The Morphological Characteristics of the Block Structure in Central Areas

By

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ABSTRACT

This thesis aims to introduce the fundamental role of the block structure in formation of the urban fabric, and with the aim to develop an alternative method for optimum conditions of the block structure, unlike the formation methods of the 'Development Regulation'. Block structure refers to arrangement of the plots, buildings and spaces within the building blocks. So, this thesis revealed the importance of the appropriate formation of the block structure to form the urban space creating the urban vitality in central part of the city. In order to achieve these aims, urban fabric, urban space, block structure, and streets are defined with their components to understand the scope of the study. After that, the existing conditions of the urban planning techniques are mentioned to expose the formation methods of the current applications. Then, the design criteria, which are selected in the literature survey, are introduced to well-adjusted design conditions of the block structure arrangement. Within this framework, the design methods are designated to analyze and design the optimum formation conditions of the block structure. Finally, these design methods, which are defined as 'Comparative Study', 'Typo-Morphological Approach', 'Figure-Ground Theory', 'Density Distribution Model', 'Natural Lighting Assessment Method', 'Urban Design Guidelines' and 'Urban Coding', are used to suggest a conceptual model for an alternative size and form of the block structure, in contrast the existing conditions of the case study area with the aim to evaluate the determination process of the optimum conditions.

Key Words: Urban Fabric, Urban Form, Block Structure, Plot Pattern, Building Structure, Network, Building Density, Design Criteria, Urban Morphology, Urban Design Guidelines, Comparative Study.

ÖZ

Bu tezin amacı, kentsel yapının oluşumunda yapı adasının temel rolünü ve mevcut imar mevzuatının tariflediği yapılanma yöntemlerine alternatif olabilecek bir optimum yapı adasının oluşum koşullarını ortaya koymaktır. 'Block Structure' kavramı yapı adalarının içerisinde yer alan parsel, bina ve mekanların düzenlenmesi anlamında kullanılmaktadır. Dolayısıyla, bu tez kentin merkezi alanlarında, kentsel canlılığın yaratılabilmesi için yapı adalarının uygun koşullarda yapılandırılmasının önemini açıklamaktadır. Bu amacın gerçekleştirilebilmesi için, kentsel yapı, kentsel mekan, yapı adası, ve yol kavramları ve bunları oluşturan öğeleri birlikte tanımlanmakta ve bu şekilde tezin kapsamı açıklanmaktadır. Bu tanımlamanın ardından, yapı adasının oluşumunda mevcut uygulamalar ortaya konulmakta ve mevcut planlama tekniklerinden bahsedilmektedir. Daha sonrasında, yapı adasının uygun koşullarda oluşumu ile ilgili tasarım kriterleri anlatılmaktadır. Bu çerçevede, yapı adasının optimum koşullarının belirlenmesinde analiz ve tasarım üretimi için kullanılabilecek tasarım yöntemleri tariflenmektedir. Sonuç olarak, 'Karşılaştırmalı Analizler', 'Yapısal Tipolojik Yaklaşımı', 'Figure-Ground Teorisi', 'Bina Yoğunluğunun Dağılım Modeli', 'Gün Işığını Değerlendirme Metodu', 'Kentsel Tasarım Yönetmelikleri' ve 'Kentsel Kodlama', çalışma alanın mevcut koşularına ilişkin alternatif bir yapı adası formu ve büyüklüğü seçiminde kullanılmak üzere tanımlanmışlardır.

Anahtar Kelimeler: Kentsel Yapı, Kentsel Form, Yapı Adası, Parsel Dokusu, Binalar, Altyapı, Bina Yoğunluğu, Tasarım Kriterleri, Kentsel Morfoloji, Kentsel Tasarım Kılavuzları, Karşılaştırmalı Analizler.

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CHAPTER 1
INTRODUCTION:

1.1 Problem Definition

The practice of urban planning is argued to be unsuccessful in creating a healthy urban environment both in terms of its methods and ineffective use of these methods during the implementation process. This situation, also, causes a handicap for the creation of a qualitative urban space which is one of the main concerns of urban design discipline.

Urban planning is considered to be a tool of modernist thinking for the physical arrangement of urban fabric. The critics mainly point on the ill-effects of monotonous and standardized built environment created by the modernist planning methods. Associated particularly with the ideas of Le Corbusier, the built environment composed of high-density mega-structures surrounded by wide open and green areas are criticized as they result with the loss of urban space, isolation of land uses and lack of urban vitality. In modernist approaches, urban planning deals only with the spatial allocation of land uses and determination of an urban form based on minimum urban space standards and maximum construction density and by reason of, aims to provide a rapid urban growth and minimize the construction costs.

Modernist planning principles and the urban space shaped according to these principles have also been criticized by theorists and researchers of urban design particularly after 1960's. They propose to replace a mechanistic urban space understanding with an approach which given more importance to human needs. Accordingly more concern is given to the creation of an urban space which provides fine grain for all kinds of urban elements and takes into consideration of perceptual and visual needs, variety and vitality. As stated by Jane Jacobs (1994), in order to form an urban life before individualization, there is a need to provide a public life and mixed-use instead of separation of land uses.

While making evaluations on urban physical structure, urban designer mainly focus on the main elements of this structure. They identify two main components of urban physical structure as block structure and streets. With in this frame a redefinition

of the optimum requirements of these elements – block structure, streets and public spaces – becomes important for the arrangement of these elements and urban space.

Urban design literature includes many studies related to identification and arrangement of urban fabric and its components. However, these studies cover general concepts and there is a need for a re-evaluation of these concepts in terms of local characteristics. Adaptation of the broad methods of planning and design to a specific space becomes a more complicated problem for a country like Turkiye which lives a rapid and uncontrolled urbanization. In Turkiye, the complexity of existing structure, insufficient and ineffective tools for implementation of planning decisions, interventions of policy-maker and public demands towards high-density building rights make the spatial arrangements more problematic. In this respect, the problems related to formation of urban fabric and its elements of this structure – block structure and streets – in Turkiye can be briefly classified as:

1) The form and size of buildings are insufficient to meet the needs of people. The in-use spaces of the buildings are improper in terms of size, natural lighting and construction quality.
2) The plot pattern formed within the block structure is subject to private ownership and therefore is not open to public use. This pattern especially in central parts of the city reduces the ground floor use which is worth for commercial uses. Moreover, the gardens formed around the buildings through the type of organization are not wide enough even for the buildings' users and soon these gardens transform into useless vacant spaces.
3) The form and size of the block structure and plot pattern restricts an effective vehicular and pedestrian circulation. Vehicular traffic arrangements cannot provide a contiguous system and propose lots of functions because of the existing conditions. On the other hand, in terms of pedestrian circulation, a safe and contiguous fine-mesh circulation pattern cannot be provided.
4) The deficiencies in circulation pattern create problems for the formation of public spaces and squares and for the provision of their properly use. Efficient and active public spaces cannot be formed.
5) Considered in the third dimension, the standards brought about the fine-grain and urban aesthetics are not successful. The criteria, regulation and planning methods on this subject cannot be fully determined. As the solutions in the third dimension mostly depend on individualistic and architectural preferences, urban fabric turns to be a collage of discordant buildings.

6) Speculative expectations and high density construction demands on the built environment have all of the above problems to a more crucial point. There is an increasing tendency towards re-arrangement of block structure by amalgamation the plots and constructing high-density buildings or building groups on them without changing the boundaries of block structure and street pattern. This new process prevents to form a fine-grain of solids and voids and volumes on urban space. Moreover the increasing density, in the future, may prevent to make new re-arrangements on urban space.
7) In addition to the problems related to urban physical structure, another problem is that local conditions are not considered within the planning and design methods. Development regulations defined in terms of specific standards, bring restrictions even for the sites which approaches which will be in accordance with the existing conditions and in which local characteristics will be included in the planning and design processes.

Consequently, today many countries face with the problems related to the formation of urban fabric. These problems are either about the construction principles or about the deficiencies during the implementation process. On the other hand, there exist a vast amount of literature including both theoretical debates and researches related to the implementation. However, more concern has to be given to the development of new approaches concerning the block structure – as one of the components of urban physical structure – and to the buildings, plots and interior block circulation – as elements of block structure. There is a need to describe a how building form which will not only shape or re-shape block structure through re-organization of ownership pattern but also will be of help to the formation of public space.

1.2 Aim of the Study

The main aim of this study is to discuss the possibilities of the description of an optimum block structure form and size to make a spatial arrangement which will provide urban fine grain and increase place value on urban space by taking into consideration of the concepts and debates found in urban design literature. For the description of this new structure, it is aimed to describe design criteria related to block structure and its components as building structure, plot pattern, land use pattern and interior-block circulation elements and to determine the spatial arrangements based on these criteria and to develop methods in this respect.

In order to reach to this aim of the thesis some objectives must be determined to expose the scope of the study. These objectives could be mentioned that well-designed urban form, which is vital, sensible, well-fitted, accessible, well-controlled and efficient urban spaces with in justice, as Lynch (1994) defined, to create a place value in urban spaces. Therefore, there is a need to determine an optimum block structure form and size which is functional, well-adjusted with its surroundings, which will create variety and increase circulation possibilities.

Arnis Siksna's works (1995, 1998) has been an important reference for this study. He made analysis in American and Australian cities concerning with the optimum form and size of block structures based particularly on the most effective allocation of pedestrian and vehicular circulation. He described an optimum block structure through analyzing the transformation and amalgamation of block structures or separation of them by new streets and changes in plot pattern since the initial planning efforts of the city. Based on these analyses he came to conclusion as: "a circulation mesh ranging from 80 m. to 110 m. can be regarded as an optimal provision, because cities with coarser initial meshes have progressively evolved towards such a mesh size, at least in the areas of greatest pedestrian activity. Sometimes a still finer pedestrian mesh, from 50 m. to 70 m. spacing, has emerged in intensively used retail blocks." (Siksna, 1998: 278)

Besides this work of Siksna (1995, 1998), Jacobs (1994), Jo (1998), and Montgomery (1998) emphasis the importance of the pedestrian circulation for urban vitality and criticized the emphasis on vehicular traffic. In order to increase the pedestrian circulation, they put forward the need not to make large block structures and long buildings.

These two group's statements on the form and size of block structure highlight the need to question the effects of determination of an optimum form and size on urban fabric, in contrast for current planning practices. Therefore, within the frame of this study, depending on the objectives stated above that formation of the block structure is discussed and optimum conditions are determined by taking into consideration Turkiye's circumstances.

1.3 Context and Method of the Study

Within the frame of this study, it is attempted to constitute the optimum conditions of the form and size of the block structure, based on to a conceptual model. This model is constructed according to the design criteria discussed in urban design literature. For the purpose of defining and evaluating this model, two kinds of method should be necessitated as below:

1) Theoretical Background: Literature survey is carried out to provide constitution of the theoretical background. Urban fabric, block structure and its components are defined and design criteria are interpreted, and then, theories and investigations are clarified.
2) Case Study: As the case study, the design criteria and design methods defined within the theoretical framework are evaluated and interpreted on a case area. The case area is determined as Alsancak District which is located within the central part of the city of Izmir. Finally, a conceptual design scheme presenting an alternative arrangement of block structure is proposed.

There are two reasons to be mentioned for selection of central part of the city, which is below:

1) There are some deficiencies in the definitions of design concepts. These deficiencies stems from the great variety of the conceptual discussions in urban design literature about the formation of the urban fabric. When the variety of functions, economic and social conditions and local characteristics are taken into consideration, designation of the block structure and its components are subject to more comprehensive discussion. Therefore, with the aim to set a limit to the scope of the study, the emphasis is given to morphological characteristics of the central part of the city.
2) As literature survey demonstrates, central part of the city is the most vital places of urban life. So, it is the adequate places to emphasize the importance of the public space and its quality. The efficiency of the commercial and business activities, also related with the increasing of the urban vitality.
3) Central part of the city has a contiguous transformation process and development process. These transformations provide a base for the generation of new ideas and methods to solve the problems.

The definitions on the urban fabric and its physical components and determining the design criteria are discussed a comprehensive scope. So, this theoretical background must be described and synthesis according to thesis statements. For this reason, concepts of the urban fabric, urban form, and urban space are defined, and then, the physical components of the urban fabric are described. These descriptions give the general framework of the thesis components, and expose the interrelation of them, which affect the formation process of the optimum block form and size.

The scope of the thesis includes the evolution process of the block structure and its components and street pattern to understand the factors of the formation process in time. It is also important to evaluate the current conditions of the urban fabric from the historical background. For this purpose, the formation and development of the block structures and street patterns are explained briefly in the periods of history. Especially, the definitions of the physical characteristics of the urban fabric, in modernism period have an important role by mean the formation of block structure. Also, anti-modernist approaches are defined which intensify the human needs and its effect on the formation of urban fabric and its components.

There are some problems of the formation process of urban fabric and block structure in recent conditions. These current problems could be understood with exposing the factors and planning criteria which determined the planning and design procedures and practices. For this purpose, at first the factor effecting the planning procedure are explained and then design criteria are exposed to be make design process adequate for formation of the block structure. These factors could be mentioned as below, which are to determine the planning and implementation process.

1) Decision making mechanism and actors
2) Existing conditions of the planning area
3) Current legislative framework
4) Current planning methods.

After the description of the planning procedure and its factors, the urban design criteria are interpreted from theoretical background, and compared with the problems of the case study. So, the design criteria are discussed and their features area detailed within the sections. (Figure: 1-1) These are mentioned as below:

1) Spatial structure refers to two and three dimensional framework of the physical components. These are consisting of the density of the urban fabric with their size, height and volume. These dimensions are formed according to different methods, as density control, height control, setback distances for plot and building arrangement. So, these methods and features of the arrangement are mentioned with their general idea for formation of urban spaces as fine grain, human dimension and traditional values that related to architectural values.
2) Functional features are mentioned as the making better places to in terms of adequacy for people use. So, the functional criteria of the designing block structure should be provided these conditions. Especially, criteria are important to create for public life and circulation in places. These criteria are the determinant factors of the vehicular and pedestrian circulation and land use distribution.
3) Environmental design features of the design criteria aim to provide comfortable conditions within the public spaces and also, private spaces and buildings. These design criteria can help to make conditions more adequate for all elements of the urban fabric. So, the formation of the block structure and its components greatly interrelated to these criteria both the public uses and private uses in urban areas.
4) Perceptual components are consisting of a series of features which are defined by responsive environment concept. These design criteria are related with the human perception producing the sense of place. This concept has become important since 1960's and affected the physical arrangement methods. So, these criteria are mentioned and selected to be appropriate in according to formation process of the block structure.
5) Visual elements of the process are included personal feelings of the observers who are passing into the places. These feeling caused the different expectations for observer. Therefore, the visual elements and its design criteria related with the basic design rules. The aesthetic features of the urban design affect the architectural style of the block structure and its components.

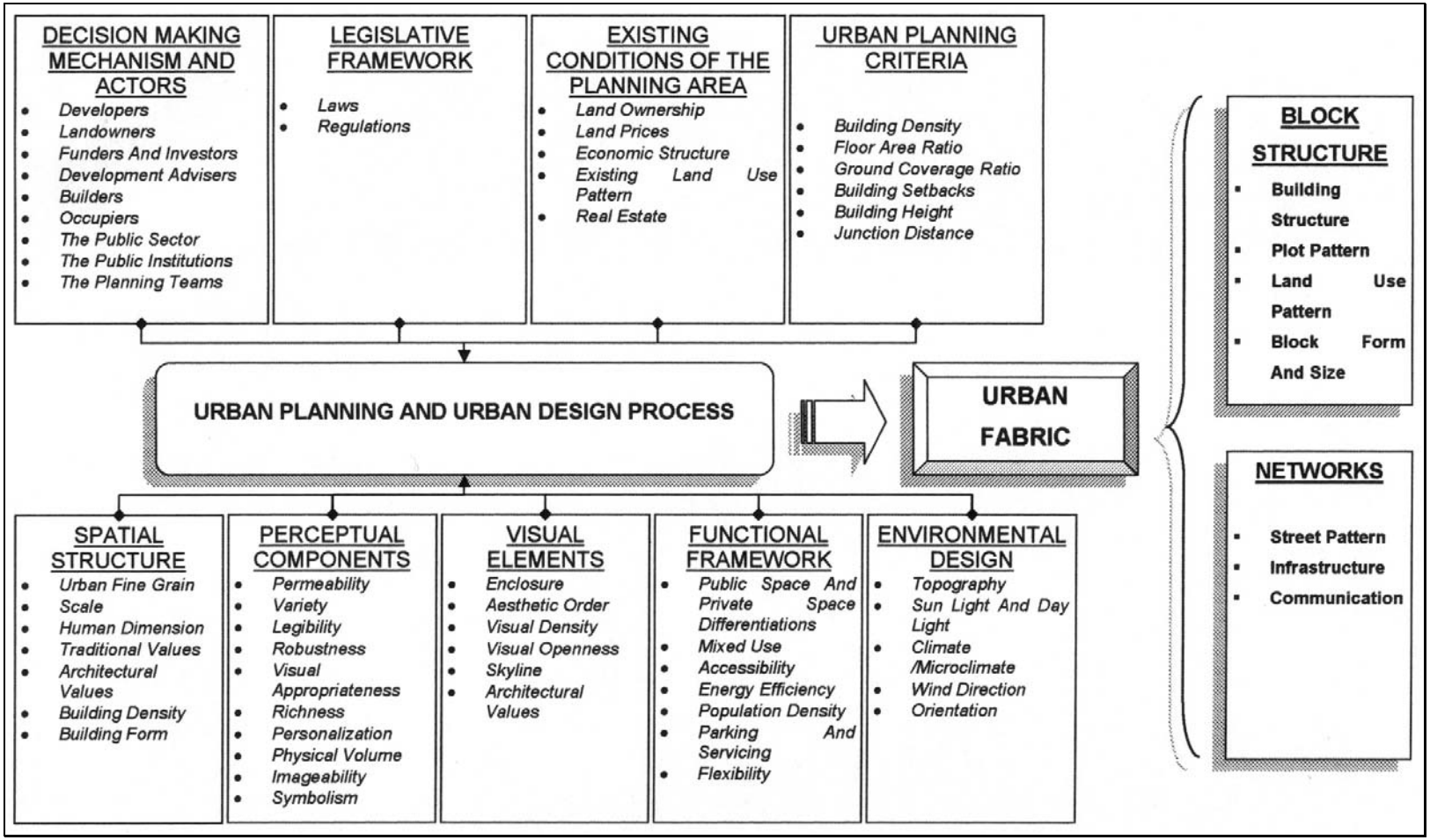


Figure 1-1: Design Criteria of the Formation Process Of Urban Fabric (Prepared By Author)

The determination of the design criteria provides a clear idea to evolve some design methods to form the block structure. This scope of the design criteria is used to select the design methods which are proposed into the urban design literature, in respect to conditions and requirements of the case study area, which are defined by general observation. So, the design criteria and selected design methods are worked together to create the conceptual block structure model. These design methods and its selection reasons are mentioned as below with the aim to clarify their effects for formulation process of the block structure. Methods are described under two main groups.

A. First group could be named as Urban Morphology, which aims to analyze the existing and proposing conditions of the urban fabric. So, urban morphology, in this context, help to synthesis of the existing structure with their problems, characteristics and typologies. In the scope of thesis, three methods are selected to use, which are below:

    a) Comparative Study: These type of analyses attempt to understand the discrepancy between the different urban fabrics or different parts of the urban fabric, in this respect of their selected criteria. These analyses are important to expose the characteristics of the existing block structure into the urban fabric. So, analysis provides preservation of the local characteristics, and also, adaptation of the proposed models to the existing fabric. Into the case study, this method provides to understand existing conditions and then, evaluate a proposing model which is well-adjusted with the existing fabric.
    b) Typo-Morphological Approaches: Typo-morphological analyses give a classification of typological characteristics of the physical components according to existing urban fabric. These analyses provide the appropriate conditions for block structure, building and plot pattern in existing pattern. This method is generally used for architectural characteristics to procure the quality of public frontage.
    c) Figure-Ground Analysis: This method are defined the solid-void relationship of the urban fabric with using the solid-void graphics. These graphics are achieved the density of the urban fabric in second dimension and correlation of the buildings, street and square or open spaces. So, these density and correlation enable a better understanding

of patterns to provide a new block structure area relative with existing one. Moreover, the typology of buildings and location of them into the block structure could be read easily in these diagrams to classify the arrangement models.

B. The other group for design methods are mentioned to put forward the three dimensional arrangement of the building structure. These are the alternative methods for current practice and its implementations. So, these three method are mentioned as below:

a) Density Distribution Based Mathematical Model: This method is based on to explain the density differentiation of the three main types of buildings, as pavilion building, row building and courtyard building. So, density distribution of the buildings is explained with using basic mathematical and geometrical formulations to compare the density related to height control. So, this method is used to expose the advantages of the courtyard building type in this thesis. And also, it is used to suggest a new conceptual model in case area with comparing the different density conditions of the courtyard building in contrast to the detached or contiguous order buildings which are described in 'Development Regulations of Izmir',

b) Daylight and Sunlight Assessment Method: This method put forward an analytic to designate the conditions of the natural lighting in urban areas with using the angel of the sunlight and sky dome index. So, it is particularly dealt with the natural lighting of street and public open spaces, but it is possible to understand the building structure. This method exposes some arrangements for form of buildings and its setbacks to provide well-adjusted lighting conditions. So, this method is used to understand for existing conditions of the case area and suggest a formal arrangement for buildings, which is produced within the conceptual block structure model.

c) Urban Design Guidelines and Urban Coding: Urban design guidelines are used to arrange the physical components of the block structure, but especially building structure. These guidelines gives the general principles of the formation process and its three dimensional construction with architectural arrangements. On the other hand, urban coding method could be related with typo-morphological approach to

determine the building codes appropriate for existing structure. Those methods are attempted to define the codes for case study area with the aim to form the three dimensional and aesthetic arrangements providing quality of urban space. So, these guidelines is used to describe the arrangement principles of the contextual block structure model in case area with the aim to constitute a checklist for its appropriateness according to design criteria which are defined in scope of the thesis.

Consequently, these design methods are to attempt the arrangement features of the block structure to be made a conceptual block structure model. So, this model shows the practicability of the design methods in respect to design criteria. For the purpose of the examination of this practicability, case study is formed in six steps, which are below:

1) First step of the case study is explanation of the existing problems and circumstances with making general observation with the aim to expose the requirements of the conceptual model.
2) Evolution process is revealed to understand the transformation of the block structure and circulation pattern from initial plan to existing conditions.
3) The other step is to analyze the existing situations with using the investigation methods. So, comparative analysis gives the typology of the existing structure from initial plans to existing conditions to show the requirements of the physical structure in history. Then, the figure-ground analysis exposes the solid-void relationship, and also, shows the network of the case area. Daylight and sunlight assessment method is used to analyze with the aim to show the natural lighting conditions of the existing structure.
4) After the analysis of the existing conditions, the conceptual block structure model is introduced. For the purpose of the creation an alternative block structure, with the form and size, the comparison are made between conditions of existing structure and proposed model. With the aim to make comparison, density distribution model used to compare the conceptual model and existing arrangement model according to ‘Development Regulation’. So, this comparison shows the advantages and disadvantages of the proposed model for block structure.
5) On the other hand, the daylight and sunlight conditions of the proposed model are tested and the new conditions are compared with the existing natural lighting conditions.

6) Finally, the urban design guidelines are described to form a checklist and general framework of the arrangement for conceptual block structure model.

Consequently, importance of formation of the conceptual block structure model is mentioned that the describing a process is to find an optimum conditions of the block structure. So, according to this process some advantages and disadvantages of the formation of proposed model could be exposed about the adequacy for design criteria. These advantages and disadvantages help to discuss the formation of the optimum block structure.

CHAPTER 2
THE DEFINITIONS, APPROACHES AND CONCEPTS OF THE URBAN FABRIC AND ITS COMPONENTS

The notion of the city describes a fabric including concrete and abstract features, which appeared in result some necessities to put the relationship of people and nature in order and to form them in a way. So, the city is a fabric consisting of the relation between human groups, production and distribution of the goods and creating social and cultural interaction into the physical dimension. The notion of the urban fabric is composed of the interaction between social, cultural, economic factors in physical structures of the city. Thus, urban physical structure describes a three dimensional space that all those factors become concrete. City, as an artifact, describes the 'whole' having been constituted by interaction of the city parts, which must be defined as well as possible.

The basic part of the physical structure of the city is the block structure, which includes sub-structures as buildings, plots, and internal circulation elements. This complex structure is constituted the urban form as a geometrical pattern of the physical built along with the linking components as network.

This chapter of the thesis aims to explain of the block structure in urban design literature in order to understand which components of the physical built are affected the design process. The general definitions of the urban fabric and its components, as block structure and network, are defined by form and the pattern characteristics of the formation process and shaping and improving features of the physical structure. And interrelation of these components also explains to clarify the important and dominant role of the block structure into the formation process. Therefore, the unity of the all components is emphasized for a good city form, in order to complete the necessities of the meaning of the block structure for urban designer.

2.1 Context of the Urban Fabric

The morphological characteristic of the city as urban fabric has formed from interaction and relationship between the social, cultural, economic and political

dynamics of the city. The reflections of these interconnections, which affect the urban space, are the human artifacts in physical dimension.

According to Kostof (1991:40), the most enduring features of the city are its physical build (pattern, language, geometry, fabric, order, layout, landscape etc.) Urban form is considered inclusive, non-linear, multidimensional entities which express human concerns and environmental factors through its physical presence.

The features of the physical structure were described by Spreiregen (1965: 64) that "suppose that we think of urban form in the following way: a city or town is generally thought of in terms of size – its population and physical extent. Size is closely linked to shape – the physical outline in horizontal plan form and vertical profile or contour. Size and shape are qualified by pattern – the underlying geometry of city form. Size, shape, and pattern are further modified by density – the intensity of use of land by people and buildings. Density is determined by urban texture and grain – the degree of homogeneity or heterogeneity of use by people or buildings."

The characteristic features of the urban fabric could be seen with "an urban pattern is the geometry, regular or irregular, formed by routes, open spaces, and buildings. Grain is the degree of fineness or coarseness in an urban area. Texture is the degree of mixture of fine and coarse elements." (Spreiregen, 1965: 55)

In these definitions, the city may have a fine-grain and uniform texture, but also have a coarse-grain and uneven texture. "In the city, large blocks with buildings of varying sizes could be described as having a coarse-grain and an uneven texture. If the buildings are uniform in size, they could be described as having a coarse-grain but a uniform texture." (Spreiregen, 1965: 55)

In the urban history, there are a lot of urban fabrics having developed with an incremental urbanization. These types of urban patterns have been constituted with cadastral roads and ownership property, when the cities have formed with the natural features, topography and the necessities of the pedestrian movement. So, these relationships between the movement and spatial organization could be seen as today's city structure. As Hillier (1996a, 1996b, and Hillier et al., 1993) theorized, "the urban grid's structure is the 'most powerful single determinant' of urban movement." which is largely dictates the structures of urban space.

There are two main concepts of the physical conceptions of the city. First concept is a ‘structure of spaces’, which can be described as a space given form within the contiguous building pattern. Also, physical structures of the city “have had its streets and open spaces carved out of what was once a solid mass of stuff.” (Ellis, 1991: 115) The second concept is, ‘structure of solids’ having been brought up by modernist. That is, the city is an “open land - a park or meadow – into which buildings have been introduced as objects sitting on a plane.” (Ellis, 1991: 115) and building is a main ‘generated’ element organizing the city structure.

Urban shape, pattern, grain, size, density and texture are primarily aspects of solid for – the building masses of the city. The urban space is a formal structure, which modeled by solids, and also volume of the buildings with building façades and floors. The other city part is the open spaces, which are natural or arranged into the city parks.

The definitions of ‘solid’ and ‘void’ are the useful terminology to understand the urban space. (Figure: 2-1) ‘Solid’ includes both a building and building groups into an area, and also to describe all types of masses. On the contrary, ‘Void’ includes all open spaces, passages, and emptiness describing the soft spaces, which is the contrast of the architectural forms.

Figure 2-1: The Solid-Void Relationship of the Different Urban Fabrics (Anderson, 1991:115)

As Ellis (1191: 126) mentioned, the city as an organization of solids and spaces. The arrangement of spaces classified into the two main types. “The first can be called the structures as unified wall; the other, the street as a series of pavilions.” These two types also define the street space as a ‘bounded configuration’. “But the unified walls

produce a positive spatial configuration while the pavilion street produces a negative one."

The traditional street space has accommodated the elements and the functions of the structure. It has an ability to provide variety of open space and place qualities. It has created a balanced system of building groups and urban spaces. So, these properties could be lead for a contemporary conception of the urban form. It can be suggested that a city viable both socially and operationally can grow out of traditional, as well as more recent, conceptions of physical city.

So, "the notion of an equivalency between solid and spatial elements of a city is an important one. The exterior spaces of the city are the rooms of the city, and the built streets are the walls of those rooms. These walls owe a responsibility to the formation of those rooms. The interior functional consideration of buildings can be coordinated to allow them to perform the function of creating exterior city space." (Ellis, 1991: 130)

Urban space is a product having formed the consequences of the interactions and conflicts of the factors that produce the city, in a dynamic process. Urban space formed with a social, economic and political interactions, and local cultural properties. (Figure: 2-2) It should be appropriate the life conditions of the citizens. At the same time, this is the consequences of the social evolution in the physical environment. All physical settings of the urban space have transformed in time to be existing structure. This transformation have realized with a spontaneous process or a planning process, in time.

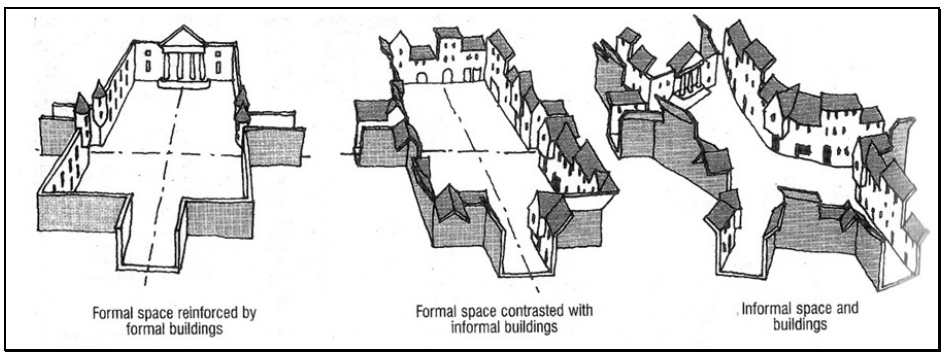


Figure 2-2: The Formation of the Urban Space (Carmona, 2003: 142)

"Thus, in designing a city's built form around city blocks and streets, other elements of a public realm or space system would be built into the city form, including squares, meeting places and promenading routes." (Montgomery, 1998:110)

"In fact, the public realm in a city performs many functions, not only by providing meeting places but also in helping to define the built environment, offering spaces for local traditions and customs such as festivals and carnivals and representing meaning and identity. It is therefore as important to think through the design of the public realm- its sequences, proportions and dimensions- as it is for city blocks and individual buildings." (Montgomery, 1998:110)

2.2 The Physical Components of the Urban Fabric

The physical components of the urban fabric are mentioned in this thesis context as block structure – and its components as building structure, plot pattern and land use pattern - and network – and its components as street pattern, infrastructure and communication - in the cities. These two main physical components and its sub-structures are formed the overall the urban fabric in mutual relationship and close interaction. Furthermore, block structure constituted the volume of the physical structure, and network provides their connection and separation with each other. (Figure: 2-3)

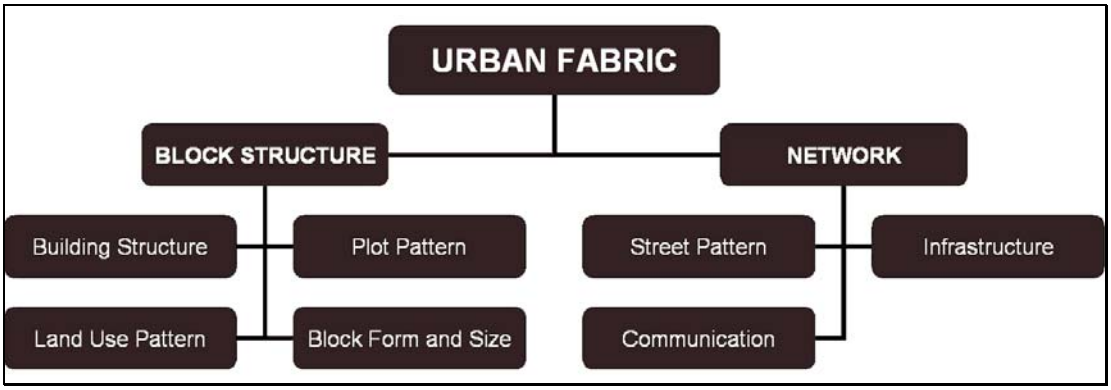


Figure 2-3: The Physical Components of the Urban Fabric (Prepared By Author)

The principles of design of urban scale, urban space, urban masses, urban activity areas and urban circulation patterns form the components of the urban design.

There is a substantial literature on the morphology of the city. Comparable studies have not been made about this sub artifact – the block. Block structure is the

one of the most important element to be determined the urban form in urban design and urban morphology disciplines. As an artificially created environment, the city is a whole and the block structure as a part structured through the reflection of developments, changes and flexibility of the productive forces.

Urban fabric is analyzed by the form and the pattern of the city. These analyzes give the knowledge to designer about the local patterns and development process of change in order to understand the existing conditions. According to Conzen (1960) morphology of settlements could be understood in four types of urban space components, which are land uses, building structures, plot patterns and street patterns. However, there are differences of the flexibility of these morphological elements. Buildings and land uses are more changeable components of the city structure than the other. Changing conditions of market necessities and building requirements have provided the reconstruction of these elements. Although, plot pattern is a more stable element, nevertheless, especially for individual parcels, subdivision and amalgamation is a common procedure for developing the urban fabric. Finally, the street pattern is the most enduring component of the urban space. Because, being a network including on the transportation, infrastructure and communication networks, streets require a large amount of cost. And also, its reconstruction process is connected to be able to change the ownership, building and land use pattern, which is required a large-scale organization and comprehensive redevelopment.

Urban fabric, in terms of two dimensional frameworks, is constituted by street and block structure. Block structures are connected each other with circulation pattern and communication network. And streets form a kind of open space system, which intersect into the nodes. The blocks and streets have their own characteristics, and one is always defined by the other.

“Street and block patterns reflect differences among cities beyond those of scale, complexity, available choices, and the nature of the spaces. They relate to the time period when the city was built, to geography, to differing cultures, to city functions or purposes, to design or political philosophies, and to technological demands, to name some of the more obvious. They are, as well, the settings within which great and not so great streets are to be found.” (Jacops, 1996:202)

The construction of the freestanding building into the traditional urban spaces have been changed and broken down the block structure system. The adjacent type of

these traditional spaces have been formed the open spaces with the walls of the plots and their facades, which are sited to one another, have been formed the enclosed urban and public spaces. Furthermore, building's back and sides have provided the privacy for daily life "without detriment to the public realm." (Carmona, 2003: 68)

Leon Krier defined the importance of the interrelation between the block structure, street and square by mean creating the urban space, and introduced three models to conceive urban space.(Figure: 2-4)

1. "The blocks are the result of a street and square pattern.
2. The streets and squares are the result of the position of blocks.
3. The streets and squares are precise spatial types. The block is a result.
4. The buildings do not form a describable space, the public space is accidental." (Gruber, 1978: 58-59)

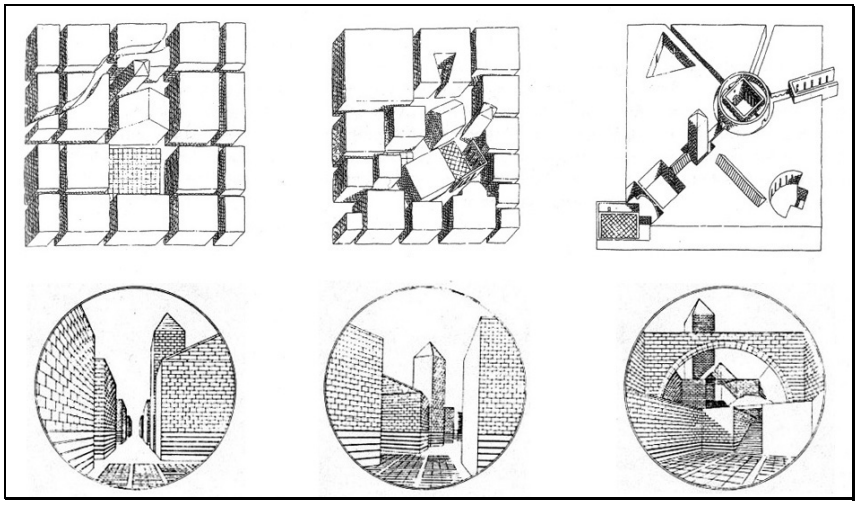


Figure 2-4: The Leon Krier's Definitions of the Urban Space (Gruber, 1978: 58)

2.2.1 The Block Structure of the City:

The block structure is the basic geometric element in urban space, and it must have a meaning and place value joining with the other urban space components. The block structure is a complex typological construction expressing the values of the societies that are reflected on the physical space in each period of development.

In urban design literature, the block structure is defined as an element, module, segment or a cell of a city. This structure is bounded on each side by streets or alleys,

which have vehicular or pedestrian circulation on it. And also, the block structure is created by masses, circulation networks, and public-private space differentiations. ‘Inner block’ refers to the area which is constituted by lots, functions, solids and voids.

As Spreiregen (1965: 150) mentioned; the block structure is basic and important module for city space as lot sizes and building form. The block structure is the grouping of buildings constituting the size and relationship between block structures. A further consideration of block design concerns orientation, grouping and building type. Block structure, on the horizontal level is composed of lots (plots or parcels). A lot can also be defined as a measured parcel of land having fixed boundaries and access to public circulation.

“Block structure is explained as a space especially in a city, usually rectangular, enclosed by streets, and occupied by or intended for buildings. Other common phrases used, that refer to the same meaning, can be listed as; ‘building block’, ‘building or block island’, ‘insula’, ‘insuale’, ‘ilots’, and ‘chequer’. Among all, ‘insula’, ‘insuale’, ‘ilots’, and ‘chequer’ are used to define formal plans with orthogonal geometric physical spaces (generally forming a grid-iron organization pattern). The others ‘block’ and ‘building or (block) island’, in general, defines a physical structure of any geometric form and dimension.” (Eren, 1995: 20)

The first struggling of the people is creating boundary to define their territory. The man’s endeavor created the ownership concept, which is used today’s terminology, introducing to arrange according to his need and the rights of use.

“The definition of the block implies the definition of boundaries, which depend on perceived discontinuities in physical and social cues. The variability of definitions depends on the judgments about where one place ends and another begins, where ‘ownership’ and belonging change. Boundaries are clearest and strangest and the distinctions among areas clearest, when all physical and social cues coincide.” (Rapoport, 1977: 160)

The urban block is an important and territorial definition of the urban fabric. The territory can be identified by physical barriers like, masses, walls of objects or identical continuity of spaces. And the territory means as privacy “(1) the ownership of or rights to use a place. (2) the personalization or making of an area. (3) the right to defend against intrusion and (4) the serving of several functions ranging from the meeting of

basic psychological needs to the satisfaction of cognitive and aesthetic needs. (Lang, 1987:148)

"The features of private ownership of the land and of the distribution of building plots are products of the evolution of both the special local conditions of each community and of the historical developments in relations of ownership and the institutions which define and determine that ownership. Since the more permanent characteristics of the space and the institutions of the property change only slowly with the passing of time, the traces of the property relations which leave their imprint on the ground are lasting characteristics which are directly dependent on the geo-morphological features of the location." (Kalogirou, 2002:41)

Block structure is not only a two dimensional concept, it also have a definition of space covering "three dimensional field of experience, the distance between two points, or the area of volume between specified boundaries." (Trancik, 1982: 63) Of course, the two dimensional thinking for block structure may mislead the design period. So, while figure-ground relationship shows us the two dimensional patterns and form of the urban space, in the third dimension, height and building density produce the character of the area.

