URBAN MORPHOLOGIC ANALYSES OF SULEYMANİYE
THROUGH SPACE SYNTAX

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June, 2006
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ABBREVIATION

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SÜLEYMANİYE’ NİN SPACE SYNTAX METODOLOJİSİ İLE MORFOLOJİK ANALİZİ

ÖZET

Bu çalışma Süleymaniye Mahallesinin morfolojik durumunu Space Syntax metodolojisi doğrultusunda araştırmayı amaçlamaktadır.

Bu süreçte açıklayıcı şehirsel modellerden biri olan "Mekan sentаксı" yöntemi ile, şehirlerin yapışal organizasyonlarına farklı bir boyut getirilmiştir.

Çalışma 7 bölümden oluşmaktadır. İlk bölüm olan Giriş bölümü çalışmayı tanıttır, çalışmaların hedefini, amaçlarını, metodolojisini ve çalışma alanının seçilme kriterlerini anlatır.

İkinci bölüm, mekan, şehirsel mekan kavramlarını, yapılaşmış çevre, kültür ve sosyal yapı arasındaki ilişkileri incelemektedir.

Üçüncü bölüm, şehir, kent morfolojisi ve Osmanlı Kültürüyle şekillenen şehirlerdeki biçimlenme süreçlerini anlatır.

Dördüncü bölüm, İstanbul’un Osmanlı şehirleşme sürecindeki önemine, Süleymaniye’nin yapışal özelliklerine ve Süleymaniye’ nin çalışma alanı olarak seçilme nedenlerine odaklanmıştır.

Beşinci bölüm, Space Syntax metodolojisisini anlatırken, sağladığı avantajları, bu çalışma için neden bu metodolojinin seçildiğini anlatır.

Altıncı bölüm, çalışma alanında yapılan incelemelerin "International Housing Database" terminolojisi ve daha önceki Clerkenwell örnek çalışması etüdleri kullanarak sunulmasıdır.

Yedinci bölüm olan sonuç bölümünde yapılan araştırmaların verileri Süleymaniye morfolojisi, yapı tarzı ve fiziksel çevresi bağlamında sunulur.
URBAN MORPHOLOGIC ANALYSES OF SULEYMANIYE THROUGH SPACE SYNTAX

SUMMARY

This paper is prepared in the aim of research in the morphological structure of Süleymaniye through the methodology of Space Syntax.

In the process, a different dimension in identifying spatial organization of cities is provided with the method called “Space Syntax”, explanatory urban model for space.

This study consists of seven chapters. Chapter one, the introduction, presents the purpose of the study, the goals and the objectives of the thesis in the context of the Suleymaniye quarter’s urban morphology by using the methodology of the Space Syntax.

Chapter two provides to understand the space, urban space and the interaction of the culture, built form and the social structures concepts.

Chapter three discusses the city, the urban morphological characters of the cities situated through ottoman culture.

Chapter four explains Istanbul’s importance in the urbanization process of the Ottoman Empire, the built form of Süleymaniye, why Suleymaniye is selected as the study area, and the urban developing process of the pilot area.

Chapter five deals with the methodology of Space Syntax, it has been devoted to present the Space Syntax methodology. It also explains its advantages as a methodology.

Chapter six is written to present area study and all the analysis about the quarter according to the International Housing Database Guideline.

Chapter seven, conclusion, portrays the related urban morphology, built environment, and social structure conditions of Suleymaniye and the applicability’s of these conditions to entire district.
1. INTRODUCTION

Urban design is a complex and rich discipline concerned with the shaping of built forms in relation to various cultural, social, environmental and economic contexts. Though, urban design may consider visual dynamics and aesthetic of streets and buildings, it should also be concerned with the totality of urban form; the interplay of public and private realms, the interface between natural, built, and cultural environments; and political and socio-economic forces driving the production and consumption of urban spaces. Urban form is what we experience and see where we walk, drive or bike, where we study, shop, recreate, and where we live, work and interact with other people in the city. This urban form perspective includes buildings, houses, offices, schools, commercial and recreational facilities, suburbs, streets, parks, open spaces, highways, paths, routes, etc. Within this understanding, urban form is the result of the work of whole people of the city.

Urban design is concerned with the social and physical aspects of the urban environment, and argued to be a powerful agency for developing social well-being. The contemporary city, however, offers a challenging context for urban design.

The social and physical dimensions of urban form have a dynamic relationship. Physical fabric is produced and conditioned by different social procedures. At the same time, the urban form of urban space, once built can exert influence upon the way these procedures occur.

The importance of studying the forces that shape the physical form of cities and how we see and think about urban phenomena have been recognized as critical. From neighbourhood to city, region to nation, and to world systems, urban processes affect the physical and spatial form of urban environment.

The deteriorating quality of life in urban setting is one of the most pressing concerns facing several disciplines, especially architecture, urban design and urban planning. A range of urban problems are blamed for decline of the quality of life in our cities, and parts of the cities.

World culture is rapidly becoming aware of and dedicated to the issue that surrounded its overall health and well-being, mental, physical, and spiritual. This
awareness is grounded in a renewed respect for and understanding of our connection to nature and of the connection that exists between mind, body, and spirit. We are seeking sources of healing and renewal to mend the fragmentation of contemporary culture and to create meaning in our lives.

A city is not just a place where people live. The city is also a place where people pursue their own personal evolutions. Every architect and planner has a good idea for his own city and that of others. The city will give them the opportunity to show these ideas, by mobilizing to create feasible projects, capable of capturing the imagination of citizens and raising the awareness of their administrators.

In cities that succeed in making this kind of transformation, there is a possibility of a beginning, a rising. That is what makes a city react. Urban planning is a process that, even at its best, is no longer able produce immediate change. City usually is a spark that initiates a sequence of actions: a real urban innovation, urban rehabilitation.

1.1 Thesis

It appears that many urban residential and commercial areas can be enhanced and better utilized with designed circulation patterns that have the potential of improving levels of social interaction.

The position of this thesis is that learning about buildings takes place through movement within it. Approaching the issue of environmental learning from the perspective of movement within it, this study proposes a rethinking of environmental units. It elaborates on the concept of relational properties of the environment. This is considered an important aspect that has consequences on understanding the environment. The pilot quarter is a very important part of the architectural and urban heritage of Istanbul. Today, Süleymaniye has two main distinguishing forms of urban structure: traditional and non-traditional. Non-traditional urban structure does not have the architectural qualities as contemporary design guidelines do and this structure constitutes a big threat to the centre, the traditional values of the urban pattern. The rapid paces of urbanization and immigration has created many problems as quarter expands spatially to accommodate the growing number of people who live there. We should record the urban collections of the quarter as soon as possible. This study tries to examine and understand well elaborately the urban characters to find a starting point for the future studies.
This research utilizes a set of theoretical approaches called Space Syntax that has the configuration of the built environment that can be seen within the structure both, in the nature of interactions between the people who inhabit a given spatial system, and the interactions between these people and those who could considered outside of the same system. The thesis focuses on urban morphological features and architectural characters as housing stock of the quarter by using the Space Syntax methodology by following the other pilot studies of Viva City 2020 project. I would like to study under the responsibility of being a part of a very important international database; also, the uniqueness of my study area gave me other responsibility and a wide emotion. This thesis tries to record the data and ask a question of how to create a healthy and conserved built environment that meets inhabitant’s cultural values and physical environment.

1.2 Goals

Today the metropolitans and very important historic cities have been losing their physical and cultural features because of a very rapid urban transformation. The historical texture has been occurring because of a very rapid urbanization and high-density immigration. Istanbul is the one of the most important of these metropolitans, where lots of civilisation and different cultures have been living and developing. Each day the important historic urban texture has been transforming. There are many very important historic quarters, which reflect their cultural intuition by physical form. All of them are very important as architectural and cultural heritage of Istanbul. We have to record these quarter urban features. Süleymaniye is a very imported quarter formed and reflects Ottoman cultures. Is Süleymaniye in this process of transformation? I concern of analysing and recording the architectural and urban values managed to be preserved until today. Another important starting point is the Külliye of Süleymaniye, which is the one of the masterpiece of the Grand Architect Sinan and its effects to the urban structure of Istanbul. Süleymaniye, which gave the name to the quarter and had been constituted its attraction zone, is a socio-cultural and socio-economic civic centre or just a külliye complex. For searching the responds of these questions, I made some urban morphological reaches and used the Space Syntax methodology.

The evaluation of the Space Syntax principles with regard to the possibility of significantly increasing opportunities for urban design actions were following their implementation.
The development of a viable process to evaluate urban spaces that can be easily understood and used by design professionals, including architectural and urban design students in their early design classes based on Space Syntax principles.

The thesis aims to investigate and understand the key syntactic factors in the urban environment, and relate these to the quality of life of a number of social groups in a very special part of the city urban layout. I would like to introduce the historical, geographical, demographical, and regional evolution of the quarter Süleymaniye. Urban grid, street layout, urban use, architectural diversity, local building techniques, materials particular, syntactic relations, and urban culture are discussed. The basic concepts of urban morphology and its relationships to the contemporary urban or metropolitan context are studied through the thesis.

The morphological structure of Süleymaniye is a very important study case. The architectural heritage and urban pattern from Byzantine age until contemporary Istanbul urbanization process, the morphological accumulation has been generating a vital process for urban designer who is interested in traditional town’s morphologies. The thesis tries to provide a rigorous analysis of land use and urban morphologies data such as street layout, built ages, and construction type.

There is also a need for urban morphological research to address the unprecedented expansion of cities and the unsustainable patterns of city form; and a need to direct this research at Süleymaniye, which has been growing day by day.

Architects, planners, designers, and urban morphologists have been examining Istanbul and especially its historic peninsula to have a wide comprehension, to win an affluent vision about cultures, civilizations, built form interaction and about the dialectic between yesterday and today. By this thesis, I would be referring to a very little part of this huge geography.

1.3 Objectives

This thesis tries to be the part of “International housing Database Institution”. The importance and the architectural richness of Istanbul is acknowledged by the design, and the planning authority. The major objective is managing to constitute a database for IHD by recording the built and living environment of a unique urban distinct. This study tries to provide a historical and morphological record and an ongoing resource as well as, tools for a better understanding of the evolution and issue regarding the syntactic and physical attributes of Süleymaniye design proposals in the whole city.

