

## The Qualitative Development of Land Use Structures

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### 1 ABSTRACT

Land uses constitute one of the main parameters that define the urban web. They are constantly mutating through time, as their type, size and position in the city is concerned. These changes affect and simultaneously are affected by the rest city's elements defining its total function. The question that arises is if these land uses changes are not only quantitative but at the same if they are qualitative developed leading to city's optimal function.

The current paper will investigate the changes of land uses regarding their kind, size and position and the structures they create as they exist in the city. As the word quality means the structure of the being's elements, the qualitative development of the city's function will result from the evaluation of the kinds of structures that are created regarding the land uses that constitute them and their changes through time.

The evaluation of the qualitative development will result from

- the investigation of urban functions structures as they are changing in the last twenty years in Greece's capital and
- the research of their allocation in the Athenians basin in order to evaluate the service that is provided in the city's total.

### 2 THE DEFINITION OF QUALITATIVE DEVELOPMENT

The research of qualitative development includes the investigation of quality and the way its development is realised in a geographical phenomenon. The research attempts to investigate with the use of a quantitative method, the reveal of qualitative development focusing on land uses structures. It will examine the meaning of quality, development and the way qualitative development can be revealed in land uses structures that are created through time as they function in the urban web.

#### 2.1 The definition of quality

The definition of quality has been examined from the ancient years. The opinions that have been formulated differ as some philosophers believed that quality is a product of human thought and others that it is a content of matter. Aristotle has supported that quality is one of the ten main characteristics of every being while Kant said that quality, as well as form, quantity and relation are the four forms of knowledge.

According to dictionaries, quality is the total of the matter's characteristics that make it different from its similar. The most characteristic definition about quality is the one that was formulated by Spirkin in which he defines that quality is the internal definition of the basic elements of matter. It defines its internal and external form and its similarity or difference with other matters (Spirkin, 1971).

From the research of quality results that it constitutes a structure where the composing parts are the matters attributes that are continuously creating altering relations (Marcuse, 1941). The attributes constitute the necessary characteristics of the beings that possess them. But there are not only the attributes that define the quality but also the relations that are developed between these attributes.

As quality is the structure of the matter's attributes it should be pointed out that it has the three basic elements that according to Piaget every structure has the following characteristics (Piaget, 1970).

Wholeness –every structure is composed by elements based on their relations. In the city the relations that are developed between the land uses define their structure. The activities “obey” in the rules that ensure the city's total function. These rules are not only necessary for each activity's function but for the total city's function as well.

Transformation- all the structures are systems of transformation that result from their functional rules. The land uses structures are continuously transforming not only quantitatively but also areally. Any change in one land use consequently leads to changes of different intensity in the rest city's uses.

Self-regulation - it involves the maintenance of the structures composition.

Deductively the quality of land uses structure in regard with the quality of matter is shown in figure 1.

Matter	Land uses structure
Attributes	Land uses
Quality of matter	Component of land uses
(total of the matter's attributes that are related)	(total of land uses that create structures as they are related)

Fig. 1: Quality of matter and quality of land uses structure.

## 2.2 The definition of qualitative development

The development is the change in time that is realised through the passage from a state A to a state B. It is a result of two procedures:

- The differentiation, in which the attribute is creating new structures and it is defined by the relations it develops with the other attributes and,
- The integration, in which the attribute creates new structures with better relations.

This procedure is the development that is constantly mutating until a balance between the attributes relation is achieved as a result of quantitative changes that finally lead to qualitative changes. When a geographical phenomenon is realised, it needs a comparison through time to investigate if development has been achieved.

So, the process of qualitative development is the cancellation of the old quality and the creation of a new one that has better structure. As far as land uses are concerned the qualitative development of land uses will be examined through the comparison of the old land uses structures with the new land uses structures, regarding their composing activities and the relations they develop. This examination will lead to the evaluation if the changes that have been taking place have resulted to a qualitative development.

