.

We observe that the phenomenon of urbanization of areas along major axes begins to appear several centuries ago, creating a problem that in modern Greece remains unsolved. (Gospodine, 2002)

1.2.2.2 Transport Networks with Implications for the Greek Urban Area

1.2.2.2.1 Trade Routes

In urban space there are roads, with different characteristics that contribute to the formation of uses and movements. The first category of these are the central axes of the historical centers of the cities, and we find them mainly in cities with a medieval fabric. With the functions they gather, they compose an axis of reference to the city and revive the character of the monumental streets of the Renaissance. The next category is neighbourhood roads, which can reshape the distribution of land use in urban space, due to the breadth and coherence of the networks they form. The third category is linear shopping centers, which are aimed at attracting the car.

The formation of the G.E.K. is the result of the concentration of commercial activities on sections of transportation axes that pass through the city centers. The G.E.K. in many cases is a subset of the Urban Center of municipalities, but the increasing concentration of commercial uses in the former tends to shrink the importance of the latter, as commercial activities have the ability to outweigh other activities.

Another example where the category of movements characterizes the road and then the urban organization around it is Ermou Street in Athens. It is the oldest commercial street of the capital and is the main axis of development – configuration of the Commercial Triangle, a space that is synonymous with commercial activity. (Vlastos, Technical Chronicles, 1994)

1.2.2.2.2 The role of the METRO rail in Urban Development

Major changes in the structure of the land use of Athens have also been brought about by the operation of the METRO. The underground connection of many areas, and the creation of the stations, have had an impact on land use, mainly around the stations, attracting more urban centre uses. The problem is that this trend may appear new urban centers within the urban fabric, which are in contrast to the urban centers that have been defined by the corresponding General Urban Plans. This is why it is necessary to control the land uses that tend to be concentrated around stations.

It is particularly noted that for the stages during which the METRO is developed, especially at the terminals, there should be "policing" of the intensity of the uses and functions observed, given that the terminals during the construction phase and until the completion of the network constitute a temporary opportunity for development – intensity of uses and functions. (Vlastos, 2006)

The metro lines move approximately 650,000 passengers daily. It has been estimated that the operation of the METRO reduced by 71,000 private cars entering the city center or equivalently reduced the transportation with cars by 335,000 vehicle-kilometres per day. Due to the METRO, pollutants from vehicles decreased by 8% on average. (Bright,2007)

At the same time, the operation of the METRO was combined with the restructuring of the other Public Transport means with the reduction of bus terminals in the city center, due to the creation of new bus starting points near regional metro stations. The operation, therefore, of the METRO significantly reduced, apart from private cars, the movement of buses in the center of Athens.

Public transport is increasingly gaining the trust of Athenians, but this does not mean that the inhabitants of the capital are willing to leave cars for their daily commings.

This situation, along with the rapid increase in the car ownership index that will continue (Greece had in 1990 the lowest number of cars per 1,000 inhabitants among the EU countries), lead to significant problems of passenger movement at peak times and days, but also to the ever-increasing need to increase the capacity of roads in large urban centers, but this seems extremely difficult. (Bright,2007)

What is the solution? According to transportation experts, the improvement and expansion of the public transport network, but also the creation and optimal management of parking spaces.

In 2006, public transport in Athens (ETHEL, ILPAP, ISAP, AMEL, TRAM, Suburban) handled passengers compared to passengers in 2005, recording an increase of 2.16%. ETHEL (buses) reduced its passenger transportation, while the Tram and the Suburban Road increased significantly, due to the new stations and the expansion of the network. (Bright,2007)756 εκ.740 εκ.

	2001	2002	2003	2004	2005	2006
ETHEL	378	369,9	379,3	369,5	362,2	356,8
ILPAP	83,5	80,2	81	80,2	78,4	80
ISAP	109,9	108,7	104,6	113,2	116,8	124,7
AMEL	119	132,3	149,4	163,9	166,7	168,9
TRAM				3,2	12,9	21,9
PROASTIAKOS				0,6	2,9	3,9

Table 10: Passenger transportation in public transport in Athens (in public transport) (Source: Foteinos, 2007)

According to official data, in 2007, 794,500,000 passengers were transported by public transport, while in 2006, travel had reached 758,603,591.

More than half of the trips (51%) for another year were made by ethel buses, although their number was reduced by about 7 million compared to 2005 and slightly increased compared to 2006. Specifically, in 2007:

- 369,500,000 transfers by ethel buses.
- 82,500,000 trolley trips.
- 133,000,000 trips by electric railway.

- 190,000,000 transfers by Metro.
- 16,000,000 tram transfers and
- 3,500,000 movements by suburban railway. (Liliopoulou, 2007)

The biggest increase, however, occurred in the metro transportation, which continues to hold the scepter in the preferences of citizens in the measurements of satisfaction from public transport.

Passenger transportation increased by 11.2 million at the METRO in 2007, while the messages for the tram, whose passengers increased from 3.2 million in 2004 - its first year of operation - to 16 million last year are also positive.

There was a smaller increase in suburban rail passengers, as opposed to electric passengers, who increased by 8.2 million. (Liliopoulou, 2007)

In the meantime, it is with great interest that the results of the pilot night operation of electric and metro on Friday and Saturday nights, which began on February 1st, are being examined with great interest. The extension of the working hours of the two means until 2 a.m., although initially met with opposition due to the additional operating costs and the problems in the maintenance of the line, was implemented as a pilot until the end of March, while the course of passenger transportation will decide on its possible consolidation.

The measurements recorded passenger transportation of 4,020 passengers on average in Friday's two-hour extension, while for the two-hour period of Saturday the average passenger transportation stood at 7,458 people. (Bright,2007)

According to the data provided by the minister, the passenger transportation at metro was clearly higher than that of the ISAP and on Saturdays it was more increased than on Fridays, with the peak day being March 30th, when about 30,000 passengers were handled in this two-hour period. (Bright,2007)

The stations with the highest passenger transportation were the stations located in the center of Athens and in the other local centers of other municipalities of the Urban Complex of Proteusis (Piraeus, Egaleo, Dafni).

It is therefore observed that the expansion of the METRO network, in cooperation with the new opening hours, may bring about new changes in the structure of land uses in the capital's CP, as travel will become easier and time distances will be significantly reduced. (Liliopoulou, 2007)

Thus, a basic and integrated planning of uses is sought on the basis of a long-term development program of the METRO in order to avoid changes – fluctuations in the intensity of uses around the network.

1.3 Land Use and Operation of the Road Network in Urban Space

1.3.1 The Operation of the Road Network in Urban Areas

In this section we will present the legislative framework that determines the operation of the road network and how it affects land uses in both urban and extra-urban space. We will also present the categorisationof roads in urban space and how the installation of road-adjacent land uses is affected.

The legislative framework for road building in our country is chaotic and consists of numerous laws, P/D, Circulars and Ministerial decisions. In this section we will focus on the legislation concerning the categorisation of the road network, as these are more related to the operation and the roadside uses of roads. (Sperelakis, 2001)

For the categorization of road axes there are Law 3155/55 "on the construction and maintenance of roads", the Legislative Decree / 9-8-55, the Decree /6-2-56, the Minister's Decision 62556/5073/90 which established the basic road network of Attica and Thessaloniki and the P.D. 347/93 "Taking measures for the safety of interurban transport". (Sperelakis, 2001)

Law 3155/55 "on the construction and maintenance of roads", the country's road network, depending on its importance for transport, transport and the country's economy, is classified in the following categories:

- National Road Network (E.O.D.)
- Provincial Road Network
- Municipal or Community Road Network.

This categorization served a) the administrative objective of resolving the issues concerning the responsibility for the construction, maintenance, study and exploitation of the network and b) the functional role that each road had in transport and transport depending on the urban centers it connected.

The N.D./9-8-55 and the N.D./6-2-56 with which the national and provincial roads were characterized and numbered respectively, which were made without provision for the future construction of other roads and their characterization, as well as for the characterization of new engravings or bypasses. (Sperelakis, 2001)

Ministerial Decision 62556/5073/90, which defined the basic road network of Attica and Thessaloniki, also established that the road network of Attica is the responsibility of the Ministry of Public Health and Public Health, so that the central services are responsible for the construction, maintenance, study, definition of land use, etc. on the road network, in mismatch with what happens with other urban roads for which local authorities are responsible. (Sperelakis, 2001)

P.D. 374/93 "Taking measures for the safety of interurban transport" gives the opportunity to the Minister of Pe.X.O.D.E. to classify national and country roads into categories. So, after a series of Ministerial Decisions, we have the following categorization:

A. The National Road Network which is subdivided into:

- Primary
- Secondary
- Tritertiary

B. The Provincial Road Network which is subdivided into:

- Primary
- Secondary and

C. The Municipal – Community Network. (Sperelakis, 2001)

Moreover, P.D. 374/93 also formulated some institutional measures that determined the installation and intensity of transient land uses both in areas outside the city plan and in areas within the plan.

In the areas outside the plan there were measures of a preventive nature such as the imposition of a mandatory distance of the building line from the center of the axes or from its boundaries, as well as restrictive measures such as the prohibition of granting permission to properties that do not have exclusive use of residence and for the granting of a building permit requires approval of a transportation connection.

Also, on motorways and expressways, direct access to roadside facilities is not allowed except for Car Service Stations (S.E.A.) which are controlled by the National Highways Fund (T.E.O.) responsible for the management of national roads. (Sperelakis, 2001)

Of course, the above is not applied to the extent that it should be as in many places in P.A.TH.E., and especially in the area of Maliakos, there are many facilities that have simply created an opening at the boundary of the motorway, which acts as an entrance – exit to the facility.

In the areas within the city plan, the building lines as well as the uses are determined by the General Urban Plans. The control of vehicle access concerns only:

- Petrol stations (P.D. 1224/81).
- Car parks. (P.D. 455/76)
- Buildings requiring more than 30 parking spaces (P.D. 455/ 76 & P.D. 326/91) and
- Buildings requiring more than 200 parking spaces and a transportation study is required (P.D. 326/91)

In addition to the legislative texts on road-making, however, there are also pieces of legislation concerning the determination of land use, which concern the categorisation of roads.

The legislation, which is relevant to the issue in force in our country, determines with laws 947/79, 1337/83, and 3/6-3-87 the new residential areas and their extensions, giving at the same time definitions and categories for land use. (Maratou, 1992). And while there is the definition of general and specific land uses, and their relationship with the hierarchical housing system is described, it is not mentioned at any point in the relevant legislation on the relationship of land use and the operation of the urban road network.

In the E.P.A. certain specifications are given for the functional category of roads, which are however insufficient in terms of the functional characterization of the roads and their relation to the roadfront land uses. (Maratou, 1992)

Moreover, there are the laws that refer to parking spaces (P.D. 697/79, L.690/79, P.D. 1340/10-12-81, Government Gazette 164/11-4-91) which determine the relationship of the size of the parking area with the quantitative sizes and the type of uses but do not mention anything about the internal planning of transportation in the areas where the parking spaces are made

(connection to the road network, relationship between entrances and exits, internal stadium transportation).

Another P.Dma which creates additional problems in the relationship between land use and the operation of the road is the Presidential Decree 24/31-5-85, which refers to the areas outside the plan and offers favorable arrangements for plots with a face on national, provincial and communal roads, such as a larger S.D. and less integrity. This, the Presidential Decree is claimed (Maratou, 1992) to be the main cause of the failure of the sidings, which from roads with functional property of connecting a settlement with a primary network, end up as collectors end up as they become poles of attraction for new road construction along the road, resulting in the linear expansion of the settlement to the main road network. (Maratou, 1992)

The implementation of this urban planning legislation is largely due to the dysfunction of the country's primary road network, since the installation of unsuitable land uses, with great demands on attraction and genesis of movements, creates problems for the functionality of the roads.

There is therefore a framework in which there is overlap in areas such as the categorisation of roads, and this creates problems for the study and control of roads by the competent services.

That is, in the directorates of urban planning, the categorization of the E.P.A. (free avenues, arteries, collectors and local roads) is used, which determine the functional category of the road. The transportation planning and road construction directorates use the categories mentioned in P.D. 347/93 (A, B, C,) that determine the category of road design. (Maratou, 1992)

In addition, road operation control services, such as the Police, use the charges mentioned in the Highway Code (K.O.K.). However, there is no method, institutionalized or not, that interrelates and complements each other's conditions. This is due to the lack of coordination and mutual service of the relevant services dealing with the matter. (Maratou, 1992)

1.3.2 Effects on the road network of urban development

In the post-war decades, there has been an increase in suburban areas, serving mainly housing as a land use.

To serve the routes of the users of these suburban areas: house – work, house – recreation, etc. and in general the connection of these areas with the city center, the road network was improved and increased, with the construction of new roads with rich geometrical characteristics and corresponding levels of service as well as with the improvement of the existing roads.

With the expansion, enrichment and improvement of the road network, the creation of closed roads and the construction of expressways, the new roadside areas have gained easy and quick access to the centre, and to the other important suburbs. Thus, along the arteries outside the densely populated city limits, a land market developed that was cheap and large in size, compared to the corresponding prices in the city center. This land purchase acted as a pole of attraction for land uses that serve basic functions of the city such as offices, trade, etc., which until recently settled in the center. (Aravantinos, 1997)

An additional factor that contributed to this location of land use, is the fact that their operation, which depended on the center, has changed due to the widespread use of the car and technological innovations(internet,telephony) that help the dispersion of uses.

Trade, for example, was served by roads that offered a balanced set of conditions, without these being exclusive transportation routes. On the contrary, they functioned as a place of social

gathering, as we have mentioned in a previous section, and people made their purchases in shops with a face on the street, but in recent years this form of the street has changed.

Today such streets are found only in the historical centers of cities. The current trend imposes the construction of shopping malls, which mainly contain retail trade, as well as the creation of commercial parks, which include administrative, cultural functions and bank buildings. (Vlastos, 2006)

The placement of land uses in the new adventurous places, on the arteries and fast avenues, in addition to providing cheap and large plots of land, enable easy and fast access by private cars, and public transport. (Maratou, 1992)

Thus, it is observed that the relationships between land use and transportation form a two-way situation where one gives birth to the other, but also acts aggravating towards the other. The main relationship between land use and the urban transport network is shown in the chart below. The operation of land use requires movement and the increase in movements creates transportation demands that are addressed by the construction of new transport infrastructure.

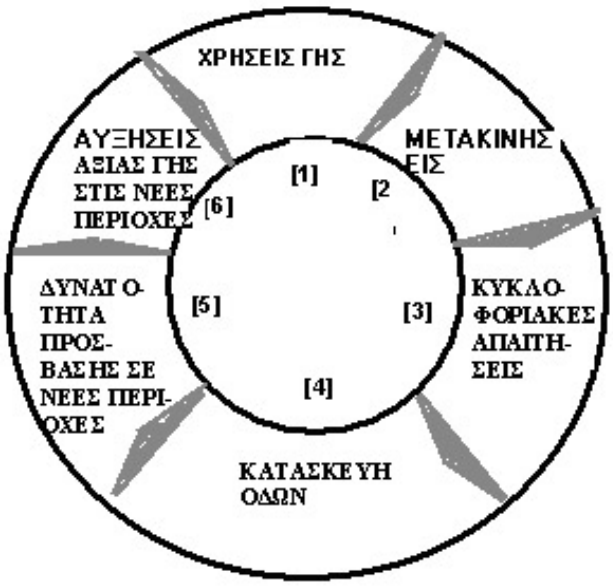


Figure 1: The Circular Relationship between Movements and Land Use (Source: Maratou, 1992)

Urban land use planning, as an object of urban planning, is responsible for the proper distribution and proper structure of uses in the urban fabric, as well as for the degree of coexistence and separation of uses. All uses, however, are cut off from the transport system and there is a need to connect them.

On the other hand, the transportation design, cut off in turn from the system of uses it is called to serve, is gradually neutralized and loses its functionality. In this way, the roads lose the category for which they were built, and adverse effects such as transportation and pollution will worsen. (Maratou, 1992)

It has been observed that arteries with rich geometric and transportation characteristics and technical works to be classified in the design category of the high-pitched avenues, do not correspond to their basic and dominant functional role, which is the connection of the central area of the city with large residential areas. (Maratou, 2001)

This incompatibility has created significant problems of congestion of road transportation locally, or even in a linear continuity. It is basically due to the excessive increase in transportation volume, which has not been foreseen, exceeding the capacity limits of the road and the level of its service. This incompatibility has two causes:

The first concerns the ever-increasing requirement of access to side roads.

