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Lack of Integration between Land Use and Transportation Planning in Greece Impacts on space and methodology of future integration

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Abstract

The importance of urban planning towards achieving a sustainable built environment is paramount although it is not the only factor. Through transportation planning cities achieve environmental goals as well. This paper examines the paradigm of Greece and how the lack of integration amongst these tools impact cities and space.

The study examines the relationship between land use and transport and how they interact in shaping the built environment. Moreover, there are highlights of the impact urban planning has of existing roads and how new roads impact existing land uses.

For this reason, proposed guidelines for the creation of that framework which will address land-use planning and transport as a single system, addressing more effectively the impact on urban space by the lack of coordinated urban and circulatory planning, creating a sustainable urban environment that respects the citizen – user.

Key words: *Urban Planning, Transportation, Integration, Sustainable Urban Mobility*

Introduction

The paper explores the great differences in the approach of spatial design in Greece on two serious issues that affect modern society: A) the city and what it expresses as a template for the development of human activities and B) transport and transportation.

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

This study will present the impact of movements on the formation of the urban environment, the context in which movement planning (traffic planning) and urban planning in Greece are implemented. The impact of the lack of coordinated planning on urban space and changes in strategic planning directions will be examined.

An effort is also being made to highlight the way in which the combined implementation of urban and traffic 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 basic principles of spatial planning formulated by the Ministry of environment, which adopt as a basic development tool the investment in road infrastructure. The basic consideration is that in the short term a single reference and planning center for urban and traffic planning should emerge.

Relationship between Land Use and Transport

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.

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:

1. Economic
2. Administrative
3. Spiritual
4. Social
5. Tourist
6. Transport.

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). 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. 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 wasted by residents on movements will be minimal". Urban movements create severe problems. as in many cases they follow the layout of a medieval mast, not designed for car traffic. Thus, many negative derivatives are created such as traffic, air pollution, noise and others that contribute to a significant extent to the degradation of the quality of life of the inhabitants (Vlastos, 2006).

Urban planning is the tool in the hands of the responsible agencies for the development and operation of cities, to give the form to the city that will optimize the quality of life of the residents.

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

The Role of Transport Networks in Spatial Integration

The European Union seeks to complete a single transport system, as it recognizes 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).

Transportation projects with Spatial Impact in Greece

Egnatia Odos

The construction of the Egnatia Road, and its perpendicular 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:

1. Change in land use:
2. Change of urban land.
3. Change of industrial and commercial land in the axis zone:.
4. Establishment of businesses:

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 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. (Source: Egnatia Observatory, 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 from the change of agricultural land to 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%. 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%).

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)

Change of Industrial and Commercial Land

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

1. 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 region of Komotini there was a decrease of 14%.
2. 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).
3. 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 region 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)

Attiki Odos

Attiki Odos is a modern motorway 65 km long. It is the ring of the wider metropolitan area of Athens and the backbone of the road network of the entire Prefecture of Attica. It is a peri-urban multimodal transport axis that connects the metropolitan area of Athens with the Athens International Airport.

Land uses, before the construction of the motorway, in the area were different for each adjoining municipality and this resulted in a strong unevenness of the urban fabric and the installation of incompatible uses on neighboring plots. Moreover, many areas were unstructured mainly next to the axis of Attiki Odos, and offered a very attractive ground for investment. The environmental impact study of Attiki Odos explicitly states that they are expected to be formed significant changes in land use, 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 of a commercial nature, with the installation of large-volume department stores. Moreover, the creation of the motorway also gathered office uses in road signs.

The allocated land uses, create an unplanned and arbitrary residential development, which is concentrated in the zone around the major roads and creates many problems in the future planning of the area. (Serraos, 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 traffic and in the urban planning sector. (Serraos, 2001)

The Suburban Railway and Spatial Impact

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 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)

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. A study by Trademco (2008) estimates an increase in the flow of movements (productions and pulls) by +30% for each local authority in the Basin with the implementation of the Suburban Railway.

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

MUNICIPALITY	2001		2004		2010		2020	
	Population	Employment	Population	Employment	Population	Employment	Population	Employment
Ag. Theodoroi	7753	4186	8433	4432	10024	4992	12740	5996
Vathi	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
Chalkida	75234	24985	79429	26465	85870	28905	96989	33198
Total	199972	77204	212606	81690	289260	90429	274248	104879

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)

Effects on the road network of urban development

In order to serve the routes of the users of the 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)

Thus, it is observed that the relationships between land use and traffic 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 traffic demands that are addressed by the construction of new transport infrastructure.

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 traffic 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 traffic and pollution will worsen. (Maratou, 1992)

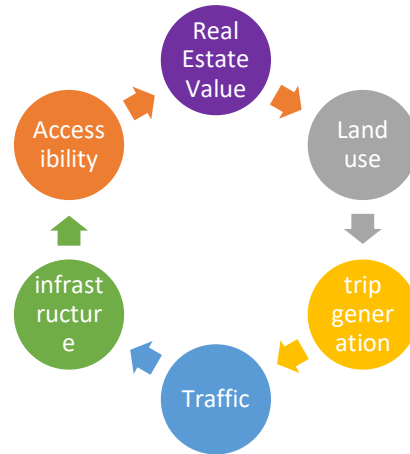


Diagram1: Circular Relations of Land Use and Transportation (Maratou, 1992)

Urban Planning in Greece and Integration of Transportation Planning – Existing Conditions

Law 1337/83 when it was passed was characterized as "transitional" was the basic legislative framework of urban planning until today. 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.)

Therefore, in this law, there is a deterioration of the traffic 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 traffic 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.

With Law 2508/97, which came in to replace 1337/83, there is no substantial effort to link urban and traffic planning, and the structure of movements in urban space is not treated with the gravity that it should.

From the above presentation of the legislative framework of urban planning in Greece, it is found that traffic 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 traffic loads. The only text that examines the importance of traffic 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 traffic planning, as many other factors, both urban and traffic, are overlooked.

Conclusions

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

The creation of new, unified urban and traffic 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:

1. The relationship and interaction of roadside uses with the road artery and its function.
2. Their service from the main road network and accesses to it.

3. Their service by public transport.
4. The forecast of traffic loads on the main axis.
5. The degree of their saturation.
6. Securing the required parking spaces and checking parking in the roadway.
7. The creation of roadside free spaces and side streets on either side of the axis and
8. The definition of traffic 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 traffic planning studies are perhaps the most important factor for achieving the implementation of integrated urban and traffic planning, with the aim of reducing the negative impact on urban space..

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