The objectives of this thesis research are:
• To gather and to represent the qualitative and quantitative data, which are piloted across the residential districts of Suleymaniye.

• To document and analyze the form and the evolution of the Suleymaniye urban layout, understanding its transformations and identifying its various components.

• To analyze the morphology of Süleymaniye through the Space Syntax methodology that gives quantitative data of built space.

• To identify the urban pattern and design principles which shaped the traditional form of the quarter.

In modelling urban environments and buildings, it is essential to model the structure of space created by built structures. Space considered the crucial element to be modelled and analyzed for one simple reason: space is what all people use in urban environments and buildings. The focus of this research will be on the spatial structure of urban environments. From a functional point of view, built environments are mostly about the use of space created by built objects. Another important reason for studying space, rather than concentrating on buildings themselves, is that the way space is organized into a particular pattern has strong effects on how the immediate built environment functions. The way space is structured often dictates how communities are functioning within the built environment.

1.4. Methodology of the Thesis: Space Syntax

Space syntax is a set of techniques for the analysis of spatial configurations of all kinds, especially where spatial configuration seems to be a significant aspect of human affairs, as it is in buildings and cities. Originally conceived by Professor Bill Hillier and his colleagues at The Bartlett, UCL in the 1980s as a tool to help architects simulate the likely effects of their designs, it has since grown to become a tool used around the world in a variety of research and areas and design applications. It has been extensively applied in the fields of architecture, urban design, planning, transportation and interior design. Over the past decade, space syntax techniques have also been used for research in fields as diverse as archaeology, information technology, urban and human geography, and anthropology [1].

The recent emergence of the Space Syntax theory offers the architectural and planning professions for a valid scientific and rigorous tool for evaluating existing
and proposed architectural and urban planning projects. The results from the few theoretical and real-world applications of research using the Space Syntax model are encouraging since they have demonstrated the potential for enhancing the quality of the environment for a range of situations.

1.5. Case Area: Quarter of Süleymaniye

Süleymaniye is situated on the third hill of Historic Peninsula and is surrounded by Haliç, Zeyrek, Bayezit, Şehzadebaşı, Vefa, Tahtakale, Rüstempaşa, Sururi, Mercanağa, Unkapanı and Ragıp Gümüşpala Streets at north, Atatürk Boulevard restricts Süleymaniye at west, Şehzadebaşı and Vezneciler Streets at south, Fuat Paşa and Uzunçarşı Streets at east.

![Figure 1.1: Süleymaniye in historic peninsula](image)

Süleymaniye is an important node of the historical townscape of Istanbul. Monumental buildings constitute a defining role in the historic area. However, a significant amount of decay is observed in the listed timber structures. Suleymaniye is one of the most important distribution nodes of goods and services in Istanbul. Manufaturacılar Bazaar on Atatürk Boulevard has a great impact on the development of the commercial and manufactural facilities, and on the type of residents since the replacement of previous housing units by warehouses or manufacture units. The university has much effect on shaping the functional reuse of the structures.

1.5.1 Why Süleymaniye Selected as the Case Area?

Today, over half of the world's population lives in cities and urban agglomerations. In comparison with life in the country, life in cities definitely seems more promising
because it offers its inhabitants economic, service, and cultural opportunities that do not exist in the country. The promise of a better life and better job opportunities is an incentive to the rural exodus to the extent of which has varied throughout the centuries. Especially influential strong in the twentieth century, this migration was driven by better jobs and earnings, which were readily available in the city as compared to rural areas. In modern times, large cities and urban areas continue to attract rural dwellers even if there are no longer the same job opportunities that there once were, at least in traditional sectors of the economy.

As recently, as ten years ago, many urban planners, sociologists and even writers felt that the problems of cities could and should be solved in the countryside. Nowadays, we have understood that the process of urbanization is irreversible. But, we have also understood that in numerous countries, both national and local authorities as well as urban planners either cannot or will not keep urban growth under control.

This is the reason that many cities present a stark contrast. They produce most of a nation's wealth while at the same time having to bear most of the poverty.

Today, building policies have been oriented towards solving housing problems, in the belief that "housing for all" would resolve the problems of large-scale urban sprawls by creating healthier, liveable cities. However, the experience of recent decades has shown that this was a short sighted and over-simplified view of the problem.

Wide-ranging housing projects, enormous complexes and even new cities have rarely given rise to true urbanity and to social life in all its varied forms, with all the different possibilities that a city dweller comes to expect of his or her city.

Süleymaniye is an example where all of this process can be examined like an urban laboratory.

The reasons for selecting Süleymaniye as the study area of the thesis are:

- Süleymaniye had been a very important residential district since the Byzantine period; the importance of the quarter increased during the Ottomanization of Istanbul. Süleymaniye's urban pattern derived from Byzantine and Turkish traditions can still reflect the characteristics of an urban texture. For these reasons, Süleymaniye, with 350 wood buildings and 110 stone buildings surrounding it and in need of protection, is like a laboratory of Istanbul's urbanization history.
Süleymaniye is a typical historical urban quarter of old Istanbul with its masonry and timber civil architecture and its cultural inheritance. It has always been a residential area. However, the increasing density of the manufacture sector, the warehouses, and the car repairing activities has been damaging the residential character of the traditional physical and social layouts. However, it still manages to preserve its urban fabric of original architectural character.

In Süleymaniye some very important examples of Ottoman urban layouts and some very important examples of civic housing architecture are still presents.

Süleymanine has been going through a process of social-corruption due to the high rate of migration. Because of this destructive process, Süleymaniye incurs to lose the traditional urban patterns and the heritage of the civic architecture.
2. SPACE

This is how spaces begin, with words only, Signs traced on the blank page.

To describe space: to name it, to trace it, like those portolano-makers who saturated the coastlines with the names of harbours, the names of capes, the names of inlets, until in the end the land was only separated from the sea by a continuous ribbon of text. Is the aleph that places in Borges from which the entire world is visible simultaneously, anything other than an alphabet?

Georges Perec, *Especes d’espace*.

We frequently hear about “space”, a term that we use easily and in a variety of contexts. We use it as if the meaning of the term is free from any problems and contradictions, as if we all agree what space means. Yet most would be surprised by the multiplicity of its meaning if we monitored our own usage of the term. The Oxford English Dictionary gives no fewer than 19 meanings for the term, including a continuous expanse in which things exist and move, “an” interval between points or objects”. These meanings reflect some aspects of the term’s common understanding as used in daily life. They also illustrate the complexity of the concept and refer to deeply rooted debates about it, which have been running for a long time.

The philosophical debates about space in the last three centuries have been dominated by a dichotomy between absolute versus relational theories. The theory of absolute space was developed by Isaac Newton, who saw space (and time) as real thing, as “place as well of themselves as of all other things”. Space and time were “containers of infinite extension or duration”. The movement or repose of things, therefore, was really taking place and was not a matter of their relation to change of other objects [2].

“Since every architectural volume, every structure of walls, constitutes a boundary, a pause in the continuity of space, it is clear that every building functions in the creation of two kinds of space: its internal space, completely defined by the building itself, and its external or urban space, defined by that building and others around it” [3].
The current and most popular perception of space is limited to the kind of geometric shape that forms it, be it a room, corridor, street, or square. The only way that this perception of space can help in understanding the relationship between a shaped space and what people do is through the obvious constraints it presents. It can easily reveal how many people a particular space can hold, whether there is a need for a larger space to hold the intended number of people or objects, or a smaller space to provide better sense of intimacy.

2.1 Urban Space

We can look at urban space in terms of the people’s different patterns of creating a diversity of places and neighbourhoods, where rich and poor are separated from each other through land. We can see how this spatial segregation has taken different social and spatial forms. It is also possible to look at how cities are structured along the lines of ethnicity, gender and age, where specific areas are, out of choice or desperation, identified with this diversity. Also, we can see urban space from viewpoint of individuals who, in their subjective capacity, understand cities differently. In this way, we could arrive at as many understandings of urban space as there are individuals, or could see how broad cultural patterns emerge out of a seemingly infinite variety.

Architecture is the tool, which must shape the city. Shape is indispensable so that citizens can understand the city. In order to achieve a good level of urban quality in cities, the priority of the voids (public spaces) without leaving aside the importance of filled spaces (buildings) [4].

The physical structures of the city or urban form reflect the social character of its people. It is influenced by the natural resources and formed by the decision-making processes that move continuously over time. These human values and natural resources determined, shaped and furnished the physical form or early cities to the contemporary. Urban form is the product of time and space, of nature and technology, of society and culture, and of political and socio-economic forces [5].

In our search for a concept of space, we have concluded that an understanding of urban space will need to take into account its physical, social and symbolic dimensions simultaneously.
2.2 Consideration of the Idea if Culture in Built Form

2.2.1 Culture and Built Form

Rapoport states that culture has two main characteristics, one as an abstract theory and the other as a global set of ideational concepts. An approach to understanding the notion of culture is to consider a concrete component of culture, including worldviews, values, lifestyle and activity systems [6]. Kent agrees that culture is ambiguous and includes many aspects. She suggests that parts of culture influence architecture and the use of space [7]. Edward T. Hall sees culture as a series of activities that are interrelated in many ways [8], while Low and Chambers argue that culture can be defined as a cognitive structure which is a set of rules that are in the mind, encoded in language, serving as a template of cultural ideas. Different cultures structure the hierarchy of values through specific design in people's minds. However, most scholars agree that social factors and human relations influence culture [9].

Because culture is a broad and vague domain, in order to make an interpretation. Culture in built form, it is necessary to limit the focal point by emphasizing one attribute over another. Although there are several ways to explore culture, it becomes understandable when the study focuses on the interpretation of the relationship between built form and human relations. Since both attributes are considered as an expression of culture, the study of housing design is a direct way to explore cultural contexts that influence built form and its occupants.

Several studies on the topic of space and its relation to social contexts suggest that Pattern in built environments is a reflection of the social and cultural order of a certain society. In order to understand the connection between architectural space and society, investigation needs to focus on a culture-specific study. The study of domestic spatial and its physical setting is an approach that directly addresses the impacts of social phenomena in built form. In fact, the change of social structure is a reflection of cultural change that may lead to the compromise of behavioural pattern and the transformation of spatial pattern. Meanwhile, many scholars have considered spatial pattern as an account of cultural attributes that reflects social norms [10].