The second reason concerns the requirement to serve the attendance of new land-use facilities along the arteries.

The increasing demand for access to side roads is due to the extensions of the city plans that were not foreseen and studied by the original urban plans in order to have the appropriate road infrastructure, but were necessarily legitimized afterwards, as the so far logical result, of arbitrary building.

The new land uses along the arteries are not controlled either for their position on the road or for their size and the intensity of the use and the effect that this will have on transportation and urban planning. (Maratou, 2001)

This rapid and uncontrolled increase in the transient installation of land use on the arteries has significant negative urban and transportation impacts. These impacts affect three spatial units:

The transportation area of the street.

The roadside space, which is affected by the operation of the road and concerns the operation of the roadside facilities, and

The city and the wider residential area, which is affected by the operation of the road and the roadside space in terms of structure, central functions and the road transport network. (Maratou, 2001)

1.3.1.1 Urban impacts

The urban impact is presented at the level of planning of the city but also at the level of the configuration of the transient area. The linear or even point presence of land uses, which serve basic central functions, such as trade or offices, but also the arbitrary construction, individually or in relation to other transient uses, is often of greater size and intensity than the city centers. At the same time, they have advantages such as easy and fast transportation communication and wide advertising due to their position on the road. (Aravantinos, 2001)

This competitive function of the transient development results in the sluggish operation or even the decline of the neighboring centers of the city. If the speed of installation, the size and the intensity of the large shopping centers over the last four years are correlated, we observe that they lead to the development of large commercial and administrative parks that challenge the dominant position of the city centers.

This fact, however, contradicts the guidelines of urban planning and its predictions.

Above, however, we mentioned that the impacts reach both the road space and the immediate environment of integration into the street. Along the street, linear residential areas are gradually formed with all the negative effects of this form of urban development. But also the bypass roads that aim at connecting the residential areas with the basic road network, are converted into a road of a linear settlement and do not serve the goal for which they were built. (Maratou, 2001)

1.3.1.2 Transportation effects

The transportation impacts of the uncontrolled roadway installation of land use are largely related to the operational capacity of the road, i.e. the projected transportation flow from transportation studies.

The unpredictability of the future installations of roadside uses has a transportation impact on the road and especially in the case of high-class roads. (Maratou, 1992)

The facilities of the uses are basically made with face and direct access to the street, and the result from this practice is a class of artery to serve all phases of travel, and to function simultaneously as the main artery, bypass, collectors, local street and internal transportation road on the plot. Each type requires a different speed of transportation, different accessibility and different design of internal transportation.

However, this confusion of the different types of transportation in a category of road combined with the lack of compatibility between them creates significant problems in the transportation function of the arteries, resulting in transportation jams and long delays. (Maratou, 2001)

1.3.3. Examples of Impacts on The Operation of the Road from RoadWays Uses

In recent decades there has been a strong trend, parcels in contact with a motorway tend to concentrate mainly commercial activities, but also other uses.

Thus, outside the compact urban fabric of the city, an elongated building with a width of a plot is formed, which makes the motorway within the urban fabric. (Tsoukaris, 2001)

The reason for using these parcels is the possibility of easy and quick access, the promotion and advertising of the business and the incomplete legal framework which enables the owner to use it for any use he wishes. Still, these lands are much cheaper than plots of a similar size in central areas, and the uses installed there are:

- Agricultural (silos, warehouses, ginning mills, etc.)
- Commercial (super market,car shows, building materials, etc.)
- Crafts (marble shops, iron processing, etc.)
- Service and entertainment (gas stations, nightclubs, hotels, etc.)

The concentration of all these uses by the road creates several side effects on the operation of the road. The most serious are the transportation, which have been presented above, while the other side effects are aesthetic, environmental and the impossibility of future extension of the road. (Tsoukaris, 2001)

1.3.3.1 Attiki Odos

In Greece, in recent years, major road axes have been created which have a direct impact on the structure of land use in urban space. The first case that presents great interest is the creation of the Attiki Odos and its relationship with the urban development of the neighboring municipalities.

The Attiki Odos is a modern long motorway It is the ring road of the wider metropolitan area of Athens and the backbone of the road network of the entire Prefecture of Attica. It is an urban-peri-urban type motorway, with 3 lanes of transportation per direction and an emergency lane. In the middle of it, in a specially designed area, moves the suburban railway. It is a unique infrastructure project, even by European standards, of a closed motorway with tolls, which crosses a metropolitan capital with heavy transportation65 χλμ.congestion. (www. aodos. gr)

As a closed motorway it has full control of the accesses and consists of two vertical sections between them:

1. The Free Avenue of Elefsina-Stavros-Spata (E.L.E-S-S), approximately and52 χλμ.
2. The Western Ring Road of Hymettus (D.P.L.Y.), approximately long 13 χλμ.

The neighboring municipalities that receive the most changes in land use are the Municipalities of Maroussi, Chalandri and Vrillisia. These municipalities are of interest as they are located at the exit of the Athens conurbation to eastern Attica, where rapid urban development is expected with the concentration of population and an increase in travel is expected due to the airport of Spata. (www. aodos. gr)

Moreover, with the construction of attiki odos inside them, and the implementation of THE METRO and suburban railway stations, they acquire particular importance as transport hubs for the capital, serving and hyperlocal important facilities, such as OACA. (www. aodos. gr)

The land uses, before the construction of the motorway, in the area were different for each municipality and this resulted in the intense unevenness of the urban fabric and the installation of incompatible uses in neighboring plots. Moreover, many areas were unstructured mainly next

to the axis of Attiki Odos, and offered a very attractive ground for investments. The environmental impact study of Attiki Odos explicitly states that significant changes in land use are expected to take shape, since pre-existing crops will be replaced by residential uses and commercial activities. (Siolas, 2001)

After the start of operation of the Attiki Odos and the new airport, in Spata, there were large investments in plots within the boundaries of the motorway. The uses were mainly of a commercial nature, and the most notable of these were the large shopping center The Mall,and the branch of the IKEAchain of stores. , within walking distance of the airport and the construction of a interchange for access to the building.

Figure 11: The IKEA building on Attiki Odos In the Park of D.AA. (Source: www. google. com)

Figure 12: The building of the offices of Alpha on the Attiki Odos (Source: www. google. com)

Also, Attiki Odos gave the opportunity for urban development in the suburbs of Eastern Attica, in the area of Mesogeia. The plain of Mesogeia was for many years the reception area of intensive land uses mainly in zones around the main roads. As in the neighboring municipalities of Attiki Odos, so in Mesogeia there is a great attraction of uses such as office buildings, trade and manufacturing activities while removing traditional agricultural uses. The uses installed, create an unplanned and possibly, arbitrary residential development, which is concentrated in the zone around the major roads and creates many problems in the future planning of the area. (Serres, 2001)

The prevailing trend of residential development in the area of Mesogeia is the unregulated development and the creation of linear hyperlocal centers on the avenues that run through the area. The placement of commercial and craft activities on the roadside plots and the creation of frequent and unorganized access to the adjacent plots create problems both in the transportation and in the urban planning sector. (Serres, 2001)

Other arteries in the Athens area that are under pressure from land use with the change of existing uses are Athinon Avenue and Athinon - Lamia Avenue. On these roads, there are free spaces from shells of old factories and large companies, mainly in the tertiary sector, tend to occupy places on roadways plots of these arteries. (Ktenas,2003)

The Avenue athens - lamia gathers uses of services up to the height of the Kifissia junction, and from there on it gathers mainly industrial and craft activity, with food, clothing and medicine industries concentrated despite its own axis. The continuous concentration of uses creates the right conditions for the road axis to become in the future a connecting axis of Athens with Chalkida and Oinofyta, and to contribute to the creation of a linear industrial center. (Nikas,2003)

The transformation of Athinon Avenue into a new business center of the capital should be combined with the redevelopment of the Olive Grove, the transfer of the new KTEL facilities, as well as the extension of the METRO line. The commercial activity on the boulevard is not yet very developed, but the installation a few years ago of a large supermarket by Carrefour and the presence of several car dealerships was the beginning of new investments in the area. Moreover, the construction of the offices and the transfer of the Athens Stock Exchange are expected to take place in the summer on Athinon Avenue, dragging on other financial services and contributing to the future increase in the attraction of travel. (Kapsohas, 2007)

Figure 13: The building of the Athens Stock Exchange and the National Bank of Greece (Source: www. skyscrapercity. com)

1.3.3.2 Kifissias Avenue

In the above paragraphs it has been mentioned that the incompatibility of the functional category of the road and the design category, on the basis of which it has been built, is a phenzmenon that is found in many cases within the urban space.

An example is Kifissias Avenue, which was designed as an expressway and eventually there are long delays and intense transportation problems. The reason for the transportation jams is the approach to two large suburbs, Maroussi and Kifissia, and the increase in local transportation, but there are other factors that contribute to the current situation. (Siolas, 2001)

The most important factor contributing to the degradation of the road's operation is the abolition of side roads and the concentration of commercial uses, of a hyperlocal nature, which attract a large number of movements and increase the transportation volume.

The boulevard, which was designed to quickly connect the northern suburbs with the center, is becoming a meeting point as it has been gathering more and more entertainment venues in recent years. However, the transformation of a large part of the boulevard into a world-wide "center", with an over-concentration of shopping centers, ministries, hospitals and other important uses, has serious consequences for the operation of the capital, as it deprives the northern suburbs of their most important axis of connection to the center. (Siolas, 2001)

In recent years, Kifissias Avenue gathers more and more shopping centers. "The transportation and environmental impact studies they submit are not audited. They are trying with alchemy to prove that there will be no repercussions in the area", says Mr. Aravantinos and adds that "The creation of new shopping centers should have been banned, especially where there are no side roads". Lialios,2007)

A problem in the proper operation of Kifissias Avenue is not only created by the over-concentration of commercial uses, but also by the fact that shops were allowed to have a "face" on Kifissias Avenue. As a result, drivers who want to visit the shops reduce speed and cancel the right lane of the road. A major problem in the operation of the avenue is also caused by the abolition of the lanes. (Polydoros, 2006)

Also, with the exploitation of the Olympic properties and their reuse, new spaces will be created, shopping centers, of hyperlocal importance, with repercussions on the urban development and the transportation organization of Athens.

Law 3342/2005, which was passed by the government, assigns to private investors by OLYMPIC PROPERTIES S.A. the Galatsi Olympic Gymnasium and the International Radio and Television Center in Maroussi for the construction of shopping centers. By Law 3377/2005, the licensing of shopping centers in Athens – unlike the periphery – does not have to take into account the impact on the local economy, the impact on the environment and the burden of travel. (Polydoros, 2006)

There is no study on the siting or urban viability of the large shopping centers in Athens and the new shopping centers that are being prepared are within walking distance with the existing Mall in Maroussi. These MALLs are not integrated into the city and will enhance the linear development on Veikou Avenue, Kifissias and Attiki Odos Avenue, i.e. that is, the worst for the viability of the city. That is, the free public spaces and the only cohesive bond are shrinking. of the city will now be the boulevards that connect huge shopping malls.

Moreover, the concentration of these uses will also have great transportationeffects. Polydoros, 2006)

In the next 8 to 10 years there will be no METRO station near the planned MALLs, so their visitors' dependence on cars will be almost total. This runs counter to the declared goal of the current government to increase the share of Public Transport in Athens to 50%.

The Transportation Management Center of the Ministry of the Environment, Physical Planning and Public Works, which counts on a 24-hour basis after the Olympics the transportation in Athens, observes in the period 2005-2007 an increase in transportation volume on Veikou and Kifissias Avenues by 12% and 7% with a corresponding increase in saturation (queues of cars) at their signalled junctions. These are arteries designed for hyperlocal connections and not for transient uses. (Polydoros, 2006)

1.3.3.3. Vouliagmenis Avenue and Panormou Street

Apart from the problems encountered on the road by attracting intensive land uses, such as the increase in transportation volume and transportation congestion, there are also repercussions in terms of access, internal transportation planning and the location of use on the plot.

A first example of these impacts is the result of the opening of a large super market on Vouliagmenis Avenue.(Maratou,1992)

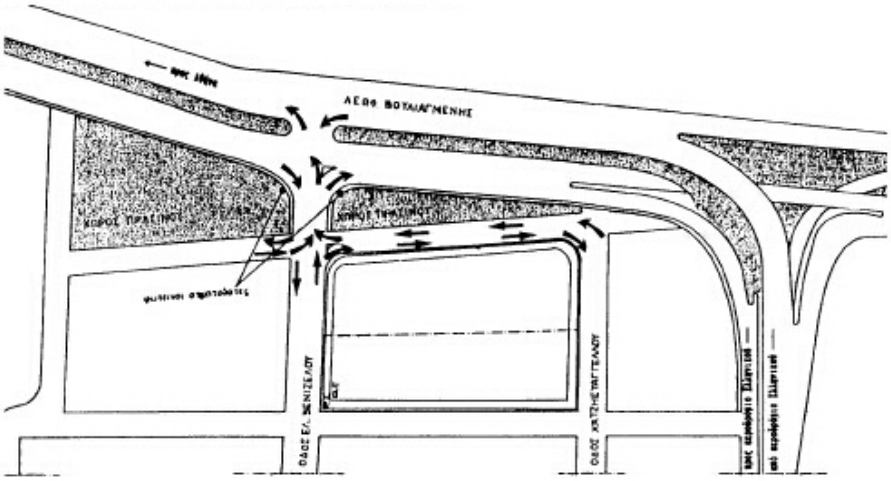


Figure 2:The transportation situation on Vouliagmenis Avenue before the installation of the super market (Source: Maratou, 1992)

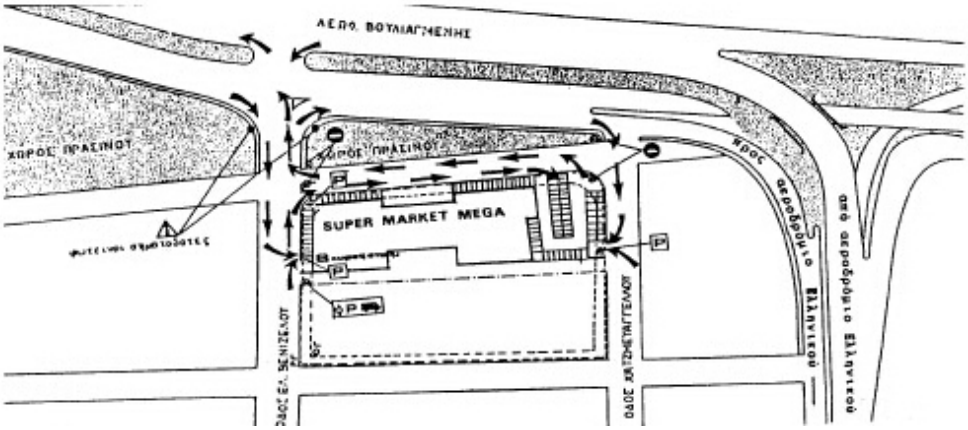


Figure 3:The transportation situation on Vouliagmenis Avenue after the installation of the super market. (Source: Maratou, 1992)

In the above images, the change in access to Vouliagmenis Avenue and in the access of the super marketisobserved. The increased load and the attraction of customers to the super market,led some to the decision to abolish the partition of Leoforos with Hadjievangelou Street in order to create a new entrance for the super market. . This means that the commercial has direct access to an expressway, without the necessary planning for the safe movement of cars. This creates problems not only for transportation but also for the safety of travel. In addition, the location of the new commercial store enables parking on the adjacent streets located at the entrance and exit of the avenue (El. Venizelou, Hadjievangelou) creating in this way problems for those who move to and from Vouliagmenis Avenue. (Maratou, 1992)

Another example of antithetical roadbill use regarding the operation of the road is the siting of another large super market on Panormou Street, where no parking space was provided, nor has access to and from the artery been resolved, thus creating transportation piers.

Panormou Street operates as a bypass of the interchange of Ampelokipi, connecting Alexandras Avenue with Kifissias Avenue.

Figure 4:The location of the super market on Panormou Street (Source: Maratou, 1992)

Thus, with the transportation congestion that is observed its function as a bypass, it is altered and transformed into a collecting road that channels the movement of vehicles in the surrounding area. (Maratou, 1992)

From the above presentation it follows that in order to ensure the functionality of the arteries within the urban space, and to maintain the quality of the built environment, some strategic directions should be followed. In order to achieve this goal, there should be a correlation of the information used in urban and transportation planning, as well as in road studies in order to address the negative impacts and make the space multifilary operational.