## 2.3 The quantitative research of qualitative development

The structures of land uses will be revealed with the use of Principal Components Analysis. This statistical technique reveals the structures of the variables that are inserted in the Analysis, which in our case are land uses. The Components that are extracted from this Analysis are the land uses that are expressed in a linear form, show which land uses are areally and simultaneously functionally related and constitute the qualities of the current research. The rotated component matrix that results from this analysis shows the land uses that are included in each component. Finally the kind of rotation that is chosen is varimax rotation which allows the best thematic and areal correlation of land uses.

The qualitative development will be examined in two levels. Initially, in thematic level the research will examine the shaped land uses structures that have been recorded in 1978 and in 2001 in Attica's basin. From this comparison it will result if qualitative development has been achieved. Then in second level the areal forms and positions of these structures will be compared and they will be evaluated with the criteria of the accessibility, level of service and kind of distribution they provide in the city's total function.

## 3 THE QUALITATIVE DEVELOPMENT OF LAND USES STRUCTURES IN ATTICA'S BASIN

The research will initially examine the structures that were shaped in 1978 in Attica's basin and their areal forms and positions. Then it will examine the corresponding elements of 2001 and finally it will proceed to the evaluation if qualitative development has been achieved.

### 3.1 The land uses structures in Attica's basin in 1978

From the census that had taken place in 1978 it is concluded that Attica's basin concentrated the majority of employment and population. Employment had been distributed in 38 different functions (the specialization is bigger but the current research will use these 38 categories) and the retail trade and manufacture concentrated the majority of employees while banks and transports had the biggest enterprises. It was the time the big industries were leaving the cities not for environmental reasons but for expenses reduction and only small sized units remained. The question that arises is how these small enterprises that are recorded in



Attica's basin are allocated, what structures they create and what are the areas they prefer and the forms they make as they function in the basin.

The records from the employment in the economic activities that were functioning in Attica's basin in 1978 and were inserted in the Analysis have revealed that these functions were grouped in four components-qualities (Fig. 2). These qualities are composed by many and different activities.

The first quality is composed by eleven activities that are relevant with trade and services but also industries that create clothes and paper. The co-existence of these activities was a frequent phenomenon in the Attica's basin as it served the function of these activities. The manufacture created the products, that were sold in the retail stores, creating centers which simultaneously attracted and other activities, as offices, that needed to be in areas with costumers. The composing parts of this component-quality in some degree are also created not only because they are functionally related, but because they are functioning in a better way when they are allocated in certain central city's parts.

The second and the third quality have elements that are incompatible as industries co-exist with insurances while often restaurants are close to storages and carrier means manufacture. The explanation for this phenomenon is the fact that until the examined chronology no legislation restrictions or urban planning laws directed the enterprises allocation but they were allowed to function anywhere in the urban web. As for the fourth quality it concentrates industrial activities, elements that have similar needs (import of materials, export of products) and are functioning relatively (timber industries provide materials to furniture industries).

THE QUALITIES OF ATTICA'S BASIN IN 1978	
Component	Economic activity
Trade and manufacture	Wholesale Trade
	Clothing and footwear Industries
	Brokers and representatives
	Rest Industries
	Transactions of Affairs
	Retail Trade
	Leather and furs Industries
	Publications
	Personal Services
	Paper Industries
	Medical and Sanitary Services
Mixed uses	Insurances
	Oil industries
	Mobile Renting
Mixed uses	Transports
	Renting
	Restaurants and Hotels
	Banks and rest Economic Institutions
	Manufacture of Carrier means
	Storages
	Services of Recreation and Culture
	Communications
	Services of Hygiene and Cemeteries
	Industries
Industries of not metal mining products	
Textile Industries	
Industries of Furniture and goods of furnishing	
Industries of Timber and Cork	
Manufacture of metallic products	
Chemical industries	
Basic Metallurgic Industries	
Industry of Food except drinks	
Wholesale trade of Litter and Clippings	
Drinks Industries	
Manufacture of machines and appliances	
Manufacture of electric machines, appliances and remaining tyres	
Tobacco industries	

Fig. 2: The qualities of Attica's basin in 1978.