In general, house styles and arrangements have developed across time in order to accommodate new requirements based on the change of lifestyle and attitudes. The new house style design and spatial arrangement influence physical alterations, which consequently affect the interactions among occupants and their daily routines.
The way domestic space organizes in built form is the way in which people manipulate spaces, select their choices and adapt an existing design to support personal preference and their behaviour.

2.3 Spatial Study

Space has meaning. Built form is created through a sequence of design decisions, whether made by a professional or a builder. The arrangement of space associates with a logical process because it must at least serve the functional objective [11]. The pattern of space in built forms is explored in order to understand the link between the design of built spaces and its cultural consequences. Many studies illustrate the complexity of built forms by interpreting the messages from the spatial structure.

In general, spatial study can be conducted in two ways, from the observation of buildings tracing back to the experience of users or builders, or from the living experience of built space followed by speculation about how spaces are created.

The recent study of vernacular architecture from a spatial viewpoint has focused on an approach to describing spatial experience and movement by its users. The analysis concerns the interpretation of architectural space from different patterns of interior circulation that are formed regarding daily life experience. In order to create a supportive built space, the arrangement of space depends on the nature of activity, users, cultural values and norms. Such a range of physical conditions is not randomly structured; therefore, spatial study from a configurationally aspect relies on assumptions from both functional and social logic.

The configurationally approach of spatial arrangement is based on the theoretical concept that if built space is composed of organizational units; it is because they are responding to precise living patterns. The way space is organized by its inhabitants gives a deeper understanding of experience taking into account a social system. It is therefore necessary to examine those patterns in order to understand the organizational principles underlying the built spaces.

The development of a methodological approach to exploring spatial configuration is continuously established. The publications of Architectural Morphology by Steadman (1983) and The Social Logic of Space by Hillier and Hanson (1984) have introduced the analyses of domestic space configuration through architectural morphology. It has since become a tool applied around the world in a variety of research disciplines and design applications. According to Steadman spatial study begins with the
investigation of a morphological diagram that is based on the building floor plan. Shape and the arrangement of spaces provide information for an explanation of spatial relations in a systematic manner. Hillier and Hanson's approach acknowledges spatial study by developing the analysis method from configurationally measurements that later are known as the space syntax approach. Spatial layout is used as an architectural variable to reveal social and behavioural patterns.

Spatial organization interrelates with the concept of social pattern such as gender, family structure and mode of privacy. Moreover it can identify more abstract meanings including values and belief systems. Spatial properties and their arrangements are culturally and behaviourally formulated. The study of spatial configuration is an approach that reveals the social order embedded in spatial pattern. An analysis of the house floor plans as artefacts and existing elements can identify social and cultural consequences associated with the design of the house. Archaeologists, geographers and architects have adopted spatial study to examine the logic of cultural attributes from the relationships between spatial and social patterns.

Several research studies have built a theoretical understanding of spatial pattern, aiming both to establish a relationship between spatial properties and functions and to explore design possibility and behavioural conditions. Focusing on the change through the physical arrangement of household spaces contributes to and reinforces our understanding of the phenomenon of how spatial pattern influences domestic activities, social and cultural content.

2.3.1 The Need to Study Space

In modelling urban environments and buildings, it is essential to model the structure of space created by built structures. Space is considered the crucial element to be modelled and analysed for one simple reason: space is what all people use in urban environments and buildings. Another important reason for studying space, rather than concentrating on buildings themselves, is that the way space is organized into a particular pattern has strong effects on how the immediate built environment functions. The way space is structured often dictates how communities function within the built environments.

The effects of spaces on people, how they use it, or on how communities and organizations function within it, cannot be grasped from this viewpoint. An alternative approach is needed for defining space in a way that enables us to
perceive and analyse those relationships. It is necessary to understand space from functional perspective in terms of what people do in it. The communal and organizational functions are conceived at the level of a system of interrelated spaces.

Space created by buildings and other objects is a crucial element in the environment in which we live. Although space is usually described in conjunction with buildings, it should be conceived independently of physical elements. Space is what everyone actually uses and experiences. In social sciences, space is usually tied to other attributes, such as the human agent and the land-use-aspects of spaces [15]. Space, in this document, refers to the usable open outdoors area that constitutes a continuous web. Any space separated from the web is not considered in this study.

The study of space is crucial for studying and analysing architecture and planning. At the most basic level, a building is a construction of physical elements, which creates the space that we actually use. A building creates change in the spatial configuration that existed before construction. Spatial configuration has social values and attributes associated with it.

2.4 Space and Social Relations

Many researchers have explored a specific characteristic of attributes in order to get a more accurate explanation of culture. Hall’s study provides a conceptual work on the subject of space and social relations. He points out that every culture has its definition of activities which vary depending on the way spaces are occupied [8]. His cross-cultural observation on the distance between people while engaging in social interaction, specified as proxemics, reveals a great variability. People’s interaction appears to interconnect with social meanings, which therefore influence spatial use and its design. Based on the proxemics, the relation between architectural space and human behaviour has taken a psychological approach into account when conducting a built environment and behavioural study. The design of built spaces must provide an appropriate distance for users in a particular culture. According to Hall’s findings, spatial design directly influences people and their behaviour. Therefore, properties of space not only describe behavioural conditions but also reflect cultural dimensions of social phenomena. From an anthropological perspective, architectural space is discussed in terms of material culture and artefacts, including cosmological and ritual beliefs. The housing layout and settlement correspond to social structure and belief systems. The organization of space is structured from cultural orders such as orientation system, hierarchy of
access and rules related to conceptual ideas. Architectural researches have later introduced the research methodology applied in anthropological studies to spatial study in order to examine the mechanism that arranges and organizes space. By means of various theoretical approaches, some researches are specifically concerned with the relationship between built spaces and social structure.

The use of space varies from culture to culture because each culture has different values and social norms. The spatial layout created by interior arrangement and a partitioning system is an important factor that has control over the inhabitant’s activity.

It is a controlling factor that reflects social interaction between family members and the relations among domestic spaces in the household. The cross-cultural study of domestic space by Kent reveals that architectural partitioning reflects some cultural aspects in terms of socio-cultural dimension. The use of walls, curtains and other partitions is based on the perceived gender, activity, function and lifestyle. These elements become important factors that predict the change occurring in spatial and social orders. A society with more political complexity tends to have the more segmented architectural spaces as well as the more complex use of space [7].

Hillier and Hanson note that socio-cultural factors influence the arrangement of building. Social orders exist and Express themselves through architectural space following the same rules that govern the relations among its occupants. They suggest that to understand cultural orders it is necessary to examine how space configures in the design of spatial layout. Therefore, the examination of space by physical appearances such as shape, scale and proportion, may not be able to reveal underlying dimensions influenced by occupant’s lifestyle and social norms [12].

Another cross-cultural study of Turkish and Italian vernacular houses by Baskaya and Symes (1992) reveals the interrelationship between socio-cultural dimensions and spatial pattern. The open spaces of traditional houses in both cultures have been transformed into part of an enclosed interior space in order to satisfy the need for privacy and security as well as to accommodate the new functional need and social changes. Moreover, the differences and similarities between these cultures can be identified by studying their spatial organization. The impacts of spatial design not only physically correspond to global culture, but also reflect social conditions such as changes of religious aspects, gender relationships and family structure [13].

Later the study by Kirsan and Cagdas concerns a similar analysis of the change
among spatial patterns, but their focus shifts to the relation between space and historical contents. They conclude that different spatial patterns show the diversity of the occupants. The arrangement of space reflects a specific group of users who played important roles during the period of construction and built a particular type of building pattern to accommodate their needs [14]. Their study supports the idea that spatial form, process of construction and pattern of alteration are not only an indication of social changes that reflect in the house floor plans but also represent the identity of a subgroup in a particular culture. The review of previous studies suggests that social contents associate closely with spatial organization. The study of the associations is one way to develop the understandable connection of culture, social relation and the expression of both patterns through the design and arrangement of spaces.
3. CITY

3.1 What is the City?

The city described in the briefest, most schematic and, no doubt, least precise way is a massive agglomeration of people who live, grouped together, on an area of land with a perimeter which is identifiable but often undefined.

The city is a common good. Its administration must therefore have group concerns as its policy or, in other words, its priority interest.

The city is hardly ever a whole. We must recognise it, conceive it and plan it from each of its components that have their own identity, yet not leave out an identity of another order.

The distinguishing feature of the city is the coexistence of its people. The areas of coexistence are public spaces, either in the open air or indoors, which allow interpersonal and group relations and enable the citizens to meet and exist together.

Cities are large collections of buildings linked by spaces. Buildings represent economic, cultural, social and residential opportunities. Space connects them into a system of mutual accessibility.

The urban form of the cities is continuously changing and its final form reflects the life character of its people. The physical setting the political and socio-economic environments, the cultural behaviours of the society, as well as the administrative system, are factors that affect development of cities.

The city is a fundamental and universal human creation. It is a unique centre for social life as well as individual and collective fulfilment. The frantic, irreversible urban growth that societies throughout the world have experienced over the past few decades has caused a transformation of cities and agglomerations, which rarely corresponds to inhabitants legitimate needs, expectations, and aspirations.

A city is not just a place where people live. It's also a place where people pursue their own personal evolution and try to get the most out of life. Actions that get the city and its citizens to react. That drive an area in a certain way that it helps the
whole to heal, to improve, to create positive reactions that intervene to revitalize, to make the body work differently. In cities that succeed in making this kind of

The vast major of today’s population live in cities. The size of the city and the enormity of its social, physical and political problems tend to render difficult the implementation of ameliorative measures. Yet the lives that are caught up in the crush of the city demand amelioration. Urban design seeks to provide tools and techniques for of an environment whose complexity resists traditional approaches.

The city as field is approached in terms of matrix, frame and module as an attempt to question the possibilities of the role of the architectural project within the city as it is currently found.

3.2. Urban Morphology

Morphology is commonly referred as the study of the form and structure of an organism, or any of its parts. Morphology is defined as the science of form, or of the various factors that govern and influence form. In other words, all urban architecture is inherently morphological: it has an overall shape or configuration of line and surface and ordering of parts which determine these shapes; a definite arrangement of its internal, structure; and volumetric enclosure with surface organization and constituent elements (space). Morphology can be defined as form, structure, physical expression of that form, and the manner in which the various physical components are related to each other in a system of form interaction. Urban morphology can be, simply defined, the study of the physical form and structure of the city.