CHAPTER 2

URBAN AND TRANSPORTATION PLANNING: THE INTERNATIONAL EXPERIENCE

2.1 International and European context

2.1.1 ESDP - European Spatial Development Perspective

Since the entry into force of the European Economic and Monetary Union (EMU), European integration has made considerable progress. With increasing economic and social cohesion, the Community's internal borders are increasingly losing their divisive character, and closer relations and interactions are emerging between cities and regions of the Member States.

This means, among other things, that the results of regional, national and Community projects in one country can also have a significant impact on the spatial structure and housing organisation of other countries. In the conduct of Community policies in the future, account must be taken of their spatial effects in good time, and in this way spatial planning can be an important factor in avoiding major regional disparities. (ESDP., p.7)

The national spatial development policies of the Member States, and the EU's sectoral policies, where the area is treated in a unified manner, require clear, spatial development directions. These directions are given by the Development Plan of the Community Area.

Long-term trends in spatial development in the European area are mainly influenced by three factors:

The progressing economic integration and the increasing cooperation of the Member States.

The growing importance of local and regional administrative bodies, and their role in spatial development and

The expected enlargement of the EU and the development of relations with its neighbours. (ESDP, p.7)

The ESDP gives the opportunity to expand the way of dealing with spatial problems and aims at the general situation prevailing on European soil and at the same time provides the opportunity to take into account the development opportunities that arise in each region. The new forms of cooperation proposed in the D.A.K.C., the sectoral policies implemented until now, in the future, should cooperate if they concern the same spatial entity. The European Community also considers the active participation of cities and regions to be a crucial factor in the implementation of the SACA proposals. In this way, the principle of subsidiarity, which is one of the basic principles in the formulation of European policies, is being implemented. (ESDP, p.8)

2.1.1.1 Basic Objectives of ESDP

Given the existing regional disparities, and the contrasting spatial effects of Community policies, all those responsible for planning should be oriented towards the direction of spatial development. The Community Area Development Plan is geared towards the EU's objective of sustainable development, focusing on economic and social cohesion. This means that the impact

on the economy and society of the implementation of Community policies must be compatible with the environmental and cultural functions of the area, thus contributing to a sustainable and balanced development in spatial groups. (ESDP, p.11)

This creates a triangle of objectives relating to European policy and includes:

- economic and social cohesion;
- the protection of natural resources and cultural heritage, and
- the more balanced competitiveness of the European area.

The contribution of spatial development policies is to promote sustainable development in the EU through a balanced spatial organisation. In 1994, the Ministers for Spatial Planning agreed on the three objectives to be pursued for the territorial development of the EU:

- Development of a balanced and polycentric urban system and a new relationship between town and country.
- Ensuring equal access to infrastructure and knowledge, and
- Sustainable development, and protection of natural and cultural heritage. (ESDP, p.11)

These three objectives are the objectives of the Community's Development Plan. These objectives should be pursued by the European institutions, as well as by governments and local and regional authorities.

The ESDP conveys a vision for the organization of the EU area in the future. In the context of its objectives and guidelines, it offers a frame of reference for actions and measures of public and private decision-makers with an impact on the area. In addition, the CSD should serve as a signal for the broad participation of the public in the political debate on the decisions taken at European level and their impact on the cities and regions of the European Union. (ESDP, p.12)

2.2 Land Use planning and transport abroad

Three frameworks for the implementation of urban planning can be distinguished in Europe: the first is a completely centralized system, regardless of whether there are other bodies in the planning. The second shows a balance in the assumption of responsibilities and responsibilities between the different levels of government. The third is the completely decentralized system, providing full autonomy at every level of government. In some countries the plans are only some guiding principles, in others they are laws that need to be implemented.

This chapter will present the differences and similarities between national urban planning systems in European countries. Urban planning acquires its institutional character through its incorporation into legislation. The main points of each country's legislation differ, and this may affect the policy formulated for urban planning. Moreover, the implementation of planning is the responsibility of different levels of power and this in turn shapes the policy to be followed in the planning. (Banister,1995)

To begin with, we must note the differences observed in the legislation and administrative structure of each country, differences which arise mainly due to the historical development of each country. Studies (Newman)indicate that the central point in the differences observed in the structure of urban planning legislation is related to the balance of responsibilities between central and local government. (Banister,1995)

These differences can be seen by examining the Constitution of each country, distinguishing between 4 basic 'models' of constitutional structure, in European countries as well as the American model. The American model and the European models, the British, French, German and Scandinavian models, are presented in order. Finally, a new proposal for combined urban and transportation planning from a region of China is listed, with considerable interest in the environmental sensitivity of policies.

2.2.1 American model

The United States of America is a federal league of 50 states and is the oldest federal state.

The American model advocates the complete decentralization of the country's administrative structure and defines three levels of government:

- The Federal Government,
- The government of each state and
- Local governments. (Cullingworth, 1997)

Local governments in turn are divided into two subcategories: a)counties and b) municipal authorities. The Federal Government has the power to exercise the three powers, the legislative, the executive and the judicial. Moreover, issues of national importance such as security, economic development, environmental policy are the responsibility of the state, establishing the framework within which the above policies are implemented. (Dear, Scott,1981).

State governments are the most important body in shaping the context of Americans' daily lives. Each state has its own constitution, its own government and its own legislative framework, resulting in great differences in legislation and policy-making on issues such as education, health, property and others. The highest body of each state is the governor, elected by the citizens of each state. Moreover, each state has an elected legislature whose members are the representatives of the citizens.

Each state also has its own judicial system, and in some states, the members of the courts and the higher courts are elected by the citizens while in others these members are appointed by the federal government. (Cullingworth, 1997)

Local governments can have as executive bodies either the municipal authorities or the administrative bodies of counties. The main role for the administrative leadership of local governments lies with the provincial(county)authorities, which also have the ability to institutionalize on issues such as transportation, public safety, and have the power to impose taxation and have control of the security forces.

Land use planning is integrated within this administrative framework and is treated differently by each administrative level.

The powers of the different levels of administration enable them to plan independently, and for their own benefit, with the result that a form of integrated planning cannot be achieved. Thus, in America, land use planning faces problems in its implementation and is confronted with sectoral development programs, and there is a conflict between the interests of private initiative and the well-being of society as a whole. (Cullingworth,1997)

Also, the decentralized system of governance that exists in the U.S.A. enables the development of participatory planning, as many social groups, scientific associations, local organizations and economic operators of the areas of influence of land use plans, participate and shape the policy followed in the field of land use.

Something similar is happening with transportation planning in America. Each state is responsible for the design and construction of transport infrastructure and the evolution of the transport system within its administrative boundaries. Moreover, investments, the operation and the exploitation of transport infrastructure have a great participation of the private sector, but the public services can intervene in issues that arise such as the functionality of the arteries, the impact on the environment, etc. (Hall,Hall,2002)

Also, the lower administrative levels have the responsibility for transportation planning in cities and suburbs, promoting urban transport and urban transport networks. Local governments have the option of approving local transportation arrangements and interventions and are also responsible for drawing up operational plans for urban transport.

2.2.2 British Model

The British model stands out because it is isolated from the structure of others. The system of administration in England can be described as a dual system. This means that central powers place legal and financial limits on local administrations and mainly have the role of supervisor, whereas local authorities act as the means of implementing state policies and are financed mainly from state funds. Moreover, the structure of administrative power in England is shaped in such a way that the levels of power are as distinct as possible and this enables local authorities to they work better in providing services to citizens, in contrast to what happens in Greece where local authorities operate with expediency.

In Britain, and especially in England, planning is done in three stages. In the first stage, local governments form a committee, which is responsible for the opinion of any investment - development proposals made in their area. (Newman, Thornley,1996)

This committee exercises control over the proposal submitted to the local council, and one of its institutions is an advisory group, composed of scientific staff, which shall submit the final report for the opinion. (Newman, Thornley,1996)

That committee then draws up a land use plan, which concerns the area where the investment is made, but that plan is not of a regulatory nature. These plans are called development plans, and are divided into two categories:

- The first category concerns the strategic plans, which are prepared by the provinces – counties and
- The second category concerns projects submitted by local governments. (,1998)Taylor

The plans submitted by the local governments, as mentioned above, are not of a regulatory nature but must take into account the General Strategic Directions for Planning, which are formulated by the central government and concern the directions on issues of national importance.

Moreover, local authorities have the authority to make laws for their area of influence, and submit strategic planning guidelines themselves, at that site. Moreover, the plans produced by local governments do not need the approval of the central government, but it has the ability to intervene in the planning process, and to propose a different direction from the one proposed by the local authority in the preparation of a development plan. (Imrie,Thomas,1999)

Thus, although development plansalso address other issues of major importance, such as the movements to be created and the environmental impact, in addition to land use issues, their implementation is governed by a complex system, due to their non-regulatory nature. This results

in the lack of significant projects due to the intrusiveness of others, and the alteration of the plans. In Britain, as in land-use planning, two levels of decision-making are discerned in transportation planning: central government and local governments. (Newman, Thornley,1996)

At central level, until 2001, the ministry of environment, transport and the regions were fully responsible for transport planning in Britain. Later, the Ministry of Transport, Local Government and the Regions was created, whose responsibility is for the design of transport policy, and issues that can have an impact on land use planning, and local governments.

The structure of the British state has a special form as it includes different ethnicities, which have local representatives in parliament. This enables them to have separate instruments for implementing policies in areas such as the environment, tourism and transport. Thus, Wales, Northern Ireland and Scotland have their own services and administrative bodies for transport planning, and Northern Ireland in particular has a different legislative framework on transport.

The management of the transport infrastructure is carried out by state services such as the Highway Agency, which is responsible for the construction and maintenance of the national axes. Moreover, there is the Vehicle Control Directorate which is responsible for the safety control of vehicles on an annual basis and there are corresponding services for the rail transport network. It is worth noting that in transport planning, there is cooperation between operators in Britain, such as the Department of Transport, the Committee on Combined Transport and other Ministries. . (Newman, Thornley,1996)

However, the partial autonomy of local governments enables them to implement programs for the development of transport systems and, in particular, the promotion of public transport and rail transport. As mentioned in the planning of land use, local authorities are responsible for drawing up development plans by which they define strategic guidelines for transport planning.

Moreover, within the responsibilities of local governments are the maintenance and construction of the local road network, the control of parking and the opinion on the siting and operation of a parking space, and finally the economic policy followed in public transport. (Imrie,Thomas,1999)

2.2.3 French Model

In the French model, the structure of administrative power is more centralised, creating close links between central authority and local authorities. Thus, local authorities do not have much self-reliance and there is a great dependence on the possibility of financing central government. Still, this model is followed by most European countries, due to napoleon's campaigns, and the introduction into the legislation of the conquered territories of French laws. (Fereira,1981)

The centralized structure of the French state began to diversify from the mid-80s onwards. It was then that a transfer of powers relating to spatial planning began to local governments by means ofthe'Code de l'Urbanisme et de l'Habitat'law.

In the French system, we find four levels of power, which are involved in shaping the policy of spatial planning. These levels are:

- The state,
- The regions,
- The Departemens(counties??)
- The communities - municipalities.

The state is responsible for defining national policies and can direct transport policy and national strategic directions for planning. The regions are responsible for drawing up spatial plans, while the municipalities and municipalities have no competence to draw up land use plans, but can influence their design indirectly by submitting proposals in areas such as transport, industry or tourism. (Fereira,1981)

This system operated until the '90s. When a duo of spatial planning studies is created, which is now the responsibility of the communities to prepare them. The first part is 'Schema Directeure', which are carried out by the municipalities, which are strategic studies of a strategic nature. Moreover, these studies are most often carried out in intermunicipal cooperation; including the neighboring municipalities in addition to the municipality of study, while the state organizations also have an advisory role. The second stage is the 'Plan d'Occupation du Sols', which are studies that define strict zones of uses, and are the responsibility of the local authorities. (Vlastos, 2006)

France is perhaps the only European country where it has established a legislative framework that promotes combined urban and transportation planning. In the legislative texts 2003-1208/13.12.2000"Solidarite et renouvellement urbain – urban renewal and solidarity", and 2003-590/2.7.2003 "UrbanismeetHabitat – Town Planning and Housing" it becomes clear that urban planning, urban transport and road transportation constitute a single system, and so their combined design is imperative. Moreover, these two laws make it compulsory to draw up regional cohesion plans (Schemas de Coherence Territoriale- SCoT). The latter include Sustainable Development and Management Plans which identify the objectives for economic development, transportation organization, transport and parking policy for settlements. (Vlastos, 2006)

An example of the implementation of the above combined urban and transportation planning plans is the city of Orleans. This city is located an hour from Paris, and some key features as given by Vlastos (2006) are:

- The increase in reciprocating movements between the centre and the periphery, with almost 60% of the population working in a different place from the place of residence, compared to 1982 (53%)
- The city's shopping center accounts for more than a third of central functions
- There is a lot of use of private car for transportation as we have 62% with private car, 15% with public transport, 6% with two-wheelers and 16% with walking.

The strategy chosen for the city was to shape future urban development in a polycentric way, based on the morphology of the tram network. The objectives of this strategy were: a) to contain urban expansion, b) to enhance the attractiveness of the center and c) to expand it to suburban centers with the tram network as its axis. (Vlastos, 2006)

Some of the policies followed to achieve these goals are the premium of extensions near the public transport junctions, the improvement of the center by creating pavements and cycle paths, the improvement of public transport and the restriction of the car in the center and the implementation of a program for the construction of apartment buildings. (Vlastos, 2006)

2.2.4 German model

The German model is regarded as an independent offshoot of the French model, and is adopted by Germany, Austria and Switzerland. In both models there is a great deal of legal codification, but the difference lies in the historical development of the countries. In Germany, there was no institutional state to create a rational legislative system. Later, after a series of political events, Germany has acquired its own constitution, thus creating a new model. (Sieber,2001)

In the German model, great importance is attached to the application of the laws. Thus, it clearly shapes the responsibilities between the different levels of administration, creating a Federal model of administration. The central state shares its powers with the local states, which have their own laws and their own representatives in the central authority. There are also different structures between the Länder, and in particular in the way in which they share their responsibilities with the lower strata of power.

After the unification of the German state, a stable constitutional framework, and a very decentralized administrative structure, were established. The Länder were completely independent in the decision-making process and had the power to make laws. (Sieber,2001)

The role of the central authority was to set the Strategic Directions, on issues of planning and other issues of national importance. These guidelines formed the framework within which the Länder can formulate laws on a common basis. Spatial planning in Germany is primarily regulated by the Federal Planning Act. (Sieber,2001)

Immediately afterwards is the regional planning of the Länder, which aims at the balanced development of the region. Moreover, the Länder have the power to draw up spatial plans and environmental protection programs, but spatial planning plans must adopt the guidelines of the National Framework for Regional Planning. (Economou, 2005)

In the last tier of power, there are local governments. The local authorities are responsible for drawing up two types of urban plans, which are divided into two categories: i)the Land Use Plans that are preparatory and ii) the Building Plans, which are binding urban plans.

The first study, defines at a strategic level the land uses in the municipality, and is not a completely binding plan. The second is more of a regulatory nature and must always be in line with the instructions of the first strategic plan. Moreover, this second study defines the S.D., the height of the buildings, the integrity, the areas and other urban planning elements. (Aravantinos, 1997:213)

At this point, it should be noted that the German model has many similarities in terms of the categorization of plans with the system in our country, while the most important difference is in the competent institutions of institutionalization.

The Länder have many responsibilities for the financing of local authorities. Thus, they have the ability to pursue policies in the areas of housing, urban planning, transport and others. In Germany, urban regeneration is a priority for the state and this policy sets four main objectives:

- Strengthening existing centralities;
- Promotion of mixed use plans in the urban fabric and smaller densities.
- Improvement of the quality of public spaces and
- Improvement of public transport.