For this reason, block structure should be elucidated with the all components, as block structures, plot patterns and land use patterns, which identified the functional relationship of the physical structure. Also, the pedestrian circulation and vehicular circulation- for parking needs – in block structure should be explained as a most important feature of the city life, into the block structure section of the thesis.

2.2.1.1 Building Structure

As Spreiregen, (1965: 65) defined "building is the immobile masses of a city. Arrangements of buildings form patterns of mass. Arrangements of building also form urban spaces, which exist as patterns of channels and reservoirs."

"The building-block as a complex typological construction forms the basic element of the urban compositions; of the urban pattern." (Gruber, 1978: 74)

Buildings are preferably designed by their type and their function. This allows for some changes in use and for multiple adaptations over time without compromising a building's form or rendering it obsolete.

The perimeter side of the block structure could be divided into parkway, sidewalk and setback. Threshold elements at the setback line are consisted of the buildings interface, such as arcades, porches, stoops, stairs, balconies, eaves, chimneys, entrances and windows.

The arrangement of building forms has a lot of different typologies in order to provide possibilities for different necessities into urban form. The formation process of the building form may be related with the use, building density, construction cost, maintenance cost, architectural style, expectations of political or development actors, natural or topographic features, existing implementation plan conditions that restricted the building plot and building density. Moreover, the ideology or vision of the architecture determines the designing of the building form.

As Lynch (1994) defined, there are seven main typologies for building form. Of course, these types of buildings show the relationship of the current ideology for structuring the city. For example, high slab buildings and tower buildings represent the modernist ideologies, while freestanding buildings generally seen in suburban areas. The typologies of the building form could be explained as below:

1) High Slab Buildings: This is the form of long, slab like buildings, which have central corridors and elevators. These can be built to prefabrication and rapid erection. For residential use, these types of apartments have economy in central part of the city against high land cost. The construction of the high slab buildings are more costly to build than the other lower-density housing types. (Figure: 2-5-a)

There are two typical grouping of linear megastructures, "the buildings only partially fill the grid segments." And into the second type "the buildings more or less completely fill the grid segments, the building lines coinciding with the lot lines." (Ellis, 1991: 118)

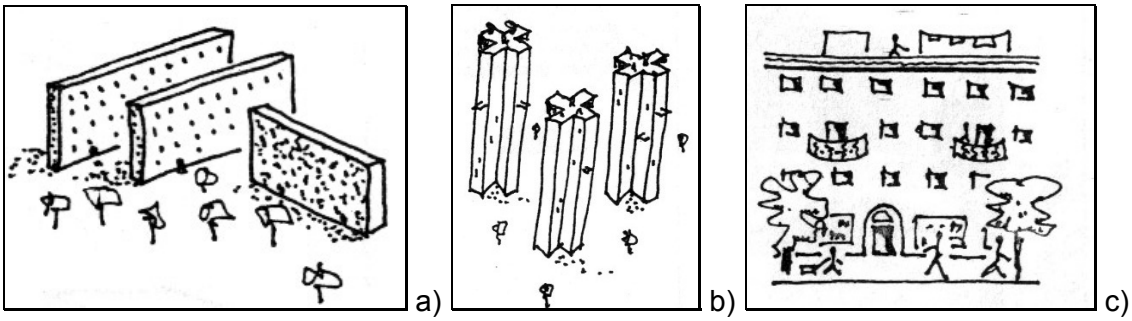


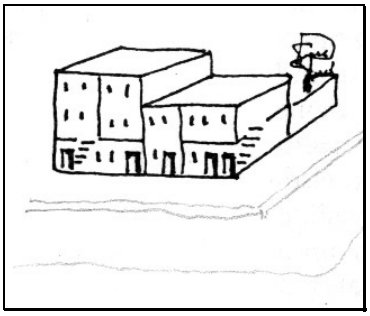
Figure 2-5: Lynch's Definitions for Building Types a) High Slab Buildings, b) Tower Buildings, c) Dense Walkups (Lynch, 1994: 410-412)

2) Tower buildings: As Ellis (1991:118) defined, the tower buildings and high slab building, as linear megastructures, are versions of the pavilion building, which are standing in urban space freely. Their structure design to provide healthy conditions which having good ventilation, lighting and clear view, for occupants. These building types have high density and a large percentage of ground floors for open spaces. Especially, tower buildings could not give any enclosure or surrounding open spaces. So, these types of buildings couldn't create continuity into the urban physical structure.

These types of buildings have a prestigious symbol for official use and also it fits the economics of urban luxury housing, that tower in the green ideology. Also, in European examples, these types of houses made up in a large landscape to create broad views and recreation facilities. (Figure: 2-5-b)

3) Dense Walkups: They have an adequate density with four to six story heights, and form a ground floor frontage. These types of housing is increased the public life in the street, and also sustained to work local shops and services plentifully. (Figure: 2-5-c)

4) Ground – Access Walkups: These walkups have moderate coverage and building height, with direct access to the ground. They have generally built two or three story and the complex types have a private garden for each unit. These building types, for housing, can be economical in the central city land. "The generic class seems a good basic model for apartment living, both in the center city and in the suburbs." (Lynch, 1994: 414) (Figure: 2-6-a)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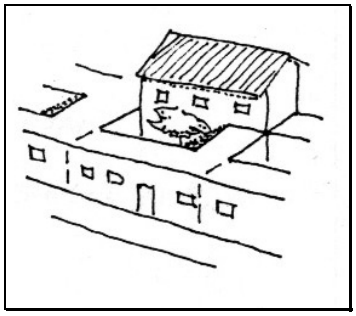
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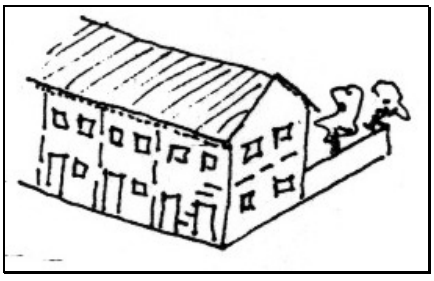
Figure 2-6: Lynch's Definitions for Building Types a) Ground-Access Buildings,

b) Courtyard Buildings, (Lynch, 1994: 413-414)

5) Courtyard Buildings: Courtyard buildings are a traditional Mediterranean building type, which is right for the climatic conditions that are warm, dry and sunny of the region. The entire building units are lighted and aired both outward and inward. Especially, one or two stories building have an adequate sun lighted court. Also, the yard is a completely private for residential use and semi-public for official and commercial facilities. Courtyard building provides an achieving urban density and useful model for special urban situations. . (Figure: 2-6-b)

6) Attached Building: "At moderate densities and low height, a large array of housing types is possible now houses, duplexes, and low garden apartments… Compact and inexpensive relative to other types, they still provide the desired qualities of direct access and parking unit identity and private open space." (Lynch, 1994: 415) Attached buildings have some advantages rather than the freestanding building and slab buildings. They have close densities and create a streetscape; in contrast freestanding buildings show a repetition of buildings. On the other hand, attached buildings constitute an intimate scale and have some different arrangement in the space rather the long slab buildings. . (Figure: 2-7-a)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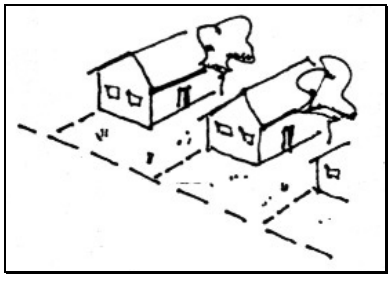

b)

Figure 2-7: Lynch's Definitions for Building Types a) Attached Buildings,

b) Freestanding Buildings, (Lynch, 1994: 415)

7) Freestanding Building: These types of buildings are the main suburban arrangement model into the American family housing stock. Because of their single family house effect and strong identity, and also, ownership private open space and owner maintenance get more advantage to the suburban life. . (Figure: 2-7-b)

Development of the building structure is also interconnected with the plot pattern development. Plot patterns have developed into an acceptable process named the Burgage Cycle, which was mentioned by Conzen (1960) and Carmona (2003) etc… (Figure: 2-8) The Medieval cities of England and nineteenth century industrial towns and twentieth century suburbs of France have had this cycle of building development. The first building typology of these cities had plot dominant, long and narrow structure. Into development process of the cities, land uses and building structure were changed, the demand having increased density "the tail of the plots becomes built-up. The intermediate space – perhaps fields or gardens – is developed as freestanding buildings or, more typically, through additions to the existing buildings. New, larger, taller buildings may replace the initial ones." (Carmona, 2003: 63) So, the increasing density caused the inadequate light and air conditions for the building units. Then, the highest point of the plots series for density or 'climax phase' have came into being after this process partial or complete reconstruction have developed. As a result, larger buildings have constructed, plots have amalgamated or "truncated by running mid-block alleys through, creating independent plots." (Carmona, 2003: 63)

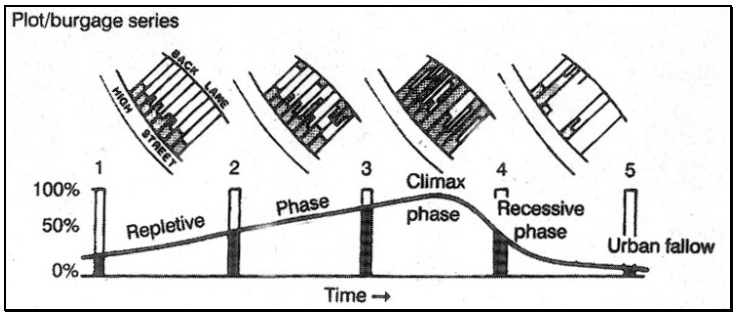


Figure 2-8: Definition of Conzen's Burgage Cycle (Carmona 2003: 63)

2.2.1.2 Plot Pattern

"Each block structure represents a group of contiguous land parcels or else a single land parcel. Each parcel is essentially a unit of land use; it is physically defined by boundaries on or above ground and may be called a plot, whatever its size. The

arrangement of contiguous plots is evident from the plot boundaries and, when considered separately from other elements of the town plan, may be called the plot pattern. A row of plots, placed contiguously along the same street-line, each with its own frontage, forms a plot series." (Conzen, 1960:5)

The plot pattern forms the block structure with the other components, alleys and public spaces into the block. This pattern has changeable characteristics in the city, because of the ownership properties. Into the time, the boundaries of the plots could be changed within the market conditions. So, amalgamation and subdivision are the basic features of the plot pattern. Into time, large plots may be subdivided, or several may be amalgamated to become large building structures like shopping centers in the central areas. Whole plots in the block structures could be amalgamated, or some extreme examples, several block structures could be amalgamated to each other.

"The fundamental morphology framework provided by plots of the land has traditionally been rectilinear, because of the ease of surveying, the efficiency of use of space and ease of laying out streets. It follows that city blocks and street layouts have also tended to be rectilinear. The dominance of this form eventually provoked a reaction." (Knox, 2000: 78) (Figure: 2-9)

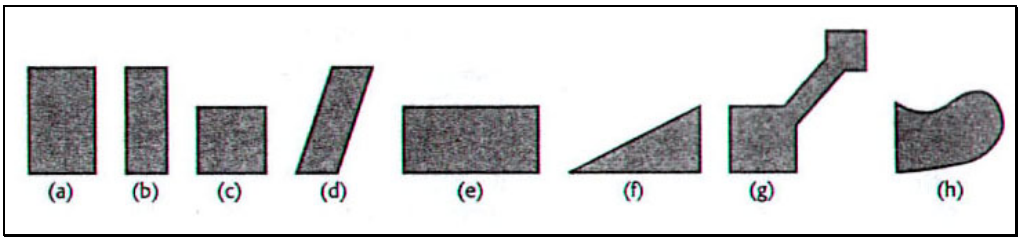


Figure 2-9: Types of the Plots in Planned Areas (Knox, 2000: 79)

Changing characteristic of the plot pattern also changed the city structure. "Although plot and block amalgamations remove most of the evidence of earlier forms." (Carmona, 2003: 63) and this process have improved to create larger block structure with amalgamation. Subdivision process occurs more rarely than the amalgamation. So, the block structure has improved in direction of more dense structure with larger and bulky buildings.

An actual lot size is one of the basic modules of the conception of spaces, which is related with the building setback, street width, and landscaping and open

space distribution. Arrangement of lots and their building masses create a place, which can be good enclosed or interrupted street facades. Furthermore, lot sizes are related with the building form for appropriate design. For instance, narrow lots can create a result in awkward spaces between buildings, according to solve this problem the better with front and/or rear yards.

2.2.1.3 Land Use Pattern

In recent years, the comprehensive planning techniques are the basis for urban planning practice. All zoning and other planning activities must be consistent with both the intent and the purpose of the comprehensive plan, which is dealt with use of land and that it's most definitive forms are the zoning and subdivision regulations. So, zoning plans expose the distribution of land uses in planning area with the aim to "protect and promote health, education and the general welfare" of the city life. (Eisner, 1993: 242)

As a land use distribution tool, master plans and implementation plans is divided the planning area into districts which the land is restricted to certain classification uses. The size, shape and location of these districts reflect the major uses indicated by the comprehensive plan. Also, the plan provide for different densities of population and buildings in different districts.

'Development Regulation' of Turkiye classifies the land in five categories in urban areas. 1) Residential Areas, 2) Commercial Areas, 3) Industrial Areas, 4) Socio-Cultural and Public Areas, 5) Open Spaces and Parks. In respect to scope of the thesis, commercial areas are defined in the regulation as office, bazaar, restaurant, multi-storey large stores, banks, hotels, cinemas, and theater uses. So, the development plans are locate these functions into the planning areas.

Although as a basic part of the modernist planning methods functional zoning approaches have been criticized. Especially, Jacobs (1961) exposed the importance of the vitality for central parts of the city. So, she focuses on the importance of the diversity into the city's streets and district. She mentioned for conditions as below:

- "The district and indeed as many of its internal parts as possible, must serve more than primary function, preferably more than two.

- Most blocks must be short, that is, streets and opportunities to turn corners must be frequent.
- The district must mingle buildings that vary in general and condition.
- These must be a sufficient dense concentration of people, for whatever purposes that may be there." (Jacobs, 1961: 162-163)

On the other hand, Carmona (2003: 181) argued that, "all over the critics of the functional zoning, market conditions are generally necessitated the mono-functional areas. Because developers and property owners demand to develop their property in its highest and best possible use, so it is caused to reduce the secondary uses. But, rather than extremely segregation of the uses, the typo-morphological zoning could be preferable for strict segregation with typical zoning codes which have several dozen land use designation."

"Although the mixing of uses may occur spontaneously through market conditions, appropriate physical conditions of building or development patterns increase the possibility of the mixing of the use. So, creation of mixed uses in existing central areas requires introducing residential uses into non-residential areas." (Carmona, 2003: 182) Developing structure of the city creates new requirements of the physical structure of the city. New economical, political changing, some new investments of the city parts have changed the use of land over time. Creation of new buildings, amalgamation or subdivision of the plots and changing of the street patterns effect the land use types for adaptation of new conditions.

The land use types effect the formation of the block structure, because of the requirements of the uses. Especially, for mixed use development necessitate the special considerations because of the privacy requirements of the residential uses. So, the formation of the block structure and its components expose the market demand with the appropriateness for the uses. The important point of the construction of the block structure is the flexibility of buildings with size and form and adaptability for new land uses. And also, the design variety of the building units provides the opportunities to demand of the developers and investors.

The useful development pattern for mixed uses is mentioned by Llewellyn-Davies (200: 96) that providing the flexibility for land uses in different ways could be provided by using perimeter block structures. Insertion of managed workspaces or compatible employment uses into the backland or block interior, introduction of a mews

line through the block structure providing single-aspect offices, workshops or studios, and/or placing a residential mews within a commercial block structure, are the possibilities to use the perimeter block structure efficiently.

2.2.1.4 Block Form and Size

The block structure is an essential module of urban pattern and the geometrical structure of the blocks is the determinant factor of urban form. The arrangement and use of building blocks must have flexibility. But today's urban planning practices create an array of blocks with a modular arrangement. Traffic based street structure and modular parceling method of the implementation plans brings some difficulties for an attractive urban space. In spite of some limitations, this structure could be able to make an accent in urban fabric with inbuilt areas like an urban park or urban plaza.

The forms of the block structure are to be square, rectangular or irregular in their shape. Independent of shape, block structure is divided plots and this plotted side can be defined by public space. A variety of widths and depths of individual plots determine the different type and scale of building types and densities. (Figure: 2-10)

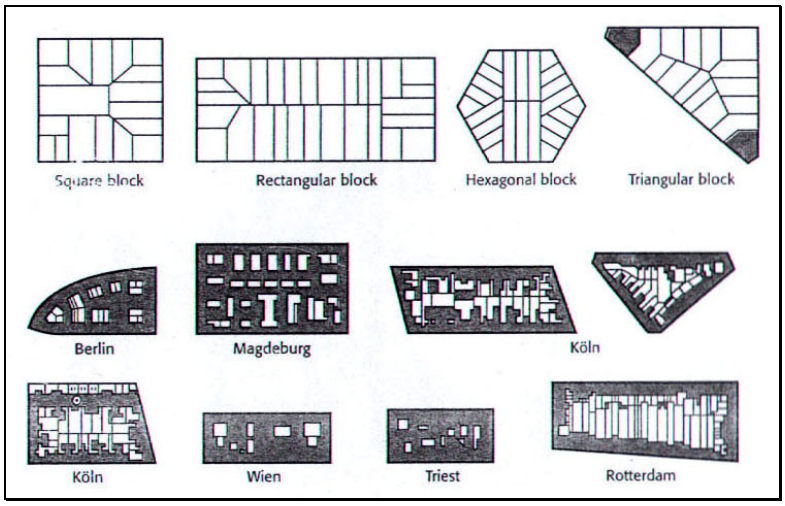


Figure 2-10: Formation Types of the Block Structure (Knox, 2000: 79)

As Spreiregen (1965:127) mentioned, length of a block relates to street dimensions. Too long city blocks provide rhythmic relief and lateral access. On the contrary, too short blocks allow substantial development.

“Each space system consists of two component parts: a two-dimensional pattern (‘small blocks’ or ‘super blocks’) and a three-dimensional form (‘buildings enclosing space’ or ‘buildings in space’). In what can be considered ‘ideal’ systems, they are paired in a particular way: small blocks and buildings enclosing space (i.e. Parma/traditional urban form - type A) and super blocks and buildings in space (i.e. Saint-Die / Modernist urban space – type D). These are rarely seen as ideal systems. Indeed, it is not clear at what point ‘space between buildings’ becomes ‘open space containing buildings’. Other combinations are also possible. These are hybrid or compromised versions of the ideal systems (i.e. types B or C). Tall buildings often spring up from within small block patterns. Type C represents situations where freestanding buildings are located in small block street patterns.” (Table: 2-1) (Carmona, 2003: 62)

Table 2-1: The Block Pattern Types of the Urban Space (Carmona, 2003: 62)

	Small Block Patterns	Super Block Patterns
Building Defining and Enclosing Space	A	B
Buildings as Objects in Space	C	D

Today, one of the general using methods creating a building block structure is transforming a group of blocks into the one large single block. So, this structure has included building masses, open spaces, parking areas, and pedestrian circulation. The long blocks have been planned with closing the streets between groups of blocks. So, long blocks can be punctured with pedestrian walkways, and some interior places created into the structure.

In the developing central areas, the most common design of small block structure shows single building character with the central light well or atrium into it, because of the construction and maintenance efficiency. In contrast, larger block structures have show perimeter block type with divided buildings and plots. The ribbon of buildings creates an edge between the public fronts and private or semi-private backyards. The block structure depth related with the building depth and size of the interior space of the block structure. Building depth is related with the floor space necessity being designated as to number and size of the units, and also, the requirement of natural light and ventilation conditions. On the other hand, different purpose use of the interior block space, as car parking, garden recreational facilities, could be required a larger dimension for the block structure.

The increasing the block structure size could provide fewer intersections for vehicular movement, although the more and smaller block structures create more intersections. “Many urban planners in the past advocated fewer and larger blocks and fewer streets and intersections in order to rid the city of overcrowding and achieve greater special efficiency.” (Montgomery, 1998: 107) But the general situation of modern cities reveals the urbanity and vitality of the cities are destroyed with these types of transportation-base ideologies.

As Paumier mentioned (1988:54), in central areas, street system and block pattern are the basic elements of the space, and they create understandable and regularly spaced intersections. The regularity of the block pattern is provided a strong structure for central area development and is effected the scale of the buildings. The small block sizes are limited the horizontal dimensions of buildings. As a historical type, small block sizes improved the fine-mesh pedestrian activity by making connections to other blocks and provide easy visible and accessible connections to other subdistricts. On the other hand, small blocks affect the traffic flow and developing cost in negatively. In contrast, superblocks and megastructures are increased the efficiency in central areas.

Nevertheless, there are several urban design theorists that opposed the bulky and long structures of the building blocks. The first evident reaction came from Jane Jacops who explained the death of the modern cities. Jacobs (1994: 191) concluded that “most blocks must be short; that is, streets and opportunities to turn corners must be frequent.” She aimed to increase the social interaction and good accessibility and vitality for urban spaces. (Figure: 2-11)

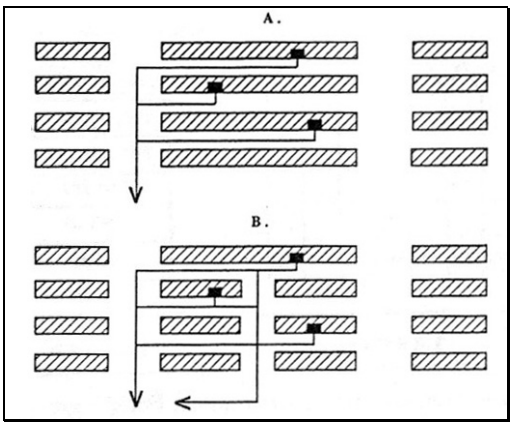


Figure 2-11: The Permeability of the Block Structure (Montgomery, 1998: 108)

“When the lot is small in the formal grid area, there are limited options and, hence, predictability in resulting forms. But the larger the parcel is, the less predictable the building shape and its position on the land. The subdivision of land is an important mechanism to form urban structure in the modern city. Thus, the modern city is viewed as a collection of parcels formed over time through a horizontal accumulation of boundaries and streets resulting from the historical process of land subdivision.” (Jo, 1998: 300)

The presence of the designing process should be related with the consideration of scale for building structure. As Jacobs (1994) mentioned the block structure must be short to provide more circulation routes to walk down and more opportunities to turn corners. Moreover the successful distribution of the alleys, ginnels and courtyards serve to increase the permeability of an area. So, the fine-mesh for pedestrians and more building facades that along the streets are increased the economically viable points for trading especially for small enterprises. “Psychologically, people are less inclined to walk down long unbroken streets with little activity or a mono functional identity, so that such streets become self-isolating and stagnant.” (Montgomery, 1998:108) Long block structures thwart permeability for pedestrian and the development of the small enterprises. Therefore, more streets become inactive and this process turn in cycle, which is increased the grouping up the bigger plots because nothing happens around here.

According to Montgomery (1998: 108), “city districts which have more shorter blocks tend also to generate more street life and even more streets where, for example, back alleyways and courtyards are opened up to active use. To be successful, then, city districts would comprise as many blocks as possible, and these should only rarely exceed 300x300 feet (90 meters).”

Also, Llewelyn-Davies (200: 58) recommended that “blocks of external dimensions of about 90 m.x90 m., containing private or communal gardens, provide a good trade-off between biodiversity and other considerations.”

In Montgomery’s words (1998: 108), “All of this means that, for a new city, city blocks should ideally not exceed 300x300 feet. Building would not tend to be set back from the street or positioned centrally within a plot but rather around central courtyards.”

The physical pattern of the block structure is related both building pattern and the exterior space patterns of the area. So, the exterior parts of block structure is constituted by backs and fronts of buildings, which have different conditions in the traditional city. Fronts of the buildings have formed the street space and created activities to be vital frontage of the street. On the other hand, interior space of the block structure may be generated a courtyard space or broken up into individual rear lots for servicing to the buildings. “We know that the depth of the block contains some kind of back-up structures.” (Ellis, 1991: 118) But there is no certain to arrangement of the interior space of the block structure.

Through-Block Connections:

“Through-block connections are pedestrian pathway, located at street level, but of the street, to provide short cuts through development blocks.” (Paumier, 1988: 71) Through-block connections are the important features of the pedestrian system especially in long block patterns, because of the creating new movement in the urban space. (Figure: 2-12)

Through-block connections can be formed by open walkways, courtyards, covered arcades, or lobby atrium spaces. So, when they are designed to complement the level of pedestrian activity in the streets, they create a new texture and variety of the circulation system. Furthermore, they increase the shopping frontage to provide a new retail activity.

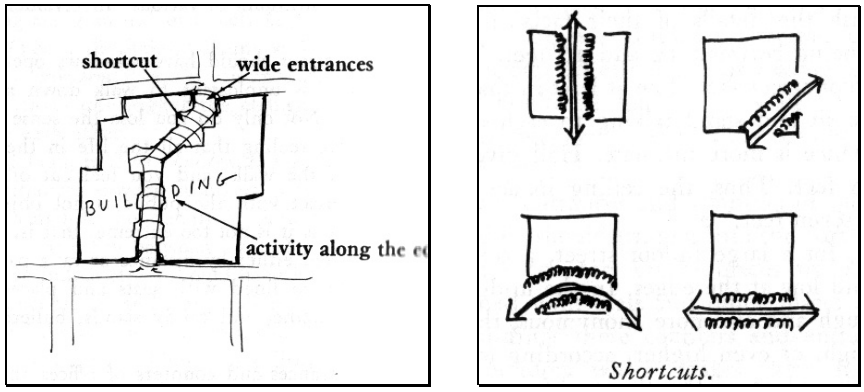


Figure 2-12: Through-Block Connections In Building Structure (Alexander, 1977: 495-498)

“The actual levels of use of the passages correlate approximately with expected levels derived from an examination of the network. However, the distinct hierarchy of paths at the local level is a consequence of the geometry of the streets and public ways as well as the location of major activities. The propensity for individuals to follow a shortest path itinerary appears to be critical explanatory factor in the local pattern of movement. A model for cumulative density and movement patterns would seem to call for a consideration of the level of integration, block geometry and relative distance along paths between major urban generators.” (Zacharias, 1994: 395)

2.2.2 Networks

Network is the morphology channels of the people, vehicles, goods, and information between the land uses and physical components of the urban fabric. These channels represent the surface and also underground structures which provides the evident flow routes of the elements.

Circulation has been the fundamental requirement of interaction of whole society and individuals. The amount and nature of movement are determined by the nature and volume of urban activities. The description of a structure of circulation can be introduced in terms of composition, volume, distance, time, rhythms, location, routes and channels, density, kinds of circulation and kinds of establishments.

Traffic is the movement of pedestrians or vehicles transportation of persons or goods. The structure of traffic by its distribution in time and space is dependent on how many people choose to use a particular mode or route of travel at a particular time.

The general acceptance that different kinds of land use generate different kinds and amounts of movement, both pedestrian and vehicular mean, in a particular part of city or even in whole urban fabric. On the contrary, the changing conditions of the movement, as amount of traffic or changing routes of the needs, could be affected on the location pattern of the land uses. So, it could be said that there are mutual relationship between land use and circulation pattern.

In order to increase the size and amount of buildings affect the traffic flow quality on existing streets negatively. Therefore, the new arrangement of buildings and their connection with the street pattern might because done according to carrying of the existing structure. (Figure: 2-13)

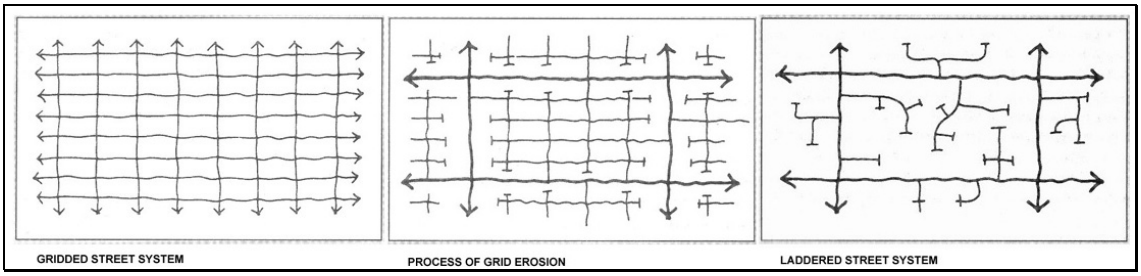


Figure 2-13: The Alternative Patterns of the Street Pattern and the Infrastructure Network (Carmona, 2003: 73)

The street pattern defines the physical area of circulation channels available for movement. “The street system constitutes the framework of a city, to a considerable degree the size, shape and orientation of blocks, and lots are determined by the street pattern.” (Mitchell, 1974: 128) The important point of the determination of the circulation channel is accessibility, service installation or movement clarifies the role of circulation in the formation of urban space. Lynch (1994: 357) mentioned, the urban pattern can be seen as a network. “The network can have a form, a degree of specialization and many of these characteristics can be described in the mathematical language of graph theory.”

Streets as the channels of movement have not always been formed for accessibility of people and vehicles; they are also designed to serve to the parcels that can be defined as the main reason behind the circulation problems. Moreover, streets generally carry the infrastructure which is the main requirements of the block structure.

The integration of the circulation components into the urban patterns creates same problems by mean impacts of movement system on formation of the patterns. The urban patterns are reduced to the form and geometry of circulation channels, that is, structure of street pattern constitutes the units of urban patterns as block structure. Each street pattern, like grid, hexagon or radio-concentric, organize circulation systems into the urban fabric with the shaping the block structure.

As Lang (1994: 39) mentioned that developing technology and life style was shaped by combinations of factors, particularly, the advanced technology of transportation that changed the formation of urban patterns dramatically. Also, geometric design standards of streets and roads are redefined, traffic planning

solutions have accommodated by automobile in urban streets. As a land subdivision process, urban planning has affected the circulation design procedure negatively.

2.2.2.1 Street Pattern

The street pattern is the network which provides the circulation of the vehicular or pedestrian access into the different mixing of uses in the city. Also, the street patterns have a hierarchy based on their pedestrian and vehicular loads.

"Our concern with street plans and city block patterns derives from an interest in the physical, designable characteristics of the best streets. In the process of determining what the best streets are and what makes them so, we want to know something of their settings, if for no other reason than to be able to locate them in their cities, to know where they are but the more we find out about the street and the block patterns, the more compelling they become in their own right. It is not only individual streets that are designed and redesigned, but whole sections of urban areas, to say nothing on new cities." (Jacops, 1996:202)

We can be able to see different types of street patterns and the variety of the typology about the urban space, when we have made some analysis using figure - ground method. These different types of patterns – grids, curvilinear, diagonal overlays, and eccentric – show us the mixture of the components and the variety of the block size, shapes and street width and lengths. (Figure: 2-14)

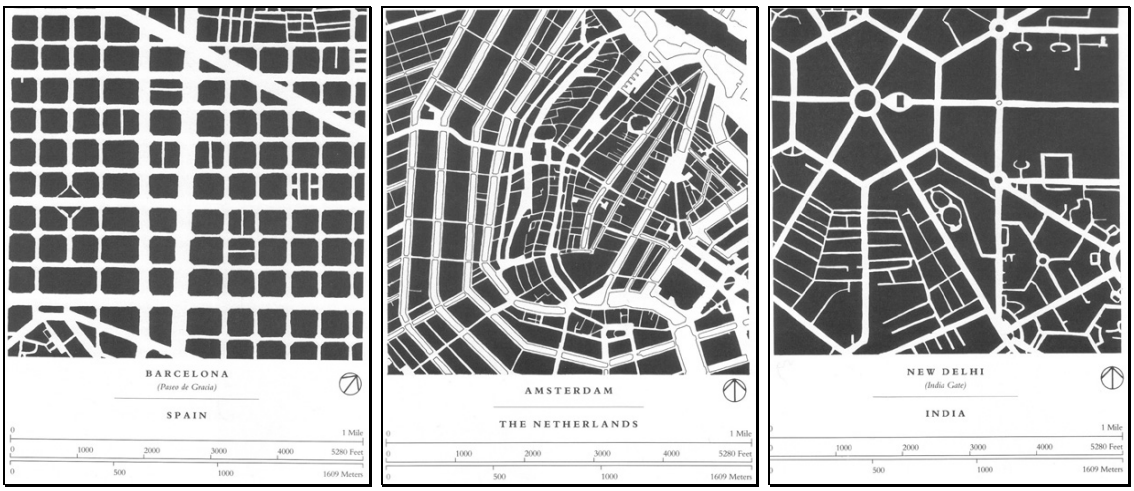


Figure 2-14: The Different Types of the Street Patterns (Jacops, 1996: 207-230)

“Beyond this general idea, there are several alternatives for the pattern itself, and these are closely linked to other features of urban form. The two principal models of pattern – the grid and the radio concentric – have already been described. The grid is usually a rectangular one, in most North American cities, and indeed throughout the world. With its advantages of simple layout, regular building plots, flexible traffic flow, and logical orientation, come familiar problems,: visual monotony, a disregard of topography, difficulties for travel on the diagonal, and the threat of fast traffic on any street.” (Lynch, 1994: 425)

In urban history, the meaning of the street has changed from the pedestrian dependent street to the vehicular transportation networks. After this changing, the last forty years in urban design trend, the meaning of the street turn to the pedestrian oriented meaning. So “the evolution of street patterns has implications for the quality and character of new urban environments. Street systems that serve many functions can have a positive impact on a community. Designers and planners should understand that streets are more than utility corridor for motor vehicles, but rather are critical urban design elements that help shape the quality of a community’s environment.” (Eren, 1995: 42 from Southworth and Ovens, 1993: 276-277)

According to new urbanism approach, streets which carry only the vehicular traffic will never be abandoned. Contrary, designing the streets only for pedestrian use will be caused the reducing their vitality. So, providing a vital street for pedestrian to be possible with the local vehicular access, also, “the distances between intersections will favor the walkability of streets and a proper rhythm of building form on given blocks.” (Katz, 1994: xxii)

In the same manner, Paumier (1988: 26) focused on the importance of the balance between vehicular and pedestrian movement. “While vehicular access and parking to serve central city should be convenient and efficient, a clear emphasis on pedestrian use must be established in the centre, if walking and street activities are to be encouraged. A positive balance between vehicular and pedestrian use of the street must be established. A well defined circulation pattern can ensure efficient vehicular access as well as a quality pedestrian movement.”

Street patterns formed of many small sized building blocks into the general historical urban fabric. These types of patterns are perceived in a fine urban grain.

Also, small blocks create a lot of alternative routes to choice into all of them, furthermore, visually permeability are increased with small building block pattern.

All streets have settings, in street patterns and block structures and, at a finer scale, amidst buildings and spaces, may be it is the contrast of are street with surrounding ones, in size or direction or shape, or in the nature and size of the buildings that are found on it, that sets the one street apart and makes it special.

2.2.2.1.1 Vehicular Circulation

The hierarchical road system is the most useful traffic arrangement model to separate the nodes of travel since the 1920's. The main approach to this system is distribution traffic routes according to traffic flow and direction of the vehicles for efficiency. In order to create this system some roads have constructed to carry the higher and factor traffic loads in a hierarchical system. The main arrangement to create these type roads, have required the less pedestrian crossing, and less connection with the private roads and reducing the cross-sections with the other roads.

The increasing the links between the roads and pedestrian ways to provide more safety and faster traffic flow have caused the reducing the permeability for the circulation systems. Moreover, the hierarchical and one direction road system have created the restrictions for urban fabric. This system may be appropriate for residential areas because of creating an exclusive destination of vehicles, which prevent to pass though on the way to somewhere else and generate a sense of identity for community living with safety and security.

The 'super block' is an area, surrounding by major arterial roads. It may be include a hierarchy of roads to arrange the local traffic in it and with a grid or discontinuous streets. The super block can include a specialized single use like residential areas or include mixed-use functions.

According to Buchanan Report (1964) the most important point of the arrangement of the traffic networks is the providing balance between the fine-mesh traffic flows and the sustaining the quality of urban life.

2.2.2.1.2 Pedestrian Circulation

In recent planning techniques gives more important for requirements of cars rather than pedestrian requirements. For the purpose of increasing the traffic efficiency, different types of arrangements are implemented by engineers in urban environment. However, pedestrian circulation is more important to provide vitality in urban areas rather than vehicular circulation. Especially, central parts of the city have a lot of public transportation alternatives. So, the greater numbers of people are carried by buses, underground, street car. Therefore, contemporary approaches try to design as to pedestrian circulation mesh to give precedence to pedestrians.

There are different methods to increase the opportunities of pedestrian circulation. Particularly, into the central parts of the city, “pavement widening/road narrowing schemes, and closing of subways and reintroduction of surface level crossing” (Carmona, 2003: 188) and more importantly pedestrianization of the existing or new roads are the most common methods to increase the pedestrian routes. Also, control of the vehicular speeds are tried to lowered by controls and regulations, by speed bumps or other obstacles and manipulating and configuring sight lines.

The notion of the providing requirements of the needs and efficiency of the road network and pedestrian network is the most determinant factor for the designing of the urban fabric. The forms and size of the block structure, the number of intersections of the traffic circulation and the pedestrianization of the streets are depending on the pattern of the components of the physical structure.

Pedestrian circulation is not only interrelated with the street network but also arrangement of the block structure. Especially, at the central part of the city have a great number of pedestrian density, both horizontal and vertical directions, because of the communication and sharing documentation and trading needs. So, these interior circulation of the block structure are required the adequacy for stairs, ramps, elevators, escalators and also, arcades, passages and alleys for providing permeability of movement through the buildings.

The efficiency of the pedestrian circulation layout also related with the interaction quality between public spaces including activities and spaces. The most used sitting places are generally adjacent to the pedestrian circulation, which allows the watch the activities. On the other hand, fine grain of the public spaces on the

pedestrian network creates different types of variety and richness in the urban fabric. In contrast, the public spaces into the block structure, which could be defined as semi-public or semi-private space, could create attractiveness for people walking in the street.

Consequently, the most important function of the urban design is to increase the accessibility of the pedestrians toward the activities. Also, the perceptual, visual and functional needs of people could be received into the urban space. The arrangements of the block structure effect to the pedestrian activities both in block structure and in street space. The general opinion about the designing of fine pedestrian space with pattern of small block structure, expose the fundamental point of the designing block structure for more permeability and accessibility.

2.2.2.2 Infrastructure

Infrastructure, as below ground network is becoming increasingly important and generative elements for the urban areas. Developing technology and increasing density require more complicated and sophisticated networks, and also require the more capacity. Because incremental and large amount of building density increases has overloaded many infrastructure system and caused conflicts and deficiency. So, there are mutual relationship between the infrastructure system and block structure and street structure. They could be determined to the capacity of the other. Hence, they must be well designed and to be flexible. However, the planners, urban designers and architects have ignored the networked infrastructure that knit buildings together, attached and configuring the broader spaces of urban areas.

Networks of the below ground are consist of water supply networks, sewage disposal systems, electric network, telephone networks, cable networks, gas supply networks and also combined heat and light systems, furthermore, underground transportation systems, such as subway and underground parking. However, some of these systems are more flexible and the others more stagnant in respect of changing conditions. But, developing technologies and increasing capacity are required to interfere to the existing infrastructure, while the becoming old the other reason.