The concept of urban morphology has been recognized by social scientists as the systematic or structural nature of urban complexes. Human communities –cities, towns, and neighbourhoods- are interrelated entities with underlying regularities and orders. In other words, urban morphology not only represents the result of the societal process, but also can be defined as the complexes system or structure which influences every setting for human activities. It should be regarded as a heading for the semi-atomically artefact rather than a kind of unity.

Urban morphology is concerned with the city of build-up area of the city and its layout, its form, and its functions and the ways which these elements have evolved over time. Johson listed three morphological components of a city. First is the plan of the streets, which display past and present methods of transportation. A second component is building form, which is more susceptible to gradual change through
time [15]. The functions of the streets and buildings constitute a third element in city morphology. An example of this function is the bustle of people on a city’s streets and their activities within its buildings. The urban landscape components, such as streets, buildings, gardens, and other open spaces, furnish a demonstration of the city’s inner workings and its past.

Urban Morphology has traditionally studied sites and urban settlements. It has been concerned with understanding the process, which shape the built form or type of settlements is searching for two basic aspects of the civilisation: the evolution of the role and purpose of cities, and the process fabric of those cities. The study of the urban form has been developed in several directions and urban morphology has proven to be of great value as a source of ideas for urban design interventions.

The morphological studies have focused on developing a conceptual understanding of the evolution and character of towns and cities, a greater value and a practical use can be achieved if efforts are concentrated on producing practical solutions to design new and repairing old areas.

The social and physical dimension of urban morphology has a dynamic relationship. Physical fabric is produced and conditioned by different social procedures. At the same time, the form of urban design, once built, can exert influence upon the way these procedures occur.

Urban physical develop and economic development, is argued to be one of the three complementary approaches to creating urban environments in which people might flourish, and in which people have equal opportunity to flourish, including other species and members of future generation who cannot speak for them.

Urban morphology as the spatial structure of a city mentioned by Edward Relph that urban landscape is the visual context of the daily existence. According to him, cities grew and were shaped by ideas as well as by the creation of buildings in a particular society. The reference of buildings and their surrounding, in create an urban form that will reflect the built environment in the future [16].

There are four major elements that shape the urban form:

- Building form
- Street pattern
- Land use pattern
- Open space
3.2.1 Building Form

The man purpose of a building is to house human activities such as living, working, entertaining, etc. Although they seem to have similar size, form and appearance, each building shows its own life. For example, while office buildings are alive during the day, entertainment buildings begin their life at midnight.

Buildings may also serve and as pieces of furniture. The background of various forms of buildings gives the city its form and that makes the city different from ant other.

Buildings and districts within cities are significant artefacts. They are sometimes protected and preserved from demolition because they represent specific achievements within a particular district.

3.2.2 Street Pattern

Like buildings, streets as an element of urban, become an interesting factor for the urban studies. Since its early days, the city has been the centre of social and physical change and transformation for the society. It carries several attributes in responses to people’s activities. In a broad sense, most towns with grid streets pattern were the result of defence, agricultural and trade mounting. Historically, grid streets pattern has served two major purposes. The city as a symbol of the power of the rulers was delineated by orthogonal plan in the spatial structure to reflect a rigid hierarchy system of governance. It organized the distribution of spatial order of government, administrative buildings, religious structure, and housing according to class.

Streets are mostly defined as physical entries the more or less narrow, linear spaces lined by buildings found settlement and used for circulation and sometimes other activities [17]. Streets are generic, pervasive elements of cities.

The street is also a social, economic and political space. It has symbolic, ceremonial, social and political meaning to people. It is meeting place for people to exchange information with one another.

The street is also a factor that changes lives. The new construction or widening of street achieves accessibility in transportation, generates business activity, and can also cause displacement of a large number the poor [17].

The street is a place where the dynamism of city is manifested. Traffic congestion, busy pedestrians, street vendors, routine construction works, car accidents, and colourful street furniture are some features of a dynamic city.
Street patterns influence the land use pattern of a city and in turn they create the form of the city. Four basic street networks that influence most urban forms of a city are namely grid, continues curvilinear, loops and cul-de-sac [18]. In certain areas, due to people’s need for various activities, a combination of types emerges, such as the medium grid, cul-de-sac, and continuous cul-de-sac. The building arrangements with their ground floor dimensions and the street networks shape the land use and henceforth, characterize the urban form.

3.2.3 Land Use Pattern

Land use has been the focus of traditional physical development. In preparing their settlements, early societies already arranged the use of their land. They divided their land into several parcels for various purposes, such as for building houses, cultivating crops and planting fruit trees, herding cattle, conducting ceremonies, etc. Their needs for each parcel were intertwined with each other. Considering this premise, they thus arranged parcels according to which had to be placed near another, and which had to be separated according to their attributes. This traditional manner of arranging the use of land became the basis for contemporary societies in organizing their land in the modern city. Although a modern city has more complex land use patterns, apparently, its basic idea for separating living space from working space came from traditional society.

Until recently, land use was still the key element of urban planning and design. It determined the basic two-dimensional plans on which three-dimensional spaces were created and functions were performed. On this basis most cities organize their land into five major areas of development:

1) residential
2) commercial
3) industrial
4) open space [19].

Until recently, most local governments utilized the traditional land use plan, which localized urban facilities into particular parcels of land according to their functions. Occasionally they also created social and visual problems. The domination of single-function urban facilities in a certain area of the city may create a repetitions or monotonous building form and, furthermore, it causes a dull and uninteresting urban form. Thus, some scholars suggest different approaches to organize the use of land for facilitating people is socio cultural and socio cultural needs. One of the key issue
for consideration in land use decision, is the recent suggestion recently is to mixed use land plans.

3.2.4 Open Space

The urban form of a city is not merely composed of buildings, but the urban open spaces as well. Building and open spaces are elements that shape the land use pattern of the city. Like buildings, the open spaces also give a city its character. To provide a creative environment for people to live, in one has to start with the basic material of urbanism.

3.3 Cities Shaped by Ottoman Culture

Cities, especially ancient cities where history has accumulated in layers, are key documents for the investigation of society’s evolving relationship with the past in the case of newly created buildings and objects, the use of forms derived from past, and the dissemination of standardized forms [20].

Cities and urban life were a central concern in Ottoman culture. In the administration of the empire, cities were the nodes through which Istanbul’s dominance was enforced and cultural idea were disseminated. Ottomans reshaped the cities, layered them with architecture, and produced a literature, which described, represented, categorized and praised cities and urban life. [20].

The cosmology of the Ottoman city has traditionally followed certain dominant and unanimous ideas responsive to the social norms and Islamic value systems. These values found their expression in the forms and structures of the city and became the precepts of architecture, built form, and the unique architectural expression [21].

The urban structure of the city reflected the economic, political, social and spiritual value systems. The mosque being the temple of God on earth, determined the general structure of the city. The Friday mosque located at the intersection of the major thoroughfares leading to the city gates, commanded an important and dominant place in the city, and played a decisive role in structuring the urban centre. Its function in this regard is not unlike that of the Gothic Cathedral in the medieval European city. The integration of the mosque as an architectural element with the rest of the city and the streets surrounding it determined its shape and form. The mosque, in accord to the Islamic notion of modesty and humility, had no eloquent façade but utilized other identifying signs: the minaret and the dome. The minaret, from which the call for prayers was announced was the tallest structure in the city,
dominated the skyline, and was a focal point of reference and a visual landmark [21].

Mosque is a common feature of all Ottoman cities. It has a great influence on the city’s shape and morphology. The mosque in any city must face toward Mecca. Although it is a fact that the street in cities wind and twist, when reaching the mosque they must be parallel. There are two kinds of mosques. Local mosques, found inside the neighbourhood, are more frequent than the mosque. The mosque, located along the main thoroughfare, is larger and has multiple functions. For centuries, the Mosque was spiritual, political and educational centre of the city.

In addition, the mosque being hub of the city influenced the location of various commercial activities. The market developed spontaneously following strict specialization, in the central part of the city, the open square, and around the mosque creating visual varieties within a single unified design. A hierarchical framework of location based on the perceived standing of a trade or product, in terms of its purity and its affiliation with the mosque, governed its acceptable proximity to the mosque. Consequently, the city’s activities were developed by radiating out from the zone of the mosque and the market. This movement from the centre toward the city’s perimeter created a hierarchical order ranging from pure to impure, as spaces and professions that were considered impure, such as burial sites and metal works were located in outlying sections, avoiding visual pollution. Such an arrangement fostered a healthy, clean, peaceful and quiet environment underscoring the sanctity of the mosque, reflecting Islamic concerns for the maintenance of health [21].

Attached to the mosque was the learning centre (medrese). Government buildings, palaces and other institutions were located at or near the city centre and along the major thoroughfares. The Ottoman city thus evolved gradually, unified by fortified walls, with the mosque, and government institutions forming the religious, political and administrative centre—the mosque and the palace being the most prominent structures. As a result, the square served as the religious and civic centre of the city. Apart from its busy commercial activities, the square was the scene for processions, religious and other public events [21].

Further, and due to the predominant Islamic value systems and the pronounced concern for privacy and proper communal behaviour, the city experienced an apparent differentiation between the large-scale economic activity and residential districts through the division of space into public, semi-public, semi-private and
private, ranging from the main routes in the city to the patio in the house. A fundamental characteristic of the traditional Muslim city is therefore, its closed residential quarters and the differentiated business centre. These features emphasize the ever-present overriding concern for privacy and the strict distinction of personal life from public activities [21].

This market yet spontaneous division of the city into small, identifiable neighbourhoods/quarters constituting groups of streets and buildings, provided an intimate human scale and created social neighbourhoods responsible for community cohesion, and the recognition of special rights and responsibilities of neighbour toward each other, particularly in self-policing each other’s privacy and security [21].

The bazaar was linear with narrow streets bordered by small shops. The same kind of merchandise will occupy adjacent stalls. The arrangement was portrayed. Besides their commercial functions, the bazaars also have religious and social roles. The mosque is nearby; thus the people can stop their activities during the prayer time and proceed to the mosque. It was here that people from diverse segments of the urban population could meet, have social interaction, trade, and exchange ideas.