Thus, we see in Germany that extensions and housing plans take place near centres which have a very good level of service from public transport networks. (Sieber,2001)

As far as transport planning in Germany is concerned, all three levels of power are responsible for its implementation: the federal state, the 16 Länder and the local communities. Transport policy is drawn up at central level by the Federal Government in accordance with the following procedure. The Länder draw up programmes for the development of their region's transport systems and submit them to the Ministry of Transport. Then, the Ministry evaluates the best proposals from each state and in turn prepares the new National Transport Policy. (Sieber,2001)

In the last decade, a new methodology has been followed in the planning of transport, by the Ministry, taking into account in the planning, the impact that investments in transport projects will have in the area. Specifically, the Ministry of Transport cooperates with the Federal Directorate of Regional Planning and develops a planning methodology so that it is in harmony with the directions of the country's spatial development framework and is combined with the procedures of the federal transport policy. (Sieber,2001)

Moreover, local governments are responsible for the transportation planning of urban transport and have the ability to make decisions to deal with any problems that arise at the local level. Also, local communities are responsible for the maintenance of urban arteries, and the construction of new axes of local importance as well as for the policy of urban transport. (Sieber,2001)

The example to be developed below concerns the town of Tübingen, a small town with a large number of students which is about distance from Stuttgart. Some features of the city are that its population is 80,000 inhabitants and 1/4 are students. Moreover, the historic center of the city is an area of protection from motorized means as one part of it has been pedestrianized and another has been converted into a soft transportation area. Due to the short distance from Stuttgart, there are many reciprocating movements between the two cities, the main means of transport of which are the private car. Measures to restrict the car in the urban fabric have also been imposed and, in cooperation with the lack of parking spaces, many households do not have a car. In the suburbs the opposite is true with car ownership being two per household. (Vlastos, 2006)30 χλμ.

The urban planning department of the city has chosen the policy of sustainable urban development and the retention of its population. The goals it has set regarding land use and the transportation organization of the city are:

- Reduction of the volume of motorized movements.
- Promote the use of non-motorised means by increasing the density of activities.
- Improvement of working and living conditions in the city.
- Restriction of the movement of private means. . (Vlastos, 2006)

The policies selected for the implementation of the above objectives are innovative elements in urban planning. Specifically, these policies propose:

- Redevelopment of 'brownfields' areas, i.e. areas with old factories, former military bases, etc., and planning of mixed uses with high densities.
- Further restriction of parking spaces. In particular, the operation of multi-storey parking spaces is foreseen, with a distance of approximately from the residences and the public transport stations.
- Prohibition of passage of the car through the historic center.
- Introduction of a regime of mild movement in the new residential areas.
- Creation of a friendly environment for pedestrians and cyclists.

We observe that the policies followed are also directly related to the design of uses and promote the form of a city that emphasizes the principles of sustainable mobility such as the identity of the

resident, the exercise of the body and the contact with the greenery and generally the importance on the human scale of the city. (Vlastos, 2006)

2.2.5 Netherlands

The Netherlands, although not a federal state, has a fairly decentralized system of government. This system is divided into three levels:

- The Central State.
- The provinces and
- The municipal authorities. (Kraay, 2004)

The principle of subsidiarity applies to this system, i.e. every issue is dealt with by the level at which the problem can be managed most effectively.

The central state is responsible for formulating strategy and general guidelines on issues such as transport policy, land use policies, the environment and economic policy. Also, the role of the state is to supervise the procedures carried out by the provinces and the local authorities, since these two levels enjoy a high degree of autonomy. The state can only give the general guidelines and if the central administration wants to intervene in a local issue, it must be done through a legislative decree procedure. (Kraay, 2004)

The level of the provinces holds the most important role in shaping urban and transportation planning in the country. They have the ability to draw up land use plans and are responsible for transportation planning in their area. The land use plans that are being drawn up are of a strategic nature for the whole province and give directions that must be followed by the respective plans of the municipalities. The provinces also have the responsibility for the development of transport networks in their region and the management of transport infrastructure.

The lowest tier of administrative organisation is the municipalities, but they have several powers in relation to municipal authorities in other countries of Europe. In particular, municipal authorities have the ability, within the framework of the strategic guidelines defined by the central administration, to formulate their own transport policy, to design their own transport network and to shape the policy of sustainable development in their area. (Kraay,2004)

The Dutch system of administration is considered the most effective in adopting sustainable urban development policies (Vlastos,2006). The Netherlands is the first country in the world to try to incorporate combined land use and transport planning into an environmental policy. Dutch scholars, for the period 1990 to 2015, predicted that the population would increase by 1.5 million inhabitants, per capita income would increase by 40%, and homes and cars would increase by many millions. This will cause enormous spatial pressure, especially in the Randstadregion, around the four major urban centres of the country. (Vlastos,2006)

This strategy has three phases: a) a policy of siting functions that limits distances and movements to a minimum, b) a policy to reduce speed limits and more attractive public transport, c) promotion of public transport through a stricter parking policy. (Vlastos,2006)

The central idea is to bring together the residence, workplaces and recreation areas, so as to minimize travel distances, and most of them are done by bicycle and urban transport. This strategy has been called "StrategyA-B-C". Thesite is ranked at three levels according to its degree of accessibility by public transport networks. Functions that require a very large number of workers and visitors, such as theatres, museums, office buildings and others, are characterised by an A and must be very close to central urban transport stations. B characterizes functions that

have good access from both public transport transport as well as from the road network, such as hospitals and research centers. Finally, with C are the functions that require a small number of employees and visitors, and are installed in areas accessible exclusively by the road network. (Aravantinos, 1997)

A typical example is the redevelopment of the South West Region of Amsterdam. The redevelopment project was called arena Boulevard and is a large area which is a centrally functional site. In this area, mixed land use planning was chosen and the area is classified as a category A according to the definition in the previous paragraph. On the eastern boundary of the area there is an electric railway line and a central station, while on the west side there is the A2 motorway. (www.arena-boulevard.nl)

In this area there are many offices, mainly financial services, hospitals, theaters and concert venues, shopping centers, a University department and a state-of-the-art football field. It should be noted that the springboard for this developmental explosion was the construction of the stadium. At the same time, the construction of a METRO and the addition of public transport lines are planned in the area. Moreover, as shown on the map, there are many parking spaces scattered throughout the area. (www.arena-boulevard.nl)

Figure 14: The Area of arena Boulevard Source: www. arena-boulevard. nl

Figure 15:The new railway station at Arena Boulevard Source: www. arena-boulevard. nl

2.2.6 Scandinavian Model

In the Scandinavian model, as in the French model, there is a strong relationship between central and local powers. But the cornerstone of constitutional structures in Scandinavia is the self-government of local authorities, giving complete freedom to political decisions on planning issues. The role of central government is to implement policies of national importance, while matters of local importance are primarily the responsibility of local governments.

As far as urban planning is concerned, three levels of government can be seen in Denmark. At the highest level is the central government, in the second is the districts and in the third is the municipal authorities (Newman, Thornley,1996). As stated previously the Scandinavian model has a complete decentralization of responsibilities. In Denmark, too, local government is responsible for land-use policy, based on the independence of local government.

As in the examples above, so in Denmark, the state government is primarily responsible for drawing up the national strategy but has the possibility to intervene in the approval process in cases where the plans of the local authorities offend state competences.

In Denmark, space is divided into three categories:

- In the extra-urban space,
- In the urban,
- In the outdoor area.

In the first category, only uses related to the primary production sector are allowed, while the other two categories are bound by local land use plans. Municipalities are the competent bodies for the implementation of urban planning and the approval of the plans is done by them. Also, as in the German model, there are two categories of studies here. The first concerns the strategic planning of land use throughout the municipality, while the second concerns the implementation of programs for the redevelopment of special areas, such as brownfields, historical centers, etc. (Newman, Thornley,1996)

From Denmark we will present the case of Copenhagen, and in particular the Municipal Development Plan drawn up in 2001. This Plan combines urban development with travel and

environmental protection, thus promoting the policy of sustainable mobility, in accordance with the commission'srequirements. The Plan is governed by three principles:

- Urban planning must prevent the dispersion of urban development and promote high densities, so as to help reduce the travel required while at the same time reducing pollution and energy consumption.
- Emphasis on the renovation and reconstruction of brownfield areas, with the aim of creating local centers.
- Optimization of the use of existing transportation infrastructure both in relation to the utilization of resources and for the protection of the environment. (Newman, Thornley,1996)

The policy followed on the basis of the above principles is formulated in the Plan as follows: "The development strategy supports the promotion of public transport based on a network of urban railways, with the aim of reducing through-through car travel from the center and the densely built residential areas."

One of the general objectives of the municipal plan is to develop a sustainable urban transport system in which urban development and transportation infrastructure are in harmony with each other so that the transportation requirement is largely met by urban transport and private transportation covers a much smaller proportion. (Newman, Thornley,1996)

One measure to achieve the above objective is the establishment of two criteria regarding the location of uses that create and attract a large number of movements. The first is the short distance from public transport stations, and the second is the value of the attractiveness of use. Based on this, in the city of Copenhagen, residential and office complexes have been created around METRO and bus stations, helping the use of environmentally friendly means of transport, thus promoting a sustainable model of transportation organisation.

One such complex is Ørestad Down Town.Ørestad is the largest and most ambitious urban development effort in the Copenhagen region. The area is just south of the historic centre of the city and consists of a narrow development zone , surrounded by a 25 5 kmkm^2 park to the west and the new elevated light railroad lines. The original idea was to build residential complexes alongside the Railways. (www. daniel-libeskind. com)

There are buildings of 6, 8 and 11 floors which are gathered around free spaces, while two towers form the core of the urban composition and create a landmark for the area. . Such as the cones of the historic city of Copenhagen that show the location of important public spaces. On the south side there are the free time spaces, the cinemas and the hotel, which is planned to be the largest in Denmark, while in the western part of the area there are offices of administrative public services and under the whole area a large parking space is planned. Moreover, it should be noted that there are no roads in the interior of the area and thus the through transportation is excluded, thus pronouncing the space for walking and the use of bicycles. (www.daniel-libeskind.com)

Figure 16: The new center in Ørestad Source: (www. daniel-libeskind. com)

2.2.7 The Case of China

In recent decades we have seen the entry into China's business world on the international stage. A country with a population of more than 1 billion inhabitants, which is experiencing enormous economic growth. This development brings about major changes in the urban development of the major urban centers of that country. From 1980 to 2001, 400 million people escaped the poverty line and nearly 300 million people moved to the cities. (www. dac. dk)

This large movement of population from rural areas to urban centres has created many problems for them, and new requirements in terms of the planning and sustainability of urban areas. In China every year a floor area of about 2 billion square meters is created, which corresponds to half of the world's produced floor area each year. As the International Observatory states characteristically "... in China, 47% of the world's concrete production was consumed in 2005." (www. dac. dk)

Of course, this rapid urban and economic development has also led to a very high consumption of energy, to very great needs for coal and oil, thus burdening the environment. It is known that China is the second largest emitter of air pollutants, after the United States, producing 145 of annual emissions. (www. dac. dk)

Contaminating water resources with industrial, agricultural and human waste is a long-standing problem in China. Leaks and deposits, mainly from industry, are major causes of water pollution, and the government's response is the implementation of environmental laws, control systems and the construction of wastewater treatment facilities in urban and rural areas. (www. dac. dk)

China has quickly become the world's largest producer of solid waste. Urbanization, urban population growth, growing prosperity and consumption are the guiding forces behind this growth. Less than 20% of municipal waste in China is deposited in accordance with international

standards for landfilling. This is the cause of soil and groundwater pollution. Today's waste repositories also occupy valuable soil, thus recycling waste and cleaning up brownfields are major challenges, crucial for future urban development. (www. dac. dk)

There are also many transportation problems in urban areas. It is characteristically reported that in the 90s, the total length of the road built in China increased by only 30 percent while the total passenger volume and road load volume increased by 120% and 46% respectively. The number of cars on the roads during the same period quadrupled from 15 million to 68 million.

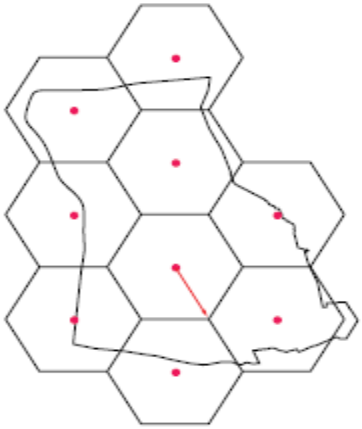
Based on the above data we understand that China is creating great urban pressures. Since 2006, a programme to change the direction of economic and urban development has been launched, focusing on people and the path to sustainable development. The example we will present below is that of the town of Chongqing,which, with a population of 31.5 million inhabitants, is the largest municipality in the world; most urban space is structured and every year, 50 million people are added. Km^2 and road network. 500 χλμ.(www. dac. dk)

The plan chosen is to smooth out urban pressures from construction and transportation and help the city in another direction towards sustainable urban development. It should be noted here that the study group consists of Chinese and Danish scholars. The project has been called the "Green CBD", and the aim is to create an area of central functions, environmentally friendly. In the area will be created buildings that will have the role of "urban mountains", which will be framed by free green spaces, as "valleys". (www.dac.dk)

Figure 17: The G-CBD Area (Source: (www. dac. dk)

It is also proposed that 1/3 of the region should function as a living machine in which production, consumption, waste, and recycling are linked to the goal of reducing pollution, high energy efficiency and low energy demand.

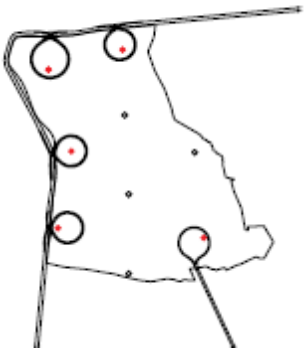
In this center the design is such that all the stations, entertainment and trade centers inside are only 5 minutes away, thus promoting the use of bicycles and walking as ways of transportation, deliberately excluding cars from its interior. (www. dac. dk)



Map 11: The Beehives of 5 minutes Map 12: The Green Network

(Source:www. dac. dk)(Source:www. dac. dk)

Travel to and from the GCBDwill be served by the construction of a state-of-the-art single-track light rail, the stations of which are located at the points with the highest densities. These points are shown on Map 11 and are 5 minutes walk away from each other. Moreover, the construction of a ring road and park and rideareas, near the stations, isplanned, so as to exclude any through-through movement by car.



Map 13: The Mono Network -Rail Map 14: The Regional and the(Source:www. dac. dk) ParkStations - and-Ride(Source:www. dac. dk)

Finally, the proposed land uses for the area are: 60% offices, 20% residences, 12% commercial uses, 10% recreation and 8% hotels in a allocated area of 2.2 square kilometers. (www. dac. dk)

Map 15: The Final Form of G-CBD(Source:www. dac. dk)

CHAPTER 3
Urban Planning in Greece and Dealing with Transportation Planning

3.1 Introduction

Urban planning is the main tool for the exercise of urban policy which concerns the city and the urban space, allocating land use and indirectly the distribution of movements. This chapter presents the relationship that urban planning has with urban movements, through the examination of the legislative framework and the treatment of movements from it,

The framework for action of the planning is determined by three sub-factors: the legislative framework, the financing and the various administrative issues. More specifically, it is the legislative texts that place particular restrictions on the conduct of urban policy and the implementation of urban planning, and also set out the rules for its implementation. Insufficient funding can hinder the implementation of the urban plan even if the necessary money is not available. Administrative matters, on the other hand, relate to the public bodies responsible for implementing the urban planning plan. his plan and proposals.

3.2 Historical evolution

Urban planning in Greece began shortly after the revolution of 1821 and continues to this day. Its history is basically divided into four periods:

- 1th Period: from 1828 to 1923
- 2th Period: from 1923 to the 70s
- 3rd Period: from the 70s to 1982
- 4th Period: from 1982 to the present day.

During the first period, several town planning plans were drawn up, which did not have legal rules that would determine their implementation and preparation, and generally did not set urban planning rules and restrictions, but only police provisions concerning the construction itself. (Aravantinos, 1997).

The second period was a focal point for the formation of the framework of urban planning and greatly influenced the image of the Greek area, whether it is urban, rural or rural.

During this period, he characterizes the pioneering for his time (and internationally) N.D. of 17-7-1923 "On the Plans of Cities, Towns and Settlements of the State and their Building". This Decree, which is still in force today, was the basic legislative framework of urban planning for about half a century, and contained rules of law concerning, among other things, the preparation and approval of urban plans. It should also be noted that the Decree of '23 subsequently underwent innumerable modifications and distortions in its interpretation and application. The result is that today in the whole of Greece we have basically three kinds of areas:

- the areas within the City Plan, as defined by the Legislative Decree 17-7-1923 (the City Plans)
- settlements pre-existing of the Decree 17-7-1923, which do not have an approved City Plan and are subject to a special legal status and

- in areas outside the boundaries of street plans with the Decree-Law 17-7-1923 and outside the boundaries of settlements that existed before 1923, which are simply called "Out of Town Plan" areas. (Aravantinos, 1997)

The Decree-Law of 17-7-1923 did not include provisions that would examine the organic correlation between the building and the developmental environment, but only set basic specific limits for the size and volume of constructions.