While infrastructure is the most important requirement for the city life there is no evident determination for the formation of the block structure. Especially, using new flexible materials in implementation of the infrastructure provide more flexible character

for the street and building arrangements. Of course, existing infrastructure must be taken into consideration in design process, because of the renewal cost. But sometimes the new formation of the space entails the renewal, especially, for central part of the city.

Arrangement of the block structure, buildings, and plot pattern could be designed that fractal and smaller than the megastructures because of the flexibility needs. Bulky and greater structures could cause to obstruct the some repairing and renewal efforts while contiguous or attached buildings more adequate. Consequently, block structure could be mentioned that the capacity requirements and flexible design types of the buildings.

2.2.2.3 Communication

The human history shows that people have lived together for mutual security or to be close water, food resources. Cities and its central areas are constituted to require the people's needs to come together which are mentioned that trade and the exchange of goods and services, access to information and specific resources, and necessity for community effort and organization. However, the evolution of the transportation opportunities, especially, development of the automobile has provided to disperse of the central city. In the post-war era, the suburbia became the lifestyle for most of people to leave the overcrowding city life, which have had crime and disease.

Communication has two different meanings, which are communication of the people with each other, and communication networks as infrastructure. These are mostly related to each other and effect the built environment. According to the first mean Rapoport (1977: 325) mentioned that "The built environment is partly the organization of meaning and communication. This concerns the structuring of communication among people. It is also concerns the organization of the communication from the environment itself." This organization constitutes the formation of the urban fabric. Because, sharing information necessities define the requirements of the physical structure, for example face-to-face meeting or sending documents. Also, these necessities are determined the area of block structure and street pattern. Especially, in central parts of the city appears the high building and people density for the reason that intensifies of the communication requirements for business and trade activity. The high rise development in central areas is the result of the easy sharing document requirements. On the other hand, increased mobility with the remote

communication systems has reduced the need for the spatial concentration of activities has allowed activities to spread out. Moreover, development of the electronic communication networks cause the powerful decentralization and anti-urbanization in the city.

Developments of the electronic communication provide the ability to work from home, and in future may be necessity for workplace. However, it creates new conditions for living and working, and to allow greater choices for place of residences. “Telecommunication does not remove the need to design and create places where people want to live, work and play.” (Carmona, 2003: 32) Also necessitates for the face-to-face communication in the community life will be never end. And the need for public spaces always remains vital.

The new conditions of the city life are important to structure the physical parts of the city. Because, intensity of the city parts is constituted by the developer’s demand. If the necessity of communication reduces the high density development, urbanism may be affected negatively according to new conditions.

Building density, as a main characteristic of the physical structure, determinates the formation of the block structure. So, the high level urban life effect the density distribution in city and block structure and network could be formed appropriate for vital urban life. The scope of this thesis is mentioned that rich, dense and interdependent combinations of meeting places and public spaces supported by necessity of the face-to-face communication. Furthermore, intense and pedestrian based commercial and business areas within the mixed use areas. Therefore, the reducing urban life cause some differentiations of the modeling the optimum conditions of the block structure formation. The most important features of communication to design the block structure could be exposed that the increasing the meeting spaces and public places.

On the other hand, the second meaning of the communication, as mentioned by networks has no significant determination of the physical structure. Because, developing infrastructure technologies provide unlimited engineering facilities for physical structure. So, there isn’t any determination for formation the block structure and its components.

The increasing our physical and electronic networks, which are highways, telegraph, telephone, television, internet and video-conferencing technology are

caused the separation of the people from the friends and relatives. So, unity of the people with community has broken down. So, the fragmented society has been a reality for people and social life.

2.3 Historical Background of the Block Structure Formation

2.3.1 The Formation of the Block Structure before the Urban Planning Epoch

In the history, the conscious creations of the city resulted from both defensive and implication convenience. The Greek, the Hellenistic and Roman Empires showed tendency to design the city with formal plans. Blocks in square and rectangular grid pattern consolidated as the most general device and had been in use in the Ionian Cities since the seventh century B.C. “in Greek Cities, the concept of dividing a city into square or rectangular blocks with long, straight streets is often attributed to Hippodamus of Miletus.

“In the Early Greek Colonies the grid, far from being a democratic device employed assure an equitable allotment of property of all citizens, was the means of perpetuating the privileges of the properly-owning class descendent from the original settlers, and bolstering a territorial aristocracy.” (Kostof, 1991:99-100)

“At Miletus two house blocks form a common unit. Priene has four houses per insula … At Olynthus; however there were ten houses per insula, divided by a narrow alley, into two strips of five. Here we have a prototype ‘super block’, in which a major grid is subdivided by a parallel subsidiary route system.” (Evans, 1978: 74) (Figure: 2-15-a)

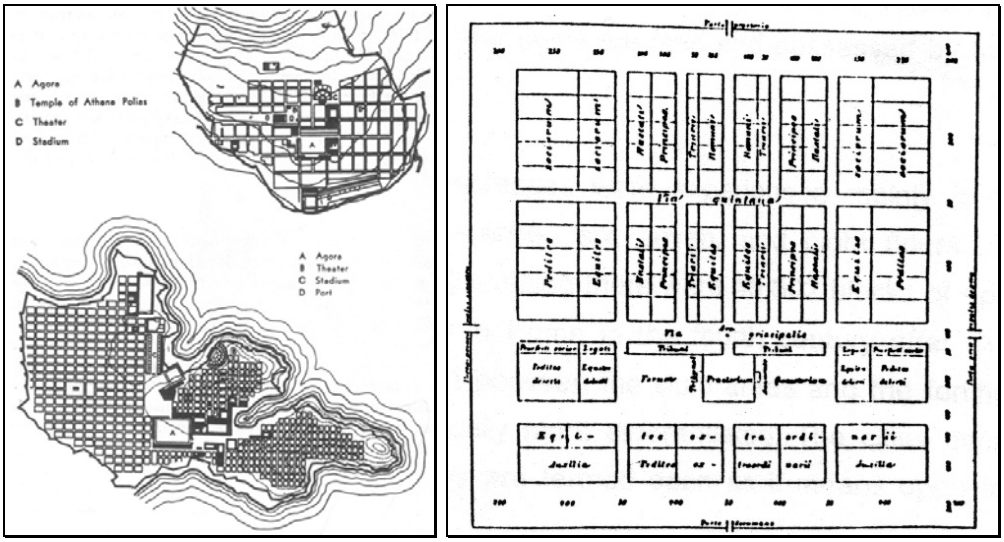


Figure 2-15: a) City of Miletus (Eisner, 1993: 64) b) Plan of Roman Military Camp with Strict Regular Pattern (Lavedan, 1966: 361)

Into the Roman Empire period in Roman colonies plans were “more unitary plan with large square blocks in a tight mural frames locked into the lines of the grid, and the forum placed on or besides the crossing of two major axes.” (Kostof, 1991: 107) (Figure: 2-15-b)

In Roman plans, relative to historical urban settlements, building block dimensions were larger and proportions were variable. The physical arrangement standardized, so this resulted as building blocks of equal sizes through developments. The ability of engineers created the city structure. They like, Hellenes, lacked the philosophy of the Greeks. The plan of the city is not created the citizen.

After the Roman Empire period, which created the successful transformations in the urban physical build, open spaces demand had been provided by the consciously defined inner spaces in the form of large courtyards created among the architectural spaces. Especially, Islamic city affects the privacy idea for the buildings. The lots emerged as a result of division and distribution of the interior land for ownership and were distributed to householders and given them the rights of possession.

Accept courtyards, the streets, cul-de-sacs and plazas were the other open space forms developed as integral parts of the sites upon which the buildings were erected in the cities of both Islamic city and West city. The cul-de-sacs became semi-public spaces and they could be accepted as a structure where form, function and

property relations conflict. The city is a solid built environment “in which hollows and lanes have been excavated. The bustle of crowded streets contrasts sharply with the quite calm of the interior courtyards.” (Lynch, 1981: 384)

Between fifteenth and eighteenth centuries, the retail activities raised with a concentration of population in the cities. The transportation systems and property ownership typologies began to change. After that, the necessity of the transformation of the urban physical build revealed the commercialization of the block structure. So, the requirements of new ideologies effected more detailed explorations. On account of these necessities, first, in the Renaissance and Baroque period, and then the colonial expansions in the American Continent, new urban formation structured.

One major type of urban space is, in the historical city, “the streets and squares were hollowed out of a rather compact mass of buildings of moderate height.” (Lynch, 1994: 407) The voids of the spaces formed by the cultural and activity based relations, and also topographical features of the places. This type of spaces are identified and formalized by the local people. So this spatial framework is constituted irregularly and more complex proportional relationships. “They seem secure, legible, proportioned to the human scale, and charged with life, even if at times a little oppressive.” (Lynch, 1994: 407)

2.3.2 The Formation of the Block Structure after the Urban Planning Epoch

The other major type of urban fabric has formed by modern planning. Functional separation, traffic based circulation, machinery types buildings are the basic components of the creating the modern space. Isolation of the buildings from each other in very strict rules and creation large open spaces, which isolate the activities, is the main spatial arrangement of these type regulations. But at the end of these process, “the street space has lost its form, and become a neutral background for the form of the structures. “(Lynch, 1994: 408)

“The colossal pressure for expansion of cities led to over rapid decision making. Solutions were necessarily simplified, house-plans reduced to a minimum, building technology was stifled for economic reasons. Functional, constructional and capital concerns were the order of the day. Architecture was a low priority (towards the end of the 19th century.).” (Krier, 1979: 74)

Increasing the car and elevator technology physical structure of has changed. The elevator and the high-rise building allowed increasing the development density. Increasing roadway and space for vehicle storage have been important rather than pedestrian way necessity. As a result, widening streets and parking spaces to accommodate increased traffic often resulted in lowering the quality of the pedestrian movement.

Up to 1930's, in USA, land development as a real estate facility which created land speculation was the main reason behind the rapid development. Environmental quality was the unimportant provision for the settlements. The land subdivision was a result of competitive necessity.

Also, Ryan and McNally (1995) mentioned that "The gridiron system (the rectangular form of grid) was typical street layout of real estate development… This form enabled the land owner to create as many lots as possible from a tract." This form provided maximum private plots and minimum land cost for public uses. Therefore, minimum improvements in streets, for sidewalk, water, electricity and gas distribution were required.

According to Ryan and McNally (1995), city planners believed that reducing the traffic congestion in central city could be provided by designing broader streets or by street widening. In that reason, many projects have been implemented to construct major and secondary highway projects, junction projects, intersection controls to reduce the traffic congestion. Gallion and his collaborators (1993) mentioned that frequent intersections are interrupted flows caused to the city, because left turns occurred at all intersections, parking vehicles and pedestrian traffic were conflicted.

2.3.2.1 The Formation of the Block Structure According to Modern Planning Approaches

According to Modernist 'functionalist' ideas, the principal determinant of the building; external form was the internal space organization convenience. The requirements of inside design of the buildings consider, "light, air, hygiene, aspect, prospect, movement, openness etc…" (Carmona, 2003: 67)

In modern architecture and urban design period most useful system of measurement is consisted of unification both scale and module by Le Corbusier. The

‘Modular’ is the remarkable measurement system, which was established a relation between rhythmic harmony and fine proportion between the man and environment in order to use a city as well as a building. (Figure. 2-16)

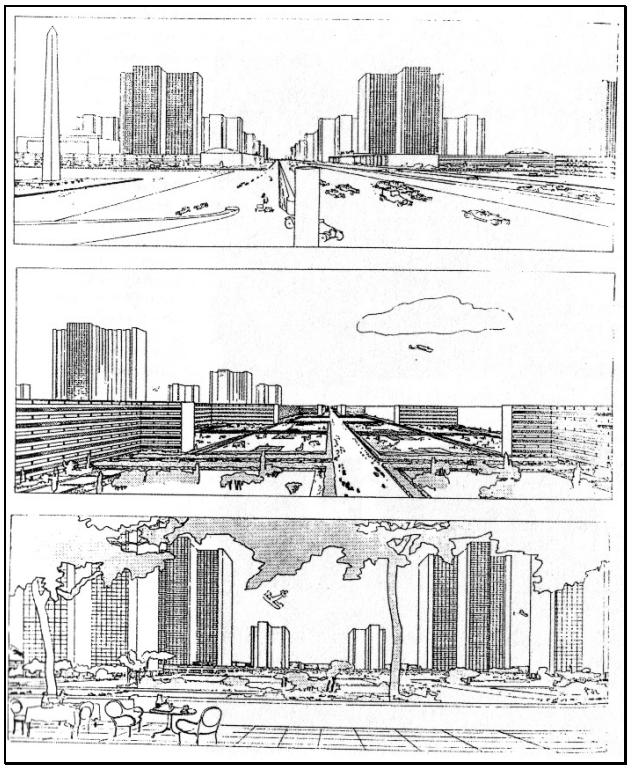


Figure 2-16: The City of Le Corbusier for Three Million Inhabitants

(Gosling and Maitland, 1984: 19)

The one of a measurement is relative proportion or ‘module’. A module consists of elements which are repeated at regular intervals. So, this repetition can be formed as a building or city parts. The module can be related with human dimensions. This is generally related with the construction technology and material types in modern building components.

In the development process of the city; structure, size and form of the block structures have showed diversity. Forming an evident and standard block structure is a difficult process with existing property pattern, and the changing necessity of the land use. Anyway, standardization of the spatial arrangement is the undesirable situation of the evolution process of the city.

2.3.2.2 The Formation of the Block Structure According to Urban Design Approaches

As Lang (1994) mentioned, during twentieth century three main urban design approaches have affected the urban history. These are City Beautiful Movement (1900's and 1930's), Garden City Movement (1930's to 1960's) and Rationalist branch of Modern Movement (1945 to 1980's). After these three branches of urban design movement, since 1980's, Post-modernism, Neo-Traditionalism and Deconstructivism have initial impact on urban design history.

In the early nineteenth century, the curvilinear patterns developed with the picturesque design principles. Especially, into the American cities this continues curvilinear layouts, has been most preferable structure of the suburban cities. While curves are provided an enclosure views and visual interest into the area, also, they have been redacted to discourage the non-residents from entering into the area. However, because of the creating developed and changed through the cul-de-sac forms, which sought to retain the aesthetic of curvilinear layouts, from the 1920's to late 1950's.

After the 1930's, Garden City approaches and Radburn principles (1928-1945) were appeared into the planning discipline, the basic improvements to the land were provided, so that at least the general public welfare would be protected. The Garden City principles began to implement to the suburban settlements. The most characteristic example for Garden City Movement implemented in Radburn plan.

The most important design features of the Garden City approach is the super block concept was used to eliminate through traffic from residential areas. The desirable of living spaces was important rather than vehicular movement. Instead of the homogeneous and standard street system of gridiron plan, the super block created different classes of streets according to needs. So, the most evident principle of the movement system is separation of the pedestrian from the automobile traffic.

Between 1960's -1980's Planned-Unit and Cluster Developments were evolved, according to Gallion and his collaborators (1993), the post-world war II period housing boom occurred within a planning framework that probably from previous period. The basic public services were provided to the residents of expansive new development by local planners. The subdivision regulations and land use controls resulted to expose

some limitations. Regulations were becoming an acceptable for control over the side effects of land development.

The predominant subdivision regulations produced to planned-unit development and cluster development. According to Lang (1994), the infrastructure reflects to rectilinear geometry that systems are the basis for all urban design because it provides the linkages between places.

After the cluster development evolution, planners hoped to rearrange land uses, by reducing land composition and building costs so that the most effective use of land. In cluster development, the street and building sites are reduced, on the contrary, the number of building units increased. So, the basic road system designed with the curvilinear streets, which provided variety and changing vistas, cul-de-sacs and loops to control the high speed.

Morphological approaches have used to understand evolution of the urban space. Beginning from 1960's Colin Rowe have studied with figure-ground diagrams to describe buildings not just as object, but also background into the urban space. "In Collage City, Rowe and Koetter (1978: 50-85) described the spatial predicament of the Modernist city as one 'object' and 'texture' objects are sculptural buildings standing freely in space, while texture is the background matrix of built for defining space." (Carmona, 2003: 69)

In the 1960's, another morphological approach for urban design was brought up by Aldo Rossi and the Italian School. Rossi (1982) resurrected ideas of architectural types and typology. In contrast to building type, which generally refers to function, the architectural type is morphological and refers to form. Architectural types are abstractions of basic principles, ideas or forms and, in a sense, are three-dimensional templates that can be repeatedly carried with endless variation.

As Kelbaugh (1997: 96) explains, while typologists may "admit that a design can present unprecedented social issues and new technical opportunities. They also know that human nature, human needs, and the human body haven't changed, nor has climate (yet) or geography (much)."

According to neo-rationalist thought developed in recent postmodernist urban design perspectives, the city is accepted as a collage of patterns. The resurrection of

the classical 18th century spatial arrangement approaches as enclosure and definitive form of the block structure are resurrected by urban design theorists such as, Leon Krier, Rob Krier, Aldo Rossi, and Manfredo Tafuri. On the other hand, new empiricists, as Gordon Cullen, Kevin Lynch, Christopher Alexander, Charles Jencks, are introduced the importance of the selectivity the forms and symbols in history in order to provide human needs. Also, Lynch aimed to preserve block structure and stressed the transformation in the inner-block. (Figure: 2-17)

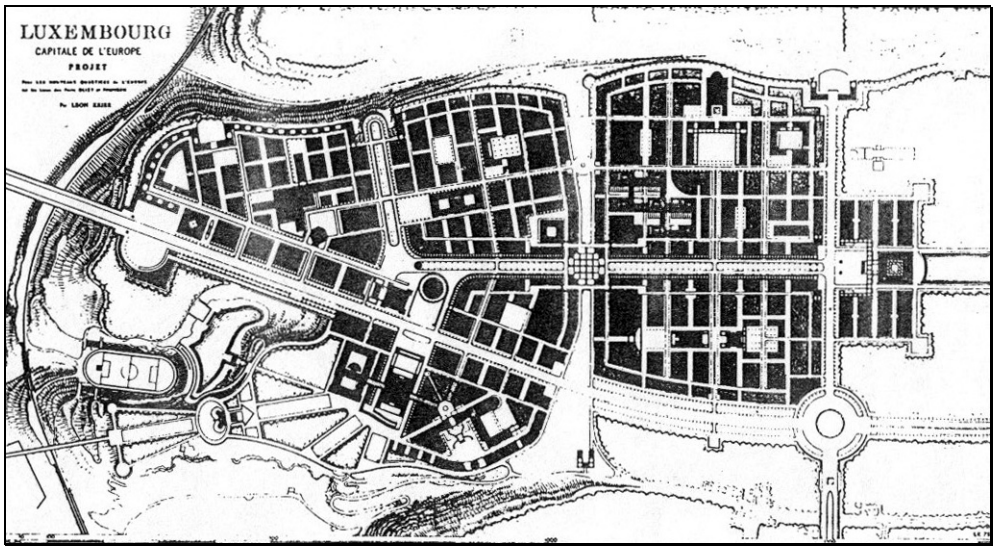


Figure 2-17: Proposals of Luxembourg by Leon Krier (Broadbent, 1990: 195)

Up until the return of the century, a continuous perimeter block structure development was experience in many western countries. Any development of the block structure began to respond to the particular form of the existing fragments. So, inner block structure with perimeter block structure have some differences as open plan, covered, divided, continuous, reconstructed and repaired block arrangements. As Krier, (1978: 38) exposed for flexibility of the guild-block structure “the overstressing of the historical centers through peripheral growth and the following breaking up of their structures by the mechanical means of transport have enforced the decomposition of the city as a complex spatial continuum.” (Figure: 2-18)

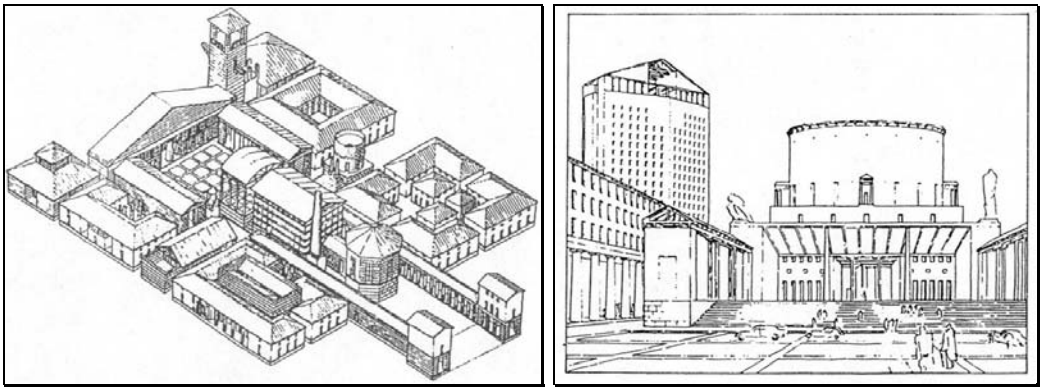


Figure 2-18: The Arrangements of Inner Block Structure (Broadbent, 1990: 197-199)

The new urbanism period began to 1980's as a reaction to the suburban period. In this approach four types of emerging concept appear, these are mentioned by Rabinowits (1991), first is the reborn of the traditional street-oriented commercial areas into high-rise mix-use centers; second, the transformation of suburban shopping malls into mini cities; third creating the central areas into the suburban settlements; and last, the automobile oriented shopping strip designing into the commercial centers.

The automobile and community designed to provide greater options for transportation, especially, walking opportunities and mass transit options. So, the integration of pedestrian with vehicular movement is the basic principle of this approach.

CHAPTER 3
CONCEPTS OF THE FORMATION PROCESS OF THE BLOCK STRUCTURE

"Many contemporary urban design projects are conceived in terms of urban blocks defining space rather than individual buildings in space. (Figure: 3-1) The layout and configuration of urban block structure is important both in determining the pattern of movement and in setting space network, such structures open up possibilities and – in conjunction with basic typologies / codes / rules about physical parameters – can provide coherence and good urban form without necessarily being deterministic about architectural form or content." (Carmona, 2003: 80)

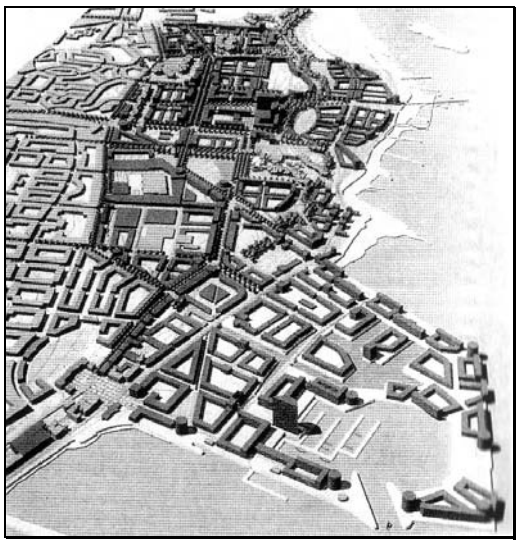


Figure 3-1: Master Plan for Granton, Edinburgh, Scotland (Carmona, 2003: 81)

Block structure is the basic pattern of the urban fabric, and it is constituted the physical environment of the city with street pattern. So, the form and size of the block structure should be balanced with the other design criteria of the designing and planning procedures. Especially, the environmental characteristics of the city, which are climatic conditions, sunlight and daylight, and wind direction, give a coherent knowledge about the designing process of the block structure arrangement. On the other hand, vitality, flexibility and accessibility are the most important features of the urban development, especially, for commercial development. So, the designing of vital block structure and building structure should be provided the sufficient pedestrian

circulation for accessibility and optimum range of building types, for flexibility. For the purpose of ensuring the diversity of building types and land uses the most important criteria is the different range of building block sizes.

As Montgomery (1998: 108) argued that modern urban planning approach has been create a lot of failures by mean creating a successful urban space. The planning method that arranged the simple buildings or building groups in the middle of a plot with setbacks as opposed way creating a successful street line. Hence this type of planning approach have caused the unused land for placing any function and less activity made possible. On the contrary, a building line could create a defining the space rather than simple being set in it, and ideally building groups could form a courtyard which makes the interior side of the building block livable.

The determination of the optimum block structure size has been discussed by different urban design theorists, because of its importance for structuring the urban form. The first reaction against modernist long type block structure was mentioned by Jane Jacops (1961: 191-199) she advocated the small block structure to increase permeability and variety of choices to create a vital environment for city life. Leon Krier (1990:197-198) also focuses on the importance of the 'comparison and experience' to understand the 'more apt' sizes of block structure to form a 'complex urban pattern'. According to Krier, "in most European cities that have evolved organically, the smallest and typologically most complex blocks are generally found at the urban center." (Carmona, 2003: 82) In contrast the urban center, the periphery side of the city has showed the larger and simpler typology for block structure, with freestanding buildings. Krier mentioned, the small block structures and close density provided more intimate character and more feasible for greater urbanity.

3.1 The Design Criteria of the Block Structure

In Turkiye, urban planning process has similar procedure like a lot of country which plans their settlements in comprehensive planning techniques, in a way from macro-scale plans to micro-scale plans. As Şakar (1996) mentioned, this procedure begins with 'Environmental Plans', which arranges the major region types, the regional land use distribution and traffic corridors. After that, 'Master Plans' or 'Development Plans' are prepared with respect to 'Environmental Plans'. Master plans aims to arrange the general land use types, population densities for land use areas, transportation system levels, and also suggest some solutions of planning the existing

problems, with a detailed report and plan schemas. Finally, for urban planning process, the ‘Implementation Plans’ are prepared to arrange the physical structure of the planning areas. This plan arranges the block structures, which involves their boundaries, land use types, density conditions setbacks and maximum height restricts, on the other hand, it arranges the road hierarchy with junctions and road widths. Also, these plans exposes the construction conditions with restricts. The all type of development plans have to prepare according to the regulations called ‘Development Law’ by institutions that put something into practice.

Certainly, the municipalities can add some issues which are appropriate or necessary for their local conditions of the settlement, with the decision of municipal council. However, these new issues and additions have to because appropriate for Development Law and have not to change to change the content of the statutes.

The other regulative arrangement of the development plans are ‘Typical Development Regulation issued 3030’. This regulation is implemented in the municipal boundaries and development plan must because prepared by this regulations. This regulation involves the physical restricts and main arrangement methods for the implementation plan.

In Turkish urban planning process aims two main issues: first, is determining the road direction with their widths, and second the functional zoning of the block structure into the city. As a result, the urban land divides into small regions to serve for residential, commercial, industrial and socio-cultural infrastructure requirements in respect to the development regulations. The other step of the implementation plans includes the arrangement of the building block, and it’s inside structure with plots and base areas. The formation of the block structure determines the new ownership patterns and the location and dimensions of the buildings in the plots.

The main aim of the implementation plan could be interpreted the transformation of the cadastral parcels to development plots, for unplanned areas, and also redevelopment of the existing plots to the new situation. As a result, the areas will be surrendered to public use and remaining land is reallocated to landowners for development. However, in implementation process, the allotment of the cadastral parcels are generally made by cartographers, even though the Article 9 of the ‘Regulation Regarding Basis of Development Plan Preparation and Its Alterations’, which expresses that development plots within a building block have to be shown in

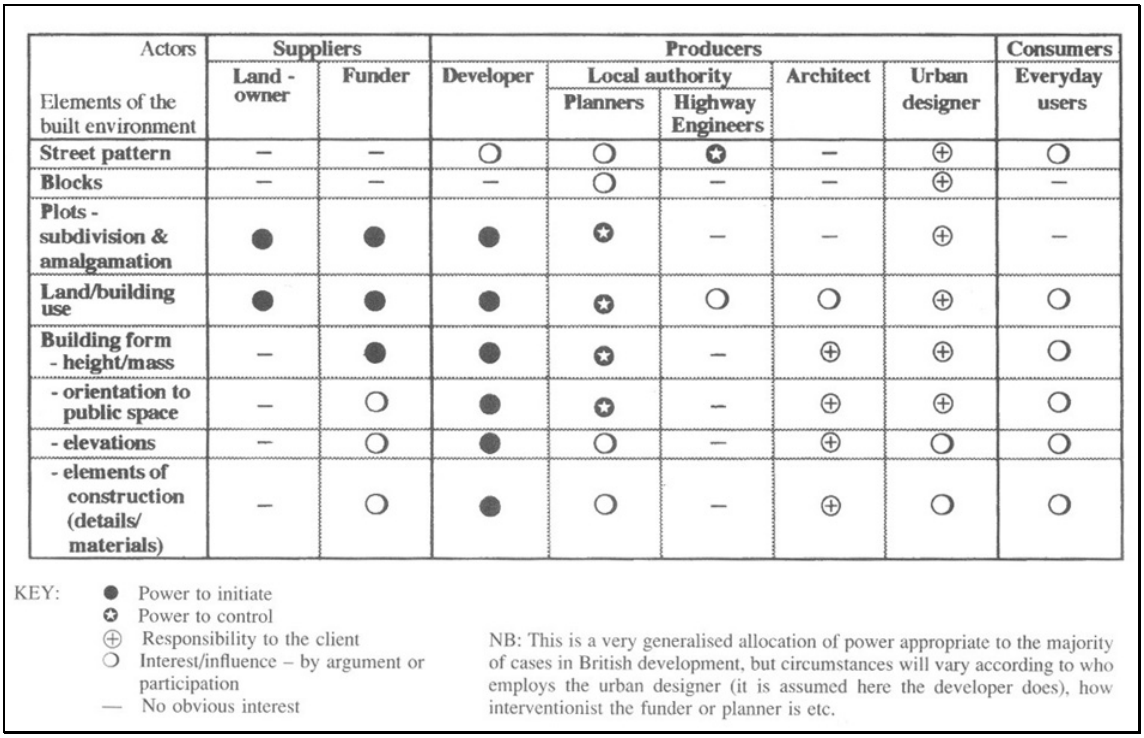
development plans. Because, the important part of the implementation plan is defining the construction conditions of the plots to form the block structure with base area ratio, floor area ratio and other construction restricts as building height restrictions, building density and setbacks.

According to development regulation, more than one building can be constructed in a plot provided that these buildings are located within the boundaries of set back distances. In addition, Cadastral Office can unify the development plots in one building block and can set up horizontal flat ownership and flat shares on the newly obtained plot.

3.1.1 Decision Making Mechanism and Actors

Regarding the factor, actors, it can be emphasized that in the process of urban design project, a multitude of different professions; planners, designers, architects, engineers, landscape architects, economist, sociologist, archaeologists… etc. and another multitude of actors; property owners, politicians, bureaucrats, investors, citizens … etc. are involved. Within this framework, urban design process is based on the integration of the multitude of professions and actors.

Actors have different role in the formation process of the urban fabric. Sue McGlynn (1993) “has highlighted both the differential distribution of power and conflicting roles and values of the different actors in urban design in a ‘power gram’, which suggest the relative influence of different actors on various aspects of urban form:” (Figure: 3-2) (Punter and Carmona, 1997: 85)



Actors / Elements of the built environment	Suppliers		Producers					Consumers
	Land - owner	Funder	Developer	Local authority: Planners	Local authority: Highway Engineers	Architect	Urban designer	Everyday users
Street pattern	–	–	○	○	✪	–	⊕	○
Blocks	–	–	–	○	–	–	⊕	–
Plots - subdivision & amalgamation	●	●	●	✪	–	–	⊕	–
Land/building use	●	●	●	✪	○	○	⊕	○
Building form - height/mass	–	●	●	✪	–	⊕	⊕	○
- orientation to public space	–	○	●	✪	–	⊕	⊕	○
- elevations	–	○	●	○	–	⊕	○	○
- elements of construction (details/ materials)	–	○	●	○	–	⊕	○	○

KEY:
● Power to initiate
✪ Power to control
⊕ Responsibility to the client
○ Interest/influence – by argument or participation
— No obvious interest

NB: This is a very generalised allocation of power appropriate to the majority of cases in British development, but circumstances will vary according to who employs the urban designer (it is assumed here the developer does), how interventionist the funder or planner is etc.

Figure 3-2: The Actors of the Decision Making Mechanism and Their Concerns about the Urban Design Process (Punter And Carmona, 1997: 86)

3.1.2 Existing Conditions of the Planning Area

The existing pattern of the project area should be effect the decision process of the development. The existing block structure, plot pattern, building types, building density and street pattern constitute the local context, which carrying the spatial, cultural, economic, and social meaning of the city. So, the effective way of establishing the block sizes could be considering circulation routes and connections and working within the grain of the local context. Because designation of appropriate circulation distribution, and also, land use distribution could be analyzed for requirement of existing conditions, and “the use of historical precedence – that is, patterns that have endured and accommodated growth and change over time.” (Carmona, 2003: 82)

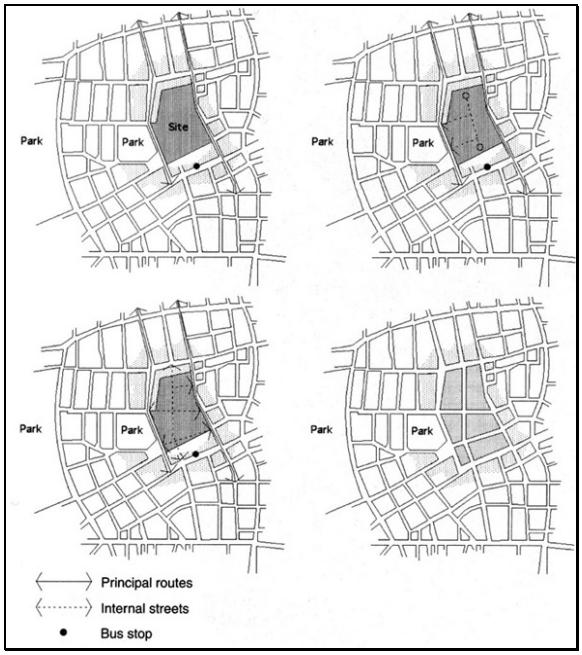


Figure 3-3: The Adequacy of the Existing Urban Fabric Is the Important Especially For Circulation Routes (Carmona, 2003: 82)

Generally, planning activities are executed to predetermined objectives and goals. They are not carried out in terms of the boundaries of the property ownership. Nevertheless, analyses of property ownership patterns are eventually conducted during the urban design process of the project. In this process, models are developed to solve the problems originating from property ownership. In this respect, land tenure or property ownership pattern which took its from constitutional traditions of the society are the significant factors in the processes of urban design projects re-arrange property ownership patterns that represents complex fabric of social reality. (Figure: 3-3)

3.1.3 Legislative Framework

Laws and regulations of all kinds have impact of the planning of cities. Some of them are permissive and some of them are obligatory. Legislations are determined that planners and designers understand their responsibilities under the laws in the area. So, the aim of the laws and regulations provide the development and protect the public welfare.

In Turkish legislations, there are two main determinations for the planning process. The one of them is ‘Development Law issued 3194’ and the other is ‘Typical Development Regulation issued 3030’. These regulations aim to arrange the minimum

conditions of the physical build. Therefore, some definitions of the planning process are introduced and these are explained in a hierarchy. These planning criteria include generally constructional features of the physical build, especially into the development regulation. However, the arrangement of the block structure introduced with its sub-artifacts as plots and buildings.

The minimum conditions of the plots and buildings are produced with a mutual systematic. Because the building couldn't be smaller than the human needs and service requirements of the buildings. So, the minimum physical conditions of the building affect the plot and also block structure. On the other hand, block structure determines the plot pattern with a land ownership properties and this plot pattern have some limitations because of the fragmented ownership pattern. As a result the plot dimensions are affected the building dimensions with the setback restrictions. 'Typical Development Regulation issued 3030' established all part of the block structure to be interrelated with each other. Also, the main approach of the regulation is to provide a healthy public and private relation between these parts.

The fundamental problem for the legislation of Turkish planning system is lack of the sufficient qualified to create a variety for the different situations. However, the development regulation provides a changeable structure for the local institutions, like municipalities. But, these alterations are generally insufficient too.

Consequently, the Turkish legislation about urban planning system must be improved to provide a variety for the urban fabric. In Western planning examples show us the new generation of these legislative framework. Especially, urban design guidelines have some notions about the different conditions of the local characteristics of the city. Also, these types of guidelines include the all step of the design procedure as planning, urban design, architecture, engineering and landscape. These will be clarified in section of the urban design guidelines.

Finally, the restrictions of the regulation are given to explain the arrangement types of the Turkish legislative on planning system. These are described in four main categories, which are block structure, buildings, plot pattern and land use pattern. So, the sub-definitions and restrictions are given and schematized.

3.1.3.1 Formation of the Block Structure

The formation of the shape and size of the block structure are determined according to existing conditions, which are ownership, existing land use pattern, existing street pattern and topographic conditions of the land. Furthermore, some boundaries as administrative borders, planning borders, and some borders of historical preservation areas could be limited the planning area and its formation. The arrangement of the block structure and street layout must be appropriate for the master plan. On the other hand, the plot arrangement determined the building structure with construction conditions and these are formed the plan form of the whole urban fabric.

Nevertheless, some development institutions as mass housing corporate, cooperatives and great construction agencies, especially for foreign countries, demand some development plans to implement block basis structure. This type of arrangement brings more flexible design for block size and shapes, and also building arrangement.

3.1.3.2 Formation of the Building Structure:

The arrangement of the location, shape, size and height of the building structure into the plot pattern is determined by the minimum standards in the 'Typical Development Regulation issued 3030'. There are some definitions and restrictions of the building structure, which locate into the plot pattern. This process have mutual characteristic for the formation of buildings and plots. One of these two components of the block structure effect the formation of the other, but this is related with the minimum conditions which define in regulations. However, the building size has to be appropriate for human needs, so it must be dominant factors of the design process.

The formation of the building into the plots could be related with building orders, building dimensions and setback distances in the regulations, which only includes the minimum restrictions for construction.

3.1.3.2.1 Building Orders:

The building order is defined the building types into the urban area. Şakar (1996: 200) defined these types from regulations, which are detached order, contiguous order and block order.

- Detached order is defined that the building has no adjoining wall with the neighboring buildings.
- Contiguous order is defined that the buildings are attached with one or more neighboring structures. Also, the semi-detached order could be mentioned as a block composed of two buildings which are partly or completely detached to each other.
- Block order is defined as a structure of one building mass with garden locating a one or more plots, which frontage length, depth and height are determined according to the development laws and its regulations.

3.1.3.2.2 Building Dimensions:

According to development regulation of Izmir Greater City Municipality (2002) the building dimensions are defined by three categories, which are building frontage, building depth and building height. The regulation determined the minimum conditions of the construction.

1) Building Frontage: According to the development regulation, the maximum building frontage is 30.00 m. for detached order. The municipal has the power of constituting two or three building blocks whose total frontage does not exceed 30.00 m. by unifying several narrow plots according to the building characteristics of that area.

2) Building Depth: It is the distance between the front and back frontage lines of the building. According to the development regulation, provided that the building depth does not exceed 22.00 m. and does not approach to the back set back wall more than the half of the building height (H/2), with a minimum distance of 3.00 m., it is calculated with the following alternative formulas.

[B = D – (F+H / 2)]

B = Building depth (m.)
D = Parcel depth (m.)
F = Front set back distance (m.)
H = Building height (m.)

[B = A x BAR / W – S]

B = Building depth (m.)
A = Plot Area (m^2)
BAR=Base Area Ratio
W = Plot Width (m.)
S = Sum of the Side Backs (m.)

But these formulations have some alterations into the development regulation (Şakar, 1996: 207) for formation of the building depth. These are mentioned as below:

- The building depth could be increased to 10.00 m., if the building depth calculated less than 10.00 m. But, the rear yard of the plots couldn't be less than 1.00 m.
- For corner lots, building depth is determined by the building depth of the neighboring plots, which have the same street frontage.
- Into the implementation plans, the ground floor ft block order and contiguous order building, for commercial uses, could be constructed along the plot depth. But front setback and side setbacks couldn't be changed.