Quarters included communities of both rich and poor without any radical separation of economic classes, testifying to the prevalence of social equity. There existed, however, an economic and ethnic basis for the homogeneity of particular quarters, as some were named after a market, craft or common occupation. Many of the quarters maintained solidarity based on closely-knit and communities retaining a unique character. The solidarity of some neighbourhoods was based on commonality of economic or political interests, on religious identity or ethnicity; and was reinforced by the responsibilities of neighbours toward each other, and the administrative responsibilities, which developed upon it [22].

The prevalence of cases revolving around building heights and their threatened invasion of the visual privacy of a neighbour’s court, or the number of cases of litigation over the obstruction of access to an individual dwelling by occupation of a common easement testify to the manner in which neighbours exercised control over the development of their immediate vicinity [22].

Social solidarity was extended to include communal defence. In times of war, quarters barricaded themselves behind great doors, closed off the thoroughfares to the rest of the city, and hid themselves from attack. Nevertheless, the quarters were never isolated cells, but adjacent streets and districts within the cities [23].
Moreover, the development of a rich vocabulary of architectural pattern such as bent entrances, corridors, courtyards and split levels has enabled the traditional Islamic architecture to follow religious precepts. These architectural characteristics had a symbolic meaning and role in the relationship between society and the environment. The acute concern for privacy accounted for the placement of external doors, the architectural treatment of windows, the bent entrances, and the limit on building heights throughout the city, and the introvert arrangement of houses overlooking a central courtyard [23].

3.3.1 Concept of These Cities Urban Morphology Principles

Ottoman urban principles inspired by historical precedents of the past, derived from the main source of Islamic jurisprudence and extracted from neighbourhood and building guidelines implemented by local jurist (kadi) in Muslim societies to resolve urban conflict among neighbour, constitute the performance criteria necessary for the development of a meaningful built form in many Muslim cities. Urban principles thus, portray an extension to the established laws of Islamic jurisprudence as applied to the solution of urban problems [23]

The following identifies specific urban principles, which complement the socio-cultural, economical and administrative value systems illustrated.

3.3.1.1 Provision of an efficient fabric for the flow

The traditional Muslim city was primarily pedestrian oriented, though occasional transport of goods by horse and camel, on public thoroughfares was authorized. The exclusion of heavy traffic from the clustered dwelling areas allowed the use of shaded space for neighbourhood interaction. In addition, the intricate richness of the street pattern, in corporate a hierarchical order ranging from the relatively wide public thoroughfares to the relatively narrow dead end streets thus rendering an efficient fabric for the flow of pedestrians across the city.

Street should render an efficient fabric for the flow pedestrians across the city, while integrating commercial and recreational facilities on its edges to promote and encourage social interaction. In addition, street widths should be reduced as they approach residential neighbourhoods, securing a lower density of pedestrian traffic thereby safeguarding the privacy of its inhabitants.
3.3.1.2 Provision of various grade of seclusion

The traditional Muslim city emphasized the predominant role of privacy and strict separation from public activities. Closed residential neighbourhoods and differentiated business centres should also be incorporated in the planning and design of Muslim cities. In addition, dwellings should be introvert in their organization, overlooking a central courtyard where possible. Moreover, design standards should regulate and restrict, if necessary the location, height and treatment of external fenestrations so as to ensure the privacy of neighbouring properties.

3.3.1.3 Provision for closely-knit homogeneous communities

The division of the traditional Muslim city into residential quarters was a manifestation of the prevalent community organizations, and an attribute of the concepts of community, privacy, and social solidarity, responsibility toward neighbours, equity and interdependence. Quarters were social neighbourhoods based on religious identity or ethnicity, afforded an intimate scale, and was responsible for the overriding concern for privacy, proper communal behaviour and community cohesion.

3.3.1.4 Integration of the Whole Community within Itself

As a manifestation of the spirit of community the traditional Friday mosque provided the scene for involving the entire population of the city, thereby justifying its central location. The city square functioned as the psychological extension of the sacred space of the mosque and thus, experienced a considerable share of public life.

Yet, much of the activities that once took place within the mosque have developed into institutions in their own right. Nevertheless, the mosque continues to assert its spiritual prominence.

In many Western societies however, where a general secular social order prevails, the mosque may well be replaced by secular focal point, such as government institutions or the shopping mall, serving similar purposes as that of the Greek Agora. Here, the components and elements that once characterized the design and placement of the mosque, or cathedral; symbolism; orientation, spiritual commonality; psychological security; cultural advancement; and prestige of the city, translate into modern equivalents, except for the spiritual religious element [24].
4. STUDY AREA: İSTANBUL & SüLEYMANİYE

4.1 İstanbul

Spectacularly located on the Bosporus, which connects the Black Sea to the Mediterranean across the Marmara Sea and the Aegean, Istanbul ranks high in the World Heritage. As capital of both the Roman Empire of the East from its foundation until 1453, and of the Ottoman Empire from 1453 until 1922, it contains the main architectural works of either civilization. Yet, Istanbul, a place brimming with history, is also a modern city whose population has grown tenfold over the past fifty years. Various perils threaten its heritage.

Destined to replace Rome as the centre of the Empire, Constantinople was endowed with some of the most prestigious buildings of late Antiquity. Threatened by barbarian invasions, it was protected by a formidable array of fortifications foreshadowing the military architecture of the middle Ages. Nowadays, of the great palace deserted after the 12th century, only a few vestiges survive.

Istanbul, a capital of the Mediterranean basin for almost sixteen centuries (from the foundation of Constantinople in the 4th century A.D. to the end of the Ottoman Empire in the 1920s), has not been given due attention by urban and architectural historians. Compared with the rich scholarly literature on the historical urban centres of the West, there are only a handful of studies on the Byzantine/Ottoman capital. The Byzantine city to the end of Justinian’s reign and the classical period of Ottoman architecture—the fifteenth and sixteenth centuries—have attracted relatively greater interest, whereas the aesthetically less climatic phases in the capital’s history, such as the late Middle Ages and the eighteenth and nineteenth century is especially important, because it opens a new era in the city’s history [28].

The harbour, perhaps the most vital zone of economic activity for this ville-ventre, which produced almost no foodstuff, was at the entrance to the Golden Horn. The densest part of the Istanbul peninsula was its eastern half, where the major monuments were concentrated and where the street formed a tight network. Here, between Hagia Sophia and Beyazit Square were the traces of what for centuries had been Istanbul’s main thoroughfare—Divanyolu. The great markets were located
between the Divanyolu and the harbour, making this area the commercial core of the capital.

The fundamental goal in the development of Istanbul after conquest was to create a Muslim city in which the communities could live in accordance with the philosophy of Islam. Muslim neighbourhoods grew around religious complexes. To bring more of the physical city under the jurisdiction of Islamic social codes, property owners established permanent endowments of land or other immovable property by a deed of restraint. Through this act, called vakif, the owner surrendered his power over disposal of the property with the stipulation that the property be used for good purposes, namely for those compatible with Islam. The first vakif, established by Mehmet II himself, was Hagia Sophia, which had been converted into the Great Mosque, the day the Sultan entered the city [22].

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The definitive change in the street fabric of the Byzantine city must have begun during Mehmet II's reign. We have noticed earlier that the back streets of Constantinople formed an irregular and very dense pattern. However, there were large main arteries that connected the great public squares. As the fifteenth-century city developed around self-contained nahiyes and their subunits, mahalles, each originating from a central node, the importance of large public open spaces and wide avenues diminished; they were gradually absorbed by the incremental growth. But, the Byzantine structure did not disintegrate immediately [22].

4.1.1 Fifteenth and Sixteenth Centuries Istanbul

The last decades of the Byzantine capital and the early development of the city after 1453 have been well recorded in documents and personal memoirs. The Spanish ambassador to Timur’s court in Central Asia, Clavijo, who saw Constantinopolis in 1403, says that the space within the walls consisted of a number of hamlets
separated by orchards and fields. Palaces and churches were in ruins. Only the quarters on the coast had a certain density of population. The capital of the Eastern Roman Empire was reduced to a ruined city of less than 50,000 souls before the Turkish conquest.

Immediately after the conquest, old monasteries and habitable buildings were given to newcomers. A mixed population from various parts of the Empire was settled in Istanbul. Hagia Sophia was converted into a mosque. The city walls were repaired. A new castle was built against the western Imperial gate. A palace was built near or on the Forum Tauri. And a second palace was started on the promontory dominating the entrance of the Golden Horn over the site of the first Greek city. During the reign of Mehmet II the number of public constructions reached 300; the capital’s population at the end of his reign was about 120,000. The most important and symbolic urban act was the foundation of Mehmet’s mosque and tomb over the destroyed church of the Holy Apostles where originally the martyrium Constantine was. The great Turkish-Muslim feature of the new capital was the implantation of the conquerors’ signature on the image of the city. The major element in the Istanbul landscape, bringing different sense of urban organization, was the series of the great imperial mosque complexes, which shaped the form of the Turkish Istanbul.

At the end of the 15th century the German traveller Arnold von Harff found Istanbul a grand city of 200,000 people. A large part of this population was settled around the coastline overlooking the Golden Horn and surrounding the new monumental axis of the city. Beyazit II built his mosque near his palace on the old Forum Tauri. Thus before the age of Sinan and Sultan Süleyman the Magnificent the functional division of the city was already laid out and the base lines for its visual development partly shaped around the great socio-religious complexes.

Istanbul’s population grew from 16,326 houses in 1477 to 80,000 by 1535. This rapid increase resulted in higher population densities in the Istanbul peninsula, as well as in the emergence of the new Muslim neighbourhoods of Tophane, Fındıklı, Cihangir, and Kasımpaşa on the northern side of the Golden Horn. Although the population of Istanbul grew rapidly in the sixteenth century, the ratio of Muslims to non-Muslims remained fairly stable. In both the 1477 and 1535 census, Muslims constituted 58 percent, Christians 32 percent, and Jews 10 percent of the population. These ratios fluctuated only marginally thereafter; for example, in the late nineteenth century, Muslims still formed 55 percent of Istanbul’s population [22].
The expanding neighbourhoods encroached upon the main Byzantine arteries so that by the late sixteenth century, the Byzantine avenues had shrunk considerably. The population density was indeed so high that many houses were built adjacent to monuments and city walls. A 1558 imperial order (irade), which was not enforced rigorously, called for the demolition of all houses and shops abutting city walls. The housing shortage became so acute that even some of the extensive gardens belonging to palaces and villas were taken over for construction [23].