At the same time, the Decree of '23 had no provisions that treat transportation as an important factor in the urban environment. The only relevant provisions (no.1, § 3) refer to the obligation of municipalities and owners to open and maintain roads and common areas. Still, a feature that appears already from this first period is the development of road construction. Thus, an extensive network of urbanized – either legally or illegally – areas of the countryside around the main roads was created.

This current development is one of the most serious problems of the Greek countryside, due in part to some provisions of the Decree-Law 17-71923, some of which are in force until today. (Aravantinos, 1997)

The third period essentially begins with the passage of the 1975 Constitution, and is characterized by Article 24 of that Constitution. Article 24 was a groundbreaking provision not only for Greek standards but also for abroad. According to this, the protection of the natural and cultural environment as well as the control of urban development are the responsibility of the state. It also formulates some guidelines for spatial planning and urban policy. Article 24 of the Constitution introduces for the first time the concept of a contribution in land and money to meet the needs of public spaces, but there are no provisions on transportation planning in urban space.

It should be noted, however, that article 24 is not a law of urban planning legislation, but was the tool forthe creation of modern urban planning legislation forabstention,such as Law 360/76 "onspatial planning and theenvironment" and Law 1337/83 "Extension of urban plans, residential development and related regulations". (Aravantinos, 1997)

Also, during this third period there were a series of legislative texts aimed at suppressing residential development such as Law 651/1977, Law 998/79 "on the protection of forests and forest areas in general of the country" and 947/79 "on residential areas" which remained inactive even though it was not repealed but was replaced substantially very soon by Law 1337/83. (Aravantinos, 1997)

The fourth period begins with the enactment of Law 1337/83 "Extension of urban plans, residential development and related regulations". This law, although when it was passed was characterized as "transitional" was essentially the basic legislative framework of urban planning until today, since the new residential law 2508/97 not only does not abolish it but also mostly follows its basic principles. In this law we have two successive studies, the second of which must be aligned with the first. These are the General Urban Plans (G.P.S.) and the Urban Studies (P.M.). The G.P.S. gives the directions for the Urban Planning Study (P.M.). based on a proposal for the urban organization of urban units, the general assessment of their needs in communal and public benefit spaces, definition of an area for the reception of productive uses, etc. (Aravantinos, 1997)

In this law, it is mentioned that the G.P.S. includes the necessary data and public interventions for the urban development of the settlements but regarding the transportation and transportation, it mentions only the categorization of the main road transportation network. Moreover, in no.5 § 2 it is stated that "public services and organizations and utilities are obliged to adapt the housing

programs and plans for the development of infrastructure networks or services to meet the needs of the area, in accordance with the relevant provisions of the general urban plan", i.e. the proposed road network must be implemented.

Also in art. 24. § 1, it is mentioned that the opening of roads to beaches is allowed, describing them as pedestrian streets, even if they are not mentioned in the G.P.S., while in no.28, § 1, it is stated that the streets and the rest of the common areas that have been formed, even illegally, and are within approved plans now belong to the Municipalities or Communities.

Therefore, in this law, there is also a deterioration of the transportation factor and its impact on the formation of the urban environment, and no prediction is made about the effect of the new uses on movements, nor is there any reference to the impending loads that will be formed. In addition, for transportation networks there is no provision for their degree of saturation and their effect on roadside uses, and the issue of urban transport is not addressed in any provision.

In 1997, law 2508/97 "Sustainable residential development of the country's cities and settlements and other provisions" was passed. This new law complements law 1337/83 and becomes a more flexible tool aiming at the upgrading of the country's residential environment and the regulation of extra-urban areas. (Aravantinos, 1997)

With Law 2508/97, the G.P.S. are upgraded and now have a greater spatial scope as it regulates all issues throughout the area included in the administrative boundaries of the Municipality, and establishes the Plan of Spatial and Residential Organization of open city, which is done for municipalities, which have no settlements of more than 2000 inhabitants.

Regarding the transportation planning, in the new type of G.P.S. and specifically in article 4 § 5, it is mentioned that in the G.P.S. there is a proposal for urban planning which refers to the land uses, the main road transportation network, the density and the rest mentioned in a corresponding article in Law 1337/83.

And in this law, therefore, there is no substantial effort to link urban planning and transportation planning, and the structure of movements in urban space is not treated with the weight that it should.

In addition to the above law, ministerial decision 9572/1845/2000 on the technical specifications for the preparation of G.P.S. and S.H.O.O.O.A.P. is approved. and the transport and transportation network for the new areas to be urbanised.

Moreover, ministerial decision 10788/2004 approved the urban stabilizers and maximum densities limits that must be applied during the preparation of the G.P.S. and the S.H.O.O.A.P. (Government Gazette 285/2004). In relation to transportation design, these fixed standards determine the area necessary to serve the surface means of transport, and are derived as a proportion of the total area of the urban area.

Moreover, the streets are categorised into urban, suburban and interurban, depending on the location of the road (inside/ outside residential areas), the type of use of the roadside area, and the operation of the road (connection / stay / access). Also, this decision proposes fixed standards for pedestrian and bicycle paths. Specifically, for pedestrian streets a distinction is made in primary and secondary, depending on the load they are estimated to present. Similarly, cycle paths are divided into three categories, urban, peri-urban and rural, depending on the areas they connect. (Government Gazette 285/2004)

In addition, the decision on fixed standards is supplemented by a detailed annex, which sets out some general principles concerning transportation planning. The general principles include the categorisation of the road network into primary and secondary, where the former includes motorways, main arteries and primary collectors with characteristics of "continuity" in transportation, while the second includes secondary arteries, secondary collectors and local roads with characteristic features the "discontinuity" in transportation (Government Gazette 285/2004).

This annex also lists general principles for the transportation connection of road use according to the category of the road. These principles essentially concern access to roadside uses and with their institutionalization a first attempt is made to prevent the negative effects of movements on urban space and to create an integrated framework for the implementation of coordinated urban and transportation planning. (Government Gazette 285/2004)

3.3 Conclusions

From the above presentation of the legislative framework of urban planning in Greece, it is found that transportation planning was treated spasmodically to not at all by this context. Most of the texts are consumed in a simple recording and proposal of the main road network of cities without considering the interactions with land use, while at the same time they do not foresee the impact on movements and transportation loads. The only text that examines the importance of transportation planning and its interactions with urban planning is ministerial decision 10788/2004, in the annex of which are given some general principles concerning the siting of road uses in relation to the category of the road. However, these directions cannot constitute the framework for the implementation of coordinated urban and transportation planning, as many other factors, both urban and transportation, are overlooked.

CHAPTER 4

DECISION-MAKING CENTRES FOR URBAN AND TRANSPORTATION PLANNING

4.1 Introduction

Approaching the issue of the relationship between the built urban environment – transport / transportation, a weakness is first identified, which is also found in other European countries, but in Greece its importance acquires a special character due to its dramatic impact on the design of the site. The weakness is determined in the fact that the production of a built environment is supervised by different centers with different structures than those that control and address transport - travel issues.

The decision-making centers for the planning of the country's transport infrastructure operated after the war on the basis of strategic choices based on criteria of "incoming" economic policy. Thus, a road network was developed in a country with great potential for the development of the railway network and at the same time the network of financial centers was developed according to the network of transport infrastructure and not on the basis of a National Spatial and Development Plan.

It should be noted that the first spatial law - Law 360 "on spatial planning and the environment" - was passed in 1976, and the first proposal for a national spatial plan was made by Doxiadis in 1980. However, this proposal was not implemented for political reasons.

An integrated plan appears almost 30 years later, with the 12 Regional Spatial Plans of 2003. These plans were based on the framework ofLaw 2742/99 which provided for three types of spatial plans: general, regional and specific spatial plans. It should also be noted that these 12 Regional Spatial Plans were heavily criticised by the scientific workforce as they were described as general and unclear.

Moreover, in the Doxiadis proposal for the construction of regional rings in Athens, the Attiki Odos was constructed in 2000 with a logic of suppression and confrontation of the transportation problems of the capital, and not on the basis of a preventive planning.

The general situation is due to causes arising from contradictions and conflicts of different policies. Greece, dependent on an international economic status, obeys proposals – imperatives and political decisions, unable to support its positions, and this fact is mainly based on the economic dynamics of the country and the lack of an economic base.

The conflict between planning centers does not result from random events, nor is it a flawed concern of the state. On the contrary, it is part of the conflict of politicians who obey a policy of general management. A representative picture of this situation is the confusion of responsibilities at central level.

Indicative of the extent of the problem is the fact that inLaw 3481 GOVERNMENT GAZETTE 162 A/ 2006 article 7 is introduced, which determines the responsibilities for the maintenance of the roads of the various levels of power, depending on the category of the road, as well as between the other structures of power.

4.2 Transport Planning Agencies

In Greece, the stakeholders involved in the issues of transportation planning of urban areas are the following:

Ministry of Finance: responsible for financing projects.

Y.PE.CHO.D.E.: responsible for the design, planning, implementation and maintenance of the basic road network, the signalling of the entire network and urban planning.

Ministry of Transport: responsible for all matters relating to public transport (urban and interurban transport) and BWS licencesI

Ministry of Public Order: responsible for the supervision of transportation and parking rules.

Regional Administration: responsible for the approval and allocation of funds.

B' degree of Local Government: responsible for the issues of driving licenses, 'piazzas' TAXI and approval of decisions of A' degree of Local Government

First degree of Local Government: responsible for the planning, planning, implementation and maintenance of the local road network and municipal transport, co-responsible for urban planning and responsible for policing (through the Municipal Police). (Bell, 2001)

4.2.1. Ministry of Transport

The mission of the Ministry of Transport and Communications is the formulation and implementation of a national policy and the creation of an appropriate institutional framework, and the contribution to policy making and the creation of an institutional framework at European and international level, for the development of transport and transport, telecommunications and postal services of high quality, under conditions of healthy competition.

Moreover, the ministry's objective is to promote safety in transport and transport, and telecommunications and to contribute to the economic development of the country and to the improvement of the quality of life in terms of the Ministry's areas of responsibility. (www. yme. gr)

4.2.1.1 Responsibilities

The Directorate-General for Transport coordinates the operation of the service units subject to it, takes care of the planning of their administrative activities and evaluates the quality of the administrative results produced in relation to the financial and organizational cost of the exercise of the statutory responsibilities. It takes care of the formation of communication and cooperation channels with the public enterprises and organizations of the transport sector supervised by the Ministry of Transport and Communications, as well as with the administrative services of other Ministries and in general public sector bodies that exercise relevant policies, in order to achieve the satisfaction of the organizational and operational needs of the exercise of the transport and transport work and to make it appropriate and easier to ensure the a well-functioning, safe, efficient and high-quality operation of transport.

Moreover, the Directorate-General for Transport includes the Directorate of Freight Transport and the Directorate of Passenger Transport. (www. yme. gr)

4.2.1.2. Freight Transport Directorate

The Freight Transport Directorate is composed of the following departments:

- Department of Road Freight Transport
- Department of Rail and Combined Transport. (www. yme. gr)

4.2.1.2.1 Department of Road Freight Transport

The department's responsibilities include the development of competitive road freight transport services, the efficient management of border crossing permits for freight transport companies.

Also, the responsibilities of the department include the documentation and monitoring of developments in the field of road freight transport in the Greek, European and international environment and the elaboration of policy and measures for the development of the sector and the exercise of the relevant regulatory competence of the state, as well as the cooperation at European, international and transnational level on issues of the freight transport sector. the provision of information and the representation of the Ministry in the respective organizations, the conduct of negotiations and the elaboration of agreements at European, international and interstate level and finally the control of the compliance of the transport workers with the current regulatoryframework. (www. yme. gr)

4.2.1.2.2 Rail and Combined Transport Department

The department's responsibilities include the development of competitive rail and combined freight services and the documentation and monitoring of developments in the rail transport sector in the Greek, European and international environment and the relevant elaboration of policy and measures for the development of the sector and the exercise of the regulatory competence of the state.

Moreover, the department is responsible for the cooperation at European, international and transnational level on issues of the rail and combined transport sector, the provision of information and the representation of the Ministry in the respective organizations, the conduct of negotiations and the elaboration of agreements at European, international and transnational level. (www. yme. gr)

Another responsibility of the Department of Rail and Combined Transport is the cooperation with the Greek public authorities that directly or indirectly exercise regulatory competence in the field of rail and combined transport and the professional organizations of the sector and the representation of the Ministry in the respective bilateral or multilateral relations and collective bodies

Finally, under the control of the department is also the elaboration and specialization of the government policy and the planning of measures for the reorganization of the Hellenic Railways Organization (OSE) and the monitoring and evaluation of the implementation of programming in cooperation with the co-competent authorities for Public Enterprises and Organizations (PUBLIC UTILITIES), Ministries and government bodies as well as the announcement, management and monitoring of studies of the transport sector. according to the provisions of article 13 of Law

2578/98 (Government Gazette 30/A) and Presidential Decree 29/99 - Government Gazette 32/A. (www. yme. gr)

4.2.1.3 Passenger Transport Directorate

The Passenger Transport Directorate is composed of the following departments:

- Department of Urban Transport
- Department of Interurban Transport(www. yme. gr)

4.2.1.3.1 Department of Urban Transport

The responsibilities of the department include the development of competitive urban passenger transport services of high quality and the documentation and monitoring of developments in the field of urban passenger transport in the Greek, European and international environment and the elaboration of policy and measures for the development of the sector and the exercise of the relevant regulatory competence of thestate. (www. yme. gr)

Also, the responsibility of the Department of Urban Transport is the cooperation at European, international and transnational level on issues of the sector, the provision of information and the representation of the Ministry in the respective organizations, the conduct of negotiations and the elaboration of agreements at European, international and interstate level and the cooperation with the Greek public authorities that exercise directly or indirectly regulatory competence in the passenger transport sector and the professional organizations that represent the sector and the representation of the Ministry in the respective bilateral or multilateral relations and collective bodies.

Another responsibility of the department is the monitoring and evaluation of the implementation of programming, in cooperation with the ministries and government bodies responsible for public utilities and government bodies and in particular for the institutional regime of establishment and administration, the regime of organization of operation and labor relations, the development strategy, the business objectives, the exploitation and the financial results, the pricing policy and the range and quality of the services provided. (www. yme. gr)

4.2.1.3.2 Department of Interurban Transport

The responsibilities of the Department of Interurban Transport include the development of competitive intercity road transport services of high quality and the documentation and monitoring in the field of road interurban transport in the Greek, European and international environments and the elaboration of policy and measures for the development of the sector and the exercise of the relevant regulatory competence of the state.

Moreover, the department is responsible for the cooperation at European, international and transnational level on issues of the road interurban transport sector, the provision of information and the representation of the Ministry in the respective organizations, the conduct of negotiations and the elaboration of agreements at European, international and interstatelevel. (www. yme. gr)

The collection, classification and processing of data for the organization and operation, exploitation of pricing policy and level of intercity transport services provided and the preparation

of technical specifications in cooperation with the competent Department of the Vehicle Technology Directorate are also under the control of the department.

In addition, the cooperation with the Greek public authorities that exercise directly or indirectly regulatory competence in the field and with the professional organizations representing the sector and the representation of the Ministry in the respective bilateral or multilateral relations and collectivebodies. (www. yme. gr)

4.2.2. The Role of the Ministry of Transport in Transport Planning

As has been mentioned in a previous section, the Ministry of Regional Planning and Public Works is responsible for the elaboration of the National Spatial Planning, and in it proposes as the main axes of development of the country the land transport axes. It is also through spatial planning that it formulates the policy to be pursued in the field of transport. (www. minenv. gr)

The Ministry of The Ministry of Health and The it has been reported that it is responsible for the planning, planning, and construction of transport axes in the country, with the General Secretariat for Public Works as its instrument, which has as its object:

- The recommendation for the formulation of a National policy and the creation of an appropriate institutional framework, as well as the implementation of the policy in the field of Public Works.
- The supervision of the entire construction activity of the country.
- The preparation of long-term and annual programs for the implementation of projects, the securing of funding and the monitoring of their execution progress.
- The rational framework for the development and continuous monitoring of the technical, organizational and financial capabilities of the contracting companies that undertake the construction of the projects. (www. minenv. gr)

Moreover, the Ministry of The Ministry of The Ministry of Health and The Ministry of Health and The Ministry of The Ministry of The Ministry of is responsible for the legislative framework, classification of the road network and the maintenance of national axes. Law 3481/2006 provides that the control of the Ministry of the Environment, Physical Planning and Public Works includes 680 km of national road network, including national highways (PATHE, northern road axis of Crete, Corinth-Tripoli, etc.) and 320 km of roads in the prefecture of Attica. Until today, the responsibilities for the maintenance of public roads were defined by a law of 1955(Law3155, "On the construction and maintenance of roads"). The law divided the country's road network into national, provincial and municipal and stipulated that "national roads are constructed, renovated and maintained by the State through the service of Public Works, provincial roads under the Road Funds of the Prefectures and municipal and community roads by the relevant Municipalities and Communities'. N. 3155 was supplemented in 1956 by a series of presidential decrees, which "characterized" the main roads as a national, provincial or municipal network. Over time, however, confusion prevailed about the responsibilities of the Ministry of Environment, Physical Planning and Public Works and self-government, as many new roads remained in an administrative vacuum, while in other cases all those responsible declared themselves irresponsible. (www. minenv. gr)

4.3 Urban Planning Agencies

According to the Constitution, the bodies of urban policy in our country are divided into three levels: the central, the regional and the local level. Each body plays an important role in the final result that emerges as we have mentioned that urban planning must now be in line with the principles and directions of development planning and spatial planning, which are on a higher scale.