3) Building Height: In the development plans, sometimes building heights or number of storey didn't be indicated. In this situations building height and the number of the storey could be determined according to general development regulation restrictions (Şakar, 1996: 208), which are below:

- If the street width is less than 7.00 m.; the building height couldn't be exceed 6.50 m. and number of floors couldn't be exceed 2 floors except basement.
- If the street width is more than 7.00 m.; the building height couldn't be exceed 9.50 m. and number of floors couldn't be exceed 3 floors except basement.
- If the street width is more than 9.50 m.; the building height couldn't be exceed 12.50 m. and number of floors couldn't be exceed 4 floors except basement.
- If the street width is more than 12.00 m.; the building height couldn't be exceed 15.50 m. and number of floors couldn't be exceed 5 floors except basement.
- If the street width is more than 14.50 m.; the building height couldn't be exceed 18.50 m. and number of floors couldn't be exceed 6 floors except basement.
- If the street width is more than 17.00 m.; the building height couldn't be exceed 21.50 m. and number of floors couldn't be exceed 7 floors except basement.
- If the street width is more than 19.50 m.; the building height couldn't be exceed 24.50 m. and number of floors couldn't be exceed 8 floors except basement.

On the contrary to the general 'Typical Development Regulation', Izmir Greater City Municipality (2002) defined the building heights only as following conditions.

- Height of one-storey buildings = max. 3.80 m.
- Height of two-storey buildings = max. 6.80 m.
- Height of three-storey buildings = max. 9.80 m.
- Height of four-storey buildings = max. 12.80 m.
- Height of five-storey buildings = max. 15.80 m.

3.1.3.2.3 Arrangement of the Setback Distances:

Setback distances determine the location of the building into the plot with designation of the minimum distances allowed building and either the street or neighboring plot boundaries. As 'Typical Development Regulation' (Uzun, 1992) defined, that there are four types of setback distances and these are defined as below: (Figure: 3-4)

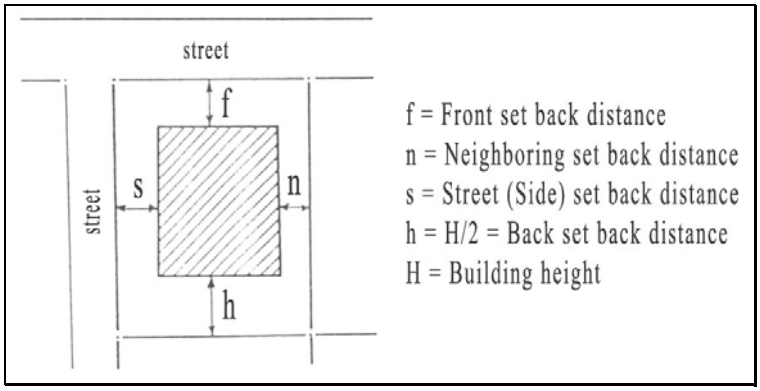


Figure 3-4: The Types of the Setback into the Development Regulation (Uzun, 1992)

1. Front Setback Distances: It is the distance between the front boundary of the plot, which looking to the street, and the front frontage of the building. According to 'Typical Development Regulation', the front setback distance of buildings in the plots must be minimum 5.00 m.
2. Street-Side Setback Distance: In corner development (building) plots, it is distance between the side boundary of the plot and the side frontage of the building (frontage looking to street). According to the typical development regulation, the side (street) set back distance of buildings to be constructed in the settlement areas is at least 5.00 m.
3. Side Setback Distance: It is distance between the neighboring plot boundary and the side frontage of the building (frontage looking to neighbor). According to the typical development regulation, the side (neighboring) set back distance of

buildings to be constructed in the settlement areas is at least 3.00 m, where four or less flats are allowed. This distance is increased 0.50 m for each extra flat.

4. Back Setback Distance: It is the distance between the back boundary of the plot and the back frontage of the building (frontage not looking to street). According to the typical development regulation, the back set back distance of buildings to be constructed in the settlement areas is at least the half of the building height (H/2), with a minimum distance of 3.00 m.

However, with the demand of increasing the flat numbers, the minimum distance between the opposite buildings has been important in order to provide a better urban environment. The application of the following formula will be useful in proposing new flat numbers.

[K = (H1 + H2) / 2 + 7 m.]

K = Distance between opposite buildings
H1 = the height of the building in front of the street
H2 = the height of the building in other front of the street

3.1.3.2.4 Building Density Regulations:

The most important criteria for planning process is building density regulations. Because the controlling the physical environment could be provided by given the right conditions of the building density in urban planning procedure. The 'Typical Development Regulation issued 3030' didn't have any restriction about the controlling of the building density. Only, the definitions are given which is used to control the building density. Building density decisions is left to the planners, who must be care of the existing conditions and local characteristic of the planning area. The definitions are defined in development regulation (Şakar, 1996: 200) as below:

- Base Area (BA): It is the maximum area covered by the building base settling on the plot; excluding light shafts and courtyards. The outbuildings constructed within the boundaries of the garden are counted in the base area.

- Base Area Ratio (BAR): It is the ratio of the base area of a building to the plot area. If the development plan does not put forth any construction provisions in a

building plot, the site back distances are taken into consideration. However, if the FAR or Plot Ratio didn't determined, for block order and detached order buildings, the base area ratio couldn't exceed 40% in that plot.

[BAR = Base Area / Plot Area]

- Floor Area (FA): It is the total area of all usable storeys; including closed projections and cellar, mezzanine, penthouse while excluding light shaft.

- Floor Area Ratio (FAR): It is ratio of the total floor area to the plot area. This ratio is also called as building floor usage coefficient.

[FAR = Floor Area / Plot Area]

Traditionally, we are more accustomed to open and semi-open spaces in urban spaces, also dwellings had their courtyard to provide their privacy and daily necessities. But, after the urban planning techniques adapted to existing conditions of our country; the 3 m. side-yard and 5 m. front-yard setbacks have caused dramatically problematic living places for people. (Figure: 3-5)

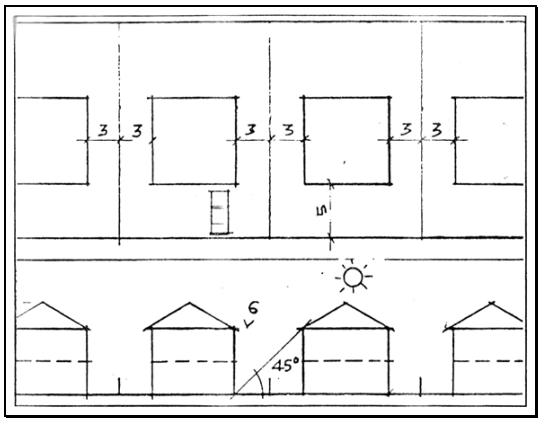


Figure 3-5: The 3 m. Side Setback for 2 Storey Houses, FAR: 0.50 (Altiner, 1994)

These setback rules improved by German city planners to produce the most efficient land parceling method which allotment the site area. These rules designed to provide the maximum profit from the natural lighting which envisioned the 45º angle of sunlight. In countries like Japan, USA and Spain, the setback distances are determined according to the angle of sunlight. So, the setback from roads exposed as to the building height /2 rules. (Figure: 3-6)

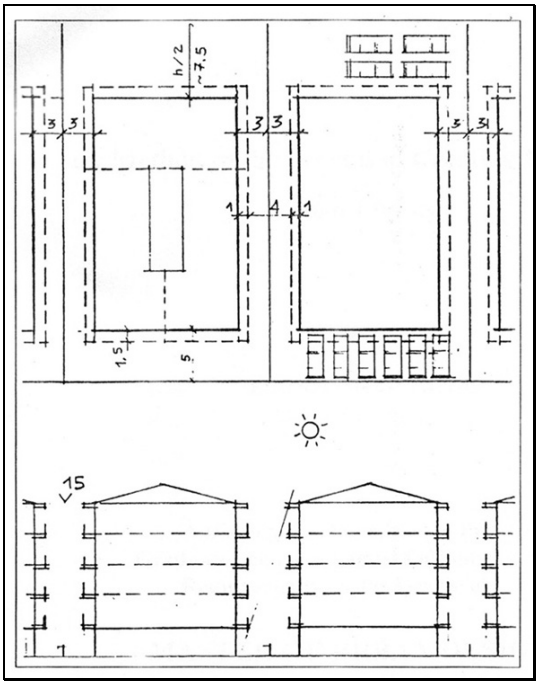


Figure 3-6: The 3 m. Side Setback for 5 Storey Houses, FAR: 2.5 (Altiner, 1994)

The rules of 5.00 m. of font setbacks and 3.00 m. of side setbacks were taken from German Law during the planning of Ankara. But, this rule was utilized for two or three storeys buildings in Germany. However, the development conditions of Turkiye required increasing the building density in parts of the central city. As a result, 2 storey designed areas have replaced by 5 storeys and more, with balconies attached the side-façade. After that, 6 m. distance between two buildings reduced to 4 m. and front garden and the sidewalk turned to car parking areas.

3.1.3.3 Formation of the Plot Pattern:

The pattern of plots is formed according to plot standards of the land use types, which defined into the 'Typical Development Regulation issued 3030'. These regulations introduce the minimum standards of the plot dimensions, because of the probability of the different situations that couldn't be defined in that way. So, the main aim of this regulation is to form building structure in a most appropriate method, into the planning area and also providing a service from the street is an important point for the formation of the plot pattern. On the other hand, the existing land ownership could be determinant factor for planning process. The remaining part of the ownership, which is remainder after a deduction amount of 35% for public services areas, could be distributed in a one or different types of plots in different dimensions.

Consequently, the two main factors could be exposed in the formation of the plot pattern. These are building orders and restriction of the minimum standards of the plots.

3.1.3.3.1 Plot Dimensions:

According to development regulation of the Izmir Greater Municipality, the minimum dimensions of the new plot due to subdivision is determined with respect to the site characteristics such as site, slope, existing buildings and so on, provided that there is no any distinctive decision in these areas of which have development plans. In addition, the dimensions and necessities of the buildings to be constructed on these plots are also diagnostic in the determination of the plot sizes. Especially, in the development regulations of greater cities, the dimensions related to plot widths and depths are separately determined according to floor heights and different land-uses.

Plot is smallest unit in urban development on which buildings can be constructed. In this framework, plot frontage is the side of the plot to the street which it locates on. In the corner plots, the side looking to the broader street is accepted as plot frontage. If two streets are equal, then the short side is accepted as plot frontage. The factors determining the plot widths, depths and areas are as follows;

1) Plot Width: It is the distance between the two sides of the parcel. The formulas for calculating the plot widths differ in each building order. These are as follows; (Figure: 3-7)

- In detached order,

a) Corner plot width = Street side setback distance + Building frontage + Side setback distance

b) Intermediate plot width = Side setback distance + Building frontage + Side setback distance

- In block order,

a) Corner plot width = Street side setback distance + Building frontage

b) Intermediate plot width = Building frontage

c) Block-head plot width = Building frontage + Side setback distance

- In contiguous order,

a) Corner plot width = Street side setback distance + Building frontage

b) Intermediate plot width = Building frontage

- In semi-detached order,

a) Corner plot width = Street side setback distance + Building frontage

b) Intermediate plot width = Building frontage + Side setback distance

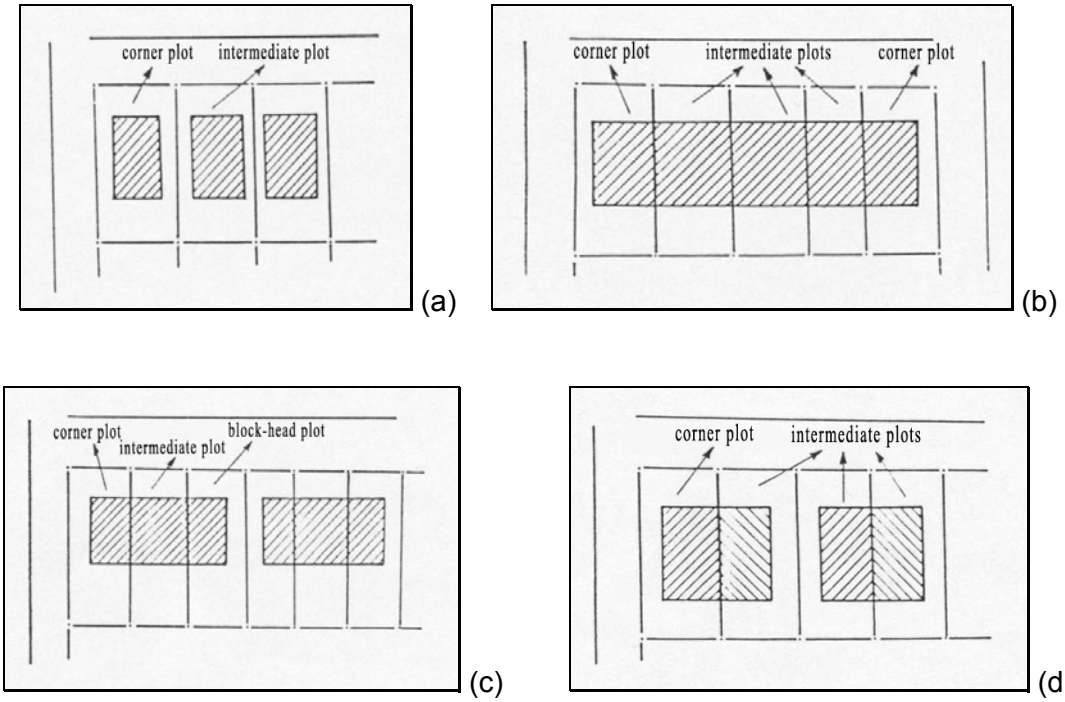


Figure 3-7: The Types of the Building Order: a) Detached, b) Block c) Contiguous, d) Semi-Detached Order (Uzun, 1992)

According to development regulation of Izmir Greater City Municipality, the plot width is determined related with the building height and setback distances of the implementation plan. So, these plot width cannot be less than the conditions which are mentioned below:

- In the areas of Residential and Commercial Land-Uses,

  A- Where 1, 2, 3 flats are allowed,

  a) In contiguous order: 6.00 m.

  b) In block ends: Side setback distance + 6.00 m.

  c) In detached order: Sum of side setback distances + 6.00 m.

B- Where 4, 5, 6 flats are allowed,

a) In contiguous order: 10.00 m.

b) In block ends: Side setback distance + 10.00 m.

c) In detached order: Sum of side setback distances + 10.00 m.

C- Where 7, 8, 9 flats are allowed,

a) In contiguous order: 12.00 m.

b) In block ends: Side setback distance + 12.00 m.

c) In detached order: Sum of side setback distances + 12.00 m.

D- Where 10 or more flats are allowed: 30.00 m.

- In the areas of Commercial Land-Uses where only one flat is allowed: 5.00 m.
- In the areas of Small Industrial Land-Uses,

  a) In contiguous order: 5.00 m.

  b) In block ends: Side setback distance + 5.00 m.
- In the areas of Industrial Land-Uses: 20.00 m.
- In the areas of Non-Residential Urban Land-Uses: Side setback distances + 10.00 m.

2) Plot Depth: It is the average distance between plot front frontage line and back frontage line. Plot depth can be calculated with the following formula; (Figure: 3-8)

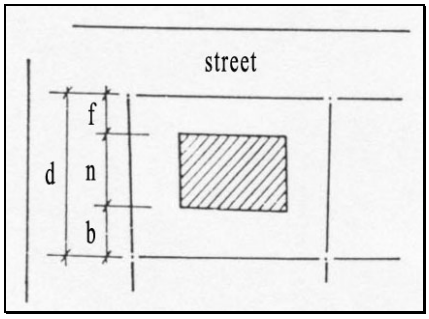


Figure 3-8: The Components of the Plot Depth (Uzun, 1992)

- In all building orders,

Plot Depth (d) = Front setback distance. (f) + Building depth (n) + Back set back distance. (b)

According to development regulation of the Izmir Greater City Municipality, the plot depths cannot be less than, these conditions which are below:

- In the areas of Residential and Commercial Land-Uses,
    a) Without front setback order: 18.00 m.
    b) With front setback order: Front setback distance + 18.00 m.
- In the areas of Commercial Land-Uses where only one flat is allowed,
    a) Without front setback order: 5.00 m.
    b) With front setback order: Front setback distance + 5.00 m.
- In the areas of Small Industrial Land-Uses: 5.00 m.
- In the areas of Industrial Land-Uses: 50.00 m.

3) Plot Area: According to development regulation of the Izmir Greater Municipality, the plot areas cannot be less than, these conditions which are below:

- In the areas of Residential and Commercial Land-Uses where 10 or more flats are allowed: 2000 m^2.
- In the areas of Industrial Land-Uses: 2000 m^2.
- In the areas of Urban Study: 500 m^2.

3.1.3.4 Formation of the Land Use:

The 'Development Law issued 3194' and 'Typical Development Regulation issued 3030' are the main regulations of the development plans. In spite of the development plans is mainly a zoning plan, the regulations have not introduced any formation process about the land use distribution in the city. This process defined in the regulations as mean hierarchy of the urban planning procedure. So, land use distribution is begun with Environment Plan decisions and than Master Plans and Implementation Plans are made in respect to Environment Plan conditions. As a result, formation of the land use is determined by institutions and planners in urban planning process according to existing conditions, local characteristics and actors of the decision making mechanism, adequately.

3.1.4 Urban Planning Methods

Urban planning is an important tool to arrange the urban fabric for development of the cities, which is used some regulations and standards to form the physical characteristics. These characteristics are constituted the two and three dimensional

framework and its functional usage. Building density, building heights and land use is determined the functional characteristics of the physical built.

The process of the urban planning, which is mentioned at the beginning of this chapter, is aimed to determine the capacity of the physical structure with ratio of building density and its setbacks. Building density means the floor space of the buildings used for working and residing. So, this floor space used to carry their function, as defined by land use control. The arrangement of the building structure for an adequate functionality is formed with their planning standards as building density, building height, setback distances and their standards as explained below.

The general issue of building density is both commercial and residential, controlling on the building and its dimensional interconnections to other buildings and spaces. The dimensions of the buildings include matters of scale, height, massing and site dimensions.

The building density is controls by plot ratios and number of habitable rooms per hectare. These are used for commercial cores, densely built-up areas and new residential developments. Plot ratios are calculated as the gross floor area divided by net site area. However, they have been widely discredited as design control instruments in Europe and USA planning applications. Because, the density controls have prescribed the maximum quantities of floor space, which must be provided the landowners expectations and to be useful in leveling out the optimum land values. But, these expectations sometimes cause the extreme building heights and building volumes, especially central part of the cities. Besides these situations, building lines and townscape have failed and uninhabitable spaces and inappropriate microclimates have created at ground level.

Plot ratio is used along with other density standards, which are habitable rooms per acre, limitation of building height, and setback rules. In the west planning regulations, such as urban design guidelines give the other perceptual elements. But the useful considerations about the designing the city are fine grained approach to setting plot ratios, different but well-adjust built forms and townscapes, and also levels of accessibility.

Building height is another fundamental control method which complements the design methods. Building height policy, also have a variety of ways. There is most

common way to define the building height, is the exact control than the storey height. Because, the general approach about building height is the appropriateness of the building to their surroundings. Hence, the exact height is the most useful tool in the urban areas, especially, central areas of the city, because of the greater storey heights of new office buildings. The general rule is that new buildings should not significantly exceed the height of surrounding buildings.

The specific height restrictions are appropriate for special characteristic areas, for example, including some natural features or near side of the conservation areas etc... On the other hand, especially central business districts, tall buildings are appropriate for development properties, which can be related to the skyline, capacity of infrastructure, and also land use pattern.

"Building density is an important indicator of land allocation and optimization in urban-built-form. Low density tends to make a city's transportation facilities uneconomic and may reduce property values. Thus, a policy of low FAR/low density urban development and a mass transit system may be self-contradictory, if an optimal urban built form is the objective. Thus, the very prescription of low FAR/low density development for an improved urban environment – precluding the provision of a mass transit system in a city due to economic considerations, consequently making the city more dependent on the pollution – increasing automobile - may the cause for increased pollution and consequent deterioration in the urban environment. If a country has a very low per capita land resource, it may again preclude any extravagant use of land in the urbanization process. It is necessary to carry out research to develop optimal urban built forms, resolving such conflicting view ports while adopting a systems approach, as part of integrated urban planning and management." (Chakrabarty, 2001:338)

3.1.5 Design Criteria

The building density of built environment is a delicate issue which cannot be easily controlled. Adequate restrictions for quality of urban space are required. In the detailed site design of the area, we must consider the size and placement of building masses. This involves such factors as function, scale, circulation, topography, appearance, open space, climatic control, natural lighting and visual appropriateness.

"We have also been implying that too many design decisions are made on the basis of factors which are irrelevant to the objectives of the design. Building masses,

placement, grouping, lot size and block size, these may be thoughtlessly drafted in the guise of expedience when it takes but a few more steps to ensure both feasibility and good design together, very likely, also gain a real economic saving in both the short and the long run." (Spreiregen, 1965: 156)

The general preoccupations of the physical arrangement of the urban areas are, consideration of the landform and natural features, scale and proportion of buildings, building height, historic features, visual impact, architectural characteristics, silhouette and materials, in other words these can said that the quality of streets and spaces.

The physical arrangement principles not only defining the building forms but also include public and private spaces and their role in the urban development. These principles encompass the issues of urban morphology and the pattern of development, figure-ground relations, enclosure of space, urban form and fine grain components, and also the public realm and good urban space development characteristics.

3.1.5.1 Spatial Structure

3.1.5.1.1 Grain:

The fundamental problem for urban design is the loss of the fine urban grain in older areas, since the beginning of the implementation plan period. Comprehensive planning or large-scale development policies have amalgamated plots and block structure and created some mega structures. But as Krier (1979: 169) defined that "the fascination of our historic cities derives from the almost infinite variety of their spatial forms and the buildings which shape them." (Krier, 1979: 169)

According to Lynch (1994: 265), grain is an important feature of the urban texture, which it's mean the different elements of a settlement are mixed together in space. These elements may be land use, block structure types, building types, and also, working or living people in there. Fine grain is a concept, which widely dispersed among these elements. Also, coarse grain is separation of the features in the urban context, like the modern planning approach has pointed at.

"Grain is simply a way of making explicit a spatial feature of cities, which is often discussed and is variously referred to by such words as segregation, integration,

diversity, purity, land use mix, or clustering. In its many forms, grain is critical to the goodness of a place." (Lynch, 1994: 266)

In spite of the important character of the fine grain settlement, there is no general rule to establish any method. It is a balance of the conflict or fit of the facilities. So, the scale of the settlement, existing conditions and also economy determine the appropriateness of the fine grain. But general approach, in spatial mean, shows us that small buildings, small open spaces and small enterprises are "more closely fitted to the varying activates of occupants, more completely under their control, and more easily sensed as connected to individual values and experiences, than are the large features of a coarser grain." (Lynch, 1994: 269)

The fine urban grain concept refers to generation of active frontages, with shops, services and small business enterprises on the ground floor level creating activity and interesting frontages for pedestrian circulation. Also, keeping small business and offices fronting onto the public realm, and large corporate users on backland or upper floors is the important planning decisions for the fine pedestrian grain concept.

3.1.5.1.2 Building Density:

There is more argument about the creation of more sustainable and compact cities. And the general acceptance is that compact cities can offer a high quality of life while minimizing resource and energy consumption with high density but quality designed urban parts. Although, development which, more compact and higher density is encouraged.

As Punter and Carmona, (1997: 163) exposed that "Increasing densities are seen as fundamental to sustainable settlements it is useful to conceive of appropriate densities of development that will support public transport, energy, conservation and economical servicing while protecting amenities."

Martin and March (1972) are studied that density must be considered in terms of the configuration of urban form. So, the formation types of the block structure are the essential factor to distribution of high densities in order to provide the useful features of the space and livable environment. The formation types of the block structure are discussed in Chapter 3.2 and also Chapter 4. In fundamental types, as a single point

block, a traditional street layout and a perimeter block enclosing open space. (Figure: 3-9)

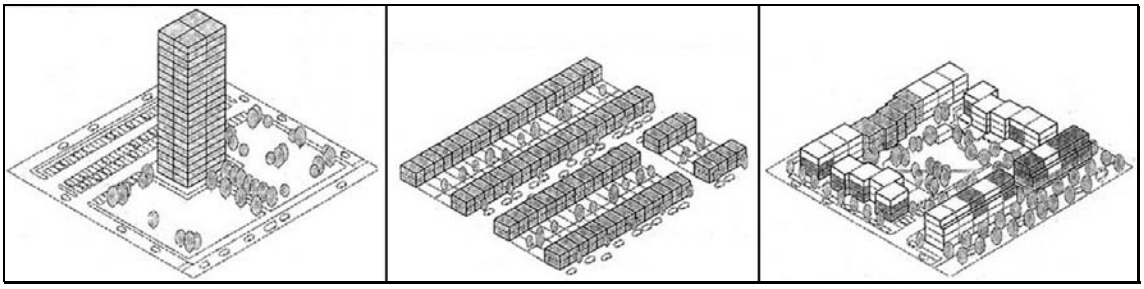


Figure 3-9: Formation of the Density with Different Building Structures (Carmona, 2003: 183)

Density is a fundamental factor of urban textures. Especially, the density of the central areas has an important effect on the quality of life by mean on costs, access, and the fit in city scale. Also, activity density is a kind of density in urban area. Service activities, commercial and shopping centers are important to access to these facilities.

“This implies high levels of ground coverage. There is no simple arithmetic answer to optimum city density, as this varies depending on the characteristics of place and mix of activities. Densities can be too low where they fail to generate vitality, and too high where they produce standardized buildings, regimented layouts and large development footprints. Thus, density in itself will not necessarily produce urbanity: density is a necessary rather than a sufficient condition for urbanity. City districts which achieve diversity tend also to achieve high pedestrian circulation.” (Montgomery, 1998:106)

Consequently, building density control is the important part of the formation of the block structure, because of the effects on the relationship between public spaces and building groups. Moreover, the capacity of the roads, infrastructure and parking spaces are the other criteria for controlling of the density. The distribution of the density, which defined according to capacity of the conditions, must be formed by the grain concept and human scale factor. Grain by mean of density is suggested that the different height and different floor space distribution of the buildings into the block structure. And also, it is related to environmental conditions such as natural lighting. Human scale, as the other significant factor related to effect of the building bulk to the public spaces and streets. As following section of the thesis is mentioned, density is the determinant factor for constitution of the human scale. Therefore, the grain of the

building heights should make well-adjusted conditions to provide human scale even for high density development.

3.1.5.1.3 Scale and Massing:

Scale is the one of the basic design parameters of urban design and architecture. This is the more complex and a multi-dimensional criterion, which is consisted of volume, height, massing, grain etc… But, common idea of the scale is the appropriateness of the new development to the existing structure of the city parts, which can be near or inside of the parts.

The basic consideration of designing the building density is the size of building masses themselves. The human vision – the eye and its abilities to perceive distance and size – are the main perceptual element for our sense of intimacy or bigness in urban spaces and in building masses.

The most theorists – like Lynch, Spreiregen, Rapoport, Tibbalds, and Rasmussen – have identified human scale as a critical criterion for successful urban design. However, developing building technology and materials and transportation opportunities have caused the overdevelopment of the urban space, because of the need for greater enterprises and necessities of the building services and the storage of vehicles.

The general means of the intimate scale that building masses should be kept small and density is generally low, especially in residential areas. On the other hand, in the higher densities more aesthetic techniques must be used. So, some economical, political or legislative factors can be affected to the site design with high density building arrangements, some long and bulky building designs can be used to cover these factors. However, stepping the facade back and forth and breaking it down into smaller sections visually is the most useful techniques to provide an appropriate scale for urban space.

The human scale and fine grain conditions are related with enclosure ratio of building height to street or space width, the length of building frontages, size of the building blocks, height of buildings and the sizes of urban space, and also, “relative distance, permeability and the sense of grandeur or intimacy of space. As such it is

closely related to intensity, for more intense places have higher buildings." (Montgomery.1998:106)

"There are no hard and fast rules concerning the relationship between building height and street widths, other than to say that higher buildings tend to require wider streets, and more generous allowances for natural light and ventilation. But even here, more intricate and complex places very often have high buildings but only very narrow streets and alleyways." (Montgomery, 1998:107)

Urban mass is the one of the essential element for scale of urban design, which is constituted by ground surface, buildings and objects in space. Arrangement of these elements can be formed the urban space and urban activity patterns. Urban spaces can be shaped successfully using the proportions and activities of building masses in a creative design.

Massing is often mentioned as a design consideration, which provides to control building bulk and the disposition of floor space on the site. This control ensures important opportunities to hide building bulk in order to create a good enclosure, to adjacent buildings or open spaces by stepping down or stepping up.

3.1.5.1.4 Building Form:

As Moule and Polyzoides (Katz, 1994: XXIV) identified that "there are two kind of building form, which are fabric and monumental. Fabric buildings are to conform to all streets and block related rules and are consistent in their form with all other building of their kind. Monumental buildings are to be free of all formal constraints. They can be unique and idiosyncratic, the point of concentrated social meaning in the city."

According to Moule and Polyzoides (Katz, 1994: XXIV) "building form and urban space are mutually interdependent with each other. The relationship of buildings to the public realm is to be reciprocal. Building frontages shall allow three scales of block structure formation:

1) Buildings emphasize the public characteristic of streets
2) Buildings reflects the semi-public spaces into the block structure
3) Buildings respond to the service nature of alley and backyards."

Nevertheless, the other important features of the formation building form are the requirements of the users. This is related to the architectural decision process. The investors and owners of the buildings have some expectations about the size and form of the building units. But there are some restrictions to design the building in the block structure, such as density and height control. In this respect, building form have unlimited alternatives with in size, form and façade arrangement. The characteristic features of the scale is designated by the human perception into the space, hence the perception of the building scale have a changeable character.

3.1.5.2 Functional Framework

As Carmona (2003, 165) defined that the functional framework of the design criteria includes the arrangement of the well-working and better places for public use. According to functionalist perspective, functional design criteria have correlation between the other criteria. That the former concerns the functioning of the space related to quality of the people usage. The human dimension is often abstracted out and reduced to aesthetic or technical criteria, especially for circulation routes.

In order to understand the features of the functional framework seven sub-characteristics could be exposed. These are 1) public-private differentiation 2) mixed use 3) accessibility 4) energy efficiency 5) flexibility 6) population density 7) parking and servicing.

These characteristics of the functional framework create each other and work together to be better places. The main idea of the functionalist frame is vitality of the urban areas and the urban spaces. As a main generator for vital places, mixed use effect all type of features positively. So, mixed use formation for urban areas increase the pedestrian density and public transportation usage. Therefore, the accessibility, flexibility and servicing could be required for development conditions. In related to this conditions population density and energy efficiency could increase in market conditions. As a result, if the necessary conditions could be produced, then, the public spaces show the increasing functionality in central part of the city.

“Whyte considered off-peak use provided the best clues to people’s preferences. When a place was crowded, people sat where they could rather than where they most wanted to. Later, some parts emptied while others continued to be used. He also found that most spaces contained well-defined sub places – often

around the edge – where people preferred to be, and arranged to meet." (Carmona, 2003: 168)

"Whyte noted that the most sociable spaces usually possessed the following features:

- A good location, preferably on a busy route and both physically and visually accessible.
- Streets being part of the social spaces – fencing off a space from the street isolated it and reduced its use.
- Places to sit – both integral (e.g. steps, low walls) and explicit (e.g. benches, seats, etc.)" (Carmona, 2003: 169)

The planning process of the city have made important to private than the public for society. But urban experiences have showed us the problem is declining the public sensitivity. The public realm, is shared space in society which brings people together, to relate one another and/or to be separate, creates a vital city performance especially into the central areas.

Related with the current planning process the new principles of the creating the public spaces might be arranged through individual buildings. Building, block structure and streets are interdependent. So, any decision about the designing these components effects the other components. This determination about the any component must be correspondent with the other.

Public realm is a remarkable point of the townscape and building forms because of the importance of the relationships between buildings, streets and public spaces. Creation of safe and comfortable streets and attractive public and semi-public places are some of the main issues of the urban design for social concerns. Proving the pedestrian activity vital and safe, streets and footpaths should be attractive having environmental quality. Also, mixed use and building density are the important factors, which dictate pedestrian flows, circulation patterns and daily activity in the street.

Consequently, as Punter and Carmona (1997: 198) mentioned some urban design policies defining the public realm should be encouraged legible, comfortable, safe and vital streets and public spaces with the concepts of mixed use, permeability of blocks and neighborhood and active frontages, at the ground level.

3.1.5.3 Environmental Design Features

The one of the fundamental role of the designing of urban fabric is the providing the comfortable and adequate physical conditions for people in cities. Especially, creating vital public places and open spaces are the main concern of the urban design, which aims to produce adequacy for public use. Furthermore, the well-adjusted development is provided a comfortable building usage in block structure. So, sensible arrangement increased the using capacity for urban fabric, according to levels of microclimate, natural lighting, and wind direction with the aim to ensure the conditions more acceptable. Forming of block structure and streets include some design criteria, such as suitable building density for climatic conditions, appropriate orientation of building structure and using walls, trees, arcades, passages for protecting people from inadequate circumstances. In this respect, the more deterministic factors for designing of urban fabric could be introduced as the natural lighting conditions to be useful tool because of their evident features such as sun direction and its obstruction angle.

As Bosselmann (1987: 205) mentioned, since mid-sixties, especially, in American cities have lived a 'Manhattanization' approach to their downtown areas, because of their artistic qualities and symbolic meaning for great enterprises. But this process has created monotonous, monolithic facades, oppressive in scale and incompatible with surrounding buildings. And this new bulky structure of the city has created unsuitable microclimatic conditions (Figure: 3-10), with shadow tunnels, and also, cold and windy open spaces.

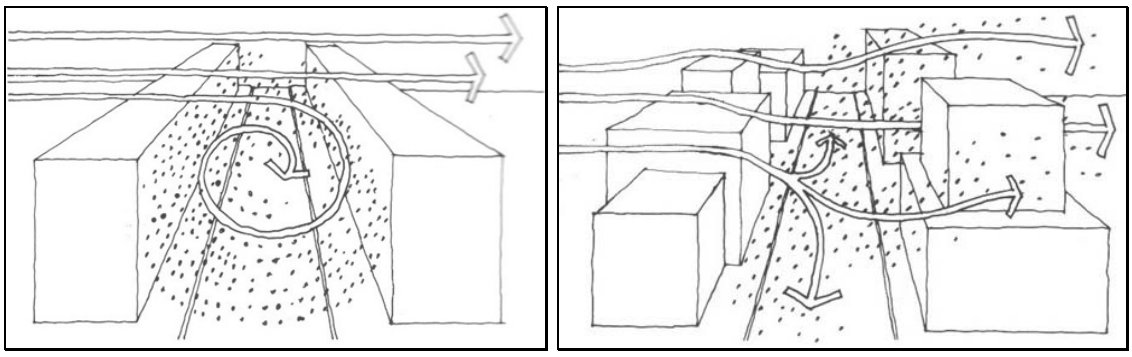


Figure 3-10: The Wind Effect in Different Arranged Urban Areas (Moudon, 1987: 311)

The existing plan legislations couldn't provide a sufficient arrangement for the urban space design. The planning process and the legislative framework of the planning concern city as a whole. There are no significant arrangement methods. So,

the planning policies are too general to reduce the impact of new development on scale, and to provide the compatibility of new massing with old the street level. Therefore new appropriate tools for planning should be used into the design process, which “measured loss of sunlight and the decrease of overhead sky above a street made a conceiving case for new building height and setback rules.” (Bosselmann, 1987: 207) (Figure: 3-11)

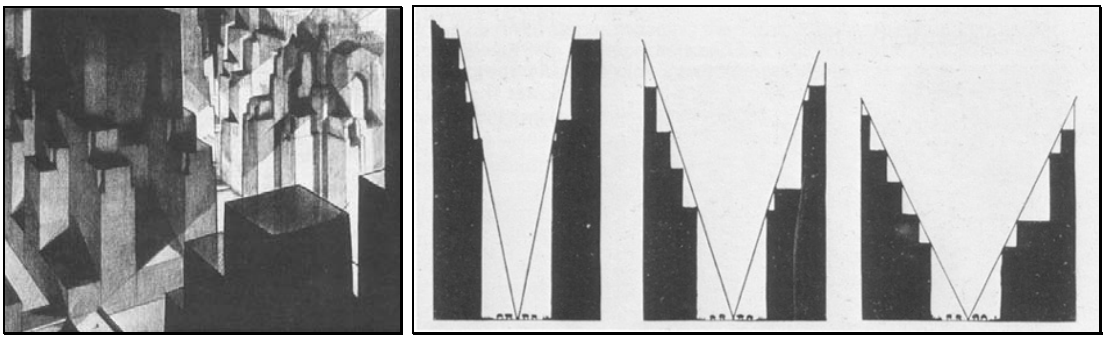


Figure 3-11: The Natural Lighting Arrangements in American Planning Techniques

(Moudon, 1987: 209)

According to Bosselmann, the measurability of the visual quality of the building arrangement for street space is limited by the contribution to the climate. However, the public interest the visual continuity and its distribution into the area because of its symbolic attributes. “Matter of scale, color, shape, street character, and view affect a population’s image of city and of itself. Visual qualities convey powerful emotional messages as to who dominates the city’s environment.” (Bosselmann, 1987: 212)

The most important criteria of the environmental design are the natural lighting for a vital, dynamic and inhabitable city. Unfortunately, development of the density with high-rise buildings reduced the natural lighting conditions of the street and open spaces in the central city area. The most common regulatory arrangement method for urban an area is Floor Area Ratio (FAR). But, this method hasn’t been able to provide environmental and aesthetic considerations. So, these types of density regulators create a density distribution into the block structure unrelated to the street.

Whether the light and air conditions affect the quality of street life negatively, nevertheless, good-arrangement of the natural conditions provides vitality for open spaces, squares, pedestrian ways and parks. Natural lighting also, increases the value of buildings, especially for residential purpose. Real estate developers know that more

lighted buildings with more windowed facades have greater value than the windowless spaces.

Orientation is a key consideration of the street. Variety of light and shadow effects during a sunny day, in north-south street create than an east-west street. On the other hand, wind direction is another basic component to orient the street, in order to alleviate the chilling effects of the winter wind, and also to increase the cooling effects of the summer breeze.

In planning standards, daylight and sunlight conditions are mentioned only a passing route. However, the control of the building density must be related with adequacy of lighting condition of the buildings and their plot ratio and space around buildings. Indeed, high-rise development have caused poor-quality spaces, and also deeply shaded spaces with inappropriate microclimatic conditions. Albeit the new technologies give the suitable requirements for lighting and heating, naturally lighted areas are still preferred by costumers.

3.1.5.4 Perceptual Components

"The perception and experience of place is the fundamental requirement for vitality in urban areas. The initial concern of the perception has been supplemented by work on symbolism and meaning in the built environment. The interest in perceptual components has been reinforced by 'sense of place' and 'lived-in' experiences associated with urban fabric. The important point for exploring people perception is to perceive environment and experience places." (Carmona, 2003: 87)

For the perceptual component the most appropriate description developed by Ian Bentley and his collaborators (1998). They exposed the responsive environment concept, which means "the built environment should provide its users with an essential democratic setting, enriching their opportunities by maximizing the degree of choice available to them." (Bentley, 1998: 9) and they classified the components of the responsiveness as below:

1) Permeability is the number of ways through an environment. So, these criteria provide the public and private space interfaces between them. So, the permeability of any system of public space creates alternative routes from one point to another. So, both physical and visual permeability depend on how the network of public

space divided the environment into block structure. Permeability could be defined as designing the overall layout of circulation pattern and development of the block. Bentley and his collaborators suggested that smaller blocks, give more physical and visual permeability and improve the people's choices in their routes.