As for the allocation of the 1978's analysis qualities it is realised that trade and manufacture are concentrated in the two big municipalities (Fig.3 A is Athens and B is Pireus port) while the rest three qualities are dispersed in the basin with some intense condensations in the east traditionally industrial areas (Fig.4,5). It must be pointed out that residence is recorded in all basin so all these functions co-exist with residence

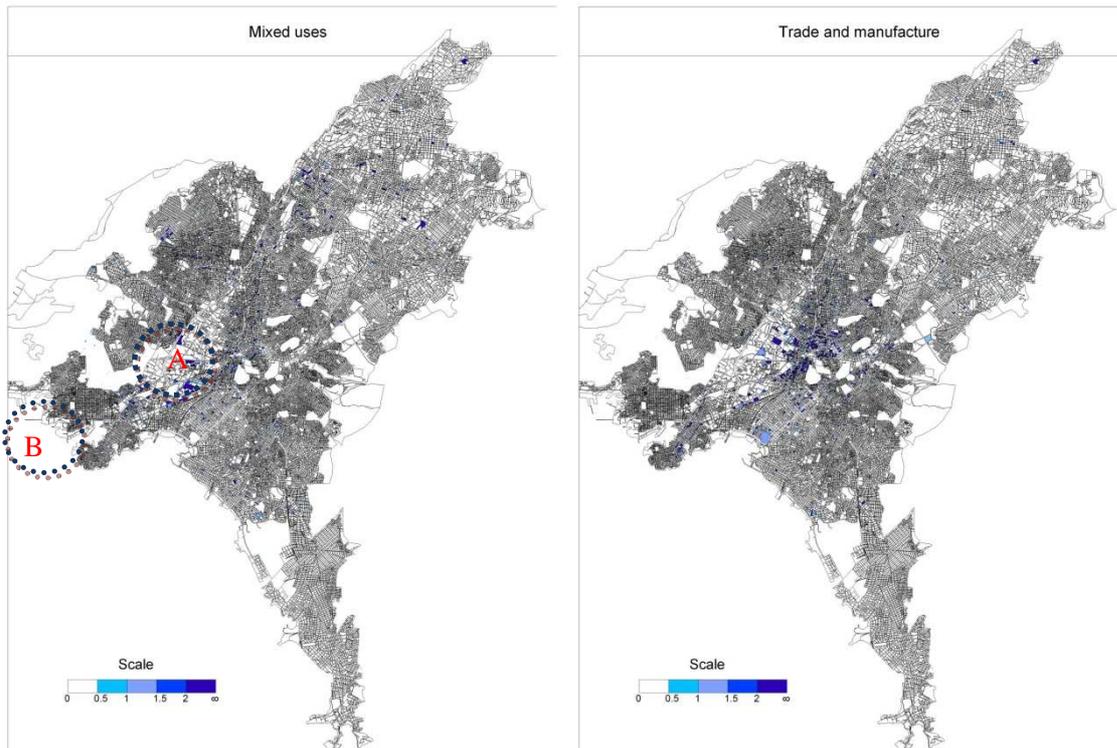


Fig. 3: Trade and manufacture in Attica's basin in 1978. Fig. 4: Mixed uses in Attica's basin in 1978.

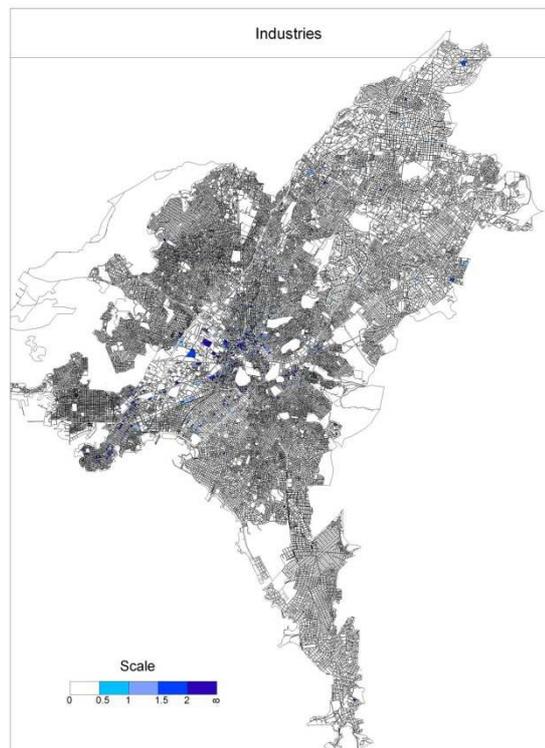


Fig. 5: Industries in Attica's basin in 1978.