At central level, the body responsible for the formulation of urban planning policy is the Ministry of Environment, Spatial Planning and Public Works (Ministry of Environment, Planning and Public Works). Moreover, the Ministry of The Ministry of The Ministry of Health and The Ministry of Health and The Ministry of The Ministry of The Ministry of it is also responsible for the award, preparation, approval and implementation of urban plans and programmes. (Aravantinos, 1997)

At regional level, responsibility is assumed by the country's regions. All the regions of the country have the Directorate of Environment and Spatial Planning, which in turn consist of the departments of Environment, Spatial Planning and Urban Planning and the Department of Secretariat. The General G.G. of the Region has the competence for the approval of the G.P.S. by law 2508/97. Attica is an exception to the above, as it operates a Directorate of Urban Planning and has as an instrument the Athens Master Plan Organization (O.R.S.A.).

At the local level, the bodies are divided into the primary local government, which consists of the municipalities and the municipalities, and the secondary local government, which is the prefectures. Regarding the role of local authorities in urban planning, it is worth mentioning that initially they were ignored and their only responsibilities were a) the drafting and submission of proposals for the preparation of urban plans, b) the opinion on the plans proposed by the administration and c) the implementation of street plans. However, after law 2508/97, an effort began so that the local authorities of the first degree acquired more powers. Indeed, several responsibilities were transferred by the Decree, such as the issuance of building permits, but their role in urban planning is still of a procedural nature. As far as the local authorities of the second degree are concerned, it should be noted that the prefect has the responsibility for the approval of a G.P.S. with a population of less than 20,000 inhabitants, S.H.O.O.A.P. and Urban Planning Studies.

4.4 Challenges from the lack of coordination of planning centres

At the beginning of the chapter it was mentioned that there is a weakness regarding land use and transport planning issues as they are supervised and dealt with by different centres. The existence of two different centres therefore results in the involvement of responsibilities between the competent bodies and a lack of coordination between them.

In Greece, the main problems observed regarding the issues raised by the lack of coordination between the competent services, in the planning of land use and transport, mainly concern problems in preventing the negative effects of urban and transport planning.

A first problem that is formulated is the lack of transport planning, as during the planning process, usually not all the parameters related to the transportation and parking of vehicles are taken into account, both in urban and extra-urban space. The stages of preparation of transport studies do not take into account the impact that transport projects will have on urban planning and land use, and as far as urban projects are concerned, often other environmental parameters and population development are not taken into account. (Karasavidou, 2001)

Accordingly, urban planning (GIS, etc.) is drawn up without any real transportation consideration or coordination with the corresponding transport planning. This creates additional problems in the configuration of urban space and in the structure of movements, which have been presented in more detail in a previous chapter. (Karasavidou, 2001)

Another problem created by the confusion of responsibilities between the planning bodies is the fragmentary study of transportation issues with corresponding inefficiency in the implementation of measures to deal with the problems and the inadequate monitoring of transportation data. Thus, it becomes impossible to evaluate the results of the implementation of transportation interventions and to draw conclusions about the way in which they affect the area and specifically their impact on the structure of land use. (Aravantinos, 2001)

There is also a major problem with regard to design levels. While three levels can be distinguished in urban planning, this is not the case in transport, except as far as the urban transport sector is concerned. This results in the poor organization and staffing of local government offices so that they can deal with transportation issues.

This lack of human resources, capable of dealing with transport and transportation issues at the level of local government of the first degree, leads to the lack of a strategy for the organization of the transport system at city level and the lack of a policy for the transportation and parking of vehicles, as well as pedestrian transportation. Thus, the transport system within the urban fabric faces many problems in terms of its functionality and does not bring about the best desired results.

A typical example of a lack of coordination between the agencies is the Athens Master Plan. The R.S.A. was drafted in a short time and is more a declaration of intent and policy than a comprehensive plan of specific principles and guidelines.

Subsequently, it was established in 1985, with Law 1515/85, by way of derogation from Law 1262/72 "On Regulatory Plans" which was in force at the time and continues to apply. The R.S.A. was then institutionalized in order to cover the Urban Planning Studies that had been made for Athens, without falling under a G.P.S., something that was not allowed after the entry into force of Law 1337/83. (G.P.S. of the Municipality of Megara, p.33). For these reasons, the R.S.A. cannot be considered an adequate tool of strategic planning. However, the problem was not only not corrected, but this tactic was also followed for the regulation of Thessaloniki, while through

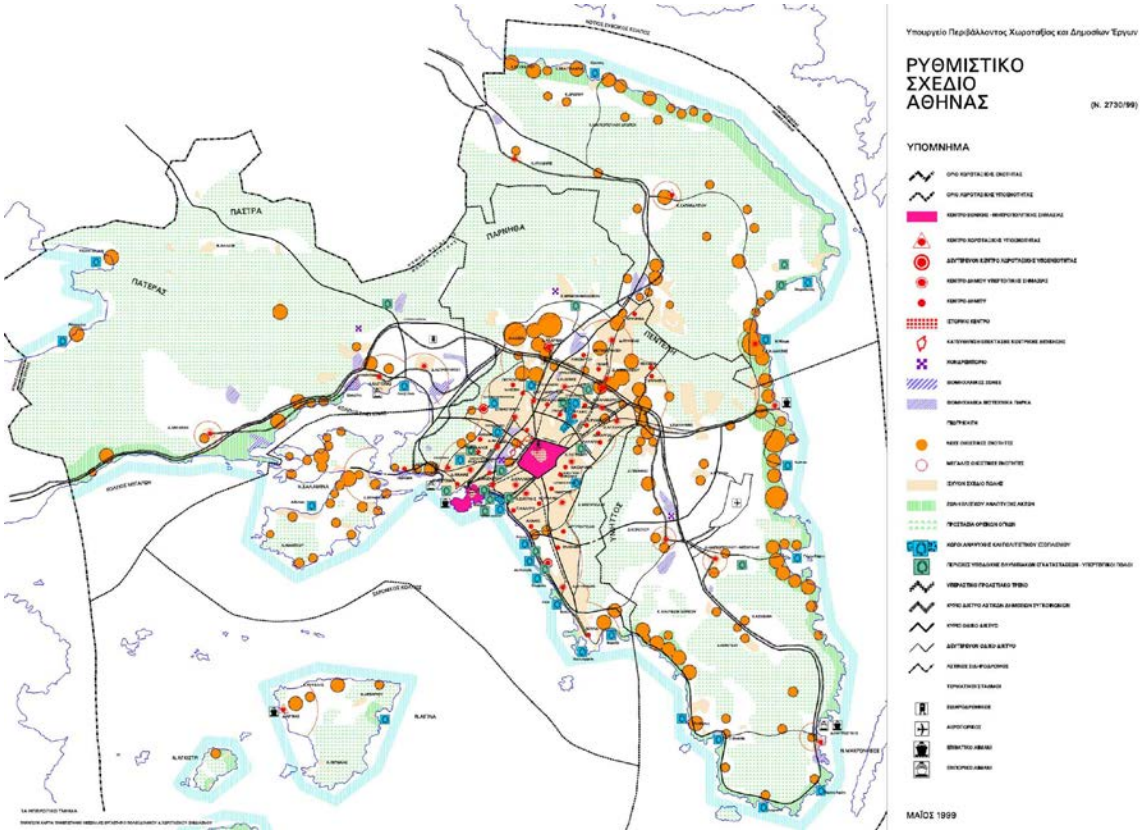
numerous amendments of Law 1515/85 for very specific reasons, the R.S.A. was consolidated as a tool for the exercise of a policy of land use in the capital.

Thus, while the P.S.A. was designed as a text of general guidelines, it ended up being used for specific and fragmentary arrangements that served circumstantial purposes. (G.P.S. of the Municipality of Megara, p.33)

It is therefore concluded that the institutionalization of the P.S.A. was accepted without any provision, specifications, procedure of approval and revision, and ultimately without restrictions. Thus, the most depressed region of the country ended up being regulated with a tool of dubious legality and operational value that in any case lacks safeguards.

Important feasibility changes of the P.S.A., which were contrary to the general guidelines of the original legislation, are those that concerned important site placements, such as those for the Olympic projects, the most characteristic example being the new Athens International Airport in Spata.

Moreover, an example with significant implications for the area is the substitution of the G.P.S., by the Regulatory For the legalization of Urban Planning Studies. Indeed, in Law 2508/97, and according to article 7, § 1, it is stated that the urbanization of areas provided for by Regulatory Plans or ZOE is allowed. In this way, an entire study (G.P.S.) and its content (maps, analyses, projections, etc.) is replaced by the provision of the R.S.A., which in essence is a very general reference in the text, while schematically it is a simple delimitation on a map of scale 1: 125,000, for the legalization of urban planning study in any location and with dubious terms and provisions for densities, sitings, etc. provided for in a G.P.S. (G.P.S. of the Municipality of Megara, p.33)



Map 16: The Athens Master Plan (Source: www. minenv. gr)

Chapter 5

CONCLUSIONS AND PROPOSED IMPLEMENTATION method OF COMBINED URBAN AND transportation PLANNING

5.1 Conclusions

The way of life in the countries of the Western world is becoming less and less sustainable. There, the inhabitants consume more energy and raw materials per head and produce more waste than the inhabitants of poor countries. This antleropia is distinguished both in the wider area and in the cities. It is the result of the interaction of land use and transport policies subservient to market conditions.

Urban forms affect the length of movements. Long distances between home and work create long journey times. The concentration of jobs therefore means longer journeys, whereas where there is a balance between housing and jobs, the routes are shorter. American studies also confirm that when neighbourhoods are rich in activitythese attract residents and contribute to reducing the dispersion of uses and thus reducing the average length of travel. (Aravantinos, 1997)

The results of studies based on models confirm that labour-decentralised policies, such as the construction of shopping parks, industrial zones and large shopping centres, have a negative impact on the economic activities of city centres. Therefore, land use policies that set limits on urban sprawl, in addition to its urban significance, have a significant impact on the choice of movement.

The effects of transport policies on travel choices tend to be much stronger than the effects of land use policies. The increase in travel time and cost leads to reductions in the length and frequency of travel. On the contrary, improving accessibility has positive effects on the length and frequency of travel and entails longer journeys for work and leisure. (Vlastos, 2006)

Transport also affects land use by changing the accessibility of a location. Improving accessibility increases the attractiveness of a niche for any kind of use and thus facilitates the dispersion of activities and extensions.

Studies confirm that the construction of transport infrastructure, such as a ring ring, entails the alleviation of transportation problems in the center but also contributes to the decentralisation of activities and the increase of travel distances. (Vlastos, 2006)

In the previous chapters, data on the relationship between land use and urban movements were presented.

It was mentioned that urban transportation is integrated into a residential fabric that was not created to serve the car, and its operation brings about various problems in everyday life. The most important of these is transportation, which also has indirect effects on the urban environment such as air pollution and noise pollution.

The continuous urban development and the development of transport networks in the urban fabric exacerbate the problems and results of land use planning and transport policies are not the desired ones. The planning and interventions proposed result in a fragmented and short-term recession of the effects and do not address them on their basis. The previous chapter mentioned the main problems from the lack of coordinated land use and transport planning.

Moreover, several examples have been cited regarding the impact that transportation data creates on the operation of urban space and vice versa, i.e. impacts of land use policy on the operation of the road. (Maratou, 1992)

This raises the need for a continuous and coordinated planning, in matters of generating a built environment and transport, in order to address the problems of movements in urban planning.

The evolution of the complex dynamical systems that are cities is determined by the interactions between their subsystems, such as land use and transport. The multiple interactions of these subsystems lead to the conclusion that only integrated urban and transport planning, the product of cooperation at all levels, is a guarantee for the viability of the city.

From the analysis cited in the previous chapters, it was also found that the antithetical relationship that exists in our country between the roadside construction and the operation of the road, and especially the negative effects on transportation and generally the environmental conditions of the roadside area. (Bell, 2001)

In Greece there is a rich institutional framework for urban and transportation planning which, however, is not mutually reinforcing and coordinated. It is becoming increasingly clear that the increase in transportation must be seen in the context of political spatial development and urban planning, and not just by expanding transport infrastructure.

There has also been a weakness regarding the cooperation of the relevant bodies in the country responsible for the planning of land use and transport policies. This weakness has caused many problems, with dramatic consequences on the planning of the Greek area. Moreover, the lack of cooperation between the agencies, which is non-existent, also creates repercussions on the definition of responsibilities between the various levels of the planning bodies. (Karassavidou, 2001)

Moreover, there is a different approach to the treatment of issues by the scientific staff. The transportation engineer approaches the problems differently and the urban planner approaches the problems differently. The approach of transportation engineers focuses on solving problems and structuring flows, while the approach of urban planners focuses on the formulation of the relationship of land use and the formation of the characteristics of the built environment.

In addition, in the relationship between the transportation engineer and the urban planner, the state intervenes and finally gives the solution, whose common practice is based on the construction of transport infrastructure projects. A solution, however, whose effectiveness in dealing with the problems arising from the lack of cooperation of the agencies, is to be explored. This is due to the lack of coordination and mutual service of the competent services dealing with the*matter.*

The data cited in previous chapters on design tools, i.e. land use studies and road studies, found that they do not complement each other in any area. Urban planning studies, although given the opportunity to determine the road network for the study area, do not have the ability to predict transportation loads and other technical elements. Conversely, transportation studies examine the data collected, in particular the loads and cross-sections of the roads, and provide solutions concerning the structure of movements in the urban fabric, and the intersection of roads, without, however, examining the urban impact on the roadside area.

There is therefore a form of division of labour, although this is not generally negative, at the design stage and in the implementation of solutions, which has had dramatic effects on the production of a built environment.

The issue of the lack of cooperation between the actors also relates to the responsibilities of the actors and the planning levels. It has been reported that in Greece the design is formed in 3 levels. The national, regional and local government levels, first and second degree. Responsibilities seem to be divided between levels but the reality is different. (Bell, 2001)

The central authority has even the most important role in shaping urban planning and the first-degree local government has responsibilities for initiating the procedures for drawing up land use plans, and approving amendments to plans without, however, being able to determine building conditions and restrictions. The approval of the G.P.S. and the Urban Planning Studies is the responsibility of the General Secretary of the Region for medium-sized urban centers, while for the metropolitan centers the minister of pe.x.d.e. is responsible, and the small urban centers are responsible for the relevant Prefect.

As far as transportation planning is concerned, responsibilities are determined according to the category of the road. The planning of the country's major road axes is the responsibility of the Ministries of Transport, PE.CHO.D.E. and Finance, while the approval of transportation arrangements in small towns is the responsibility of the relevant local bodies. However, although responsibilities appear to be equally distributed across different levels, the problem of funding invalidates the assumption of responsibilities. In other words, there is a reticence of the state in the assignment of powers and the result is the confusion of these.

5.2 Proposals for the Combination of Urban and Transportation Planning

In the above chapters, both the relationship between urban planning and transportation planning in the urban environment and the weaknesses in dealing with the problems of urban space from the planning of land use and transportation were formulated.

To date, in Greece, land use and transport policies have been drawn up independently of each other. With the institutionalization of the National Spatial Planning, the first attempt is foreseen for the implementation of an integrated planning for the sustainable development of the Greek area.