2) Variety is to maximize the variety of uses in urban areas, such as varied building types, varied people activity, and varied times for varied reasons. Because the different activities, forms, and people provide a rich perceptual mix. So, Bentley and et al. (1998: 28) mentioned that "variety within districts is reduced, as they become specialized zones of use, the variety within blocks is reduced, as sites are amalgamated into larger units, and variety within buildings is reduced, in the interest of easy management and corporate image." (Figure: 3-12)
3) Legibility is the degree of legible parts of the place and the understanding to people its layout. So, legibility is consisting of in two levels, physical form and activity patterns. The physical structure of the city is formed by the block structures and this structure affects the legibility of the urban parts. With the aim to increase legibility for new formation process, the positions of the street and block structure and the uses they house, to form the most legible relationships with the existing elements. The other important factor is designing the massing of the buildings and the enclosure of public space in order to increase legibility.
4) Robustness is the appropriate choices, which provide the useful conditions for different purposes. Especially, for public spaces, the achieving the adequate public activities in the public is the important problem. So, the appropriate building depths, building heights and access system are increased the range of uses for block structure. "To increase robustness, the edge between buildings and public spaces must be designed to enable a range of indoor activities to component-exist in close physical proximity with a range of outdoor public activities." (Bentley, 1998: 69) The statement of the robustness could be mentioned that designing the spatial and constructional arrangement of individual buildings and outdoor places.
5) Visual appropriateness affect the interpretations people put on places to interpret places as having meaning. So, visual appropriateness, as an architectural consideration, supports the legibility of its form and use, its variety and its scale conditions. The visual appropriateness is designed the external image of the urban spaces.
6) Richness is also the sensory experiences of the people's choice and its quality. This criteria is, both visual and non-visual features, related to architectural arrangements of the buildings. So, according to public space quality, richness must be increased the aesthetic quality, legibility and variety of the people.

7) Personalization is the degree of the private choices for their buildings and surrounding. It is mentioned as the privacy needs for people in urban areas. So, in order to provide the personal necessity the thresholds, which separate the personal building units to public space, become an important arrangement factor for public life. Therefore, Bentley et al. proposed to “making the design encourage people to put their own mark on the places where live and work.” (Bentley, 1998: 11)

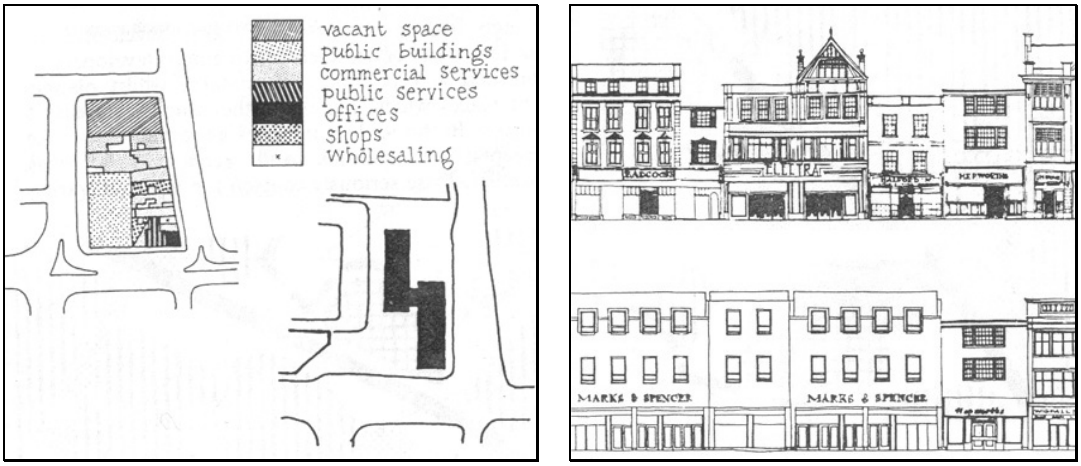


Figure 3-12: The Variety in Urban Areas (Bentley et. al, 1998: 28)

3.1.5.5 Visual Elements

The characteristics and meaning of urban fabric could be comprehended by people with their visual perception. Therefore, the visual characteristics of the physical structure are determined related with the social, cultural, economic and perceptual features of the city, although the modernism approach damaged the interrelation of physical arrangement and local characteristics with strict standards and separation of the uses.

The visual elements are composed of the arrangement of the block structure including masses and open spaces. Especially, solid-void ratio in second and third dimension is the fundamental feature of the urban fabric to understand its character. The enclosure and continuity is other component for creating the sense of place and perception related with the building density and openness of the place. Furthermore, more concerned with architectural arrangement, aesthetic order and architectural values such as traditional features are the significant property of the physical structure. At last, city skyline defines the identity of the urban fabric with building heights and their natural background.

“The city is a sedimentary base of meaning critical to the creation of further accumulations (Rossi, 1982). In this sense, the sediments of the city - which are products of physical and metaphysical interventions through time - exist as order, which is constituted by such principles as sameness, repetition, geometry, grid, rhythm, symmetry, harmony and the like.” (Jo, 1998: 286)

Townscape policies are the basic principles providing a healthy structure of the city and defining the rules which are related with the urban space, building groups and their surroundings. Townscape policies are consisted of the knowledge about the design criteria of the streetscape for buildings and other volumetric elements into it. These policies describe the relations about different vistas and views of architectural and visual components and produce some rules not to be constituted visual intrusions and anomalies. Furthermore, these policies define some rules to create urban form and public realm in regard to all dimensions. However, the definition of townscape has been taken into consideration for visual relationships in the built environment by Cullen, and especially, some English development policies.

“Massing provides a key link density and bulk, and embraces all aspects of the setting of a development. Other factors, such as eyesores, intrusion and landmarks are much less common, but they emphasize the largely visual aspects of townscape and qualitative dimension. Overall, issues of townscape are relatively well developed as a key element of design policies, although comprehensive policies incorporating perceptual elements and views are comparatively rare.” (Punter and Carmona, 1997:155)

The settings, historic and current pattern of the cities asses the development process. Street scene and adjacent spaces provide a visual perception about the city. So, the policies need to respect topography, key views and vistas, important skylines, morphology and relationship to the street scene. They group this type of importance in the general term of ‘townscape impact analyses.

The skyline of the city is also an aesthetic value for the city image. This is a physical representation of the collective vista. “It is often the single visual phenomenon which embraces the maximum amount of urban form.” (Spreiregen, 1965: 63) The pattern of block structure and its volumetric structure effect on the overall view of the

city skyline. Relationships between views, topography and building heights considered skyline and roofscapes.

There are three principles for designing skylines to be effective in urban areas. The first principle was that visual variation is good, so random numbers were used to generate heights, widths, depths, and setback of buildings. The second principle was more complicated. It used random numbers and fractal structure. The third principle was still more complicated. It was that of the building features should match with the surrounding landscape. The basic question was whether the additional complexities of fractal structure and contextual fit were necessary for creating good-looking skylines. The empirical results suggested otherwise: for the skylines tested, the participants preferred the skylines without fractal structure, and there was virtually no difference in preference between skylines with or without contextual fractal fit. (Figure: 3-13)

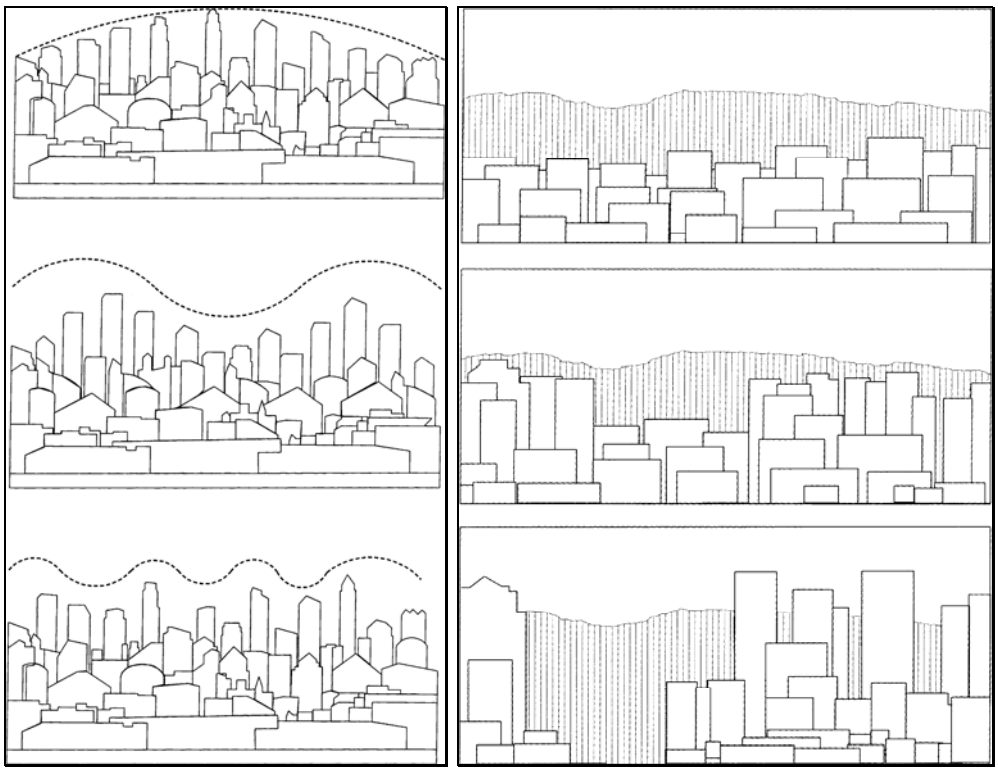


Figure 3-13:a) Skylines with Different Numbers of Convex Mounds (One, Two, And Four) in the Silhouette b) Skylines in which All Buildings Are Low (Top), Some Buildings Reach the Ridge Line (Middle), or Some Buildings Break the Ridge (Bottom).(Stamps, 2002: 169)

Planning process is curious about the economic, financial and social issues of the city. The density and height control is focused on maximum building heights and its

real estate conditions. So, development has been argued compared to higher buildings and enhancing the skyline.

3.2 The Analytical Investigation Methods and Design Methods of the Block Structure

The formation of the urban fabric and it components have been discussed since the beginning of the urban history. In this period, there have been different arrangement types and design methods for defining the urban fabric, which are mentioned in previous section. For the purpose of constituting a good urban fabric, selection of the appropriate methods is necessary in respect of the existing conditions and local characteristics of the city. Therefore, in this section urban morphology is selected as adequate way in order to understand the urban fabric and its characteristics. As a general branch in urban planning and design disciplines, urban morphology includes different types of analysis methods and principles. So, comparative study, typo-morphological approach and figure-ground theory are selected as the useful and fitted methods to introduce the local characteristics.

Formation process of the block structure is related to arrangements of the building density, building heights and masses. So, distribution of these components must be provided adequate conditions for people life and vitality for urban spaces for increasing the place value. The balanced and well-distributed density is a significant design criterion with the aim to provide these principles; density distribution and natural lighting assessment method are explained to analyze existing conditions and to suggest new notions for proposed design process. At last, urban design guidelines are introduced to give a framework to design process, with their sufficient rules and standards defined as to conclusions of the analysis process.

3.2.1 Urban Morphology as an Investigation Method

“Urban morphology is the systematic study of the form, shape, plan, structure and function of the built fabric of towns and cities, and of the origin and the way in which this fabric has evolved over time.” (Madanipour, 1996: 54) Urban morphology is concerned with understanding the processes which shape the built form of settlements, and also with understanding the ways in which that built form affects the social and economic processes which operate in settlements.

For Gordon (1984: 3), morphology entails “plots, buildings, use, streets, plans, and townscapes.” It is dealt with mostly in urban geography which studies spatial aspects of urban development from two inter-urban and intra-urban viewpoints. In the case of the latter, “urban areas are studied in terms of their morphology, producing concepts and generalization related to the character and intensity of land use within the urban area and the spatial interaction of one part of the urban area with another; i.e. internal structure and processes.” (Madanipour, 1996: 53, from Goodall, 1987)

“Urban morphology is less well developed than geomorphology and is obviously related to urban geography - social and economic - and to various historical, architectural, and planning approaches to understanding the city. Urban morphology is as providing interesting insights and ideas for introducing dynamics into spatial models, and also as providing new ways of understanding spatial arrangement.” (O'Sullivan, 2000)

As Knox (2000: 81) defined that “morphogenesis refers to the processes that create and reshape the physical fabric of urban form. Over time, urban morphology changes, not only as new urban fabric is added but also as existing fabric is modified. Basic forms, consisting of building, plot and street types of given period, become hybridized as new buildings replace old, plots are amalgamated or subdivided and street layouts are modified.”

The urban morphology concept have been used many modern urban design theories. Being a pioneer, Camillo Sitte had investigated the elements of urban spaces, and the other theorists like Krier Brothers, Cullen, Giedion, Zucker, Conzen, Moudon, A. Duany have studied the physical qualities of the urban spaces.

“The conceptual framework developed by Giafranco Caniggia for describing the development of the built environment is extremely rich. It distinguishes, amongst other things, levels of scale, classes of routes and plot patterns, and analyzes the process of formation and transformation of buildings. Curiously, however, the question of space is never raised in the theoretical texts of Caniggia and his school, even though they claim to provide a methodology for architectural and urban design.” (Malfroy, 1997:50)

“In terms of methods and underlying principles of analysis, the French practice of urbanism drew heavily on the work of neo-rationalist with their emphasis on the urban morphology as a method systematically describing the growth of towns and the

characteristics of the inherited fabric. The discipline of urban morphology refers to history as an essential component of urban design rather than an analytical tool. The approach was promoted in France in the 1970s, particularly during the appraisal work conducted by Andre Chastel whilst assessing the morphological characteristics of Les Halles in Paris." (Trache, 2001:162)

The morphological components within a city – its streets, plots, and buildings - have, in fact, different types and rates of change regardless of major functional impingements throughout the city's history (Conzen, 1960, 1981). Thus to understand the formal and spatial order of the city, we must undertake a morphological investigation dealing with both the form of the city as a collective work of architecture and the process of land subdivision. (Figure: 3-14)

Figure 3-14: Conzen's Fundamental Elements of the Town Plan (Moudon, 1994: 298)

The morphological transformation of the settlements is investigated by urban morphologists. According to changing conditions of the physical structure of city gives different types of knowledge about the local characteristics, which are mentioned existing physical conditions, land ownership pattern, economical and cultural features of the city. But, most important effect on the physical structure is development demand which create the necessity of the density increasing and transformation of the building

structure, moreover block structure. Therefore, the importance of the urban morphology appears to understand the existing conditions from definitions of the transformation process, which was interpreted by the investigation process.

The morphology of the transformation has improved in a hierarchical progress which was defined by Knox (2000: 84) from Curdes (1993: 287), this process generally the same for all kind of physical structures of city, and also, nearly all of the countries. This hierarchy of morphological transformation could be mentioned as below:

- "Change of uses on sites and in buildings.
- Reorganization within the building.
- Extension into the inbuilt areas of plots and blocks, densification.
- Increase in the number of storey.
- Linking of plots.
- Alteration of whole or relevant part of a block.
- Changes to the size of blocks through alterations to the street network.
- Alterations to a large area consisting of a number of blocks.
- Changes to a whole quarter or part of the town." (Knox, 2000: 84 from Curdes, 1993: 287)

3.2.1.1 Comparative Study

Siksna (1995, 1998) studied to evaluate a comparative study for block size and form in CBD's of twelve North American and Australian cities, which have different form and size block structures. He argued that the relationship of the persistence of the block structure and street patterns, and also the size of the circulation meshes.

Siksna (1995, 1998) observed the evolution process of the small, medium and large size block structures and concluded that small block structures were generally intact… Similarly, the medium block structures were largely intact, which included some insertion or deletion of alleys and arcades. However, the larger block structures of the cities changed largely intact. So, the initial block structures had changed considerably and in a large variety of new additions and/or deletions of alleys and arcades have formed into the block structure. Also, the plot pattern had adjusted a different variety of amalgamation and subdivision. (Figure: 3-15)

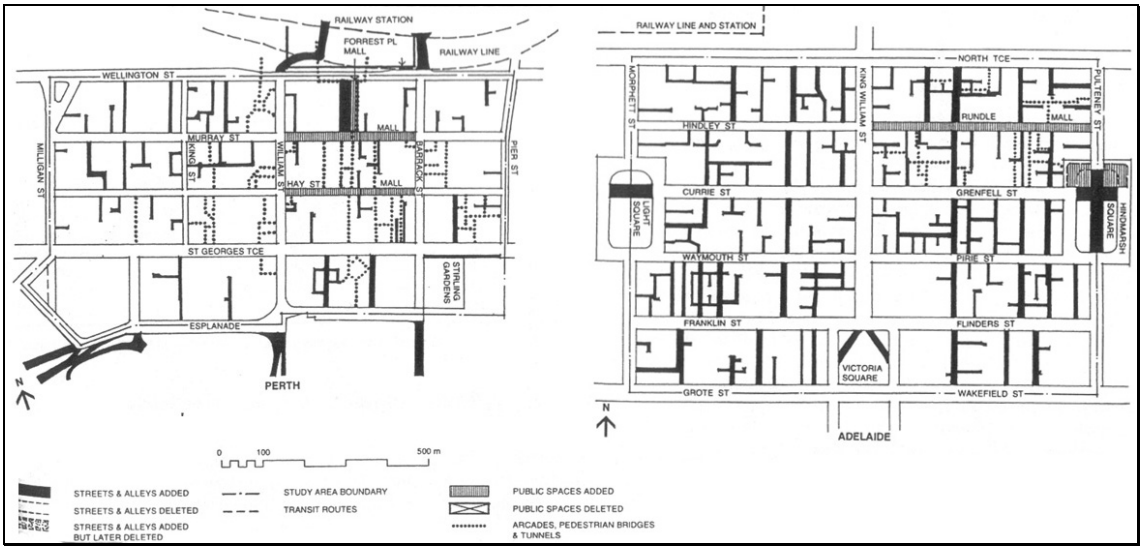


Figure 3-15: Comparative Study in Perth and Adelaide Prepared By Siksna (Siksna, 1998: 275)

According to Siksna's (1995, 1998) investigation, the optimal condition of the block structure have ranged between 80 m. and 110 m. to create a fine circulation mesh. However, in some cases a finer pedestrian mesh has ranged between 50 m. and 70 m. to create an intensive use in commercial areas. On the other hand, the vehicular mesh of most cities in the study small block structures have had a convenient mesh size with below 200 m., while medium and large block structures have had a generally exceeded 300 m. circulation mesh, which was considered inconvenient for local traffic movement.

This research has concentrated on the evolution process of the optimum block sizes with a comparative investigation method. So, Siksna revealed, that these types of investigations show us the optimum conditions of the block structure with an incremental development process, which has been reduced the deficiencies of the initial layout.

3.2.1.2 Typo-Morphological Approach

The concept of the typology is a classification feature of the characteristics in urban planning and urban design. The definition and use of typology classify the components, as streets, buildings, open spaces and architectural styles of the urban fabric. Also, typo-morphological studies, as Moudon (1994: 289) mentioned, exposed the physical and spatial structure of the urban fabric. They introduce the morphological

characteristics and meaning of the formation process over time, for all scale of the built environment, from the architectural unit to the large urban areas.

The classification of the urban fabric components includes a wide range of typologies. So, there is a need to more generic classification to prevent the confusion. This classification is mentioned by Maller (1998: 138) to easy perceiving physical components; “linear elements (i.e. boundaries, arteries), enclosed elements (i.e. piazzas, streets), massive elements (i.e. building blocks, parks) and edges (i.e. waterfronts, rail track frontage). Typological combinations were identified also according to simple, visible rules of ordering: random assemblage, filaments, nodes, nets (grids) and multidimensional grouping.”

A typo-morphological approach, which was firstly defined in Italy in the 1940’s by Saverio Muratori (1910-1973), has some differences from the other morphological approaches. First, in typo-morphological concepts all for typologies are investigated and classified by their volumetric characteristics with their masses and open spaces. So, the building is always considered with their plot characteristics and location in the block structure. Second, all types of changing are investigated with their related scales between building scale and city scale. Third, the typology is defined as a morphogenetic because of their time dimension. Time refers to process of the changing from “its conception, production, use and mutation.” (Moudon, 1994: 289)

Morphogenetic could be described Canniggia’s line of thought. “What he attempts to grasp are the dynamics of urban form in its historical development through its constituent types and thorough the evolution of these types. He calls these dynamics a typological process (processo typologico). His principles concern is with the historical formation and transformation of the types and of the urban fabrics that result.” (Levy, 1997:52)

Typological process exposes the rules and laws of the development conditions of the urban parts. These rules form the building and its structure in the urban fabric – the relationship building and plot, building and street, building and its location in the block structure. And also, the architectural features are introduced as to its type, plan, structure, façade and materials. Therefore, new development should be considered following these rules in order to fit the existing structure.

According to Caniggia, built environment is an organism, consist of different components. So, he explained the urban fabric as a ‘built object’. He classified the objects at different scales: 1) the building, 2) the group of buildings, 3) the city, and 4) the region. And each object has a complex entity made of elements, structures, systems and organism. So, he emphasized the modularity of these components like cells, and its functional and scalar dimension. Therefore, all ‘built objects’ must be studied in all scales from the single building to region in urban planning and urban design process, because of their interrelation. (Figure: 3-16)

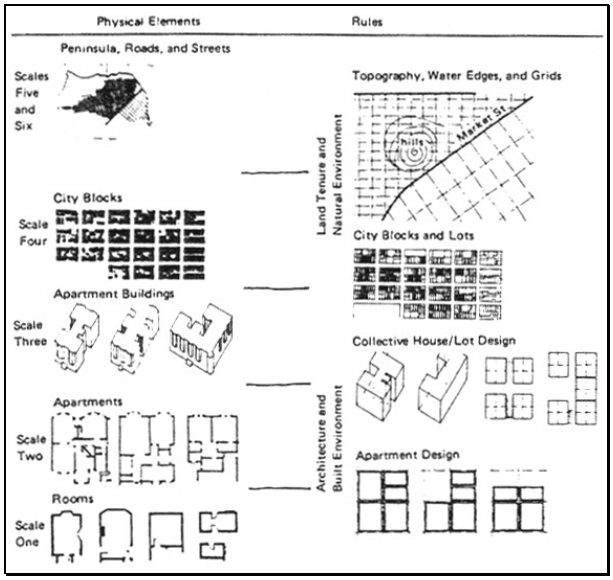


Figure 3-16: Caniggia’s Modularity for Built Environment (Moudon, 1994: 292)

Muratori and Caniggia used the typological characteristics to analyze the formation process in traditional Italian towns, and then they evolved a theory of design process using these analyses. These analyses classified the buildings and related open spaces extending from their initial layout and exposed the mutations of them over time. They claimed the structure of the urban fabric could only be understood from the historical typologies for building and urban fabric.

Nevertheless, Aymonino (1966, 1976) and Rossi (1981, 1982) accepted the reversed relationship between building and urban fabric as an irreversible change in the socioeconomic forces that shaped the city. So, according to Aymonino and his colleagues, the contemporary development of the cities changed the relationship of the building and the city, then, the traditional city analysis could give proper information for today’s cities. The continuity between existing typologies and contemporary typologies isn’t established for all type design procedures. (Figure: 3-17 and 3-18)

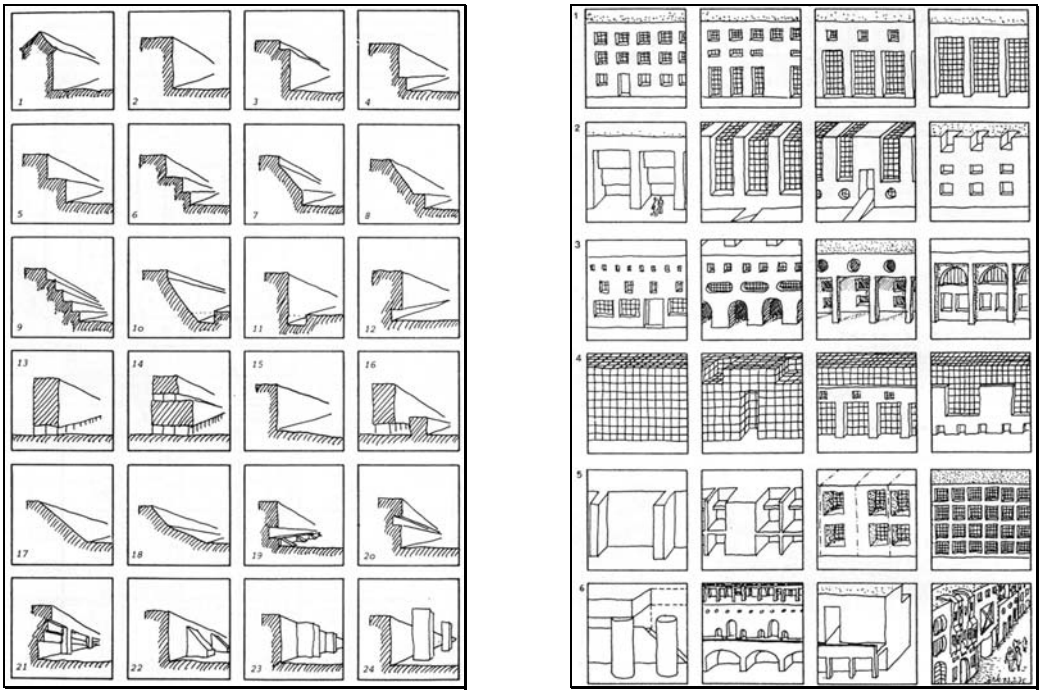


Figure 3-17: The Spatial Types for Buildings of Aldo Rossi (Rossi, 1979: 24-25)

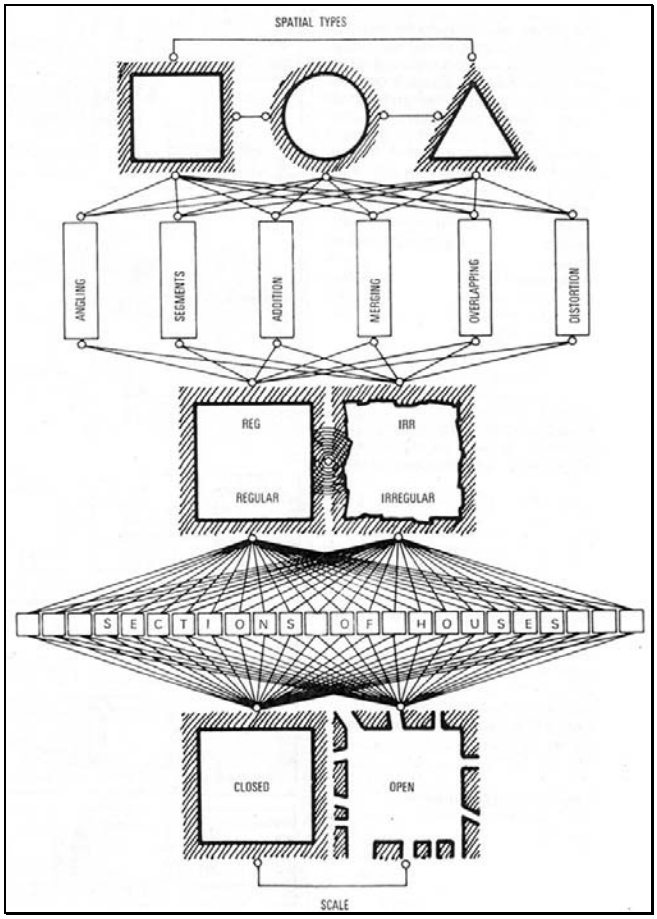


Figure 3-18: The Spatial Types for Streets and Squares of Aldo Rossi (Rossi, 1979: 29)

In England, M. R. G. Conzen focused the importance of the description, analysis and explanation of the formation process of the cities. He argued that the recent conditions of the city and understand of the developing methods for analyzing the urban fabric. He emphasized to significance to read the town plan and its conditions. Therefore, he introduced the fundamental characteristics of the urban fabric with representing a two dimensional analysis on town plan. The town plan analysis require only the cartographic representation of the physical layout, the distribution plan of building types and distribution plan of land use types. Conzen identifies three fundamental components as street, plots and building to analyze the structural elements. (Figure: 3-14)

The other main group for typo-morphologist approach in The Versailles Scholl of Architecture in France. The French approach is constituted by interdisciplinary field, by architects, geographers, sociologists, historians, and planners, joining the process. The resulting methodology for typo-morphological is oriented to design and social perspectives and "addresses issues of both design and city building process… So, the relationship between built space and social space is described as dialectic between urban form and social action." (Moudon, 1994: 301,303)

According to Versailles approach, the typological analysis has a process, which is begun with the choice of the scale to determine the levels of the analysis. The first level of the scale is architectural includes buildings and parcels. Another level is the group of buildings and parcels, which form the block structure and its groups. These determinations of the scale give the limitations for context of the study in typological analysis process. The other step for process is the classification of the building types and its selection criteria such as volume, function and architectural style. The third step is the developing the classification process with their details as rules, variations, analogues and comparative studies. And final step is the generating a typology for the site.

The general suggestions of these three schools expose the research process to provide a successful planning and design result that is appropriate to relationship between space, time, habitat and culture. So, typology is the fundamental conceptual framework for understanding the urban fabric, because of its three dimensions as time, form and scale. The built environment "is in constant state of evolution and change subject to socio-cultural forces constructing, using, transforming space. So, all

typological work must be linked to a measure of time. Built and open spaces together constitute form. They are persistence, they dominate the definition of the built environment as use and function come and goes according to social practices and related needs." (Moudon, 1994: 308)

The understanding of the individual qualities and features of the buildings is possible with a methodological investigation of the typology and morphology in urban fabric. The typological analysis exposes the basic types and variations and development process. So, the building types provide to examine the urban fabric "the way in which these basic types have developed and evolved. It is of particular importance that we examine the way in which these types are articulated into the town plan in its entirety. We will be assisted in our objective by referring to a number of representative drawings of various parts of the towns we are studying." (Kalogirou, 2002:43)

In this respect, the typological investigations and their conclusions ensure the examination of the settlements with their existing and proposed conditions. However, the understanding of the architectural and urban organization features of the urban fabric related to degree of certainty of the conclusions. A typological understanding of the urban fabric and its components assure us a systematical approach to correspond the application of the general design methods. Also, it raises new questions to utilize the future conditions of the environmental design in urban development process. The arrangement of the physical components of the urban fabric could be determined by the existing conditions and its development process over time.

Unfortunately, in developing countries the traditional structures are generally damaged because of the rapid development process, particularly in central part of the city. So, the traditional features couldn't study in all conditions. Therefore, the typological investigations couldn't be able to accomplish and making of the classification of the typology is not possible for all situations.

In spite of the difficulties, a typo-morphological approach is important for the arrangement of the physical components. So, it must be known that this approach exposed a data base for urban fabric that can be used in public improvements and regulations. This information provides a strong foundation for developing the urban design guidelines and urban codes, which are mentioned in further sections. So, the

plans, street and land subdivision layout, and architectural characteristics could be balanced appropriate for community and individual needs, and existing conditions.

3.2.2 Figure Ground Theory

Figure-ground studies provide a clear understanding for the morphological characteristics of the urban fabric. These techniques were firstly used by Giambattista Nolli's survey of Rome (1736-1748) and then different urban theorists and investigators have used these analyses to clarify the city's structure. These analyses emphasize the relationship between solids (or masses) and voids with representing white for publicly accessible space and black for coverage of the buildings. So, these graphics could expose the pattern of the components which form the urban fabric. And they could highlight the differences of the new developments and existing fabric. The best useful feature of these diagrams is to analyze the degree of the fine urban grain and enabling a better understanding of relationships and patterns in urban areas.

As Trancik (1986: 100) described "space is the medium of the urban experience, providing the sequence between public, semi-public, and private domains. For these sequences to work, circulation barriers and gaps in continuity must be minimized or eliminated." Orientation of the block structure and masses define the spatial organization of the urban fabric with their physical sequences and visual orientation between places. So, urban spaces and public places as urban voids are arranged dependent upon the disposition of urban solids as buildings, building groups, and block structures. These relationships create different combination in collective urban form. That can be mentioned as six typological patterns as grid, angular, curvilinear, radial concentric, axial and organic. (Figure: 3-19). However, most urban fabrics are consisting of the combination and permutations of these patterns in different scales.

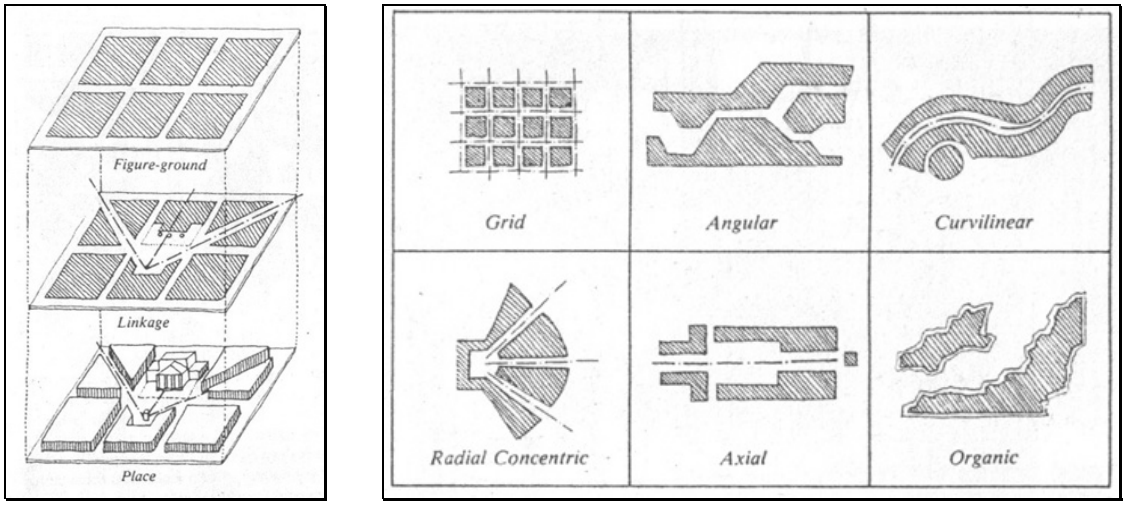


Figure 3-19: Figure-Ground Theory and Typology of the Solid and Voids (Trancik, 1986: 101)

According to Trancik (1986: 101-103) the formation of the solid structure in the urban fabric has different typologies. Particularly, traditional characteristics exposed the good arrangement of these types in a fine urban grain. These types could be mentioned as 1) public monuments as object buildings, which are freestanding to represent their significances. 2) Urban block and its pattern in urban fabric, which is formed with repetition of the parcel pattern and determination of the uses in appropriate size, pattern and orientation of the elements. 3) Non repetitive and directional building in linear formation. These types of solids define the edge of the public spaces.

Nevertheless, in modern planning process have changed the meaning of the solid formation and the relationship of the solids and voids caused poorly balanced and fragmented the continuous structure of the urban fabric. This failure of the urban space formation affects the overall structure of the city and its components. The differentiation of the traditional and modernist patterns of the urban space is shown in the comparison of Parma and Saint-Die, which are mentioned by Carmona (2003: 62):

“The plan for Parma shows buildings as constituent as in generalized, highly connected mass (urban blocks), which defines streets and squares and a small-scale, finely meshed street grid. Buildings are generally low-rise and of similar height. Taller buildings are exceptions, and usually have some civic significance as religious or major public building. The street pattern consists of a grid, the cell of which is relatively small. The plan of Saint-Die represents (Figure: 3-20) Modernist buildings as separate pavilions freestanding in a more generalized type of space and coarsely meshed road grid. The buildings are set within a super block system, the cells of which are relatively

large. The super blocks are typically surrounded by major roads carrying all non-local traffic. Modernist urban space generally appears in its pure from when built on Greenfield sites."

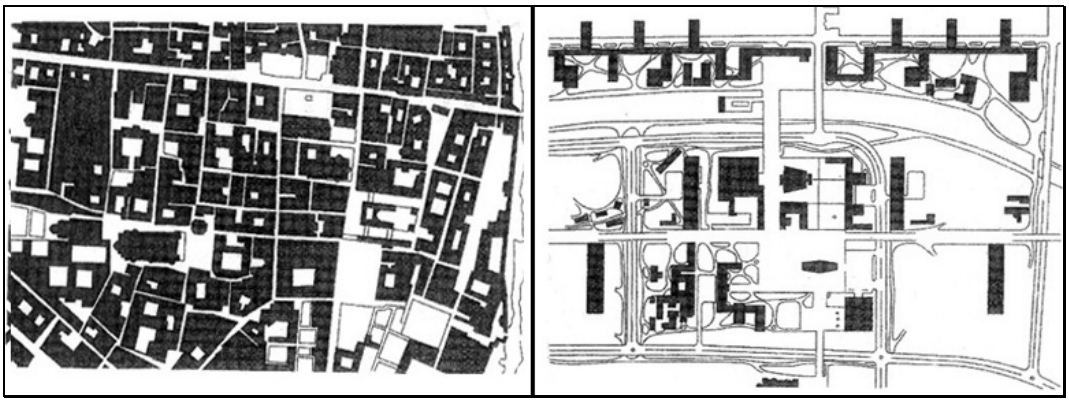


Figure 3-20: Figure-Ground Diagrams of Parma and Saint-Die (Rowe and Koetter, 1978: 62)

In this respect, the general approach for designing of the urban fabric must be considered to structure the solids in conjunction with the voids in order to provide building and space can effectively coexist. Figure-ground analysis is an effective method to show the success of the good relationship between the existing structure and new proposed structure in two dimensional frameworks. And it is appropriate for the additional methods to evolve the understanding of urban space and building masses relationship.