The sixteenth century was a time of great building activity. A synthesis of architectural forms that had evolved from the mingling of earlier Anatolian-Turkish elements with the Byzantine forms, which had already reached their perfection in the sixth century, culminated in the grand architecture of sixteenth-century Istanbul. During the long reign of Süleyman (1520-66), Istanbul was endowed with many monuments, and it was in the work of the great architect Sinan (1490-1588) that classical Ottoman architecture reached its pinnacle. The chronicles attribute over 300 buildings throughout the Empire to Sinan; about 120 of these were in Istanbul alone. The monumentality of sixteenth-century Istanbul is, therefore, closely associated with Sinan and his royal patrons, Süleyman I, his wives, daughters, sons, viziers, and his heir, Selim II [22].

In Sinan’s complexes, the site and the buildings complement and glorify each other. The silhouettes of his structures blend with their location, but at the same time elevate it. The mosque, as the spiritual and physical centre, dominates the dependent structures. Its centrality is accentuated by the use of a greater dome, surrounded by a cascade of smaller domes and half-domes. Under the domes, experimenting with squares, hexagons, and octagons, Sinan’s exploration of volumetric and spatial qualities was based on a rational expression of structural clarity [22].

The image of the city before Sinan’s great works is best conveyed by the famous miniature plan by the painter Nasuh (called al-Matraki), dated 1532. It is a clear statement of an urban concept of his time. Here the city is not conceived as a mesh of streets and squares. It is directionless. Only prominent buildings and complexes are represented within partly comprehensible spatial relationships.

The basic unifying element of Istanbul is a socio-religious complex the külliye. It is the focus of social life and backbone of the city pattern. It may be taken as a basic explanatory tool for the analysis of the Turkish capital. The monument presented
here is the Süleymaniye. The famous traveller of the 17th century Evliya Çelebi describes it as follows:

“Süleyman Han built the Mosque of Süleymaniye and its dependencies with the war booty of Beograd, the Island of Malta and Rhodes. “He built over a hilltop looking to the sea a peerless mosque. From all over the empire thousands of architects, builders, stonecutters, workers were collected. “The mosque is surrounded by an outer courtyard as large as two race courses. Tall plane trees, cypresses, and linden trees decorate the courtyard surrounded by walls pierced with windows. All the people who come to prayer can see the palaces: Üsküdar at the Anatolian side, the castles and many sites on the Bosporus and the Golden Horn. It is a courtyard to watch the world” [25].

“On the left and right of the mosque there are four great madrasas for four different rites which are full of scholars, and students. Then there is a school of hadis, a school of kuran, a school of medicine, a school for young children, a hospital, a public kitchen, a hospice, a caravanserail for the visitors, a palace for the commander of the janissaries markets for jewellers, metal workers, and shoemakers, a well illuminated bath and buildings for the employees of the complex. Around the mosque a thousand (!) domes can be counted. When seen from Galata the whole is like a complex of gigantic blue shapes. Three thousand employees serve this complex. And all the incomes of the Mediterranean islands, including Rhodes and Chios, are endowed for the upkeep of it. All knowledgeable people, engineers and architects of the world agree that there is no stronger building in the world.”

Though not especially talented when Çelebi speaks about architecture, one can catch from his description the prominent role this complex played in the life of the capital city.

Until Sinan, the great complexes of Istanbul did not include in their architectural organization a commercial component. Although both the mosque of Mehmed II and that of Beyazit II had bazaars in the vicinity, a commercial function was not part of their architectural design. In the Süleymaniye Sinan included a line of shops in the plan as an extension of the nearby market area. By adding this final activity he emphasized the all-embracing nature of this foundation, which became a common feature afterwards for even lesser buildings [25].

As an institution, the Süleymaniye practically corresponded to all the basic functions of society: daily prayer, education, health, social aid, social gathering and commerce
a complete social organization. The symbolic “charge” of such a complex is extremely high. It has always been a symbol of the might of the Ottoman Empire as well as a symbol of Turkish culture.

When formally analysed there are some striking characteristics in the Süleymaniye. It does not occupy a central point in the city and it is off the main thoroughfares. But it magnanimously creates its own centrality. Like the mosque of the Conqueror, it does not follow a natural line of urban growth. It cuts its share out of it and dictates a direction. The site was selected in the precinct of the old palace, which was still in use. Thus the palace was partly destroyed and reduced by the Sultan’s orders. The development of the palace of Topkapi during the reign of Suleyman and his successors, again by Sinan’s hand, must be the result of this reduction. The act of partial destruction of the first imperial palace for the construction of the mosque needed, obviously, the Sultan’s approval. To understand this rather radical decision we should examine the likely reasons behind it.

The most plausible hypothesis for the sitting of the Süleymaniye is the traditional Islamic relationship between the palace rulers and the main mosque. This was not the case with Conqueror. Here we find an obviously symbolic act. Mehmet II always considered himself as the successor of Caesars, but his pious son Beyazit II did not. He could reassert the Islamic tradition, and Suleyman, his grandson, followed his example. It was Sinan’s genius however, which masterfully organized the space on the uneven area towards the Golden Horn. His buildings imposed their form on the city.

This planning too an imposition of a new set of functional and visual values on the city is not felt when we come down to the street. Although overwhelming the silhouette of the city, the Süleymaniye is not even seen from the neighbouring streets. Any street around the complex gives even a partial vista of the great monument. Any street was specifically opened or directed towards this central feature, the mosque. No axis was created. This is another characteristic of the design of Süleymaniye, of all complexes of the Ottoman period. When we compare this with examples from the Renaissance and Baroque periods, or with Shah Abbas’s Isfahan, the introverted concept of Ottoman design is striking.

This large complex is not an organic extension of the city. It is a semi-detached area. This approach to design is the basis of the originality of Istanbul’s urban fabric. If we observe an old plan of the city, Istanbul seems to be a web of irregular veins and self-centred nodes (several hundreds) are single mosques often linked to a
fountain, a Koran school, and perhaps a small garden-like graveyard. The small nodes are the mescit of the quarter (a sort of parochial, but not charged with similar ecclesiastical connotations). Then there are larger nodes, which serve bigger areas and consist of a mosque, a medrese, a school, the tomb of the founder perhaps, a fountain and a sabil, sometimes also a hamam. On a much larger scale the great imperial complexes serve the entire city, even the Empire. Overwhelming in size, they dominate the urban landscape. In the hierarchical structure of the city silhouette they even dominate the Sultan's palace. And they occupy the prominent points of the peninsula. Thus this familiar plan of Istanbul is like a nerve system with nodal points, which constitute the functional “nerve centres” of the city in closed, self-centred entities.

Medrese, schools, a hospice, hospital caravanserai, bath and shops surround Süleymaniye. But even these secondary elements do not have welcoming, inviting façades or entrances toward the surrounding quarters. They encircle the mosque and they face it. From one of the side streets we enter first a circumambulation inner street surrounded on its outer side by the buildings of the complex. The mosque has an outer precinct, a garden, as a matter of fact. We pass another boundary to reach the outer courtyard. The unfolding of the monumental focus inside these concentric boundaries creates a tension of expectations, which culminates when we enter the mosque itself. This may be called the “sequential revelation” of architecture through an urban experience because the surrounding street pattern does not reveal but screens the whole: it is not part of it but adjacent to it. There is no conceived physical continuity between the Süleymaniye and its surroundings. The basic structure of the town is constituted by similar nuclei. The urban fabric remains the same although continuously changing in details: a formless background on which these structures are superimposed. This approach may change from place to place depending on the site.

If we seek in Sinan the qualities and relationships that existed in Western traditions we will not find them: this is not the concept of a city in Muslim realms. The texture is anonymous. It is the people, the community of subjects that form, though none of them is strong enough to impose a structure on the overall texture of the city. Even the sultan cannot change this pattern. But each component, whether it is the palace, the market, the han, the caravanserai, a small mosque or larger complexes, may carve out a place for itself. The amorphous city texture is flexible enough to accommodate these components without changing its character. Each large building is like a large stone placed in a pool; the water immediately surrounds it.
Neither Sinan nor any other Ottoman architect imposed on urban form. Though architecture is the essence of Istanbul's form there is no such thing as urbanism. Today it is fashionable to speak off Islamic city planning: Western cliché imposed on the Muslim élite who consider the Ummayad qasrs as cities, which they are not. Only Baghdad can perhaps be called such. Neither should the grandiose palatial schemes of Samarra be considered as cities; they are gigantic architectural complexes. City planning in Antiquity, Eastern or Western, is an enlargement of architecture for several thousand people; these centres were engulfed when the real cities with larger populations developed in the middle Ages. The renaissance city, whether on paper or actually built, was extremely limited in size, and was nothing but an expression of nostalgia for the Antique city, which never returned. Renaissance and Baroque city planning imposes geometrical schemes on medieval cities, or royal residences [26].

Seen from this perspective, the only difference between Istanbul in the 16th century and Rome is that the Turks did not have a cultural nostalgia for Antiquity. So the Sultan did not create grandiose axes like Renaissance princes, popes and later European kings.

Sixteenth century Istanbul was a molecular structure in which small, medium sized and larger functional nodules were independently conceived: their relationship was sequential in character. Developed under various organic constraints, and in the case of large complexes, following perhaps the vision of grandeur and power of their makers, they were not conceived according to some ruling principle of organization of urban space this “molecularization” results from the socio-political structure of that society. The townsment of Istanbul had barely any allegiance to the city. The ruling class, formed from the ranks of the Sultan's former slaves, was not rooted in the city, especially in the 15th and 16th centuries. It was not their homeland nor did they have any longstanding family traditions there. Possibly no vizier or grand vizier had any single memory of childhood in the city. The lower classes had their allegiance to their kinsmen, to their sects, at the most a certain community spirit in their quarters. There is no concept or physical image of a city without a ruling class-consciousness of it.

These characteristics have their impact on the shaping of urban texture and space. Other than within the great mosque compounds or in the interior of covered markets or in the courtyards of great city hans and caravanserais, open, organized urban space did not exist in Istanbul. The only exception was Atmeydani, the old Hippodrome of Septimus Severus [26].
4.1.2 The Commercial Area of in Ottoman Constantinople (Istanbul)

Of the early Ottoman undertakings in the city, those that involved the commercial centre are among the most extensive. The establishment of the commercial core of Istanbul, that is, the formation of the physical setting of commerce, manufacturing, and financial exchange, was part of a broader set of undertakings that aimed at revitalizing the economic life of the city and re-establishing its link with the hinterland from which it had been cut off in the course of the Ottoman expansion of the previous century [26].