However, the issue of implementing combined urban and transportation planning should not end with the National Spatial Planning. In order to better address the adverse effects on urban space, an appropriate framework should be created, both legislative and supervisory, which will enable the competent bodies to exercise their competences in the best possible way and to promote sustainable urban development. (Two-day conference, 2001)

This framework can be realized with the help of measures on the part of the state that will promote cooperation between urban and transportation planning bodies. These measures can be categorized into four thematic units:

- A new vision of urban planning.
- Cooperation between decision-makers.
- Definition of responsibilities between the different levels of planning, transportation and land use.
- Content with land use and transport foremen.

5.2.1 A new vision of Urban Planning

Today, in the face of the major problems of urban space which stem from the operation of the car and transportation, it is understood that the quality of urban space can be improved through the protection of the architectural and cultural heritage, the extent given to environmentally friendly means of transport such as cycling, and the reduction of urban travel by car. The above is described as the perspective for a sustainable city, and in particular for sustainable urban mobility. This perspective essentially means that urban and transportation planning are governed by an equal relationship, which never existed, and are practiced in a coordinated and combined manner, so as not to upset the balance in time. (Vlastos, 2006)

Moreover, the prospect of sustainable mobility promotes a new conception of urban planning, that of urban planning based on public transport. Already, with law 2508/97 "Sustainable residential development of the country's cities and settlements and other provisions", and the upgrading of the G.P.S. provides for the creation of local centers where there is the necessary social equipment and public transport stations, as a priority means of fixed track.

The urban planning oriented to public transport is possible through a series of actions such as:

Promotion of the use of public transport, even for long journeys, by articulating transport networks and transfer hubs;

Redesign of public transport stations and increase ofthe attractivity of the surrounding area.

Increase in densities and encourage mixed uses,

Determination of parking spaces at stations according to their location. Centralists must have limited seats as opposed to regional ones which should have more. (Vlastos, 2006)

Examples from this form of urban planning have found application in countries such as Germany, the Netherlands, and China and details have been mentioned in a previous chapter.

Another element that needs to be introduced into the planning is the examination of the operational impact of land use on the road and in order to achieve this objective there must be a correlation between the information used by urban planning and transportation planning and this implies the control of road use of land use. (Maratou, 2001)

Some general guidelines that should be followed during the planning and during the implementation stage are briefly mentioned below. It should therefore be specified:

The type of land uses that will be allowed for installation in the roadway, depending on the category of the road.

The intensity of development of each use, and here it is understood the control of the total surface of the installation with the S.D.

The layout and configuration of the building on the plot, and by extension on the block.

The way of direct or not access and parking to the plot. (Maratou, 2001)

As has been formulated in previous chapters, roadside uses, in most cases work to the detriment of the ability of the road and create problems related to the category of the road, degrading it. For this reason, the control and definition of road user uses at strategic level and the management

of access are considered necessary conditions in order to avoid incompatibilities between uses and roads. (Maratou, 2001)

The determination of the intensity of the uses can be controlled, as mentioned by the S.D. but other criteria should be included such as: ensuring the proper operation of the road, i.e. examining the loads produced and how they can affect the transportation flow, ensuring operational access to the plot and ensuring compatibility with the uses in the surrounding area. (Maratou, 2001)

Access management is an important tool for maintaining the desired levels of development of road use and for maintaining good transportation flow of the artery. Moreover, the implementation of this policy ensures the reduction of environmental burdens on the roadside area, and even the increase of road safety. (Soilemezoglou, 2001)

The control of the layout of the use in the installation can be an important factor in the overall operation of the road space. For example, the development of roadside land uses in an artery when there is no auxiliary road is intensified at intersections, because plots have, in theory at least, a higher accessibility index. (Maratou, 2001)

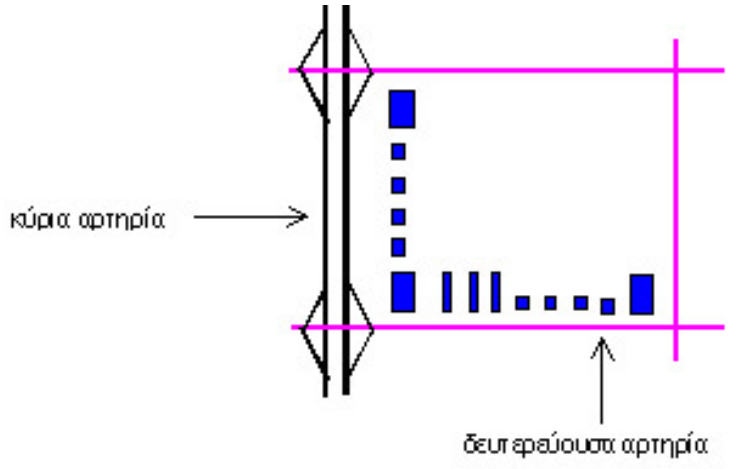


Figure 5: Constructionalong roads when there is no auxiliary road (Source: Maratou, 2001)

The development of road user uses when there is an auxiliary road is more homogeneous as it provides equivalent access. The parallel to the artery zone gathers more intensive growth on the perpendicular, artery roads.

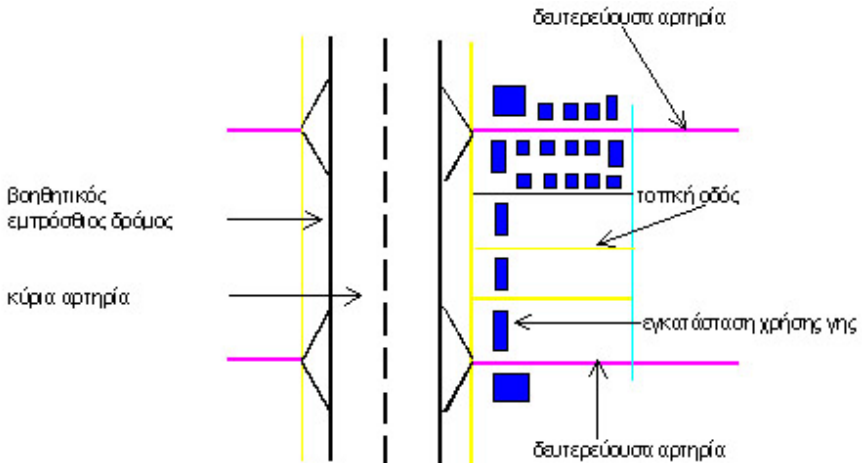


Figure 6: Building next to the road with an auxiliary side road (Source: Maratou, 2001)

Access from a rear auxiliary road is considered to be the best case. This road, serving both sides, on either side, ensures the reduction of the total percentage of surface required for their creation in relation to the auxiliary para-central artery.

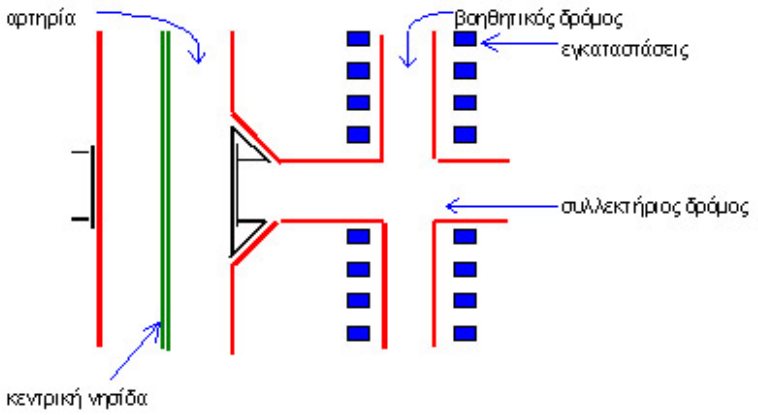


Figure 7: Building on a rear auxiliary road (Source: Maratou, 2001)

The way of access and parking to the plot presupposes the control of access to the facility in relation to the main road network, the arrangement of parking spaces within the plot and the arrangement of entrances and exits. In cases where transportation loads are estimated to be quite important, the way of access and in particular the level accesses are considered more functional.

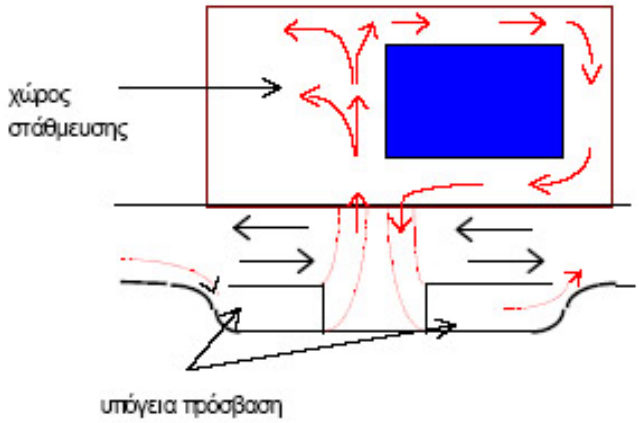


Figure 8: Level access to transhumance use (Source: Maratou, 2001)

5.2.2 Cooperation between decision-makers

The weakness of planning, as mentioned in a previous section, is mainly due to the lack of cooperation of the competent planning bodies. The policy to be followed in the future requires better cooperation between the actors at the planning stage and better quality communication between them in the supervision of actions.

The cooperation of the actors has vertical and horizontal dimensions. The vertical dimension involves the European, national, regional and local levels in a single strategy. The horizontal dimension refers to central administration, policy areas of spatial interest and stakeholders, i.e. government, investment policy or economic policy and public and private actors. (Two-day conference, 2001)

In the first stage, an effort should be made to harmonize the programmes of the Spatial – Urban and Transport Services, in order to have a general framework that gives the general directions of planning and predicts its impact. Impacts can be predicted by the Strategic Environmental Impact Assessment (SMPA), which replaces environmental impact assessments for development plans and programmes. (Sperelakis, 2001)

Furthermore, the cooperation between the Ministry of Public Health and Public Health should be intensified. and the Ministries of Transport and Finance as well as with the other bodies managing transport problems.

At a later level, the cooperation that local actors have with the central administration in the implementation of policies needs to be reviewed. This issue is directly related to the powers conferred on local government and the extent to which they can act, regardless of the convictions of the central administration. (Sperelakis, 2001)

Following this, the state must ensure the coordination of administrative and judicial bodies that supervise policing both in the field of land use and construction and in the structure of movements. (Sperelakis, 2001)

Another level on which the new planning strategy should focus is the exchange of information and the exploitation of the results of the policy pursued so far. (Bell, 2001)

The competent services must take action after the plans have been drawn up, and collect and process information related to the areas of urban and transportation planning actions. More simply, after the approval of the urban plan, a record should be made of the residential development on an annual basis, and of the transportation generated by it.

Accordingly, with the approval of the transportation studies and the construction of the proposed works, where proposed, the competent bodies should monitor and record the evolution of road user uses, and their impact on the operation of the road. The circular relationship that exists between land use, transport and road infrastructure requirements (see Figure1),reinforces the above proposal and confirms its importance.

Moreover, the above proposal can be supported by the technological tools available to scientists. The use of information systems for the measurement of transportation as well as for the recording of uses and their intensity is widespread and in some countries of Europe, there is an integrated system that collects transportation and urban information and determines the design. (Sperelakis, 2001)

In addition, the collection of urban and transportation information can be the key element for the creation of a database, which will be common to all competent bodies, and the creation of new models where the studies of extensions of city plans will be supported. (Maratou, 2001)

5.2.3 Defining responsibilities between the different levels of planning, transportation and land use

This unity is formulated as a result of a major dialogue between scientists and local authorities on the need to decentralise the country at the administrative and financial level. As far as planning is concerned, it has been mentioned that there are three levels of planning, but an essential role is played by the central administration, which forms the planning framework with its decisions and legislation.

It has been reported that there is a reticence of the state and the system of administration of the country to delegate responsibilities to a lower level. This weakness is the most important element that needs to be changed in the effort for integrated urban and transportation planning.

In the chapter of examples from abroad it was formulated that countries with experience in the implementation of coordinated urban and transportation planning also have a decentralized system of competences, legislative and executive character, while in our country the responsibilities of local bodies seem to be of a "procedural" nature.

The shift in the perception of political authorities regarding the exercise of power, and the assignment of legislative powers, in matters of planning to the regional and local level, is the first step towards coordinated urban and transportation planning.

The above proposal will also create the need for the staffing of local administrative bodies with the appropriate scientific staff, who will be able to manage the new responsibilities and new responsibilities that may arise.

Thus, it becomes clear that the role of technical services at the level of primary local government should be upgraded, and they should be given a more substantial role in monitoring the implementation of urban plans and transportation regulations.

Moreover, the appropriate departments could be created, which would be responsible for the collection of transportation and urban planning data, after the implementation of the proposals of the respective studies. These sections will have the opportunity to examine the coherence between the objectives set by the urban studies and the effects of land use and new transportation arrangements from transportation studies on the structure of movements. Also, the responsibilities of the departments could be the maintenance of the proper functioning of urban roads and the maintenance, repair and extension of the municipal network (kat. G. 374/93), as well as the proposal of transportation regulations and the management of parking.

In addition, these departments will also have the status of technical advisor of the municipal authorities on issues for the development planning of the area, thus participating in a meaningful way in the preparation of planning.

Apart from the technical services of municipalities (Department of Town Planning, works, etc.), an important role in the combined urban and transportation planning can also be acquired by their Development Companies. With the appropriate completion of their scientific potential, they can be responsible for the development planning of municipalities, and submit proposals to local councils on investment policy on infrastructure and land use issues.

Moreover, these services will have the potential for the planning of urban transport in small municipalities, up to 30,000 inhabitants, for e.g., and the policy of developing other programmes of alternative modes of transport.

The above could act as miniatures of the Ministries of PE.CHO.D.E. , Development and Transport.

Moving on to a higher level, namely the level of second-level local government and the region, the services will be mainly of a supervisory nature. At these levels, spatial plans should be drawn up, which will give the necessary guidelines to local actors for the development of their own projects. At this level, a Supervisory Office could be created, responsible for controlling the movements and land use throughout the spatial unit, both at the prefectural and regional level. (Sperelakis, 2001)

Moreover, at each of these levels there must be a service responsible for the operation of the B category road network, as defined by P.D. 374/93 "Taking measures for the safety of interurban transport", for the planning of transport and transport infrastructure of intermunicipal character.

The proposal to confer more powers on the lower levels does not mean and does not want to downgrade the role of central government. On the contrary, the central administration still has the role to take important decisions on matters of a national nature.

The state is responsible for the country's development planning and the preparation of the national spatial planning and determines the policy for the transport sector. The development of the residential organization and the development of the metropolitan centers is under the control of the state services and in particular the Ministry of The Ministry of Culture and Public Health and Public Health. Planning and investments for the development of transport infrastructure of national importance, such as motorways, trans-European networks, ports and airports, fall under the responsibilities of the Ministries of Transport, PE.HO.D.E. development. (www. yme. gr)

Also, the state services are responsible for the operation of infrastructure of national importance, and in particular, for the control and monitoring of the country's motorways, it is proposed to create a Motorway Control Centre. This centre will act as an observatory, collecting data on vehicle transportation, travel safety, and their distribution in relation to other transport infrastructure such as ports and airports. In fact, this centre should also collect data on the land

uses collected along motorways and the impact they have on its operation, as well as be involved in the process of spatial planning, both at national level and on the lower levels. (Sperelakis, 2001)

5.2.4 Content of land use and transport studies

In this thematic unit, proposals are presented on the content of urban and transportation studies, and in particular those elements that should be included in each other, in order to promote coordinated urban and transportation planning.

Moreover, these proposals include the possibility of establishing a single study for the design of the site, which will examine the urban planning and transportation elements as a whole. Changes and regulations are also proposed in the institutional framework, and the binding nature of the new studies.

In the first stage, it is therefore proposed to supplement and update the institutional framework of urban and transportation studies so that they include and clearly highlight the interaction between land uses and the operation of roads. (Bell, 2001)

The first change can be made to the specifications of G.P.S. and S.H.O.O.A.P. (Government Gazette 166D/2000) so that they are enriched with basic instructions and directions on the road network and roadside land uses.

Moreover, it is proposed to reform the Presidential Decree for the content and categories of land use in order to enrich it so as to better meet today's requirements and the special planning of areas under particular pressures (urban planning, transportation, etc.) such as the zones of major transportation axes, the areas around important transport junctions and sensitive areas such as the historical centers of cities. coastal sections and degraded, formerly industrial, central areas(brownfields).