3.2.3 Density Distribution Base Mathematical Models

There are different proposals about the typology and size of the block structure. One of them theorized by Martin and March (1972). They argued a mathematical distribution of the building density in block structure, having proposed larger block sizes with perimeter block type and courtyard development have a higher land use intensity rather than pavilion building (tower building) development. So, Martin (1972: 21-22) investigated the different results of the different development typology of the block structure, into the central Manhattan, between Park and Eight Avenues and 42nd and 57th streets . He speculated a 36-storey 'Seagram' type building into an area, than calculated the created floor space. After that, he proposed a same amount of floor space for a series of perimeter blocks, which developed by omitting some of the cross streets and created a larger block structure with interior traffic-free courts. According to Martin, this distribution model showed the variety and richness of the choices for

relationship between building blocks and open spaces. Thus, this investigation shows us the importance of necessity to design the possible configurations of urban fabric in three dimensional thinking rather than two dimensional. (Figure: 3-21)

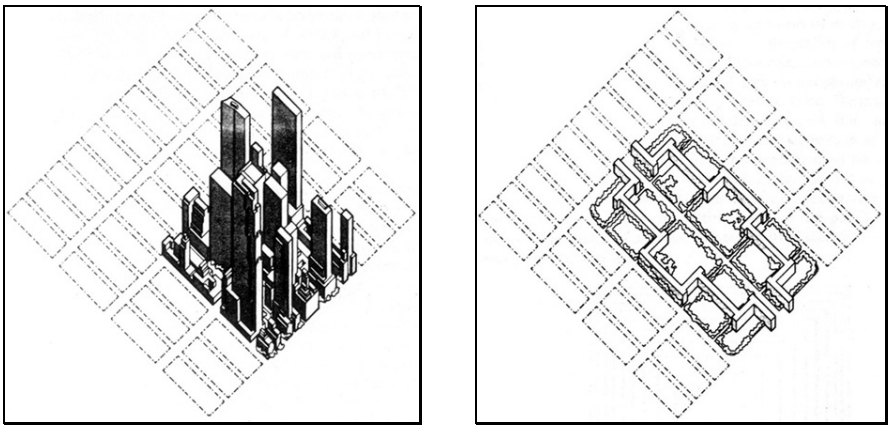


Figure 3-21: The Illustrations of the Building Plot Development in Different Density Conditions (Martin, 1972: 21-22)

The geometrical and mathematical explanation could be giving some opportunities to test the density and scale conditions of the physical structure of the environmental area. The existing conditions of the buildings and streets could be changeable into development process of the city. So, new conditions give different typologies for urban pattern, with different height and floor space necessities. “But if the geometry of the pattern is changed then precisely the same amount of floor space can be accommodated in the same general height of building but with a considerable increase in open space.” (Martin and March, 1972: 1)

According to Martin’s theory (1972: 20), there are hypothetical grid network with an area development covering 50% of site could be divided as forty-nine pavilions. (Figure: 3-22) Also the contrast of this form covered in court form with the same floor space planned as courts. This comparison must be included “the same site area, the same volume of building, the same internal depth of room. And when this is done we find that the antiform places the same amount of floor space into buildings which are exactly one third the total heights of those in pavilions form.” (Martin and March, 1966)

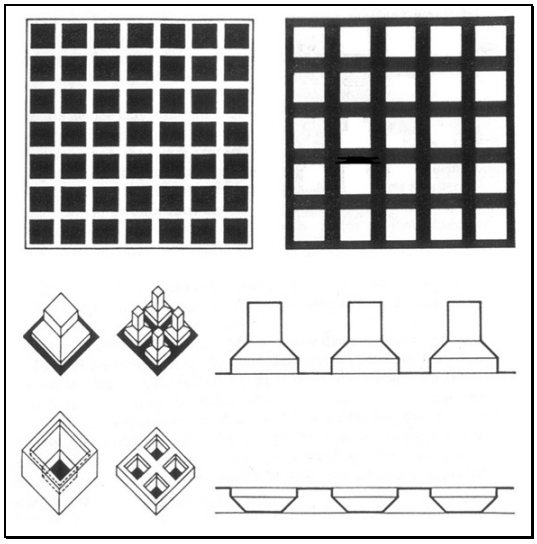


Figure 3-22: The Hypothetical Grid Network of Martin with Antiform Places (Martin, 1972: 20)

Martin (1972: 21) introduces an assumption with New York City example. He brought up the grid form of the New York and as dominant building form: tall building. So, he claimed that the pattern consisting of the same twenty-one storey tower buildings into the site, which assumed completely occupied by a building. After that, he resurrected the form having omitting some of the cross streets and designed the same amount of floor space that was contained in the towers was placed in buildings around the edges of their enlarged grid. So, the new type of buildings with courts was contained the site with 7-storey buildings and large open space at the center, in stead of the 21-storey towers. (Figure: 3-23)

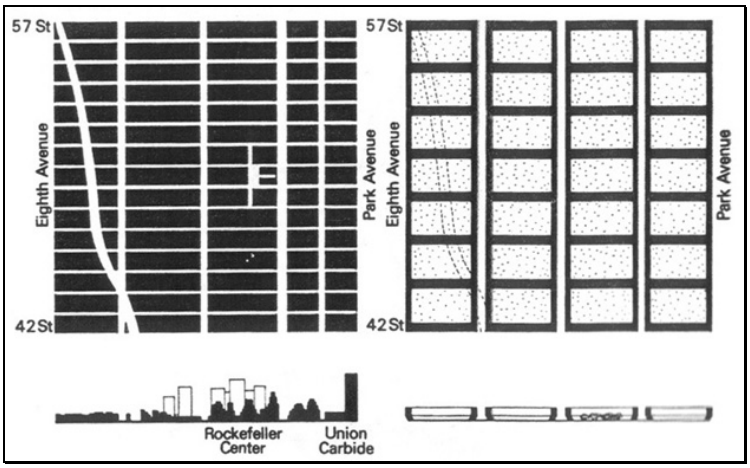


Figure 3-23: New York City Example for Different Density Arrangement Conditions

(Martin: 1972: 21)

According to Martin and March (1972:31) efficiency of the planning of buildings can be measured by the relationship of circulation area to gross area. This measure is frequently used in assessing costs and awarding grants.

Current planning techniques have defined the building arrangement with the measure of floor space index (or plot ratio) and the daylight conditions of the site. These two planning tools provide a rational relation of floor space to site and buildings will be adequately lit. And also, the floor space ratios have determined with population density and have exposed the number of building units.

“Floor space index is the gross floor area measurement of the building including the thickness of the external walls, this total is divided by the site area including half the width of the surrounding roads. Plot ratio is the same gross measurement of floor area divided by the net site area.” (Martin and March, 1972: 33)

Martin and March (1966) experiment a sample to understand which building form effective by mean of plot ratio and daylight consideration. According to this sample, they placed parallel rows of 4-storey building into an area by a conventional light angle of 45º. So, this formation cases a 2:1 plot ratio. After that, 4-storey solid block lit by courts placed into the area, so the plot ratio increased 3:1. As a result, they assumed that “the building form can have pronounced effect on the total space possible on any given site.” (Martin and March, 1972: 35) if both forms of building lend themselves equally to internal planning.

The important anxiety of the site planning is the economical development conditions of the urban land. Thus, the forms of the buildings are desirable to provide the most effective use of ground area. “The prevalent notion of high tower buildings is necessary in order to use land effectively… But if certain limits are set, such as size of site, the amount of floor space required, the acceptable depth of building, the amount of floor space with outlook, the amount without and so on, it is possible to demonstrate that a development might assume many building forms including tall towers and that a very considerable number of variables exists and a wide range of choice requires examination.” (Martin and March, 1972: 35)

The most useful examination of the efficiency for building form is the built potential. That is the ratio of the floor area of the built form to the site area.

March (1972) tried to evolve some building forms determinant with some mathematical rules according to population density, daylight considerations and efficient floor area for site. It had been developed some model to formulate these factors, but then a density base mathematical model was developed. So, some variables were defined as below:

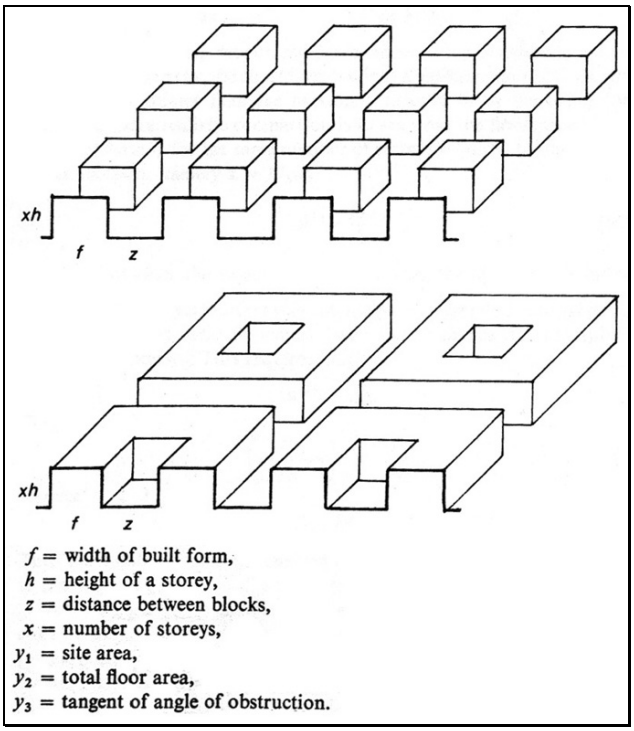


Figure 3-24: The Determination of the Forms of the Mathematical Model – Pavilion and Court Form Buildings - (March, 1972: 90)

"The principle dependent variable is; [$u = y_2 / y_1$ = the floor space index].

The superscripts $^{[0]}$ and $^{[2]}$ are represented by tower and court form (Figure: 3-24) of buildings, to identify the other dependent variables. Thus $y_1^{[0]}$ represents the floor area of tower, $y_2^{[2]}$ the site area of the court. Also, y_3 is treated as an independent variable. By the geometry of the arrangements, the following relations hold.

	Tower$^{[0]}$	Court$^{[2]}$
For the site area:	$[y_1^{[0]} = (f+z)^2]$,	$[y_1^{[2]} = 4.(f+z)^2]$
For the floor area:	$[y_2^{[0]} = f^2.x]$	$[y_2^{[2]} = 4f.(f+z).x]$
For the tangent of the obstruction angle		$[y_3 = hx/z]$

The other building form could be described as parallel rows, which was used to the same notation as court form superscripts [2], because of the same floor space index formulation. (Figure: 3-25)

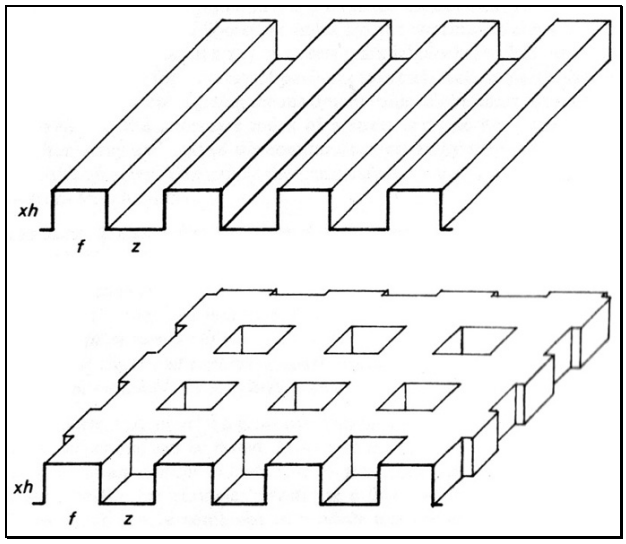


Figure 3-25: The Determination of the Forms of the Mathematical Model – Row and Cruciform Form Buildings - (March, 1972: 93)

So, the site area: $[y_1^{[2]} = (f+z)^2]$

For the floor area: $[y_2^{[2]} = f.(f+z).x]$

Cruciform was the other form by connecting, constitute a continuous series of courts. So, this form was obtained by a superscript [4].

For the site area: $[y_1^{[4]} = (f+z)^2]$

$[y_2^{[4]} = (f+2z).x]$" (Martin and March, 1972: 89-95)

Martin had described all of the formulation of the building forms, and the used some mathematical model series to conclude the floor space index for all of them. Consequently, the tower (pavilion), parallel block (street), and contiguous court forms generalize as below:

"The pavilion form: $[u^{[0]} = fy_3.\ [(fy_3+0.hx) / (fy_3+hx)^2].x]$

The street form: $[u^{[2]} = fy_3.\ [(fy_3+1.hx) / (fy_3+hx)^2].x]$

The court form: $[u^{[4]} = fy_3.\ [(fy_3+2.hx) / (fy_3+hx)^2].x]$

The general equation: $[u^{[2\infty]} = fy_3. [(fy_3+\infty.hx) / (fy_3+hx)^2].x]$ for $\infty=0,1,2$

So: $[u^{[4]} – u^{[2]} = u^{[2]} – u^{[0]} = fhy_3x^2 / (fy3+hx)^2]$

As a result, that for all x>0 the following may be written $u^{[4]} > u^{[2]} > u^{[0]}$"

Consequently, this statement showed the land use performance of arrays of built forms. There are two theorems which was evaluated by Martin and March (1972: 95) The first theorem mentioned that "comparing infinite arrays of rectangular built forms controlled by a given angle of obstruction, the floor space index of an array of contiguous courts is always greater than that of an array of streets, which, in turn, is always greater than that of an array of pavilions for an given number of storeys."

The second theorem mentioned "There is a maximum floor space index for an array of pavilions for some finite number of storey, and for this same number of storey the indices for street and contiguous court arrays are two and three times the maximum achievable by the pavilion array, respectively." (Martin and March, 1972: 95)

These types of elementary mathematical models evolve some decision about the general formulation of the urban form. The daylight condition, floor space ratio and height of the buildings could be effected the formulation of the building forms. Martin's research reveals the general outlook for the building forms. Nevertheless, more sophisticated analyzes could be made by the other environmental and planning effects, and determined the physical arrangement of the urban form.

These types of analyzes could be given a general idea for formation methods of the block structure. These formulations provides to interpret that the perimeter block structure and courtyard building typology are the most effective built form for the urban physical structure, by mean the floor space ratio – building height relationship.

3.2.4 The Daylight and Sunlight Assessment Method

The one of the important factor of the designing with environmental conditions of the daylight and sunlight necessitate the clear definition of the natural lighting conditions. The existing context must be analyzed for current lighting levels and conditions. And also, flexible design guidelines must be form for the type of light desired in different parts of the city.

As Bryan and Stuebing described (1987: 300), sunlight consists of sun rays which follow a daily path. These rays have different positions. In this path with different angles, this depends on the season. In the summer season the angle of the sun path is higher into the sky and in the winter season the sun is much lower. So, these variable angles constitute different lengths of the shadow. On the other hand, daylight is diffused from the entire sky dome and it has no any direction. So, daylight condition is related with the weather conditions – overcast or a clear sky -. Therefore, the regulation methods for sunlight are more specific and restrictive rather than the daylight considerations.

“An alternative method of the assessment to the FAR approach was adopted from a research methodology developed by the Swedish architect Gunner Pleijel (1954), who designed a technique for measuring the percentage of unobstructed sky at any urban locations. With this technique, existing conditions can be analyzed and the impact of proposed building in an existing context can be projected.” (Bryan and Stuebing, 1987: 302)

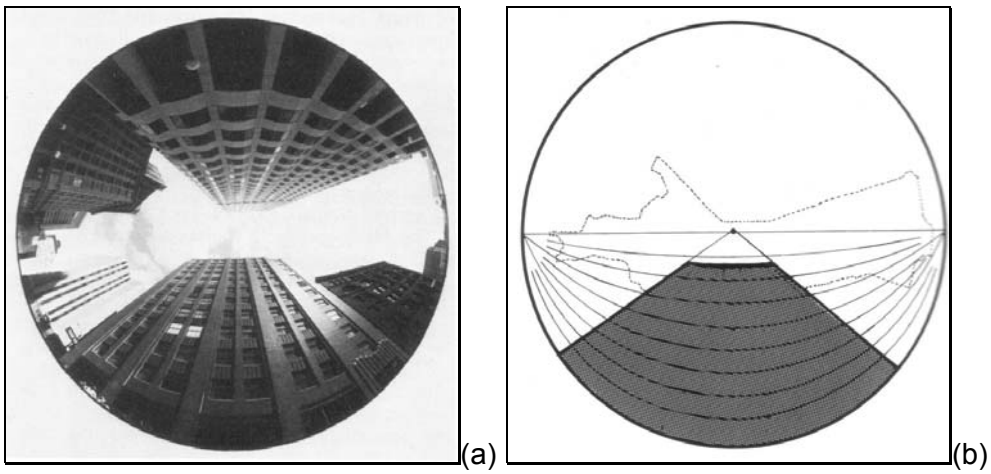

(a) (b)

Figure 3-26: Photogrametric Analyzes in existing building structure (March, 1972: 302-3003)

The alternative method include some photogrametric analyzes into existing building structure. The fish-eye-lens “photographs (Figure: 3-26-a) can document daylight at any desired location by recording distorted, yet proportional, impression of the surrounding buildings on both size of the street.” (Bryan and Stuebing, 1987: 302) So, the measuring process of the lighting conditions related with the openness of the sky dome, which bounded by building’s roof edge, into fish-eye photographs.

This edge could be designated from photograph and drawn as a transparent overlay. The building's angle of elevation, between the horizontal and the roof edge, could be measured from the overlay. (Figure: 3-26-b) Therefore, the amount of light to the street could be defined by vertical edges of the building lines to the zenith and by subtracting the boundaries of the building edge from the resulting building surface form.

As Bryan and Stuebing, (1987: 303) mentioned, the fish-eye projection technique also could be used to measure the natural lighting conditions of the open spaces. In order to measure at any reference location a fish-eye photograph, which taken from the site, is used and the sun-path diagram, which include the number of hours per day of sunlight, overlays on the photograph. So, "at any particular time of the year can be easily gauged with sun-path overlay transparencies." (Bryan and Stuebing, 1987: 303)

Bryan and Stuebing (1987: 306), focuses on the natural lighting conditions of the Boston's financial district. (Figure: 3-27) So, they exposed the lack of natural lighting conditions of the district, because of the irregular street pattern, narrow street widths, and lack of setbacks. Furthermore, the development process of the financial district has formed a new high-rise office building development. As a result, the streets were dark and shadowed.

(a) (b)

Figure 3-27: Natural Lighting Conditions (a) The Cut-Off Angle of the Street (b) Lighting Conditions of Boston (Bryan And Stuebing, 1987: 305-306)

On the other hand, not only, the high-rise development and more density cause the loss of lighting but also the building placement is the another consideration effecting the street lighting. Indeed, Bryan and Stuebing (1987: 307) illustrated an example to show the impact of the forming building to daylight conditions. (Figure: 3-28 and 3-29) They assumed that two building having same site and same FAR. However, one of them is rectangular solid, while the other has several upper storeys with setbacks and corner notched. In order to analyze the impact of the buildings for daylight conditions the fish-eye projection implemented by authors. So, the plan and elevation of the building are drawn, after the corners of the buildings placed in reference to the center of the street. The reference points of the corners determined with a series angles both vertically and horizontally, according to center of the street. Then, in fish-eye projection area were divided with ten equal angular increments both on the angle of elevation horizontally overlay and the angle of azimuth vertically. So, “the percentage of light to the street calculated by dividing the pie-shaped property envelop into 100 units.” (Bryan and Stuebing, 1987: 307) According to plan and elevations of the buildings which showed the angles of the corners the pie-shaped property envelope divided by number of units. Also the pie-shaped area, which showed the building facades into the projection, subtracted from 100 units. As a result, the percentage of light to the street is obstructed. The conclusion of the hypothetical projection exposed that the second building with setbacks account for 7 percent more daylight to the street than the other, even though it had 14,5 meter taller.

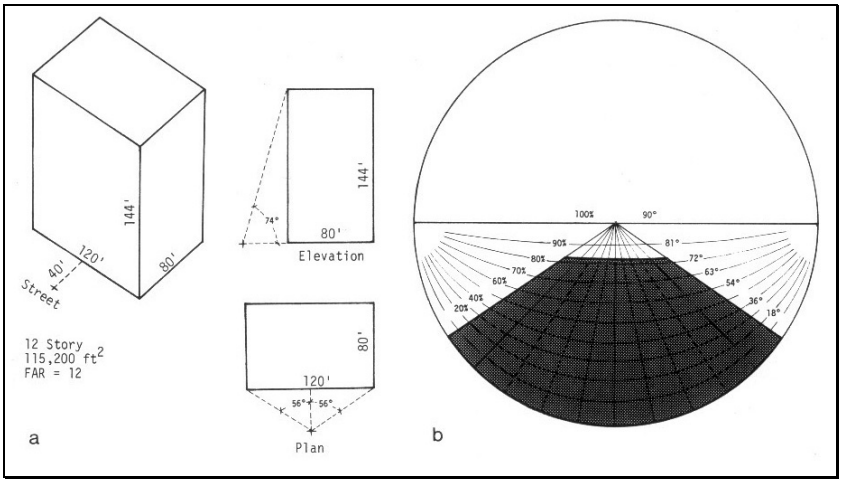


Figure 3-28: The Forming the Building to Daylight Conditions for Solid Building

(Bryan And Stuebing, 1987: 307)

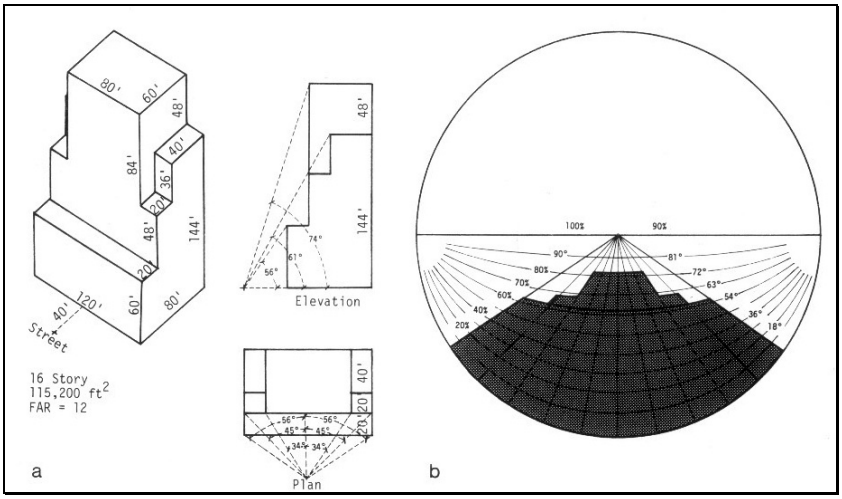


Figure 3-29: The Forming the Building to Daylight Conditions for Building with Setbacks (Bryan And Stuebing, 1987: 307)

This hypothetical projection can be interpreted that the FAR regulations couldn't provide any consideration about the daylight conditions. However, the placement of the building volume and some setbacks, both into the parcel and the building structure, could ensure daylight considerations for street and area of the building surroundings.

The daylight assessment method represented an alternative method for designing building in qualitative data for considering daylight conditions. Also, there are different alternatives could be developed for particular circumstances. But, the daylight conditions should be added to existing planning approaches.

According to Bryan and Stuebing (1987: 309), in this method, "the following concerns are critical (1) existing context, (2) building height to width of the street or street wall, (3) placement of building bulk, (4) type of light desired, specifically, sunlight or daylight and (5) type of urban spaces." In addition, type of material used on the building facade more important for design. Especially, light reflective materials ensure more positive effect on urban space than dark absorptive materials.

3.2.5 The Urban Design Guidelines

In urban design process should be parallel to other elements of the formation process of the city. Lang (1994) defined as "design of design guidelines" which involves three basic steps as below:

1. The design and acceptance of a set of overall schemata for the site.
2. The abstraction of the essential components of these schemata.
3. The writing of design guidelines to ensure that these essential characteristic are achieved.

Urban design guidelines are documents prepared by the local planning authorities. These guides are defined as supplementary planning guidance different from the regulations and development plans. They include additional information, guides and codes determining urban design and architectural features.

Zoning controls have an important effect for designing urban and architectural features of the city, in recent planning techniques in the world. Although, development plan techniques include controlling the land use, morphological characteristics such as building line, plot size and setbacks, and three dimensional frameworks of the areas such as building height, building density controls. But, more urban design criteria and architectural features are entrusted for developers and clients in planning process. The deficiencies of the development plan techniques are necessitated additional guidance to control the development process of the cities in many European and American cities. So, clear and effective design policy framework should be developed combining a spatial design strategy for the city with a set of urban design guidelines and design checklists.

A well-known and sophisticated example is Portland in America. The Portland Bureau of Planning is prepared a checklist to control the development of the city center. According to Carmona (2003: 246) “the aim of the checklist is to:

- Encourage urban design excellence.
- Integrate urban design and preservation of heritage into development process.
- Promote the development of diversity and areas of special character.
- Establish an urban design relationship between the central city districts and the center as a whole.
- Provide for a pleasant, rich and diverse pedestrian experience.
- Assist in creating a 24 hour central city that is safe, humane and prosperous.
- Assure that new development is at a human scale and relates to the character and scale of areas and of the central city as a whole.”

These types of general design principles should be based on clear understanding and appreciation of the local context. And after, the local design guidelines are determined more detailed arrangement features of the physical form than the development plan policies. However, there are not certain and final guidance to form the good urban design. The responsibility of the guides is developing a 'thinking machine' (or matrix), (Table: 3-1) which is linked objectives explicitly to form as Campbell and Cowan (1999) defined.

Urban design is a wide process and problem solving procedure with using development plans, zoning ordinances and design guidelines. All of them attempt to provide appropriate future development proposals which are abstract in nature. So, the important point for creating hierocracy of design guidance is consideration of the local circumstances in particular sites through the use of design briefs.

Table 3-1: 'Thinking Machine' (or Matrix) of the Policy Objectives (Campbell And Cowan, 1999)

FORM / OBJECTIVES	Character	Continuity and Enclosure	Environmental Quality	Accessibility	Legibility	Adaptability	Diversity	Efficiency
Layout: Structure								
Layout: Urban Grain								
Density								
Scale: Height								
Scale: Massing								
Appearance: Materials								
Landscape								

As Madanipour (1996: 174) mentioned that the major characteristic of the design guidelines that dealing with large areas or specific topics of the city. These may be limited to the general design principles within the local plan. So, the other step of the design guidance is defined as design briefs, which are dealt with the specific sites and more specific issues of the planning areas.

Design briefs are the documents prepared by the planning authority but also architects which are to attempt covering the requirements of their clients. Therefore, design briefs clarify the requirements and circumstances which include the general and specific information about purpose of the clients. There are two different professions,

planners and architects, having different position to prepare the design briefs and for implementation of them. So, design briefs as a development intention should be provided a framework for negotiation with the potential developers.

The purpose of the design guidelines is to set the acceptable limits for the formation process of the physical components for developers and builders. The typical design guidelines generally give the restrictions of the building and site context. Guidelines frequently address landscaping, signs, fences and screening, acceptable building materials and details, roof lines and massing, window and door size and shape. Building style and the block structure arrangements are frequently mentioned. So, the frequency of reviewing of the building design elements and site design elements are tabulated by Lightner (1993: 2-3) as below, for American example: (Table: 3-2 and Table: 3-3).

Table 3-2: Building Design Elements Most Frequently Reviewed Lightner (1993: 2-3)

BUILDING ELEMENT	% OF CITIES REVIEWING
1. Building Height	94
2. On Premise Signs	92
3. Building Bulk	87
4. Mechanical Equipment Screening	86
5. Material	84
6. Building Dimension	82
7. Service Area	81
8. Façade Articulation	76
9. Location Of Entrances	71
10. Colors Of Materials	71
11. Roof Profile	70
12. Details	67
13. Horizontal and Vertical Proportions	64
14. Window Size And Shape	62
15. Style Of Character	60

Table 3-3: Site Plan Elements Most Frequently Reviewed By Cities Lightner (1993: 2-3)

SITE ELEMENTS	% OF CITIES REVIEWING
1. Fences and Buffers	95
2. Parking Lot Landscaping	94
3. Screening of Loading and Trash	93
4. Distance from the Street	93
5. Location of Parking Lots	92
6. Exterior Lighting	88
7. Disturbances of Natural Landscape	79
8. Pedestrian Amenities	76
9. Conservation of Vegetation	75
10. Utilities	74
11. Public Open Spaces	71
12. Of Premise Signs	71
13. Obstruction of Views	63
14. Visual Privacy	62

These tables expose the building design elements generally related with aesthetic control of the building details and massing controls of the buildings. Also, site design elements generally related with arrangement of the landscape and site furniture. So, an important point for preparation of guidelines is to appropriateness based on typo-morphology within the context of the existing city in a systematic and flexible way working within the existing typologies, especially with traditional and local characteristics, makes urban development process more adequate for city life.

In this respect, the types of design elements considered appropriate for design guidelines as below:

For arrangement of the site plan elements:

- The position of the building on plot, the size and relationship between the pedestrian and vehicular circulation.
- Elements between the building and overall setback from the street.
- Parking location with respect to the street and the building, whether on-site or on the street.

For arrangement of the building facades:

- Building height and their number of storeys.
- The transparence of the façade
- Marking of the entry on the façade

- Proportions of key components of the façade
- The integrity of the building, and its additions and changes from the original building type.

For typical building elements:

- Roof line
- Canopies and awnings
- Porches
- Openings
- Signs and its location on the façade

3.2.5.1 Urban Coding Method

Urban design codes are used to arrange the general principles of the larger scale development. These principles attempt to guide the development with the details of the physical structure. Design codes are generally used with a master plan and they consist of several diagrams and charts, which are determined the types of the physical components of the development.

Design codes have achieved their success in the planning of New Urbanists development in America. These supplementary planning tools are developed by New Urbanists. These tools include:

- "A site layout or plan – usually termed a master plan – based on compact, mixed-use neighborhood principles, and allocating particular building types to particular sites.
- An urban code that establishes specific street and space sections to encourage pedestrian morphology and specific building types and their relation to the public spaces – including building lines, building heights, parking, outbuildings, porches and fences.
- An architectural code to direct imagery and character in line with a sense of place.
- A landscape code to enhance public spaces and the compatibility of new landscape elements with the natural ecosystem." (Carmona, 2003: 251)

New Urbanists design codes are used to determine the design principles by using illustration graphically and pictorially the key principles. These codes specify the regulation of the elements such as street profiles, building volume, building types, architectural features and relationship of all physical components.

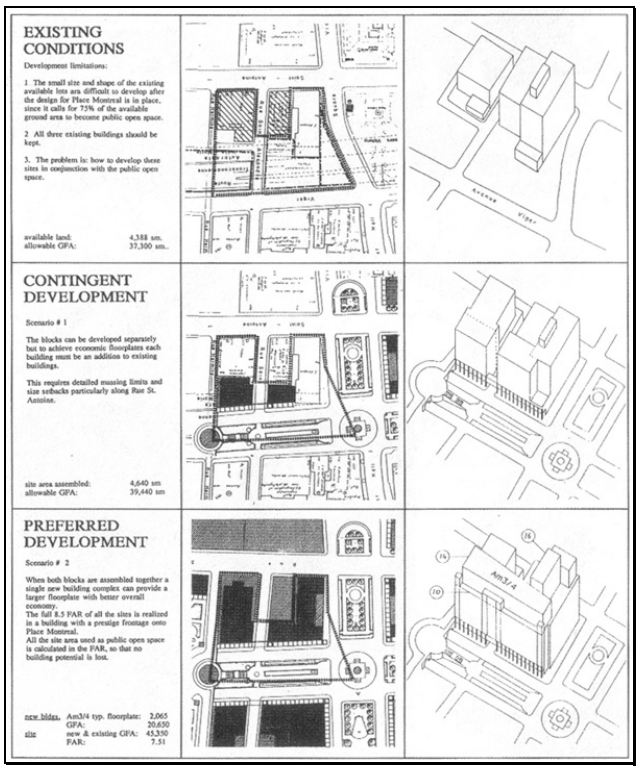


Figure 3-30: The Evolution Diagrams of the Building Structure (Katz, 1994: 125)

Moule and Polyzoides (Katz, 1994: xxiv) defined the urban coding as “specific street, block and building design rules for public or private developments shall be typologically designed and presented in the form of code. These codes are to be simply written and illustrated.” So, the rules produce the physical prescriptions of the physical structure for cities. These rules set a limit to construction for owners, designers and users of particular projects, because the generation of the public space inevitably related with the individual development of building and open spaces. Certainly, these rules could be changeable for some necessities but it must be approved by the local authority or designers.

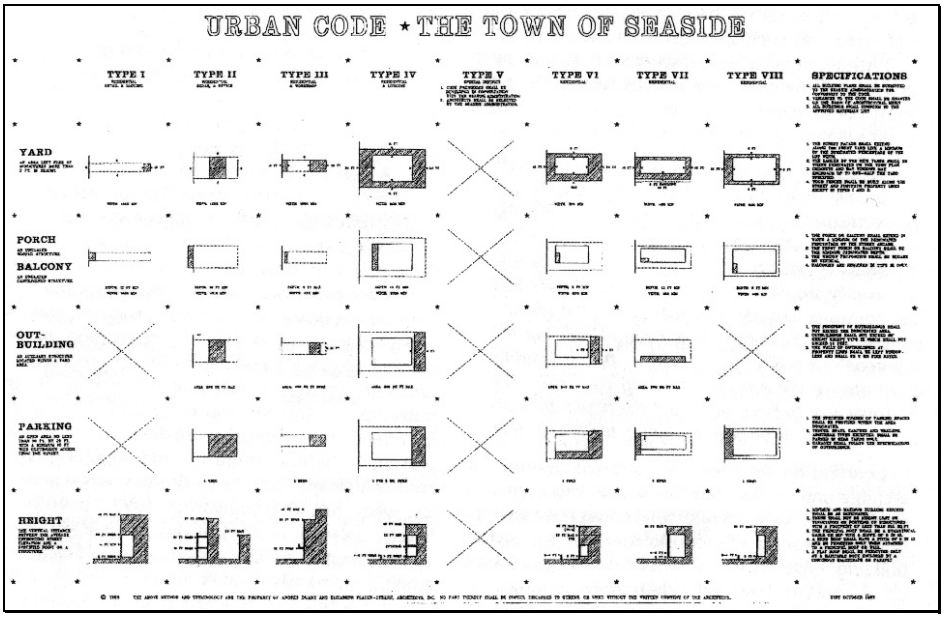


Figure 3-31: The Coding System of the Towns (Carmona, 2003: 251)

According to Moule and Polyzoides (Katz, 1994: xxiv) theorized that structuring the good city form with buildings, open spaces, and landscape could be possible using the careful coding system of design within all scale of cities as villages, towns, cities and also, metropolitan region.

CHAPTER 4
THE DESIGN PROCESS ANALYSIS - BLOCK STRUCTURE IN CASE STUDY

The context of the thesis includes a wide literature survey with the aim to introduce the general framework of the urban design concepts, which are mentioned the formation process and characteristics of the urban fabric and its components. This general framework provides a base to formulate the optimum conditions and arrangement methods of the thesis subject as block structure. In the previous chapters definitions and theories about the block structure are exposed and some design methods are mentioned to select the appropriate design method for the formation process. So, this chapter aims to recommend a contextual block structure model to discuss the optimum conditions of the block structure, which is formed by theoretical proposals and existing problems of the case area. Therefore, before all else, the reasons of the selection to central part of the city is explained and then the case study are introduced with the existing conditions and problems. After that the conceptual block structure model explained with their theoretical background and design criteria.

The theoretical background of the thesis reveals the importance of the vitality of the urban life. Especially, the public activities for the people create a livable urban fabric. So, the adequate way to understand the historical, economical, administrative and cultural structure of the city is investigation of the central part of the cities. Because, city centers are the most vital and changeable parts in cities, in rapid development process. And, this type of rapid development could provide a clear, definite and continual description about the city. Furthermore, the transformation of the physical structure is the result of this development process. This transformation provides an appropriate study area to evolve new ideas about the formation process and methods. So, the other important factor to select the central part of the city is the necessity of the public life into the city part, because of the increasing effect for commercial demand. This necessity to increase the public life constitutes to formation of public spaces and public squares and great amount of pedestrian circulation areas in the central part of the city.

The general definition about the central business district of the city include commercial, administration, information, financial and service activities, which are concentrated on the central part of the city. So, central part of the city contains different

size of commercial units, personal, professional and office services, public institutions and entertainment and food services. The central part of the city is a place which includes high population density, big capital accumulation and more accessibility. The most characteristic features of the city centers could be described with highest level of communication, goods and service transfer necessities, highest land value, multi-functional land use and daily population density. “In large cities, the principle center is likely to be of great size and to have a very high density of activity.” (Lynch, 1994:390)

The central part of the city is a focus of economic and social interactions. The diversity of land uses and concentration of urban activities come together in a compact area. The fundamental characteristics, which are accessibility, diversity and concentration, affect the success of the central areas, as a market place.

4.1 The General Design Framework of the Central Part of the City

The general central area development of the cities showing the grain of development has become coarser. Into the development process small parcels and blocks changed to larger, amalgamated plots and blocks. Further, “narrow streets were replaced by wider streets, and minor streets were closed and alleys were eliminated altogether in this process.” The changing economical conditions, real estate market and developing of corporate ownership have evolved of modern high-rise buildings and their expanding footprints and increasing height on the urban space.

The new mechanical type of urban renewal process has amalgamated the adjacent parcels, and to reorganize the streets to carry a much greater traffic and parking than before. This process has reduced the permeability of the space and turned to blocks exclusionary, introverted and uncommunicative. Therefore, the public spaces have become non-functional.

Consequently, a new understanding to design the city is necessary for urban design in order to “return to the smaller grain urban fabric that once fostered a sense of place and community and an exciting street life… and encourage small shops and buildings and a rich mix of land uses.” (Sideris and Banerjee, 1998: 307)

The creating a fine urban grain requires a new development strategy to form smaller and incremental growth and change. As Sideris and Banerjee mentioned that the institutional changes are necessary to implement a collective changes

amalgamation of block interiors and faces restructuring block structure. So, “where such deconstruction is not readily possible in the form of ad hoc subdivision of existing built form, existing public spaces and the spaces between buildings can be the medium for humanizing the block if they make room for small business, multiple ownership with decentralized control of spaces, and mix uses.” (Sideris and Banerjee, 1998: 308)

In central areas, minimum front and side yard setbacks and maximum building coverage provide an efficient use. This type of pattern with buildings forms a strong sense of spatial enclosure, which closely edging street of central areas. The grid street pattern, which commonly is preferred as the simplest way to surveying, subdividing and selling land, and building patterns of the central area created a well defined, organized and rational spatial structure.

In commercial streets, street frontage is the most competitive section of the building blocks, because of the representing access. So, the preferable parcels are deeper than they are wide in order to create a sequence and variety of each block. Furthermore, the ground levels of the structures are the best locations for commercial uses, upper level are most preferable for residential and office uses.

The quality of a central city place is constituted by the physical settings and the relationships between the elements of the build environment. Streets, sidewalks, buildings and open spaces are the basic components of the designing the space. Also, the secondary elements, which are street lights, paving, planting, signs, influenced the basic form and structure.

In order to create a successful central area, “the form, appearance, and arrangement of the diverse elements that make up the urban environment must be orchestrated to create a sense of overall organization, a pleasing visual image, a sense of vitality and a convenient setting for human activity.” (Paumier, 1988: 47)

In order to be successful as a market, central city must be successful as a place for people. The design quality of the street, public spaces and buildings in central areas, can improved the pedestrian density and create the active street life, which is increased the retail success. The well defined connections between main uses, visual continuity, physical comfort, a sense of human scale at street level and people oriented movement system can prove a successful designed urban space in the central city areas.

A clear and simple development pattern within the central area provides a unifying framework that helps the people to understand how this area is organized. An intelligible development structure helps people locate and identify central area uses and activities.

In central areas, “the relationships of buildings to the street also play a significant role in reinforcing the overall organizational pattern by creating a solid, continuous architectural edge that defines the street space. The three-dimensional framework of buildings and streets is weakened when vacant lots, surface parking, and deep setbacks and infill development that repairs and reinforces the existing urban fabric help unify central areas structure. “(Paumier, 1988: 55)

There is a good design example about the arrangement of the urban fabric with regeneration of the block structure in Cerda. (The Cerda Plan of 1859) “The Cerda plan represents a structural explosion in relationship to the intimate structure of the Roman and Medieval Barcelona.” (Gruber, 1978: 76)

The plan decisions explain the main approach to rearrange of the physical structure in Cerda. These notions include the revision of the block structure, traffic and architecture and building structure, which are evaluate as design guidelines of the process.