### 3.2 The land uses structures in Attica's basin in 2001

Since 1978 the basin's population and employment was continuously increasing and from the middle of the 90's it is stabilising with a very small reduction. Meanwhile, planning has discouraged the manufactures that pollute the environment but it has also allowed land uses mixture with a degree that aims in intense mix of all

land uses except the ones that cause noise and pollution. The majority of employment is recorded in the tertiary sector and the employees in manufacture are reduced.

The examination of the activities structures that have been created according to the 2001 census shows that five qualities are revealed (Fig. 6). The first quality concentrates the majority of activities. It is composed by manufacture, constructions, trade, hotels and other incompatible activities. Some of this quality's elements are functionally related while others seem to take advantage of each area's characteristics. The second quality includes central business district functions as it is composed by supralocal activities that require accessibility. The third and the fourth quality are composed by manufacture activities that are functionally related and "prefer" areas with low land prices. Finally it is characteristic that the fifth quality includes only transport activities, fact that shows that some activities create specialized structures.

THE QUALITIES OF ATTICA'S BASIN IN 2001	
Component	Economic activity
Constructions, trade and services	Constructions
	Clothing manufacture
	Hotels and restaurants
	Retail trade
	Manufacture of metallic products
	Furniture manufacture
	Recreation, cultural and athletic activities
	Travel agencies
	Food manufacture
	Publications
	Transport
	Administration and social services
	Other services.
	Textile manufacture
	Trade
	Plastic equipment manufacture
	Timber manufacture
	Paper production
	Basic metals production
	Leather production
Organisations	
Central business district	Finance organisation
	Education
	Health
	Information technology and relevant activities.
	Post offices and telecommunications
	Insurances
	Air transports.
	Chemical goods production
Rentings and manufactures.	Equipment renting
	Tobacco production
	Oil and fuel Production
	Vehicles trade
	Research
	Computer production
	Real estate
Manufactures of engines	Production of engines
	Medical tools production
	Electric engines production
	Manufacture of equipment
	Cars production
Transports	Water transport
	Manufacture of of transports equipment.

Fig. 6: The qualities of Attica's basin in 2001.

The areal distribution of the five qualities is shown in figures 7-11. The first quality appears with intense condensation in the central area of the basin where intense residence is also recorded in 2001 and it is less intense in more distant from the centre areas (Fig. 7). The second, central business district quality is concentrated on main road axes that "begin" from the centre of the basin and cross it towards all directions except the east industrial area (Fig. 8). Finally the three rest qualities are almost uniformly distributed in the basin's area. The fact that the central activities as trade services and offices are concentrated in the center shows that the aim of multi-centric development has not been achieved while the fact that the rest qualities are uniformly distributed is a sign of satisfactory service in local level. Finally the fact that groups of incompatible activities are concentrated in the basin's center is evaluated negatively as functions as manufactures of plastic and timber overload the environmentally congested central area.