Another element that requires the attention of scholars, and must be incorporated into urban planning and transportation studies, is the management of access to roadbill land use. Access management helps to balance the competitive factors, which are travel and access to roadside land use and to maintain transportation flow in the road system with acceptable levels of transportation capacity, speed of movement and road safety. Moreover, access management is a way of preventing congestion of movements and raises a question about the necessary legislative regulations required to approve accesses. Those arrangements concern the suitability of access in relation to the category of the road, as well as the suitability of the areas proposed for the development of a single use, in relation to its accessibility. (Soilemezoglou, Maratou, 2001)

Previous chapters have mentioned the impact of land use on transportation and vice versa the impact of new transport infrastructure on land use. The main reason for these effects is the lack of coordination between urban planning and transportation planning. The solution to this phenomenon by many scholars (Aravantinos, Frantzeskakis, Maratou) is considered to be the unified urban and transportation planning, with the simultaneous creation of unified studies.

The coordinated urban and transportation planning needs in the first stage its institutional consolidation, which can be achieved as mentioned above by completing the institutional framework for urban and transportation studies.

The creation of new, unified urban and transportation studies requires the definition of new specifications for these studies, through the structure of the specifications of the existing studies.

These studies can be created in correspondence with the G.P.S. and the P.M., i.e. there should be a strategic study for the municipality and a study of a regulatory nature for the settlements separately, where they will implement the directions of the strategic studies.

These strategic studies, in addition to the content of the G.P.S. on urban issues, can determine the planning for the transport systems in the municipality and contain provisions for transit centers, and the combined transport network where needed. They can also determine the hierarchy of the road network and the provision for future needs in transport infrastructure.

The studies that will be corresponding to the Urban Studies will examine the area of the road space regarding the roadblock development, defining the desired uses, their size and intensity (S.D., heights, coverage, etc.), the layout of the building on the plot and the building block.

Moreover, in such a single study should be considered:

- The relationship and interaction of roadside uses with the road artery and its function.
- Their service from the main road network and accesses to it.
- Their service by public transport.
- The forecast of transportation loads on the main axis.
- The degree of their saturation.
- Securing the required parking spaces and checking parking in the roadway.
- The creation of roadside free spaces and side streets on either side of the axis and
- The definition of transportation regulations in matters of road safety, speed of movement, and co-operation with other means of transport such as cycling and walking. (Karasavidou, 2001)

The above proposals regarding the content and specifications of the proposed integrated urban and transportation planning studies are perhaps the most important factor for achieving the implementation of integrated urban and transportation planning, with the aim of reducing the negative impact on urban space.

CHAPTER 6

RECAP

This work was done with the aim of highlighting the relationship between land use and travel and how these issues are addressed by planning. Also, the purpose of this paper is to explore the possibilities for the implementation of combined urban and transportation planning in Greece.

In the first chapter, a general reference is made to the historical importance of transport for the creation of the first settlements and later the first residential networks. Then, the two-way relationship between travel – transport and land use and how they affect each other, affecting the morphology of urban space, and its functionality, was presented. In the context of this interaction, it was found that movements can also shape the built environment in the roadside space and the form of urban space in general and the land uses concentrated in one area can shape the road environment, and consequently the operation of the road and the identity of the road as well.

In the second chapter, the relationship and the way the system of transfers – land use is treated, in countries from the EU but also from America and China, was presented. It was found that the design of the site is quite decentralised in all states, except France, and local authorities have the dominant role in the implementation of integrated spatial planning. A further finding is the principles governing planning, which put sustainable urban development and sustainable urban mobility first. These principles are based on the implementation of measures to reduce transportation, and its impact, on urban space by promoting public transport and environmentally friendly means of transport, citing examples of combined urban and transportation planning.

The third chapter deals with the legislative framework of urban planning in Greece and how it addresses the issue of urban travel. The general picture found is that transportation planning is not treated with due importance by urban planning and some provisions on the road network in urban planning laws cannot constitute a strong counter-argument. Only, with the completion of Law 2508/97, regarding the fixed standards that must be followed during the preparation of General Urban Plans and Urban Studies, some general principles concerning the siting and connection of activities depending on the category of the road are mentioned.

In the fourth chapter, the structure of the decision-making centres for urban planning and transportation planning was presented. From this examination, it was found that the mechanisms in place for the implementation and supervision of planning do not work with joint actions, and there is a great weakness in the evaluation of the results of the design. Also, there was a great confusion of responsibilities between the levels of planning, thus creating problems in the effective treatment of the problems that appear in the operation of urban space.

The fifth chapter refers to the general conclusions found during the examination of the relationship between land use and travel, and sets out proposals on the implementation of integrated urban and transportation planning in Greece. The proposals are divided into four thematic units, and their basic principle is to promote sustainable mobility and sustainable urban development. In conclusion, the main objective of these proposals is to create the appropriate framework and to highlight the importance of integrated planning for the sustainability of urban space, and the production of a built environment that will respect the citizen - user.

BIBLIOGRAPHY

GREEK BIBLIOGRAPHY

Aravantinos A., 1997, *Urban Planning – for a sustainable development of urban space,* Symmetry Publications

Aravantinos A., 2001, *Land Use and Transportation – Coordinated Planning and Proper Choice of Access Conditions for Preventing Mutual Degradation,* Two-day Conference – Transient Land Uses and Access Management, TE. E. – P.S.D.A.T.M.

Vlastos Th., Yiotis A., 1994, *The Linear Shopping Centers of Municipalities of Large Cities and their Treatment by Transportation Planning,*TechnicalChronicles, TEE, 14 (3), 35-52

Vlastos A., Milakis D., 2006, *Urban Planning vs Transport – from divergence to convergence,* National Technical University of Athens – Department of Geography and Regional Planning.

Giannis G. , 2001, *Hierarchy of the Urban Road Network and Road Safety,* Two-day conference – Roadside Land Uses and Access Management,T.E.E. – P.S.D.A.T.M.

Gospodini A., 2002, *Notes – Course: History of the City and Urban Planning,*University ofThessaly Publications

Dakopoulos E., Anagnostopoulos D., Karydis E., 1998, *Transportation Study of the City of Megara*

Municipality of Maria, 2006, *Transportation Planning of Small Towns – Towns*: The Example*of Kalambaka, Diploma Thesis,* Department of Spatial Planning, Urban Planning and Regional Development, University of Thessaly

Doxiadis K., article 1969, RESIDENTIAL, VOLUME 3, No 1

N.T.U.A. – Urban Research Study Centre, 2000, *Urban and Transportation Situation of "City Entrances"* - The Case of *Greater Athens,* N.T.U.A. – Urban Research Study Centre, Department of Town and Country Planning.

Scientific Committee, 2001, *Conclusions – Proposals,* Two-day conference – Road uses and Access Management, T.E.E.– P.S.D.A.T.M.

European Commission, 1999,*ESDP - Community Space Development Plan: Towards the Territorially Balanced and Sustainable Development of the European Union* European Commission

Zekkos K., 1994, *Major Projects and Regulations in Attica,*TechnicalChronicles, TEE, (1), 73- 76

Karasavvidou F., 2001, *Roadbills and Access Management- The Urban Dimension,* Two-day conference – Transient Land Uses and Access Management, T.E.E. – P.S.D.A.T.M.

Karikis Dimitrios, 2006, *Diploma Thesis: Strategic Plan for the Development of the Municipality of Megara,* Department of Spatial Planning, Town Planning and Regional Development Engineering, University of Thessaly

Kasapi E. , 2001, *The Fundamental Problems* of Access *in Greece,* Two-day conference – Transient Land Use andManagement ofThings,T.E.E. – P.S.D.A.T.M.

Kapsohas S., 2007, *The new City of Athens,* Newspaper "Kathimerini"

Kokkosis C., Athanasopoulou E., Parpairis A., 2005, *Studio* Spatial *Planning Ia*: Rural and Environmental Design – Notes and Supporting*Texts,* University Of Thessaly Publications

Kontaratos S., 1994, *Major Projects and Arrangements in Attica,*TechnicalChronicles, TEE, (1), 81-84

Koudouni S.A., 2001, *Urban Development and Operation of Road Uses of Land - Institutional Arrangements for the Confrontation of The Urban Problems of Settlements,* Two-day Conference – Transient Land Uses and Access Management, TE. E. – P.S.D.A.T.M.

KtenasSp., NikasS., 2003, *Investment plans for the new privately owned offices of subsidiaries of multinational companies in our*country, Newspaper "To Vima"

Lalenis K., 1996, *Great Land Transport Axes in Greece,*Technical Chronicles, TEE, (2), 151 – 166

Lalenis K., Serraos K., Kousidonis C., 2004, Town Planning *II: Urban Planning – Urban Planning,* University of Thessaly Publications

Lambrianidis L.,2005, *Economic Geography: Elements of Theory and Empirical Examples,* Patakis Publications

Lialios G., 2007, *Commercial "barricades" on the avenue,* Newspaper "Eleftherotypia"

Lialios G., 2008, *Attica, north of the motorways* - The three *extensions of Attiki Odos will create within 15 years a suffocatingly urbanized Basin behind Hymet o,* Newspaper "Eleftherotypia"

Lialios G., 2008, *The Suburban in Chalkida,* Newspaper "Eleftherotypia"

Liliopoulou M., 2003, *Increased by 30% the transportation in Kifissias due to the works for the Games of 2004,* Newspaper «Amarysia»

Mathioudakis M. , 2007, EMBASSY OF GREECE IN BELGRADE - OFFICE OF ECONOMIC & COMMERCIAL AFFAIRS,

Manolas C., 2003, *Chalkida, Corinth, Loutraki, the "new neighborhoods" of Athens,* Newspaper "Ta Nea"

Maratou Th., Psarianos V., 1992, *Problems of Correlation of Land Uses with the Operation of the Arteries in Greek Cities,*Technical Chronicles, TEE,12(4), 147-172

Maratou D., 2001, *The Main Road Network and its Influence on The Land Uses of Urban Space,* Two-day conference – Transient Land Uses and Access Management, T.E.E. – P.S.D.A.T.M.,

Marmaras E., 2002, *Design and Residential Space: Theoretical Approaches and Aspects of Greek Urban Geography,*Greek Letters

Moussis N.,(ed.)2005, European *Union: Law – Economy – Politics,* Papazisis Publications

Copsos D., 1994, *Major Projects and Regulations in Attica,*TechnicalChronicles, TEE, (1), 76-81

Beriatos H., 2006, *Spatial Development: Strategic Spatial Planning – National and International Level,* University of Thessaly Publications

Boumis Th., 1994, *Major Projects and Regulations in Attica,*TechnicalChronicles, TEE, (1), 69-73

GROUP OF SPATIAL AND URBAN PLANNING APPLICATIONS, 2002, General Urban Plan of *the Municipality of Megara,* MUNICIPALITY OF MEGARA

Economou D., 2005, *Urban Policy – Notes,* University of Thessaly Publications

Economou D., Lalenis K., Kousidonis C., 2005, *Studio* Urban *Planning II: Urban* Planning – General Urban *Plans,* Department of Spatial Planning and Regional Development

Economou D., 2005, *Spatial Planning I*: Introduction to*Spatial Policy,* University of Thessaly Publications

Serraos K., 2001, *Roadside Urban Development in Mesogeia, Attica – Trends and Missed Opportunities,* Two-day conference – Transient Land Use and ManagementofExpectations,TEE – P.S.D.A.T.M.

Siolas A., 2001, *Attiki Odos and the Roadside Uses in the Municipalities of Maroussi - Chalandri - Vrillisia,* Two-day conference - Roadside Land Use and Access Management, TE. E. – P.S.D.A.T.M.

Siomopoulos K., 2001, *How the prices of plots, apartments and houses are formed two months after the operation of the airport "Eleftherios Venizelos"* - Waiting stop *in Mesogeia - Everyone*is waiting for the*presidential decrees on land use,* Newspaper "To Vima"

Siomopoulos K., 2002, *Breath in Kifissias and Mesogeion,* Newspaper "To Vima"

Siomopoulos K., 2003, *The "forgotten" areas of Attica are upgraded,*Newspaper "To Vima"

Siomopoulos K., 2003, *PROFESSIONAL AKINHTA:* On demand the purchase *of land,* Newspaper "To Vima"

Siomopoulos K., 2006, *The bet of Mesogeia - The "stock market" of the region's land on the rise with prices having reached the heights,* Newspaper "To Vima"

Skagiannis P., 1994, *Infrastructure Planning Policy,* Stamoulis Publications

Skyrgiannis C., 2003, *Transport Planning and Transportation Engineering, Course Notes,* Department of Spatial Planning, Town Planning and Regional Development Engineering, University of Thessaly

Soilemezoglou G., 2001, *Access Management,* Two-day conference – Transient Land Uses and ManagementofConditions,T.E.E. – P.S.D.A.T.M.

Sperelakis I., 2001, *Road Environment – IMEO,* Two-day conference – Transient Land Use and ManagementofInterventions,T.E.E. – P.S.D.A.T.M.

TEE, 2007, *Newsletter – Issue 2467: 18-21,* Typoekdotiki

TEE,2008, *Newsletter – Issue 2485: 24,28* Typoekdotiki

Tzika – Hatzopoulou A., 2000, *Urban Planning Law,* University Publications N.T.U.A.

Totsikas P., 1994, *Major Projects and Regulations in Attica,*TechnicalChronicles, TEE, (1), 93-98

TRADEMCO,1998, *Evaluation Study of the Feasibility of Developing a Suburban Railway Network of Attica,* O.S.E.

Tripodakis A., 1994, *Major Projects and Arrangements in Attica,*Technical Chronicles, TEE, (1), 26-30

Tsoukaris S. , 2001, *Uses of Parcels in Contact with Motorways,* Two-day Conference – Transient Land Uses and Access Management, TE. E. – P.S.D.A.T.M.

Ministry of Environment, Physical Planning and Public Works, 2008-06-20, *Draft Law on National Spatial Planning,*

Ministry of the Environment, Physical Planning and Public Works, 2008, *Introductory Report on the National Spatial Planning*

Frantzeskakis I., Giannopoulos G., 1977, *Transport Planning and Transportation Engineering,* Observer

Frantzeskakis I., 2001, *Location* and Transportation Planning of Road *Uses,* Two-day conference – Transient Land Uses and Access Management, T.E.E. – P.S.D.A.T.M.,

Fotinos F., 2007, The passenger transportation of public transport touched in *2006,756 εκ.* Newspaper "Kathimerini"

Charisis N., 1994, *Major Projects and Regulations in Attica,*TechnicalChronicles, TEE, (1), 23-26

Chrysoulakis I., 1996, *Great Land Transport Axes in Greece,*Technical Chronicles, TEE, (2), 143 – 150

FOREIGN LANGUAGE BIBLIOGRAPHY

Banister D., Pickup L., 1989, *Urban Transport and Planning – A bibliography with abstracts,* Mansell Publishing

Banister David, 1995, *Transport and urban Development,* E&FN SPON,London

Button K., Nijkamp P., Rietveld P., 2003, *Urban Transport,* Edward Elgar Publishing,Cheltenham

Cullingworth J.B., 1997, *Planning in the : Policies, Issues, and ProcessesUSA,* Routledge

Dear M.J., Scott A.J., 1981, *Urbanization and Urban Planning in Capitalist Society,* Routledge

Hall P.G., Hall P., 2002, *Urban and Regional Planning,* Routledge

Imrie R., Thomas H., 1999, *British Urban Policy: An Evaluation of the Urban Development Corporations,* SAGE

Kraay J., 2004, *The NetherlandsTransportation and Transport Plan: Road Safety With a Special Focus on Speed Behaviour,* ICTCT WorkshopNagoya

Newman P., Thornley A.,1996, *Urban Planning in : International Competition, National SystemsEurope,* Routledge

Sieber N., 2001, *Spatial and Federal Transport Planning in Germany: How to Implement Spatial Planning Goals Into Federal Transport Plans,* 9th WCTR Conference inSeoul, Korea

Taylor N., 1998, *Urban planning theory since 1945,* SAGE

ADDRESSES

http://www. atticaeast. gr

http://www.egnatia.gr

http://www. observatory. egnatia. gr

http://www.aia.gr

http://www.vima.gr

http://www.kathimerini.gr

http://www.wikipedia.com

http://www.aodos.gr

http://www.nada.gr

http://www.yme.gr

http://www.minenv.gr

http://www.aia.com

http://www.greekinsight.com

http://www.olp.gr

http://google.com

http://www. skyscrapercity. com

http://www. arena-boulevard. nl

http://www. daniel-libeskind. com

http://www.dac.dk

http://www.wikipedia.com

http://www. danube-research. com

http://ec.europa.eu

http://www.skai.gr

http://www. ses. gr