The natural and historical topography of the city was doubtlessly the main reason for the continuous use of the same area in the Byzantine and the Ottoman periods. From the time of its conception as the capital of Eastern Rome, Istanbul had been the major centre of consumption in the Eastern Mediterranean. With very few natural resources in its immediate surroundings, the city had to be provisioning of the city, and especially grain had to be provisioned with goods that were transported through land and sea routes. Sea routes had been the main means of provisioning of the city, and especially grain had to be transported from the eastern Mediterranean and the Black Sea basin. On the basis of Ottoman sources of the last decades of the fifteenth century, it would appear that the area between the first two hills of the peninsula had fewer commercial buildings. This area was marked by the main street, which ran between the port and the Mese, Uzunçarsi, which served as an intermediary area from which goods were distributed to the city [24].

The size of the new commercial establishment becomes apparent when we compare the number and kinds of endowed commercial structures in Istanbul with those of contemporary Anatolian cities, with respect to their populations [24].

The grand scale commercial undertaking which involved reuse of extant structures and the construction of a large number of new ones possibly had to do with a radical change in the structure of Istanbul trade following the conquest, from a network dominated by Italian city states to one dominated by the Ottoman state, from its centre [24].

The creation of the infrastructure of mercantile activity and crafts in Istanbul should be considered within the context of the willed creation of an urban population who would “inhabit” that infrastructure [24].

The formation of the commercial area was a precondition of the massive undertaking of the provisioning of the city. The old and new focal buildings of the commercial area were space not only for the material interactions revolving around
imports, but also for their regulation by the centralized state, and the efficient collection of taxes [24].

While conforming to necessities that were part and parcel of the very existence of Istanbul, the new commercial centre introduced elements of Ottoman urban tradition to the city, which in turn merged with the Byzantine structures and tradition. The Ottoman commercial district had a double-centred structure: the area along the Golden Horn, which constituted an interesting case of the Ottomanization of a pre-existing urban structure, and the newly created bedesten area, at some distance from it. These main constituents of Ottoman commercial centres elsewhere were characterized in Istanbul by the formalization of their relationship with their urban environment [25].

The commercial area of Istanbul in the fifteenth century lay at the centre of the larger commercial district of later Ottoman Istanbul, between the Golden Horn and the Mese, and between the first and the second hills of the peninsula. The location of the commercial establishment is one of the facets of Ottoman Istanbul where the continuity with the Byzantine layout of the city is most evident. For the commercial establishments of the Byzantine city in its last decades lay largely in the same area, along the Golden Horn and the main artery that connected the port to the Mese.

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A further important aspect of the undertaking was the construction of monumental buildings in an Ottoman architectural idiom in the commercial heart of the city, and hence their signification of an Ottoman presence in a part of it which was most accessible and visible to foreign merchants and travellers and to the various communities that formed the population of the city. The bedesten constituted the monumental core of the new commercial centre [25].

4.1.3 The Idea of a Neighborhood

The formation of Istanbul's residential structure has been one of the main areas of focus. “The formation of the mahalles: the residential quarter”. Inalcı defined the mahalle as: an organic unity, a community with its own identity, settled around a mosque, a church or a synagogue. The individuals of this community were linked not only by a common culture, but also by external factors making for social solidarity. The meeting-place of the community and the symbol of its unity was the place of worship, the repair of which and the maintenance of whose staff were the joint responsibility of the inhabitants, and after which the mahalle named [24].

The town quarter was the main administrative unit in the city, functional in the collection of taxes and the administration and maintenance of security. The social centre of the quarter was the mosque or the masjid. Socially, too, the quarter functioned as an integration structure, where members of the community could act together on issues of common concern, could act as witnesses to each other in court, collected monies for the maintenance and restoration of public buildings, or for the wages of those employed in them [23]

4.2 Süleymaniye

4.2.1 The History of the Quarter

The Grand Bazaar forms a bridge between the second and the third hills; the latter is marked by Sinan’s masterpiece, the grand külliye of Süleyman I-an urban design scheme in itself, which towers above the harbour. The Beyazıt Mosque and medrese (1506) are to the south of Süleyman’s Mosque. The remainders of Mehmet II’s palace, his first residence after the conquest, is located the Süleyman and
Beyazit complexes. By the 1830s, its garden held some governmental and military offices. The şehzade Mehmet complex (1548) is to the west, toward the fourth hill.

At the same century, The Külliye, which had been started to build at the order of Kanuni Sultan Süleyman, had been located in an important place in the city general structure and urban panorama (1550-1557) close to one of the nodal point of Byzantine period (behind the Ancient Palace). The Süleymaniye Külliye has been accepted as the real symbol of the most glorious period of the Ottoman Empire. This giant masterwork of Architect Sinan changed the urban texture environmental, created a new and effective urban picture oriented Haliç [26].

At the ancient urban settlement, generally the organization of the whole neighbourhoods especially the organization of Süleymaniye is very clear. Determining component had a character religious. Cultural environment developed around this religious attraction point. At the each settlement unit of the cultural environment, the hazine and its fountain, the mosque, the small mosque, the school, the library, the hammam, the lodge or lodges were symbolizing a dealing of a socio cultural neighbourliness and participation, trust, responsibility and an interrelation. This participation and these common facilities symbolizing the participation take place even at the settlement close to big cultural centre or külliyes dedicated or founded by Sultan or important person from Sultan Environment. The little mosque near the big mosque is the explanation of this position. For this reason, explaining the conformation of the social structure, the distribution of population is probable by little mosque; mescit and common facilities integrating them, in lieu of much more bigger facilities of külliye have the complex organizational and administrative structure [26].

The planned city does not belong to any one culture. And on whatever historical perspective we would place 16th-century Ottoman culture, be it Central Asian, Islamic, Mediterranean, Middle Eastern, all these backgrounds have in their tradition the idea of regular city pattern. Yet, the immediate predecessors of the Ottoman city, the medieval Islamic and Byzantine cities, seem to have forgotten or superseded these phases. Neither in the time Sinan, which is the most glorious period of Ottoman history, nor afterwards, do we see planning efforts in Istanbul comparable to those of the early Baghdad of Abbasids or to the cities of Renaissance Europe. We have to forget planned city.

The külliye of Süleyman is the ultimate expression of the greatest age of the Ottoman Empire. The image of Istanbul as the centre of Ottoman civilization
developed during this time as well. The wealth of the empire made large investments possible and an extensive building programme was undertaken. This program includes many külliyes by Sinan [22].

Sinan’s külliyes brought the ultimate Islamic and Ottoman definition to Istanbul’s urban form—a process, which had begun immediately after the conquest with the construction of the külliye of Mehmet II. The külliyes break up the irregular fabric of the city by their geometric and axial schemes. They are integral units organized around a central structure and have no major arteries connecting them to the surrounding environment. Hence, they repeat on a monumental scale the overriding theme of introversion in Ottoman urbanism.

The külliye of Süleyman I (1557), which crowns the third hill, occupies part of the grounds of Mehmet II’s first palace. Süleymaniye is a huge socioreligious complex, consisting of a mosque with an adjacent courtyard in the centre, five medreses, a hospital, a medical school, a public kitchen, a caravansary, mausoleums, shops, and fountains. The impressive mass of the mosque dominates the complex visually. Here, Sinan interpreted the spatial and structural qualities of Hagia Sophia. That great Justinianic church, acknowledged as having one of the finest interior spaces in architecture, had challenged Turkish architects since the conquest. Sinan imitated the vaulting system of Hagia Sophia in the mosque of Süleyman. The building is covered by a centrality of Süleymaniye. This is made possible by opening the central nave to the aisles. Sinan thus created a completely perceptible interior space in Süleymaniye, replacing the “immaterialization” of Hagia Sophia by rationalization.
5. METHODOLOGY: SPACE SYNTAX

Space has a value. The buildings and streets that surround it define and in turn it gives definition to those streets and buildings. The word syntax refers to the relationships between words in a sentence. It is the system by which we arrange the words to create meaning. In the same way, how can public and private spaces be arranged so that they make sense to the people who use them?

Primarily, Syntax is a method of investigating spatial complexes in an attempt to identify its particular structure that resides at the level of the entire configuration. The method is based upon the theory that the form-function relation in buildings and cities passes through the structural properties of its configuration [27].

Space Syntax provides a creative and analytic input to the design and delivery of building and urban development projects. From the master planning of historic towns to the layout of major retail centres, Space Syntax work focuses on the fundamental link between how space is designed and how it is used.

Space Syntax is a scientific tool that has the capability of providing quantitative descriptions of built environments, which enable researchers, architects, and planners to examine with in-depth precision and argue with greater clarity issues regarding the social and cultural consequences of one physical design over another.

Space Syntax analysis examines the spatial configuration of cities by defining all external spaces as a continuous network of open spaces. The spatial configuration is represented by the set of the fewest and longest lines of vision that link all spaces in the network known as an axial map. Research has revealed the importance of the axial map in representing the patterns of movement and activity in urban environments.

The development of space syntax provides a new approach for the study of intellectual conceptions that underlie the creation of built forms. This idea is based on function and meaning in architecture and urban forms that seem to be a significant aspect of cultural and identity. The arrangement of physical conditions combines to create supportive built spaces. The design of the spatial layout depends on the nature of the activity, users, cultural values and norms. This
empirical finding identifies social patterns that are intimately linked to spatial parameters. Therefore, by analysing spatial patterns one can answer the questions of how social and cultural content are embedded in spatial patterns as well as how built spaces shape social relations. Hillier and Hanson describe space-social relation in terms of the social logic of space. The way spaces organize social interaction, among inhabitants-visitors, male-female, family members and so forth, can be interpreted in many ways from an abstract to a systematic approach [11]. The analysis of spatial configuration is a systematic approach to understanding the relation between space and society. The basic theoretical concept of space syntax is space has a social logic, and the interpretation of spatial organization can reveal social messages.