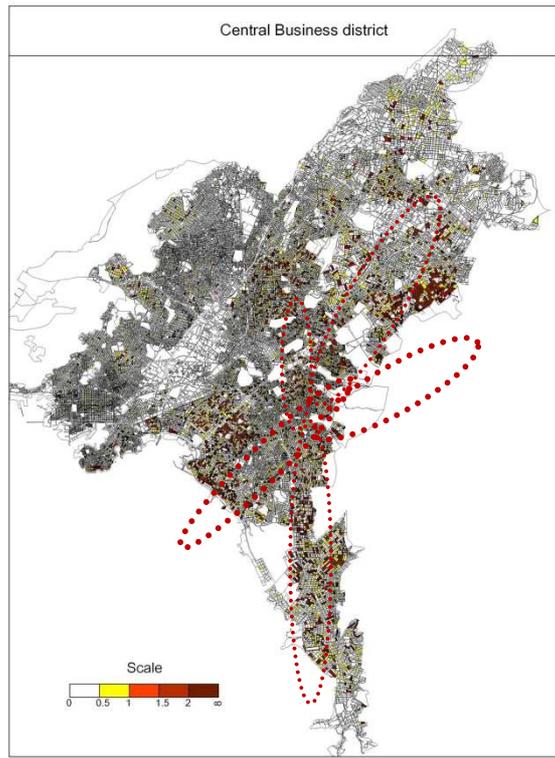
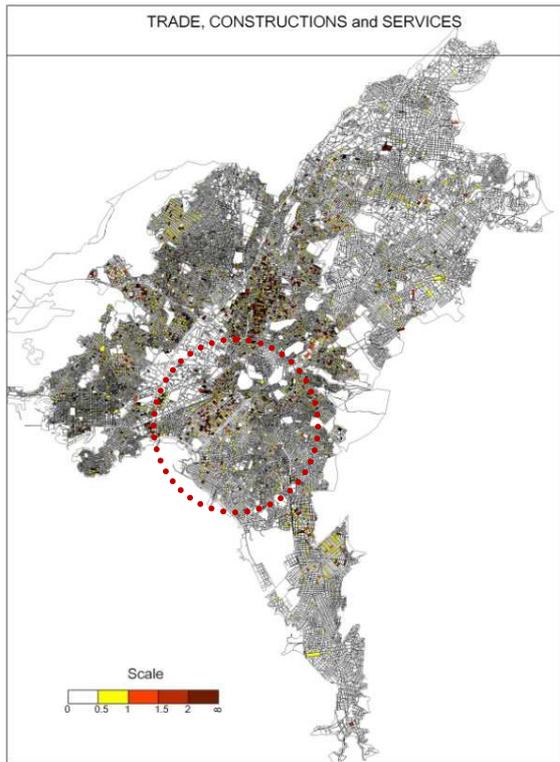


Fig. 7: Trade, constructions and services in Attica's basin in 2001. Fig. 8: Central Business District in Attica's basin in 2001.

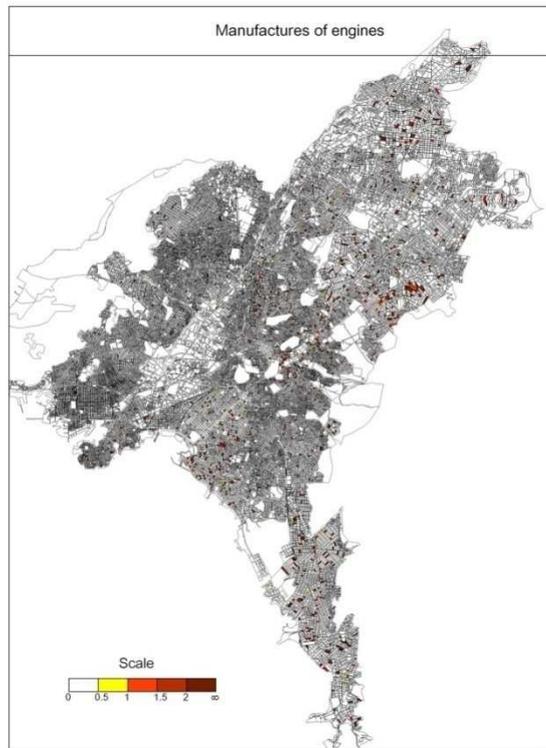
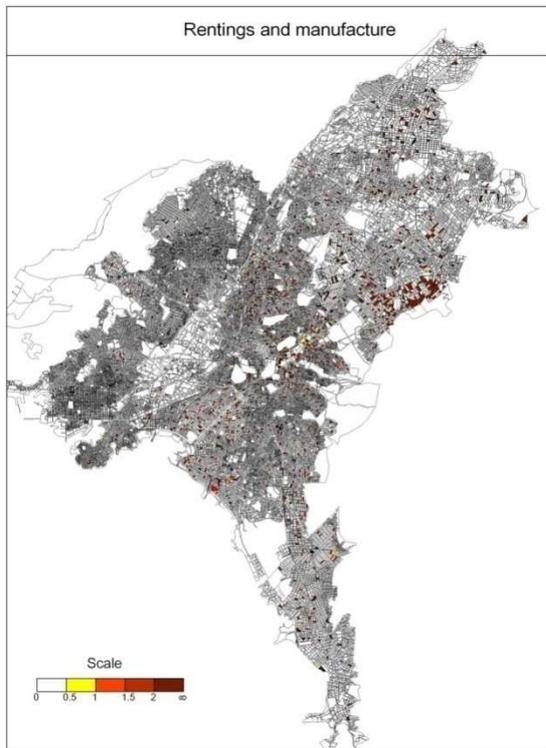