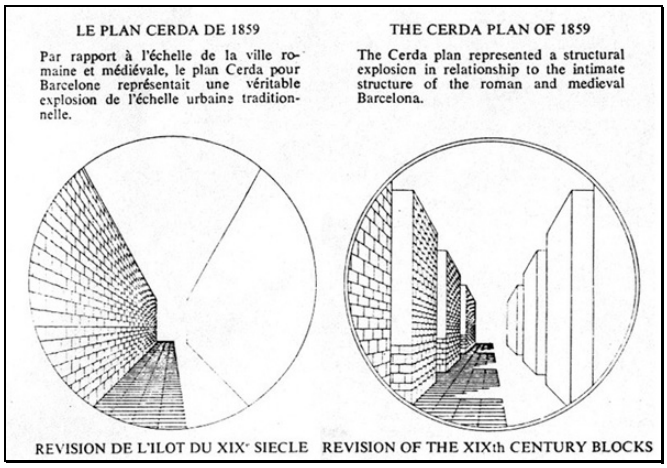


Figure 4-1: The Transformation Principles of the Cerda Blocks (Gruber, 1978: 76)

- “If we subdivide the Cerda-block (113x113m.) by 2 or 3 pedestrian streets we recreate a structural density similar to the historical centre. (Figure: 4-1)

- The central void typical of large blocks will become part of the public space of the city in the form of streets – squares – public gardens.
- The length of the public facades per block is increased from 400 m. to 900 m.
- This even possibly higher commercial exploitation of the block would however create an acceptable density by creating quite squares and parks within the block.
- The traffic remains as now only that all parking are underground and the streets and a squares within the block are pedestrians. (Figure: 4-2)
- All flats occupy the corner of a block.
- A public building is more important than a block of flats; it has to have monumental qualities. Similarly an arcade and front of shops make more importantly part of the public realm than a private loggia or bedroom window.
- Functions need not be expressed but hierarchically represented." (Gruber, 1978: 76)

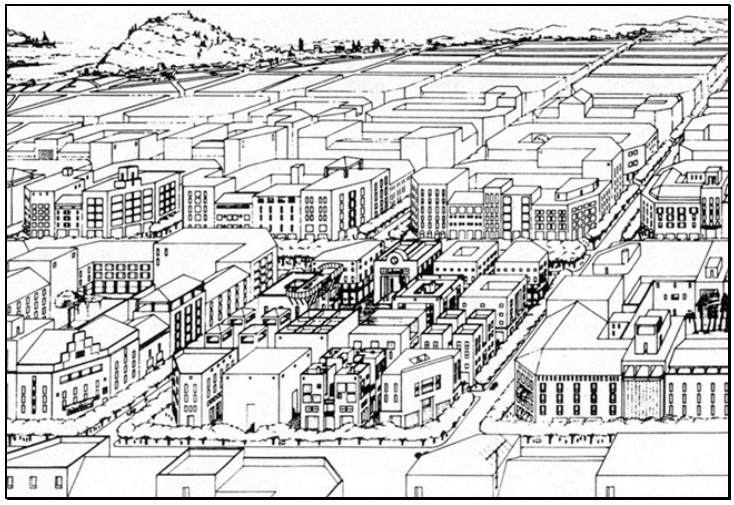


Figure 4-2: The Cerda Project (Gruber, 1978: 77)

4.2 Selection of the Case Study Area

The case study of the thesis includes some criteria to select the study area. The one of them is the development potential in current situation, and demand for renewal of the existing buildings. The other is the commercial and business potential which create a vitality and pedestrian density in the area. Also, adequacy for mixed use is the other important feature.

The case study of the thesis includes two different scales, which is aimed to expose the relationship of the parts and wholes in the case area. For the purpose of the providing good interrelation in case study, north side of the Alsancak District is selected as an analysis area of the case study, which is analyzed to provide a clear understanding for the morphological characteristics of the urban fabric. And also, north side of the Punta District is selected as a project area of the case study to develop a comparative study between alternative conceptual models and existing conditions of the block structure. Therefore, in Chapter 4, the phrase of 'The Analysis Area' is used to as a synonymous of 'The Analysis Area of the Case Study' and the phrase of 'The Project Area' is used as a synonymous of 'The Project Area of the Case Study'.

In this respect, a part of Alsancak district, which is located within the central part of the city of Izmir is selected for the analysis area, because of the vitality of the Alsancak District in the city. This vitality consists of both commercial – business activities and recreation facilities. On the other hand, these activities create a high density development demand for office and retail uses, especially in the backside area of Izmir Harbor. So, this demand is increased particularly in the north side of the Punta District, which is surrounded by Atatürk Boulevard and Talatpaşa Boulevard and port of ferry. This district is defined as a residential and commercial area in the development plan and the implementation plan, which are prepared by Izmir Greater City Municipality. However, plans couldn't be found any convenient condition to implementation and some particular revisions are made. Consequently, this part of Alsancak District is selected for a project area of the case study, because of the development potential of the new arrangements.

Selected case area have varied types of building blocks, building types and plot patterns, according to existing conditions and implementation plan conditions. And also, this area has different land use types and building densities. On the other hand, a general typology of the block structure could be observed as a small rectangular type and contiguous building order. The historical characteristics of the study area is the main reason for these type of arrangements, especially, the fragmented and small sized plot pattern effects the new developments in the analysis area. The other significant feature of the area is the traditional characteristics, such as conservation districts and single listed buildings, which have survived since the 19th century. The analysis area surrounded by local roads in three side and Atatürk Boulevard located the east side of the project area.

The main problem of the development process in the analysis area, and particularly, in the project area, the high-rise development demand in urban fabric, because of the increasing trade and business activities. But, these demands affect the physical structure negatively. Because, the developers requests the high-rise and high density buildings in the same urban pattern and block structure pattern. This type of development as the high density on same plot - same block pattern are the main reasons of the deficiencies and problems of the existing structure, particularly the human needs the importance of the pedestrian density are mentioned in the scope of the thesis for the vitality of the city. However, it is not only related with quality of urban space, but also related to the capacity of the roads, parking spaces and infrastructure.

4.3 The History of the Analysis Area of the Case Study

The urban fabric for the central part of the city of Izmir consisted of the varied morphological patterns in the half of the 19th century. As Bilsel (1999, 227) mentioned that one of them was the irregular and organic pattern on the slopes formed with multiple dead-end streets and irregular parcel pattern. The other was to have more regular lots and more straight streets on the lower parts to the north and north-east side of the central district. The other pattern of the city had multiplicity of interior courts, a tight network of streets and small plot patterns. The last type for central city extended as a narrow strip along the coast from the center towards north, with narrow lots and numerous divided streets and passages. (Figure: 4-3-b)

Figure 4-3: a) Plan of Izmir, Map of Thomas Graves Dated 1836-1837 b) Plan of Izmir Map of Luigi Storari Dated 1854. (Bilsel, 1999: 226)

According to Bilsel (2002: 34) the transformation of the physical structure of Izmir was started in the first half of the 19th century with the foreign merchants. After the 1845 fire, physical structure had changed from traditional pattern to grid iron pattern, which shown in 1854-1856 Storari maps. (Figure: 4-3-a) The important role of Punta District increased with construction of the Aydin Railway and Alsancak Train Station after 1856. This construction created a new demand for the commercial and wholesale activities with their residential needs in Alsancak District, and then urban development increased through the North side of the central city. The last significant improvement realized for the Punta District in 19th century the construction of the port in Punta toward the end of the century. The extraordinary situation could be realized in this process that was the generating new plots for foreign company in filling areas, which created during the construction of the port. So, these generated areas have been the significant high-value land prices in the central part since the second part of the 19th century. (Figure: 4-4)

Figure 4-4: a) the Urban Fabric before the 1841-1846 Fires. b) The Physical Structure of the Punta District in 1854-1856. c) The Physical Structure of the Punta District in 1876 according to Lamec Saad Map (Bilsel, 2002: 35)

In 1905, the existing cadastral structure of the Izmir was investigated to identify the location systems of the companies and merchants of the central area to establish a fire insurance policy. So, this plan shows the physical structure with roads and parcels. On the other hand, this plan includes an index to list the property owners of the parcels with their classification of sector of working. The importance of the plan is to reveal the necessity of the orientation of the parcels through the Izmir Gulf, because of the harbor activities and its storage services back side of the harbor. And also, these channels provided the good access to the sea from the interior side of the city. The smaller and narrow parcel pattern of the Izmir has been effected the today's physical structure and determined the orientation of the block structure and its components. (Figure: 4-5)

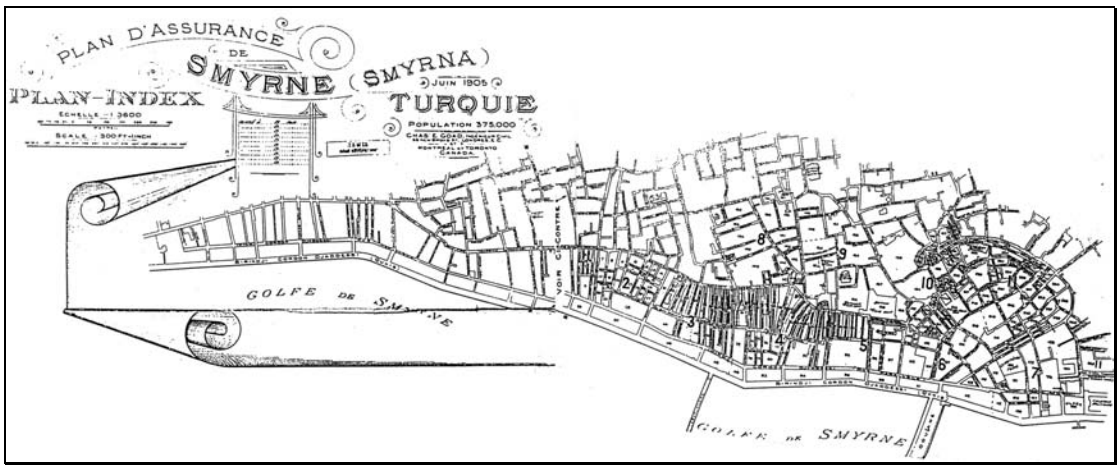


Figure 4-5: The Plan Index of the Izmir in 1905 (Atay, 1978: 157)

At the end of the War of Independence, the urban economy and spatial structure were in a state requiring reconstruction with the departure of the Levantine and Greek population, who used to control the international trade. The disruption of the economic structure and the great fire of 1922 had destroyed an area of 300 ha including the residential quarters and a great part of the business center within Frank District. After this great fire, in 1924 French urbanists Henri Prost and his collaborators, Danger Brothers prepared a plan for the burned out quarters. (Figure: 4-6)

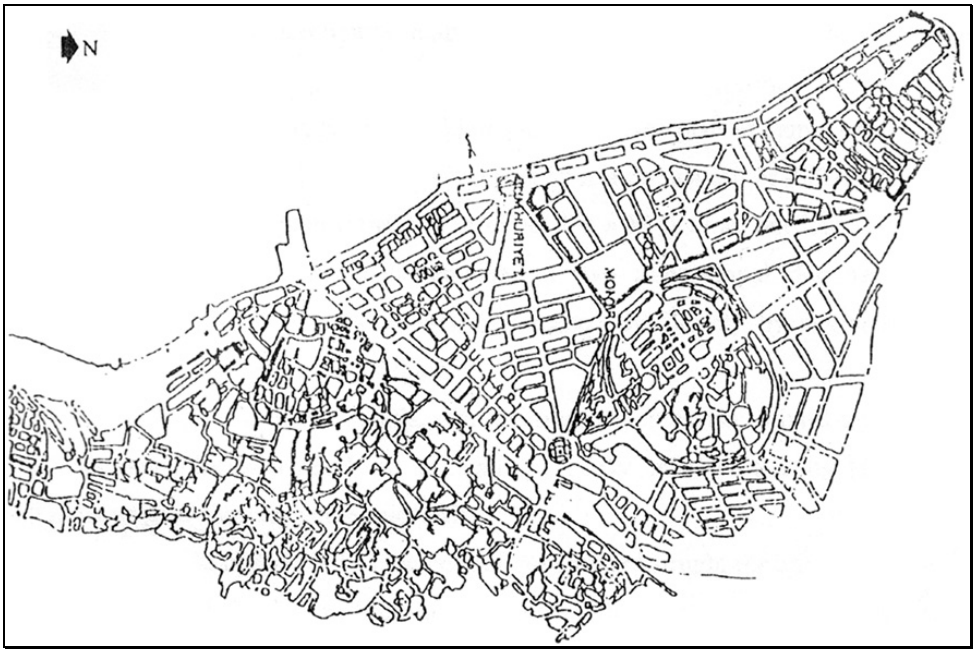


Figure 4-6: The Plan of Danger In 1924

Modernization of the physical structure has been initiated in Izmir as early as the end of the 19th century. However, The Republican Government, displayed particular interest in the preparation of urban plans, as a comprehensive planning techniques. As a representation of the new founded state the new urban plans carried an important role. To achieve this mission, the rationalist and functionalist principles of modern planning were adopted according to planning criteria such as hygiene, green space and separation of the uses.

The new urban fabric produced by the Danger Plan was based on wide diagonal boulevards, and public plazas formed at the intersection of these boulevard. For example, the Gazi Boulevard has the major importance for this fabric. It is 38 m.-wide and maintained the connection between the harbor and railway station at

Basmane. This boulevard converged with the number of other avenues in front of the station, forming a large plaza that marked the entrance to the city. On the other hand, Danger plan concentrated largely on the Frank District, because of its economical symbolism with Izmir Harbor, where formerly the Levantine population had dominated. So, the redevelopment of the Frank District resulted in the repudiation of the characteristic of the traditional center. In contrast, the large-scale interventions in the fire-ruined districts the Danger Plan adopted a protectionist attitude towards the historical center except for some proposal on the development of circulation, the existing texture was preserved.

This duality created between the historical center and development areas caused a symbolic failure for modernization program of the municipality. And, some revisions were prepared by the municipality of Izmir. So, the fire-ruined districts were rebuilt according to new plan conditions. However, after the implementation of the fire-ruin districts, municipality of Izmir exposed some deficiencies for the other parts of the plan; and application of the plan was annulled. The case study area of the thesis was formed in this plan period and its implementation process.

So, the municipality decided to obtain a new plan that would allow interventions in the historical city. And, in 1939 the municipality indented to establish a planning commission in which Le Corbusier was the act as an adviser. So, Le Corbusier prepared a few sketchy proposals. (Figure: 4-7) In 1948, Le Corbusier produced a plan for a range of 50 years, of the planning periods. But, in this plan, fragmented parts of the city was designed, while it is aim to renew the large scaled projects in all city. Le Corbusier drew some different scheme to explain his proposals. Some of them are the transportation network, the separation of uses and zoning of the commercial and business areas. According to last scheme showed that Alsancak District is a business and industrial region in the city. The important proposal of this plan could be mentioned that the proposals of the port area in Alsancak. But, this plan was evaluated as inapplicable for city. Because this plan was not realistic owing to rejections existing ownership pattern and historical structure completely, and also the difficulties implementation cost.

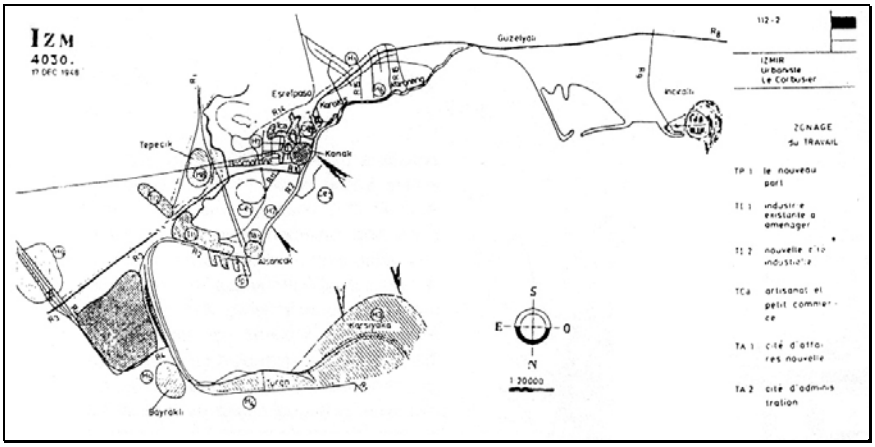


Figure 4-7: The Scheme of the Izmir Master Plan Prepared By Le Corbusier (Bilsel, 1999 B: 14)

After the Second World War, the migration from rural areas to urban areas increased the population of the cities. So, in 1950's, the rapid urbanization process caused some considerable changes were effected economical and social structure of the city. In order to propose some solutions for this problematic rapid growth, municipality attempted producing a plan with 'International Project Competition for Izmir City Plan' (May 1st and December 1st, 1951). The planning group which was the members is Kemal Ahmet Aru, Gündüz Özdeş, and Emin Canpolat won the competition and the plan was approved in 1953. (Figure: 4-8) The plan, which is prepared by Kemal Ahmet Aru, remained in effect for a long time, but like the limited plan of Danger- Prost, the plan remained a two dimensional document while municipalities gradually, but contiguously increased the building density by augmenting the building floor area and heights from three to eight floor.

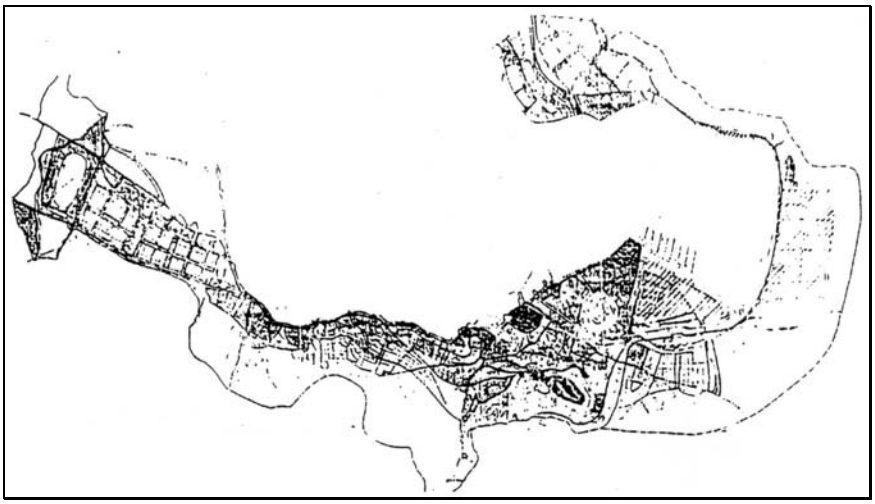


Figure 4-8: The Master Plan of 1953 Prepared By Kemal Aru

However, after the approval of the plan, some 1/5000 development plan alterations demanded. These demands were mostly to increase the building height and building densities, especially, the transition from green areas and the conservation of the existing situations. According to new demands the last proposed plan was prepared in 1961, had been accepted. Until 1985, some revisions were made by municipality in environmental plan and master plan scale. In 1989, the master plan prepared according to '3194 Development Law' and this plan has been implemented in existing circumstances. (Figure: 4-9)

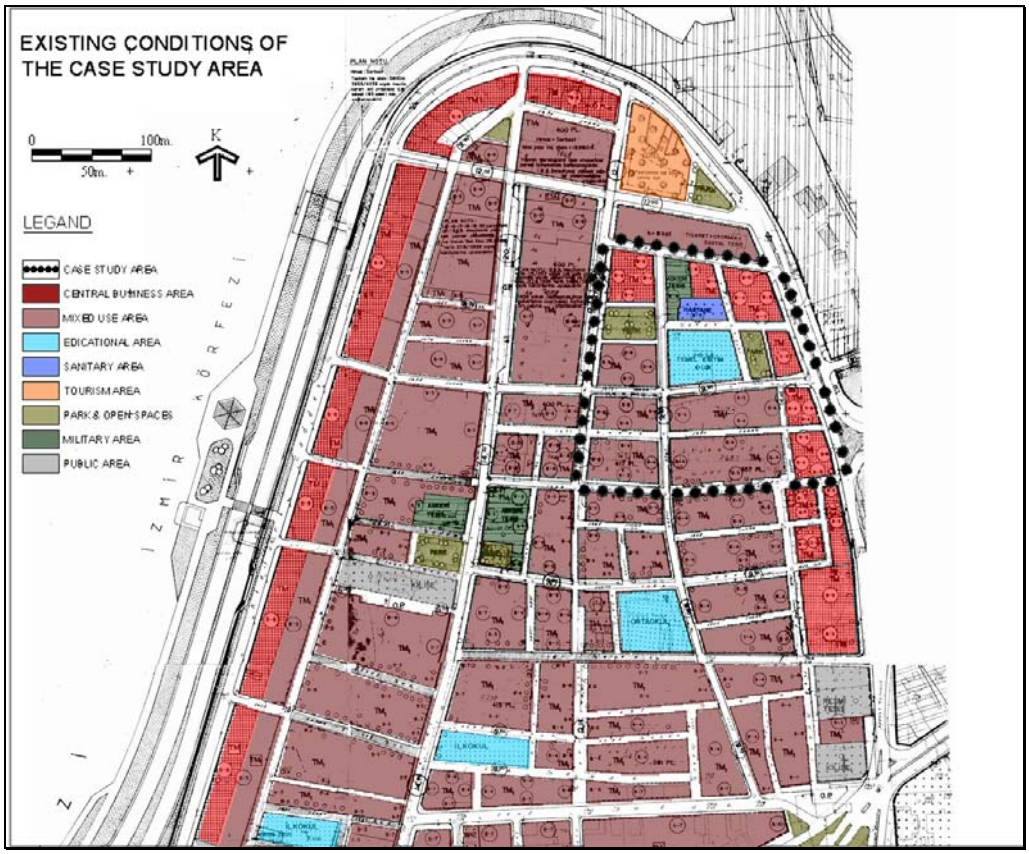


Figure 4-9: The Current Implementation Plan of the Analysis Area (Adapted By Author from the Implementation Plan)

In this respect of the development process in city scale, the urban fabric of the Izmir has changed, in rapid development conditions. Especially, the increasing population density have caused the physical problems, such as high-rise development on the coastal strip, insufficient open spaces and public spaces, the deficiencies of the circulation network and inadequate infrastructure network. But, the most important problem could be mentioned as the loss of the identity of the traditional characters. On

the other hand, the central part of the city hasn't changed critically for building block pattern as a two dimensional framework. Particularly, for Alsancak District and the analysis area have been the same block patterns as the first plan of Danger. The main roads and secondary roads have the same routes and widths. The main greenery areas and public places such as Kültürpark and Cumhuriyet Square are preserved. However, there are a great number of increases to building density with increasing of the building heights. It has been caused the inadequate scale for public life and human dimension. Consequently, the recent physical structure of Izmir have problem nodes for built environment, which are mentioned in following section for the analysis area of the case study.

4.4 Analysis of the Existing Conditions of the Case Study Area

The importance of the analysis of existing conditions is mentioned in previous chapters to form of the new and alternative block structure in urban areas. In order to be sufficient, for arrangement of the alternative block structure with appropriate to existing urban pattern is necessitated the understanding of the local characteristics. With the aim to provide these conditions, in this section a series of analyses are made according to main design criteria, which are introduced in Chapter 3.

The process of analysis includes three main group investigations. One of them tried to expose the characteristics of the distribution of the building density in urban pattern by mean fine grain concept, both vertical and horizontal dimension. So, these analyses are interpreted with the diagrams of the Figure-Ground analysis and their classification in comparative study. The second groups analyses are aimed to expose the public and private area distribution in urban space by mean the pedestrian use. The third groups analyses are consist of the distribution of the building masses in the analysis area and its effects on the urban spaces and streets in the respect of the natural lighting conditions, which are shown with shading density within different periods. The forth type of analyses expose the fine grain of the block structure with the three dimensional models. At last, the typo-morphological features of the urban fabric are revealed to understand the architectural properties.

The first group analyses are began with the initial plan conditions of Izmir, which is described in previous section. This study exposes the changing conditions and development districts in the city. From the first plan of Izmir, which was designed in 1922, there isn't any greater changing for size and form of the block structure in

analysis area. The changing only realized with increasing building heights. However, critical point for this type of improvements is to create the ill-effect development in the interior side of the building blocks. The fragmented plot pattern and the partial development is the reason for this type of problematic structure. (Figure: 4-10) Also, the current implementation plan of the analysis area investigated to understand the proposed structure in future. So, it is appeared that the existing structure is preserved with block structure and street network. But, building densities are increased within the same plot pattern. Same traffic routes are transformed by a pedestrian street to increase the pedestrian circulation into the spaces.

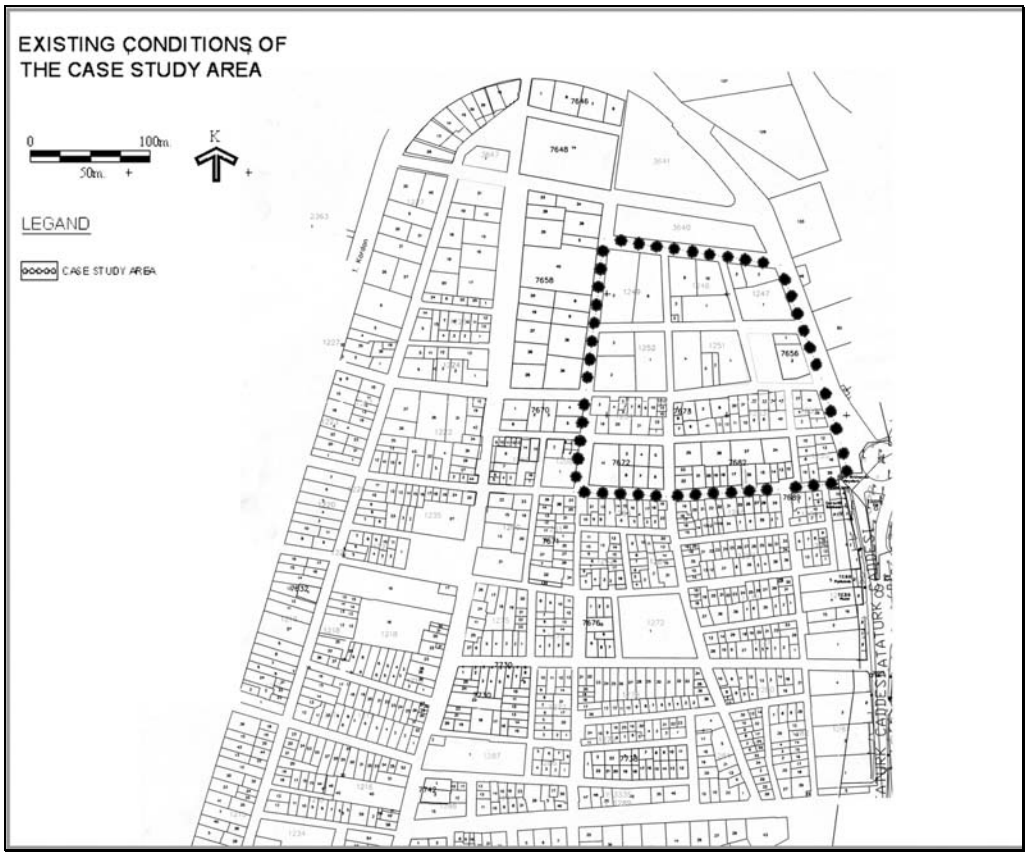


Figure 4-10: The Existing Cadastral Pattern of the Analysis Area (Municipality of Konak)

The figure- ground analyses give some information about the pattern of the city. So, there is an interesting situation for analysis area. In spite of the general observation is exposed as the negative perception about the urban pattern, while figure-ground analysis give a fine grain pattern with different size and form of block structure and buildings. The variety of the building has different floor areas and building heights into the area. Especially, listed buildings constituted a balance with together the medium

scale buildings. However, new developing buildings cause to change of the building pattern in analysis area. (Figure: 4-11)

Figure 4-11: The Changing Physical Conditions of the Analysis Area (Personal Achieve)

Figure-ground analysis ensures an interpretation about the solid-void balance in the analysis area. (Figure: 4-12) So, it could be said that there is a lack of usage for public pedestrian activity. Because there are four types of voids in this area, which are streets for vehicular access, small parks, the plots of public institutions and private plots. Therefore, there isn't any evident public place for increasing the value of public realm. Kıbrıs Şehitleri is the only characteristic parts of the public realm as a pedestrian street, is the famous promenade for people of Izmir, although, it is defined as a traffic road in implementation plan.

The last interpretation providing the figure-ground analysis is the development demands for high density buildings. The dual separation of the building height, which are buildings-5 storey and less, and buildings- more than 5 storeys, increased the understanding of the physical structure. Because, buildings are more than 5 storeys show the development potential for block structure in period of time. If there isn't any restriction about the building height, development demands cause the high-rise evolution. So, in analysis area of case study, development demand intensifies in the north side of the analysis area, which surrounded the project area. So, it is clear to decode the future development which high-rise and large scale building development in the project area. Furthermore, the existing development pattern could be an example for improvement types of developers, which could be claimed that new building development will be evolved on the same block structure with amalgamation of the

partial plots. So, this is the critical point for the future of urban fabric, as the 'Manhattanization' of the city parts.

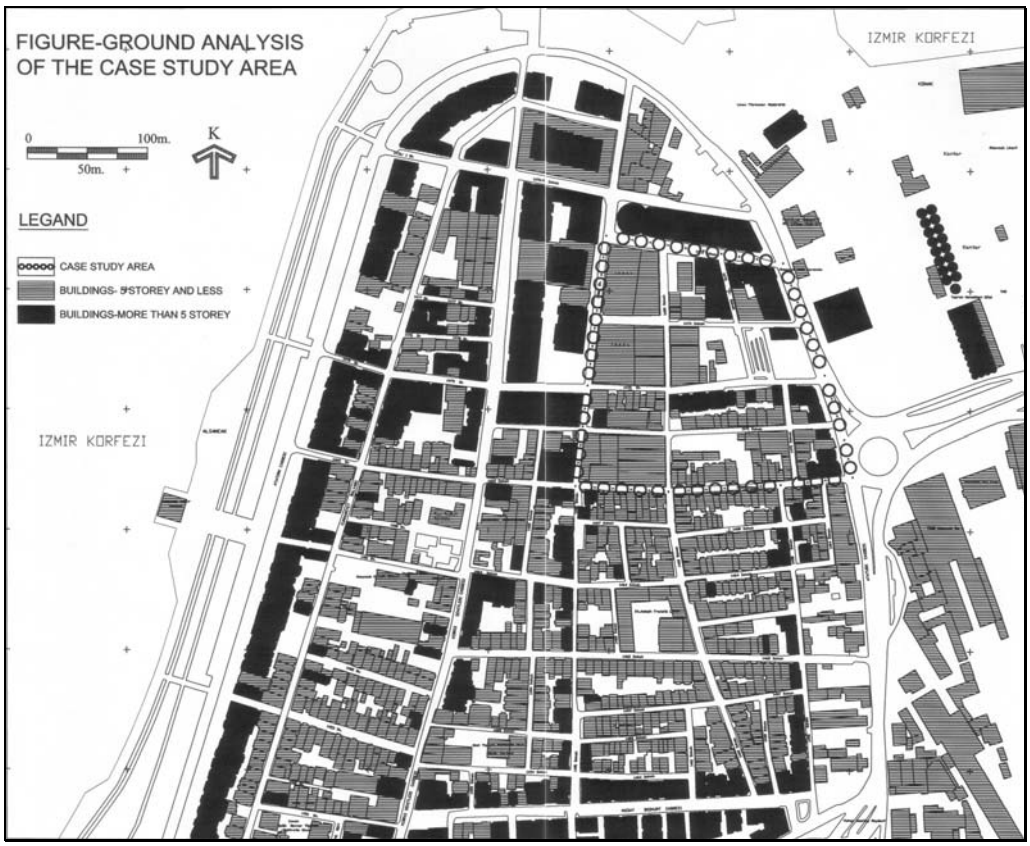


Figure 4-12: The Figure-Ground Relationship of the Case Study Area (Prepared By Author)

The second group of analysis are related with the block structure is the evolution of the public realm and its usage capacity. For the purpose of the understanding of the vitality in urban spaces, the adequate public areas for pedestrian activity are analyzed with accessibility in analysis area. Circulation network has advantages to mean the fine grain. Because there a lot of small sizes block structures with narrow street pattern, which obstruct the high capacity movement for vehicles. But, except the Kıbrıs Şehitleri Street, there isn't any adequate pedestrian street to walk in safety in existing conditions.

In this respect, for analysis area, a new circulation network is necessitated with appropriate public spaces to increase the accessibility and vitality of the places. However, existing pedestrian routes have a meaning in the historical perspectives. So, the value of the pedestrian routes is defined as their structural pattern with circulation components.

The third group of analysis aims to find the natural lighting conditions of the analysis area because of its importance for increasing people usage. For the purpose of defining the existing conditions a three dimensional models are used to find the shading places in the analysis area. CAD based computer programs help to produce the models for Izmir conditions. This model shows the sun lighting conditions in different period of time. These four periods for analysis are selected in varied possibilities, with the aim to explain the general structure of the existing circumstances. These periods are, the longest day of the year as 21 June and shortest day of years as 21 December, and also these two days are presented with their morning and afternoon conditions to show the effect of the different directions of the sun and its different obstruction angles. (Figure: 4-13, 4-14, 4-15, 4-16)

According to analyzing of these four models, the analysis area has an average with its fine grain structure. Because, the lower building heights provide an adequate circumstances different from the high rise development. However, in some parts of the area compactness and intensity of the pattern of ground level, and narrow street widths caused the overshadowing areas for winter periods. Unlike, the lower rise development, the high-rise buildings in the north side of the analysis area cause some deficiency for sun lighting conditions, because of the setback distances of the building arrangement.

In related with the sunlight conditions, day lighting is a more important feature for urban spaces. Because, as an inevitable reasons of the increasing building density sun lighting couldn’t be provided for all urban spaces, while good day lighting is possible for all spaces with appropriate arrangement methods. On the other hand, especially in hot and humid climates sunlight is not always desired for urban spaces, in contrast daylight is desired.

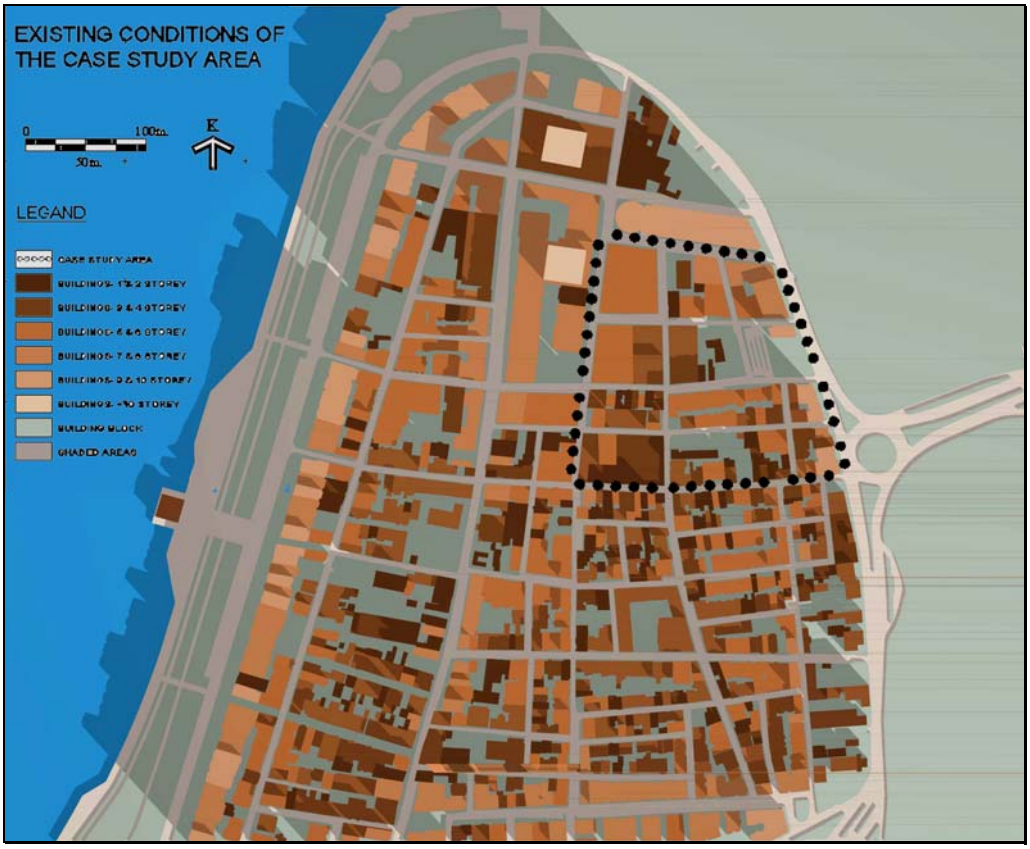


Figure 4-13: Shading Spaces in Urban Areas (21 December-10.00 a.m.) (Prepared by Author)

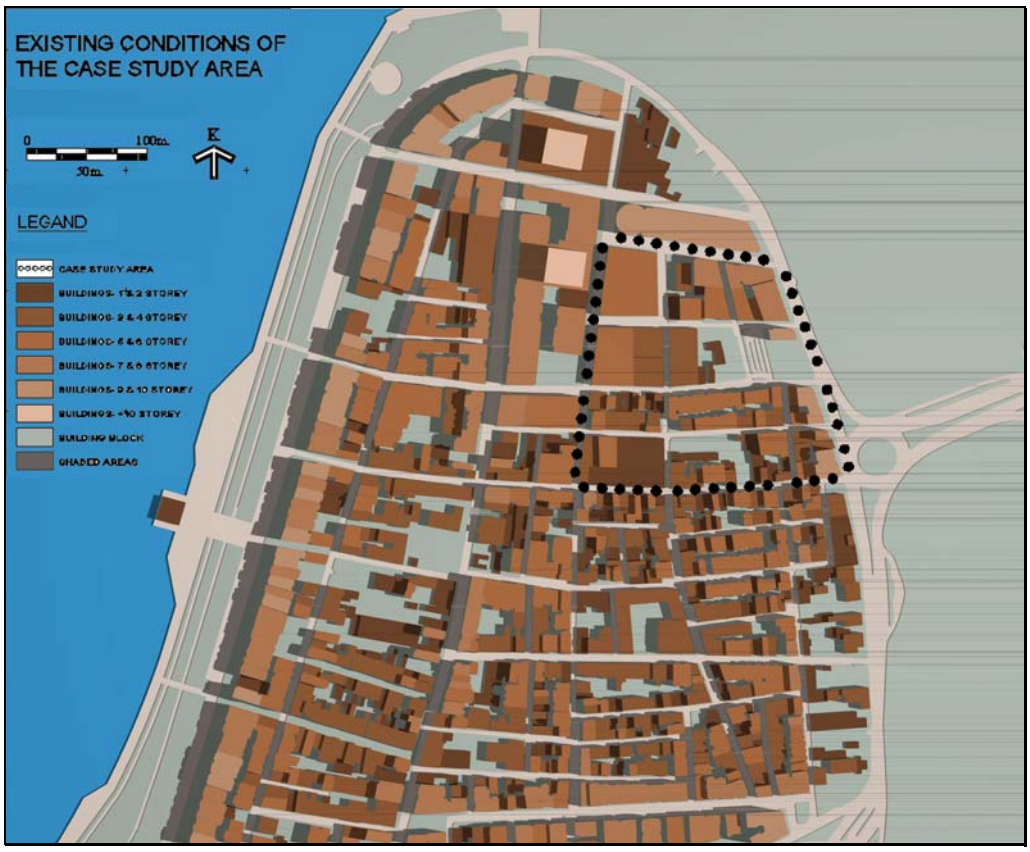


Figure 4-14: Shading Spaces in Urban Areas (21 June-10.00 a.m.) (Prepared by Author)