Fig. 9: Rentings and manufacture in Attica's basin in 2001 Fig. 10: Manufactures of engines in Attica's basin in 2001.



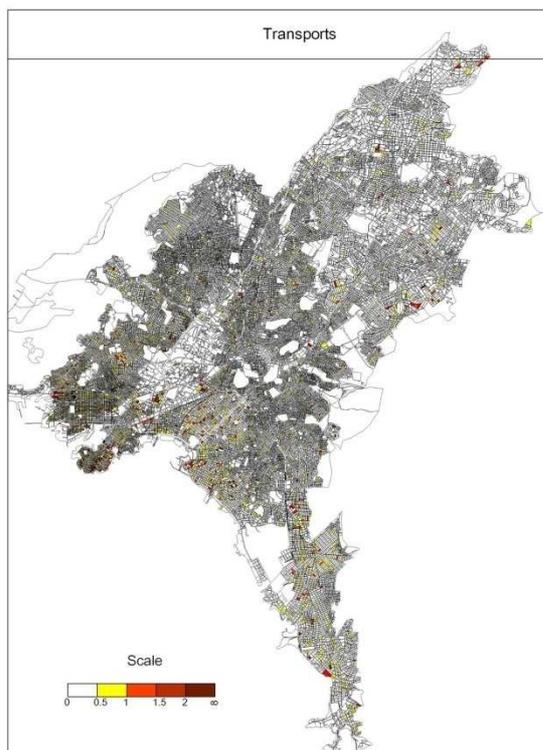


Fig. 11: Transports in Attica's basin in 2001.

#### 4 CONCLUSION

The aim of the current research is the investigation of the qualitative development of land uses structures with the use of a quantitative technique. The case study is Attica's basin the most populated area of Greece. The quality of land uses structures has been revealed by the reveal of the components, the combination of land uses that areally co-exist in the urban tissue.

The research has shown that in Attica's basin, the development of land uses structure has up to a point been achieved. As for the structures that the activities have created during the examined period, some of them have been qualitatively developed, as they are composed by compatible activities that develop functional relations and others have remained, as they are shaping groups where small manufactures co-exist with schools. It is obvious that urban planning does not seek for zones of certain activities and that land uses have to be mixed in order to create livable cities. But when this mixture is thoughtless and market forces create structures based on the highest possible profit then it is concluded that restrictions should be imposed.

Simultaneously the fact that some land uses structures are uniformly distributed serving the total of the city, while others that contain activities that pollute, appear with intense condensations in the basin's center shows that the qualitative development of land uses structures has not been achieved. Legislation has up to a point influenced this development as it has some restrictions especially in the allocation of industrial uses but it also provides freedom for the rest land uses to be allocated in the majority of urban web.

It results that Urban Planning must focus on the particularities the cities have and the parameters that shape city's development and propose specialized solutions in order to achieve the best urban function that will lead to the city's citizens best living conditions.

#### 5 REFERENCES

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