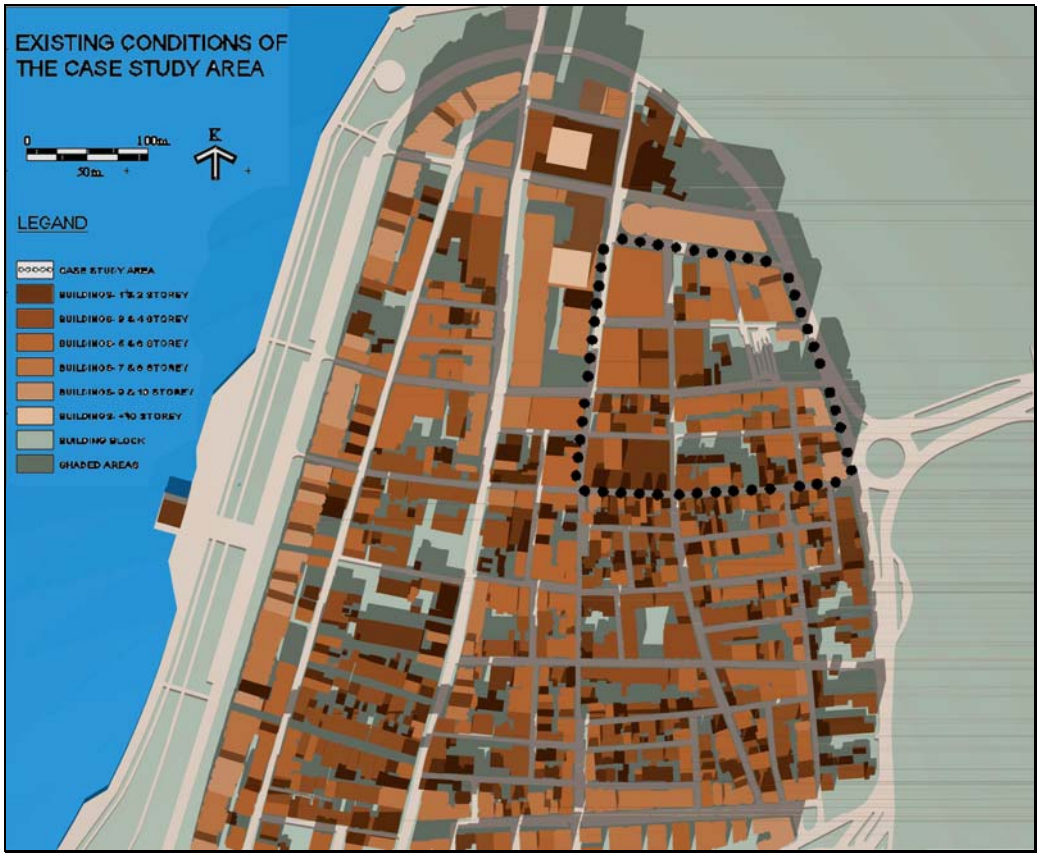


Figure 4-15: Shading Spaces in Urban Areas (21 December-14.00 p.m.) (Prepared by Author)

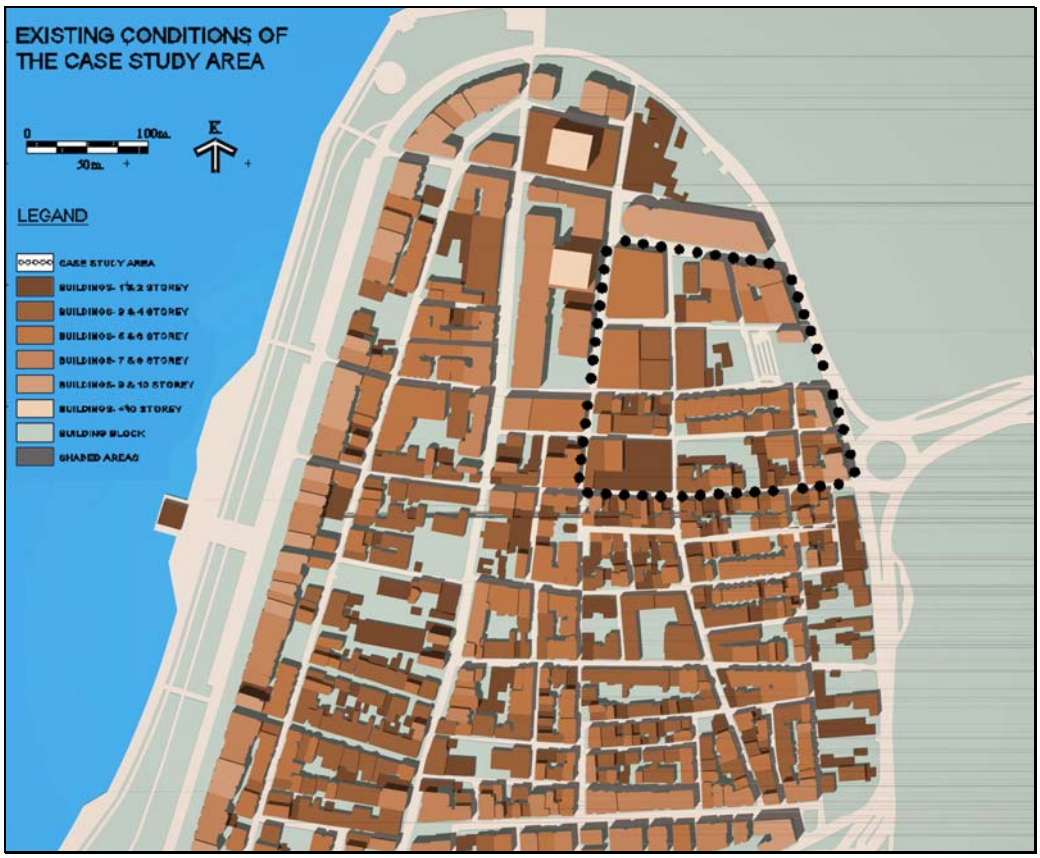


Figure 4-16: Shading Spaces in Urban Areas (21 June-14.00 p.m.) (Prepared by Author)

The fourth group of analysis is related to three dimensional perception of the urban fabric. Building densities and their distribution with building height and building floor space in urban fabric is shown with CAD based computer programs to expose the three dimensional distribution of the grain in the analysis area. The other related feature of the urban fabric is the skyline of the area. (Figure: 4-17) So, the silhouette of the analysis area are formed with solid masses independent with the architectural characters of the city, but the evaluation of these analysis are carry subjectivity for observer. On the other hand, these models expose the unbalanced conditions of the building structure in the analysis area. Into the north side of the area and coastal strip shows a bulky and high-rise character for urban grain while the other parts have intimate scale for users and the other people. (Figure: 4-18, 4-19)

Figure 4-17: The Skyline of the Analysis Area from East Side of the Area (Prepared By Author)

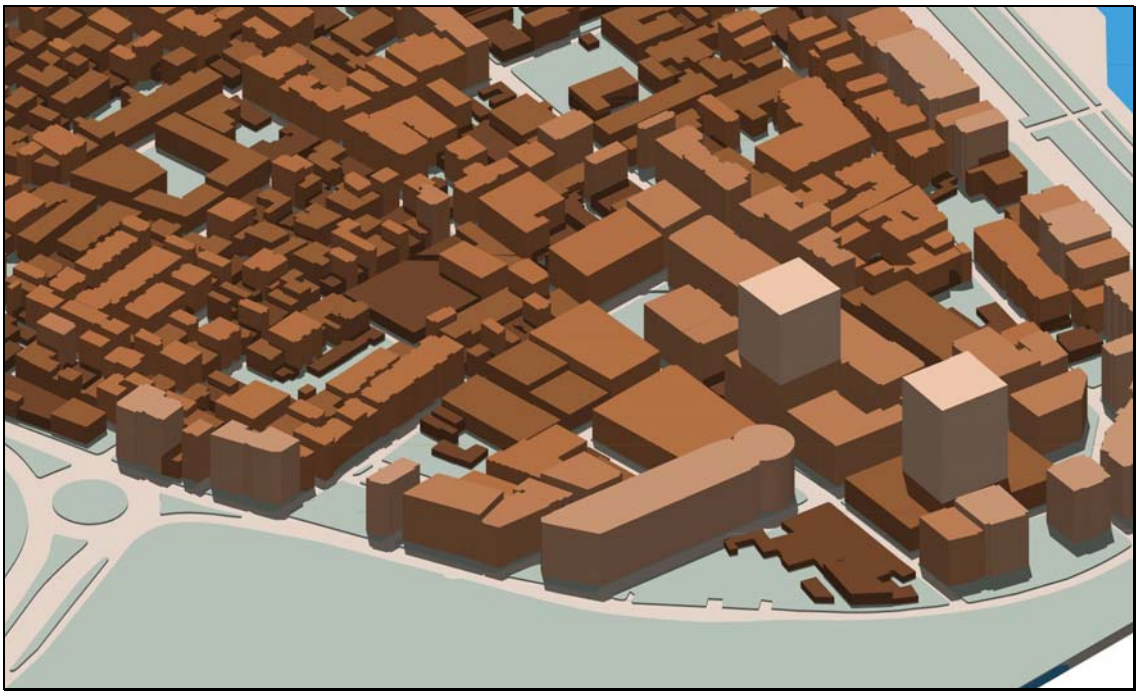


Figure 4-18: The 3D View from East Side of the Area (Prepared By Author)

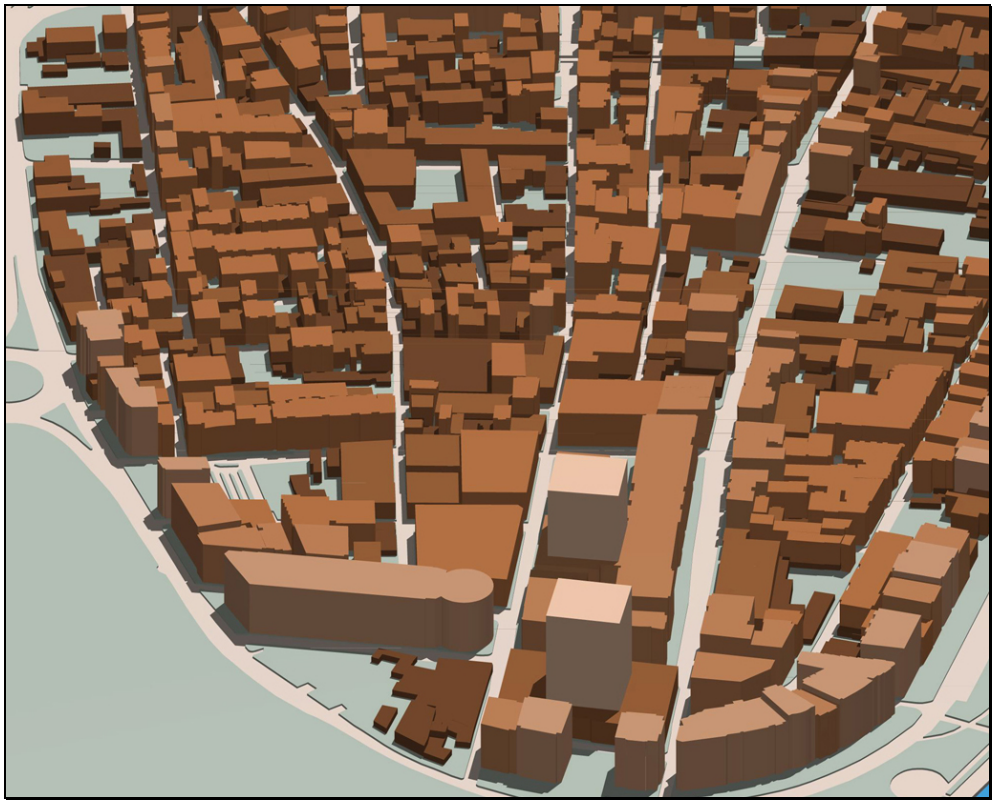


Figure 4-19: The 3D View from North-East Side of the Area (Prepared By Author)

And the last group of analysis is defined in this thesis context as the analysis of the typo-morphological characteristics. These characteristics generally refer to traditional features of the urban fabric by mean architectural types. So, the analysis area includes different type and size of the building structures. The historical fabric of the area have damaged by the new buildings and high-rise development. However, some buildings are listed to preserve their traditional values. These are generally having Levantine architectural features. The street frontage and entrance is the main characteristic of the buildings to provide a useful backyards and privacy. The other property is the two or three number of floors with bay windows in second or third floor. The narrow plot pattern and contiguous order buildings are the fundamental arrangement style in smaller and rectangular block structure.

On the other hand, the general typology of the analysis area is developed in contiguous order block structures. Buildings have five to eight numbers of floor and useless backyard areas. They generally don't have evident architectural values to develop and guidelines from their characteristics.

The distribution of the land uses indicates variety in the analysis area. The residential uses still exist into the area, while the transformation process of the functions changed the uses from residential character to office and commercial uses. Meanwhile, this transformation is constituted a demand with high-rise development on vacant plots in the area. In spite of the demand, the existing problems such as lack of the life quality and crime caused the residential areas turns to slum characteristic for social dimension.

Consequently, analysis of the case area gives different results from expected consequences, which are exposed with general observation. But some deficiencies could be mentioned that for building structure and street pattern. Buildings generally don't have any adequate size and form to their usage, and also, their interior blocks haven't enough space to give natural lighting and wind adequately. Moreover, the increasing building density caused much poor in quality for building structure. Street pattern have a fine-mesh but don't have any adequate public spaces to meet people.

4.5 The Formation of the Conceptual Block Structure Model

The scope of the thesis aims to put the design process of the block structure forward for consideration to produce some alternative design methods. Because, form the beginning of the 20th century the urban planning methods as a modernization tool condemned by different urban theorists. And some alternative design methods are suggested to solve these problems, which are mentioned in previous chapters. The problems are not only related with the methods of design but also related to structural characteristics of the existing conditions of the city. Especially, increasing building density has caused the serious problems on the existing urban fabric by mean the carrying capacity and human needs. In this respect, the requirements of the alternative formation of block structure must be introduced and then new solutions are implemented in the proposals.

According to this scope, the theoretical background of the thesis are used to expose the fundamental principles of the block structure design, and after these definitions, some analysis are introduced for new alternative block structures could be summarized as below.

1) Vitality of the city and its physical structure must be provided with adequate pedestrian accessibility and public space arrangements.

2) Flexibility of the physical structure is the other important character for design process of the block structure with different types of development demands. Especially, the building density increases is required with a flexible and changeable structures for new arrangements provide the adaptability for new conditions.
3) Diversity and grain is the other property for vital urban parts. The mixes of uses and physical typologies create attractions, particularly in central part of the city.
4) Continuity of the buildings to create enclosure of the place is the other property for perceptual and visual features of the design criteria.
5) Environmental quality and adequacy of the natural conditions is the critical consideration for comfortable places and buildings. The natural lighting is the deterministic feature for vital urban spaces and also building units.
6) Legibility and characteristic of the building structure includes the architectural properties of the buildings and its distribution in the area. Especially, adaptation of the traditional or existing characteristics is the significant feature of the formation process.
7) Efficiency and functionality are the combination of the other principles, which are mentioned above, with in a mutual relationship. The existence of the efficiency means the usefulness of the created spaces and masses and its feasibility in development process.

In this respect, the producing of the alternative conceptual model is compared according to these principles with differences from other development types. With the aim to compare these principles, three different arrangement situation are discussed in this section of the thesis, for the project area of the case study. These are explained as below. This type of formation is planned in the respect of urban planning tools as detached order with subdivision of the block structure, in a plot plan. So, the similar block structures, defined above, are used to arrange the detached order plan. So, these types of development is constituted with front setback and side setbacks, according to plot ratio=5. And the existing parks are covered in the plan appropriate for implementation plan conditions. (Figure: 4-21)

This type of arrangement model is produced with regard to the existing development conditions in the analysis area. This is the high-rise development on the same plot pattern and block structure. There is two evident example at the west side of the project area which are formed on the all plot area without any setbacks with plot ratio= 5. And they have more than fifteen storeys in their project area. So, it can be hypnotized that in future period the higher plot ratio. So, it can be hypothesized that in

future period the higher plot ratio could be arranged in same block structure model into the project area.

Second type of arrangement model is formulated according to Siksna's (1995, 1998) classification for optimum sizes of building block typology. Siksna categorized the optimum sizes as ranged between 80-110 m. for fine circulation mesh. Also, he analyzed different range of building block sizes in his study, which are 50-70 m., 80-110 m., 100-200 m., 100-300 m., 150-300 m., and 150-550 m. but also, he mentioned that these large and rectangular blocks had been divided by alleys and pedestrian ways from the initial plans to present circumstances. (Figure: 4-20)

On the other hand, the first comparative assessment for the block structure arrangement is building density distribution analysis which is adapted from the investigation of Martin and March (1972). The physical arrangement rules of the 'Development Regulation of Izmir' is investigated by the mean of minimum plot and block dimensions could be produced in proportion to maximum base area of buildings (30 m. building width x 22 m. building depth). So, this comparison exposes a range of building block sizes for block and contiguous order and detached order block structures. This range is changed for their number of floors and number of plots dividing the block structure. These calculations are described as below. (Table: 4-1, 4-2). So, minimum sizes of block structure could be constituted as (59 m. block depth x 110 m. block width) for block and contiguous order according to 5 storey buildings and 6 plots, and (69 m. block depth x 114 m. block width) detached order according to 5 storey buildings and 6 plots. However, the dimensions are changed with the number of floors together with the plot ratio. If the general plot ratio is accepted as 5 for analysis area, the similar proportions are attained, for block and contiguous order as (74 m. block depth x 100 m. block width) for 10 number of storeys and 6 plots; and for detached order as (114 m. block depth. x 144 m. block width) for 20 number storeys and 6 plots. (Table: 4-3)

Consequently, in the light of previous knowledge four different block structures are formed appropriate for existing street network in approximate sizes. And as second type of arrangement model for block structure of courtyard form, which is constituted by the theoretical background with its advantages and disadvantages of this conceptual model.

The alternative block structure model is designed appropriate for existing street network and building structure. All streets are preserved and listed buildings are attached the new buildings, in an adequate relationship. So, formation process creates a courtyard system in contrast the existing fabric. Block structures formed with 3 m. setback distances from road to provide a pedestrian circulation near the vehicular streets, and also, the interior alleys are constituted with arcades. Therefore, interior side of the block structure must be arranged as semi-public places for pedestrians in conjunctions with the arrangement of the design guidelines, and also there is the place for construction of the underground parking to serve the need of users.

The third type of arrangement is the contiguous order development with the conceptual block structure type as mentioned above. Therefore, the block structure includes a row of buildings with backyard spaces. The subdivision of the plots is formed according to long side of the block structure to increase the street frontage of the buildings. If these voids could not be arranged for public activities, these areas are formed as the private areas. However, it is possible to add back alley to increase the public characteristic for using the ground floor areas appropriately by commercial facilities. (Figure: 4-21)

These three alternative models give different patterns for urban fabric with their organization and building heights. All of three models is prepared to provide equal building density as existing implementation plan conditions. In order to ensure the good distribution of the ownership these models investigated and arranged in two district which are north side block structures of the project area and south side block structures of the project area. And they are classified in the tables with their properties.

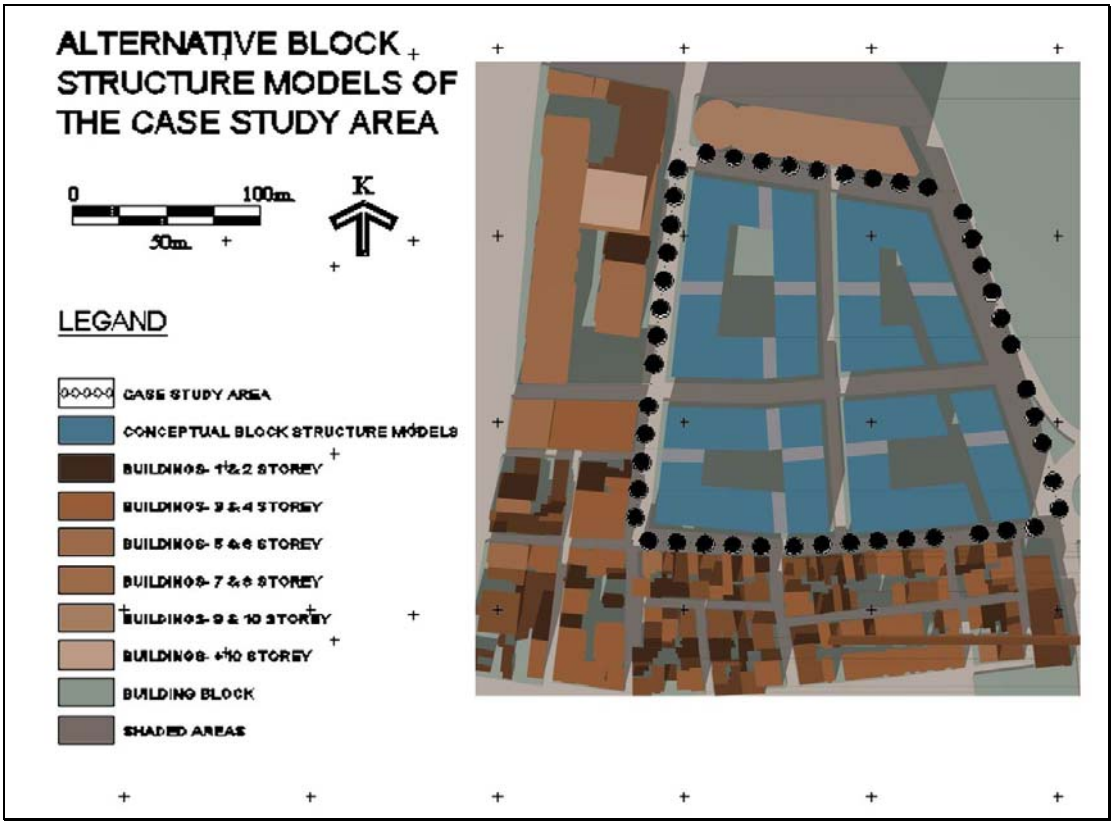


Figure 4-20: The Conceptual Model for Block Structure Arrangement with Courtyard Development (Prepared By Author)

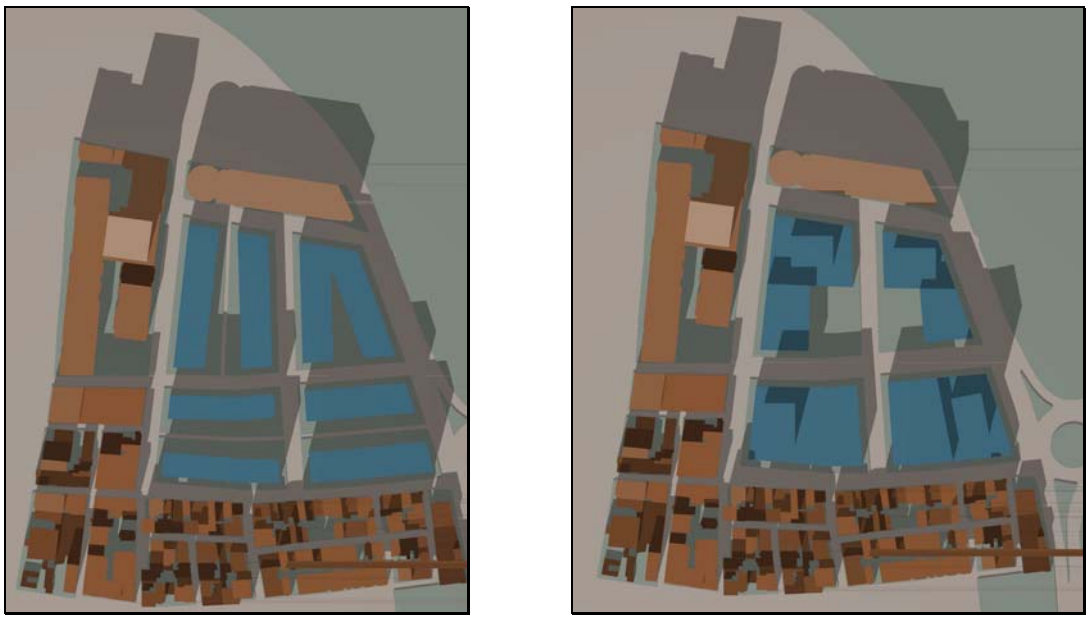


Figure 4-21: The Conceptual Model for Block Structure Arrangement With a) Contiguous Building Order and b) The Current Trend In Analysis Area with Detached Order (Prepared by Author)

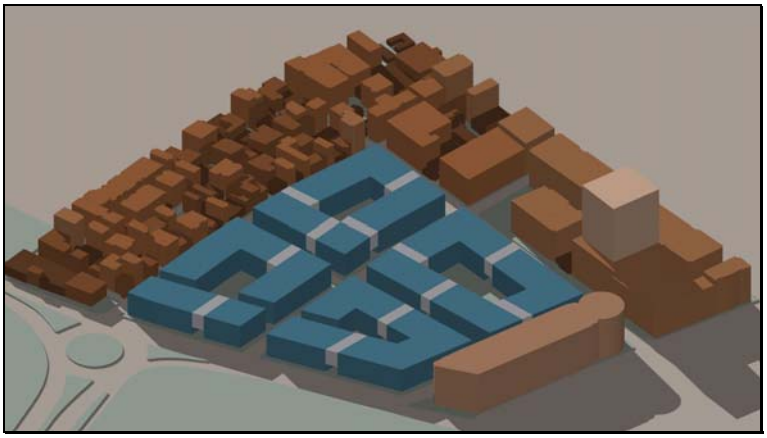


Figure 4-22: The 3d Model for Courtyard Building Structure (Prepared By Author)

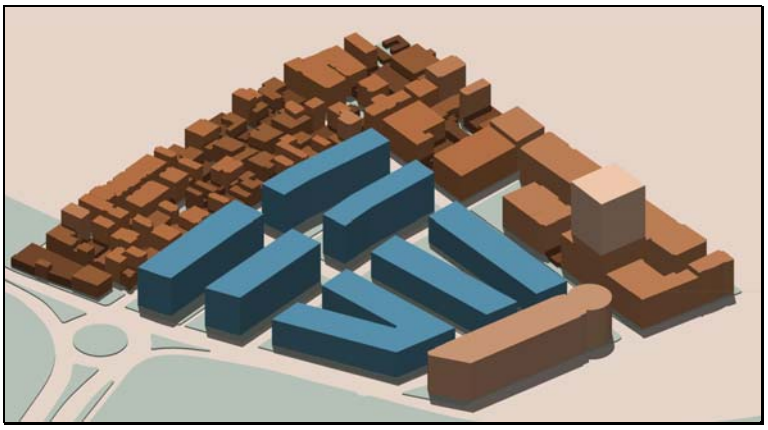


Figure 4-23: The 3d Model for Contiguous Building Structure (Prepared By Author)

Figure 4-24: The 3d Model for Current Trend Building Structure (Prepared By Author)

This comparative assessment, for building density distribution based, of the alternative formation model expose the advantages of the courtyard block structure by mean the building height and useful interior block structure. The advantages of the courtyard block structure, also, mentioned as below:

1) This formation provides a flexible design for buildings, both the size and the height of the buildings. So, surrounding buildings can be different heights and configuration.
2) Commercial and public facilities can be distributed along the ground floor, maintaining an active street frontage. Also, this type of formation increases the ground floor usage.
3) This formation provides adequate design conditions for natural lighting and massing control.
4) Buildings are arranged around a landscaped open space.
5) Interior side of the block structure can contain private activities but also public activities.
6) The arrangement of the interior block could be provided a vital spaces with interior usage – for example cafes – and circulation elements – for example arcades, passages, elevators, and escalators.

Table 4-1: Measurements of the Block Structure Formation in Development Regulation-for detached order. (Prepared By Author)

DETACHED ORDER (for corner plots)

Number of Floors	4	5	6	7	8	9	10	15	20
Building Height (m.)	12,8	15,8	18,8	21,8	24,8	27,8	30,8	45,8	60,8
Building Frontage (m.)	30	30	30	30	30	30	30	30	30
Building Depth (m.)	22	22	22	22	22	22	22	22	22
Front Setback Distance (m.)	5	5	5	5	5	5	5	5	5
Side Setback Distance (m.)	3	3,5	4	4,5	5	5,5	6	8,5	11
Plot Width (m.)	38	38,5	39	39,5	40	40,5	41	43,5	46
Plot Depth (m.)	33,4	34,9	36,4	37,9	39,4	40,9	42,4	49,9	57,4
Plot Area (m²)	1269,2	1343,65	1419,6	1497,05	1576	1656,45	1738,4	2170,65	2640,4
Building Area (m²)	2640	3300	3960	4620	5280	5940	6600	9900	13200
Plot Ratio	2,1	2,5	2,8	3,1	3,4	3,6	3,8	4,6	5,0

DETACHED ORDER (for intermediate plots)

Number of Floors	4	5	6	7	8	9	10	15	20
Building Height (m.)	12,8	15,8	18,8	21,8	24,8	27,8	30,8	45,8	60,8
Building Frontage (m.)	30	30	30	30	30	30	30	30	30
Building Depth (m.)	22	22	22	22	22	22	22	22	22
Front Setback Distance (m.)	5	5	5	5	5	5	5	5	5
Side Setback Distance (m.)	3	3,5	4	4,5	5	5,5	6	8,5	11
Plot Width (m.)	36	37	38	39	40	41	42	47	52
Plot Depth (m.)	33,4	34,9	36,4	37,9	39,4	40,9	42,4	49,9	57,4
Plot Area (m²)	1202,4	1291,3	1383,2	1478,1	1576	1676,9	1780,8	2345,3	2984,8
Building Area (m²)	2640	3300	3960	4620	5280	5940	6600	9900	13200
Plot Ratio	2,2	2,6	2,9	3,1	3,4	3,5	3,7	4,2	4,4

Table 4-2: Measurements of the Block Structure Formation in Development Regulation-for block and contiguous order. (Prepared By Author)

BLOCK and CONTIGUOUS ORDER (for corner plots)

Number of Floors	4	5	6	7	8	9	10	15	20
Building Height (m.)	12,8	15,8	18,8	21,8	24,8	27,8	30,8	45,8	60,8
Building Frontage (m.)	30	30	30	30	30	30	30	30	30
Building Depth (m.)	22	22	22	22	22	22	22	22	22
Front Setback Distance (m.)	0	0	0	0	0	0	0	0	0
Side Setback Distance (m.)	0	0	0	0	0	0	0	0	0
Plot Width (m.)	35	35	35	35	35	35	35	35	35
Plot Depth (m.)	28,4	29,9	31,4	32,9	34,4	35,9	37,4	44,9	52,4
Plot Area (m²)	994	1046,5	1099	1151,5	1204	1256,5	1309	1571,5	1834
Building Area (m²)	2640	3300	3960	4620	5280	5940	6600	9900	13200
Plot Ratio	2,7	3,2	3,6	4,0	4,4	4,7	5,0	6,3	7,2

BLOCK and CONTIGUOUS ORDER (for intermediate plots)

Number of Floors	4	5	6	7	8	9	10	15	20
Building Height (m.)	12,8	15,8	18,8	21,8	24,8	27,8	30,8	45,8	60,8
Building Frontage (m.)	30	30	30	30	30	30	30	30	30
Building Depth (m.)	22	22	22	22	22	22	22	22	22
Front Setback Distance (m.)	0	0	0	0	0	0	0	0	0
Side Setback Distance (m.)	0	0	0	0	0	0	0	0	0
Plot Width (m.)	30	30	30	30	30	30	30	30	30
Plot Depth (m.)	28,4	29,9	31,4	32,9	34,4	35,9	37,4	44,9	52,4
Plot Area (m²)	852	897	942	987	1032	1077	1122	1347	1572
Building Area (m²)	2640	3300	3960	4620	5280	5940	6600	9900	13200
Plot Ratio	3,1	3,7	4,2	4,7	5,1	5,5	5,9	7,3	8,4

Table 4-3: The Block Structure Conditions of the 'Development Regulation' (Prepared By Author)

DETACHED ORDER (30 m. X 22 m. 4 corner and 2 intermediate plots)

Number of Floors	Block Width (m.)	x	Block Depth (m.)
5	114	x	69,8
10	124	x	84,8
15	134	x	99,8
20	144	x	114,8

DETACHED ORDER (30 m. X 22 m. 4 corner and 4 intermediate plots)

Number of Floors	Block Width (m.)	x	Block Depth (m.)
5	151	x	69,8
10	166	x	84,8
15	181	x	99,8
20	196	x	114,8

BLOCK and CONTIGUOUS ORDER (30 m. X 22 m. 4 corner and 2 intermediate plots)

Number of Floors	Block Width (m.)	x	Block Depth (m.)
5	100	x	59,8
10	100	x	74,8
15	100	x	89,8
20	100	x	104,8

BLOCK and CONTIGUOUS ORDER (30 m. X 22 m. 4 corner and 4 intermediate plots)

Number of Floors	Block Width (m.)	x	Block Depth (m.)
5	130	x	59,8
10	130	x	74,8
15	130	x	89,8
20	130	x	104,8

CHAPTER 5
CONCLUSION

The formation of the urban fabric includes certain conscious and unconscious interventions of the technical man and the society to build the territory both as a boundary that covers the whole and a combination of different parts that create the features of the spaces. These parts of the urban fabric are formed by the physical components, which are block structure and streets. Block structure is the fundamental part of the physical structure because of its function to form of the volumetric structure of the city, with buildings and other masses. Also, streets are important, because streets circumscribe to separate the block structure from each other. However, streets connect the block structure to form the urban parts. For the purpose of the determination of the volumetric structure of the city, the block structure is discussed as a basic component in the thesis context.

As urban history shows us building blocks can be accepted as the most important territorial definition for cities. Also, building block is the main tool for technical man, the political groups and other decision makers which are to control the spatial organization. However, the formation of the urban fabric couldn't be an allotment model to distribute the two dimensional ownership in urban land. It is mostly related to form of three dimensional structures with buildings and other masses. In current planning techniques have a lot of deficiencies about the formation of the physical structure which are increased more and more in the implementation process and this method are not adequate to design third dimension.

The important point for the creating a new urban fabric with the combination of the block structures and streets, is appropriateness of the existing conditions. Because, existing urban fabric gives some cues for technical man, which attempt to create a new development. So, rejecting any existing pattern through the transformation process produce some lacks of harmonies.

The role of the technical man and public institutions are the control and developed the existing conditions. Urban fabric is the result of arrangement of the private ownership and public spaces. And block structure is the combination of the private plots and the determinant factor for the public spaces. Therefore, the vertical

private ownership is the useful arrangement method for creating new spatial organization with the organization of the design criteria. In contrast, the horizontal distribution is caused the spatial and formal fragmentation for the urban spaces.

The following concept of the block structure formation is the building arrangement. The existing modern urban planning techniques and design methods has created isolated and separated inner block building, in the private plots. But the transformation of the design idea is suggested the perimeter block structure with inner block arrangements for semi-public and semi-private users. Perimeter block arrangement is suggested against the separated block structure, which is criticized that the loss of unity and human needs. But the organization of the block structure must be related not only form of block structure but also formation of the building density and architectural diversity.

In recent planning and urban design discussions are concentrated to important characters of the perimeter and contiguous order block structures, as a reaction to the modernist urban planning principles. In this respect, development of the Turkish cities is observed on the contrary situations. Because, in the Anatolian cities, urban fabric was formed according to similar understanding of perimeter block structure till the early twentieth century. This structure was formed from the array of the buildings and their walls which were build a ‘perimeter wall’ to the street and provide an enclosure for street and interior of block structure such as gardens and courtyards. This unconscious formation was the result of the property ownership allotment on the land. It is the low leveled, privacy oriented, irregular and organic formation in traditional characteristics. But, after the Second World War, the urban transformation has evolved in the new geometrical pattern of the modernist urban planning techniques, in contrast the existing natural forms. So, cities have been formed with the open plan block structure that rejected the solid-void relations and create a complete loss of urban unity on those traditional urban settlements.

The loss of the physical characteristics of the Turkish cities and the ill-effects of the planning applications has created a lack of identity. But formation process of the urban fabric couldn’t be developed positively in current property conditions and existing control systems. So, there are great necessity for analyzing the positive impacts of the new block structure and evolution of the new transformation that will help to create identity and space quality for new type of urban fabric and its social structure.

In this respect, this thesis attempt to form the optimum block structure with form and size in order to create livable urban spaces. So, the concept of 'Place Value' is the considerable features of the arrangement in third dimension. The formation of the block structure is determined the degree of these values. So, the critical point of this arrangement is adequacy of the describing optimum conditions. Because this description should not cause the standardization of urban spaces likewise the modernist urban planning techniques, which are criticized by urban design theorists and sociologists.

The theoretical background, which is constituted by literature survey, includes general philosophies of the designing of urban fabric. The important design criteria is fine grain, which is defined all types of components of the city that fine grain means the appropriate and well-balanced structure of the components.

On the other hand, vitality is the other important design criteria of the city. This is to show the goodness of the urban parts both economically and physically. The pedestrian density and using the public places are the degree of vitality in the central part of the city. So, basic character of the physical structure should be giving the pedestrian activity on opportunity with their arrangement types.

As the main concern of the thesis, the form and size of the block structure must be allow the creation of the livable spaces with arranged the fine-mesh pedestrian circulation and adequate public places. The important design criteria for pedestrian are permeability of the block structure, which refers to number of ways through an environment. So, the visual and physical permeability increase the quality and accessibility of the public places.

The density is the other design criteria which affect the all physical structure of the city. All kinds of arrangement for the urban fabric are determined by the density control and as a related components building height and massing. Therefore, harmonious distribution of the density and building height could provide a fine grain arrangement for cities. For central part of the city and mixed use areas the characteristic feature is high density construction and existence of the symbolic high rise buildings for business facilities. This type of expectations creates both some obstacles and some opportunities for arrangement procedure. Especially, in the existing built-up areas density distribution get different in order to create a successful design for block structure.

In this context, designing of the block structure and its components are determined by the main criteria as fine grain, permeability, accessibility and density control. The other criteria, which are mentioned in the Chapter 3, are to control element of the spatial, functional, environmental, perceptual and visual dimensions of the urban design in the respect of formation of the block structure. Therefore, the conceptual model for block structure mainly aims to determine these three concepts in volumetric relations. And then, the urban design guidelines give a general framework to arrange the other criteria to provide a good form for block structure.

The conceptual model attempt to expose the alternative for existing block structure and results of current planning techniques; and urban design guidelines is constituted the building arrangement rules for alternatives. So, these two steps for generating the block structure are defined as a process, which is started with the analyzing the existing conditions and problems of the area and is finished the alternative conceptual model.

There are some problems to form the conceptual block structure with its optimum size and form. Some of them related with complexity of the theoretical background and determination of design criteria, while some of them are constituted in implementation process. Also, these problems affect the formation of the conceptual model. These problems are mentioned as below:

1) Urban design literature has a great variety for concepts and design methods of the urban fabric. So, these discrepancies cause to select appropriate definitions and methods for current problems of design process, particularly for the project area. But this selection doesn't have any certain rule; so, this could be selected with relative comprehension.
2) Formation process of the block structure related with both architectural scale and urban design scale. So, urban designers should not be obstructed the architectural process with determination of buildings. But, this limitation have no certain rule, it's related to the urban design process and role of the urban designers in this process.
3) Urban design literature includes some methods to analyze and design to physical components. These methods are produced after some investigations such as field survey, case studies and laboratories, because of that, the application of these methods are not always appropriate for every case. Because of that, adaptation of the methods must be necessity for local characteristic and existing structures.

4) Formation of the optimum size and form of block structure could be caused standardization in urban fabric, if the design guidelines aren't defined in appropriate conditions.

On the other hand, there are different problems for development of the design action, which are occurred in implementation process. So, these problems could be mentioned that the general problems of urban design approach, which are low awareness of the public and private actors, uncoordinated decision making mechanism, inappropriate economic conditions, fragmented ownership pattern, inflexible and tough existing structure and lack of the appropriate development and urban design policies. These problems have stable circumstances against the new development policies. Consequently, new formation alternatives for urban fabric couldn't be accomplished in all conditions. But, the problems of the existing conditions must be introduced and new alternative models must be developed in appropriate for existing structure.

Nevertheless, this conceptual model and its discussions for formation process is attempted to expose the main idea for development of the urban physical structure and its transformation. Therefore, this thesis focuses on the design criteria which are the main concerns of the urban designers. So, the contribution of the teamwork is never undervaluing for the production of the block structure and urban fabric. Especially, the engineering facilities and architectural impact are more deterministic for this process. Moreover, there is a necessity for detailed analysis and formation of the new urban design policies in existing decision making mechanism. Consequently, in spite of the deficiencies of the formation process, this thesis aims to find an alternative solution for the existing problems with the aim to create a place value and vitality for city life with public spaces. In spite of the implementation difficulties this model is constituted the more appropriate conditions then the current implementation plan in respect of design criteria.

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