Historically, the aim of space syntax was to construct a bridge between the human and physical city. Through the study of the precise spatial form of cities, it aimed to show how the physical city both embodies and shapes the human city. It is not of course alone in this. The approaches to the city we might group together as `social physics' see the physical city as emergent from aggregated human behaviours, and so define a bridge. In a quite different way, phenomenological approaches seek to show how the physical city is reflected in human experience and behaviour, and so also defines a bridge.

### 5.1 Organisation of Space

The idea that every point in the system has both a one- and a two- dimensional aspect is different from the idea of streets and squares, where spaces are expected to be either one or two-dimensional. Seeing every point in both ways means that every point has both a local and a global dimension. It is how the two come together that distinguishes the different morphological features of different types of town and urban area. Both the convex and axial organization of space constitutes an interface between the open space and the building.

### 5.2 Why Space Syntax?

Space syntax is an important component of this dissertation because it deals with topologically derived configuration and has techniques that allow the environment to be considered as independent variable. Also, it was used in previous studies on way finding that produced encouraging results.

The theory and methods of Space Syntax is often described from viewpoint of human sensibilities. In addition, this theory describes the deconstruction of large
environments into visually stable unit areas and uninterrupted visibility lines. Furthermore, it defines a technique by which topological relationships between those units can be calculated. It also provides a computer program that can be used to do all these analysis. Since the theory of Space Syntax is based on human sensibilities, it becomes a promising tool in research that considers the user.

Space Syntax methodology is a mathematically based environmental model. The purpose of Space Syntax is to analyse and describe architectural space configuration at both the micro and macro scales. It is an objective and precise quantitative method of description that can indicate how well urban environments function. Furthermore, it can describe the morphological aspects of spatial patterns in those environments.

With space syntax it is possible to take a new approach to urban design. By understanding the structure of the organization of the area surrounding a particular site, valuable clues will be given to the ‘spatial nature’ of any proposed scheme. An architect may or may not want to integrate a new scheme with the surroundings and take advantage of the existing patterns of movement and occupancy.

However, space syntax allows a proposal to be set in the existing urban fabric so that people can judge the effect of the scheme on the whole area and vice versa. This new approach, which can be tested and evaluated, we call ‘global design’.

Space syntax is used to describe the pattern of architectural space by embodying the variation that exists in spatial morphology: the closed /open pattern, hierarchical /non-hierarchical organization, and dispersed /aggregated forms. Architectural partitioning and interior elements form each space. These features not only define the different functions and internal accessibility, but also identify the interface both between the inhabitants of the house and between the inhabitants and visitors. By using spatial separation to define a controlling system of social categories, a building’s inhabitants are related to their neighbours both spatially and conceptually. Space and social contents are both conceptualised languages from a set of entities ordered into different arrangements referred to as syntax. The physical features of architecture are conveyed through diagrams or patterns representing the inhabitants’ interaction with spaces.

Space syntax research about cities seeks to redress this balance. It addresses first a problem of description: how can the physical complexity of the city are described with sufficient rigor and consistency to permit it to be controlled as a variable in
research? It gives what to some is a surprising answer: that it is best captured by representing it not as a physical stuff, but as the system of space created by the physical stuff. This is not as odd as it sounds. Buildings are physical things, but their purpose is to create the spaces and interconnections that we use. The effect of every physical intervention is to create or modify these space patterns. Cities may be aggregates of physical stuff, but space is the universal stuff, which holds the physical stuff together and gives it its overall form.

Space Syntax methodology has proven to be useful in evaluating the spatial configuration of urban environment. This thesis tries to demonstrate that Space Syntax is a powerful and holistic approach to understanding and analysing a wide range of urban layouts.

Space Syntax analysis is a holistic methodology for investigating spatial configuration. No other method incorporates every element in the system and examines its relationship with all other elements. This effect may or may not be significantly experienced depending on the relationship between the two spatial elements. No matter what the relationship is, an effect can be a strong or a weak one. This is why Space Syntax Methodology has been considered the most comprehensive and accurate of all current analysis techniques.

The theory and methods of Space Syntax has developed from the viewpoint of human sensibilities and used to emphasize the importance of spatial relationships. Space Syntax explores such relationships of topological nature. This theory describes the deconstruction of large environments into visually stable unit area and uninterrupted those units can be calculated. It also provides a computer program that can be used to do all these analysis. Since the theories of Space Syntax are based on human sensibilities, it becomes a promising tool in research that considers the user. The Syntax methods of calculating topological values, both from adjacent space and from all spaces in the system, were used to quantify them.

As mentioned movement influences most urban functions, either directly or indirectly. Levels of movement can largely be predicted using Space Syntax methodology with both global and local integration analyses.

5.3 Space Syntax Basic Concepts

5.3.1 Convex Space

A convex space is defined as the area outlined by a border of straight lines each with interior angles of less than 180°. It is a space that results in any selected point
taken within it appearing visible to all other points within that same space. Figure 5.1 illustrates a convex space. It is accompanied with a concave space to show the difference.

![Figure 5.1: Difference between convex and concave spaces](image)

### 5.3.2 Axial Line

An axial line is defined as the longest possible straight line that penetrates at least one convex space. An axial map constitutes a continuous web of axial lines that cover all convex space in the setting under investigation, be it an urban environment or a building. All axial lines have to cross with at least one and other line. Any isolated or disconnected line or group of lines must be disregarded because they are inaccessible to public spaces out of the realm of general community use.

Plotting the axial lines on the convex map is a critical step that requires accuracy and understanding of what these lines represent. In most cases, they represent lines of vision and movement. In order to draw the longest and fewest lines, a person needs to stretch lines from the corners of structures to corners of other structures forming the longest and fewest lines vision.

### 5.3.3 Axial Map

In an axial map, the space of the city is abstracted as a network of lines. These lines are laid out in such a way that they pass through all the space in the city, using the fewest number of lines and the longest lines possible. These lines are understood as potential lines of movement, literally “desire lines” in some cases. In arranging them using the fewest number and the longest lines possible, the simplest and most direct routes through a space are represented. This quality—finding the most direct routes through space—thus internalises, to a certain extent, both metric distance and direction. However, we must also note that axial lines do not represent movement from one location to another location. Instead, they represent movement from all location to all other location—any place can be an origin of travel, any place can be a destination. The basic spatial grid (in this sense, grid does not necessarily mean
an orthogonal grid) of the city makes no differentiation to where people start and
finish their journeys.

**Figure 5.2: Settlement A**

This does not mean; however, the axial map is constant. Each line in the map has a
unique relationship to every other line in the system. If we count the number of steps
it takes to get from one line to every other line in the system, we quickly find that
each line has a unique value, or depth in the system. If a line is said to be “shallow”,
it means that, relative to all other lines in the city, it takes fewer steps to reach any
other lines in the city. A “deep” line is just the opposite. If we look at the city as a
whole, it is fairly obvious that the shallowest lines will tend to be near the core of the
city while the deepest lines will be close to the periphery. This different depth values
create enormous inequalities throughout the grid.
Figure 5.4: Axial Map of Settlement A

Axial analysis is typically done in terms of different radii. This means that for a given study area the integration value is calculated for all lines within a specified number of steps: from one (radius-1, which is also known as connectivity) to three (radius-3 or local integration) to infinity (radius-n, or global integration). These different expressions of integration are crucial because when they are analysed against one another they begin to exhibit the characteristics of activity and use we associate with urban space. There are, for instance, two primary measurements based on different integration values. The first is intelligibility, which is a function of connectivity (radius-1) measured against global integration (radius_n). This is essentially an expression of how many spaces are connected to a given space.

The major function of axial analysis is the prediction of pedestrian movement. Axial analysis does not predict actual pedestrian counts or numbers. Axial analysis only shows the movement potential on a given line. The correlation between the values of an axial map and real-world values however is very high: in general, axial analysis can account for 75% of all movement through space. The remainder can be traced to functions of building density, land use, attractors, and other effects, which increase or decrease the rates of movement through space.

Different kinds of movement also follow the patterns of attractional inequalities in space. Some trips are made with the intent to traverse distance; movement of this variety requires relatively direct and unimpeded travel and tends to suggest the idea of a specific origin and destination.
5.3.4 Integration

Integration is the primary measurement in axial analysis. Whereas depth measures the mean topological distance from one line to all other lines in the system (a measurement that can be done without knowing the depths of any other lines in the system), integration is a relational measurement: the integration value of one line depends on the integration values of all other lines in the system. Integration can thus be used as a powerful analytical tool when investigating complex relational entities such as cities.

The central concept of Space Syntax is integration. The integration of space is a function of the mean number of lines and changes of direction that need to be taken to go from that space to all other spaces in the settlement system. Integration is therefore about syntactic not metric accessibility and the word ‘depth’ rather than ‘distance’ is used to describe how far lays space. Every line in a settlement layout has a certain depth from every other line. The integration value of a line is a mathematical way of expressing the depth of that line from all other lines in the system. These values will differ significantly from one line to the next, but it is one of the most significant properties of architectural and urban spatial configurations. The integration of a system as a whole is indexed by the mean RRA value—an expression used to indicate a complex mathematical index of depth—of all its lines. Smaller RRA values indicate greater integration. This value can be adjusted to eliminate the effect of size, giving a figure that varies by 1, with low values indicating shallow or integrated systems and higher values for deep and segregated systems.

5.3.5 Intelligibility and Connectivity

Intelligibility is a measure of the combined effect of integration and connectivity on the knowledge people acquire about their location in relation to the whole urban system. Connectivity is a measure of the number of lines with which each line intersects. Always a positive real number is 1 or more. From a practical viewpoint, intelligibility results from seeing and experiencing urban spaces. That experience is usually a result of generating a picture of the whole system part by part. The ability to generate a complete picture through the presence of distinguishable part is known as the intelligibility of the urban setting. If the spatial configurations of parts generally are similar to each other, the intelligibility of the urban setting is low because of the difficulty encountered in the conscious and unconscious assembly of similar parts of the whole picture and placing each part in the right place, and vice
versa. If a person will be unable to identify which particular space within the system, he or she is in [28].

A system’s intelligibility is defined as the correlation between global integration and local control. Intuitively this means that the large-scale structure of a system is intelligible to the people moving about in it to the extent that the information they receive about the space they are in – the local connectivity and control – also allows them to comprehend the structure of the whole. This seems to capture the way people can learn about large patterns from their experience of small parts, or fail to do so when the correlation is weak. Typical urban areas or towns will tend to have an intelligibility correlation of about 0.45, while unintelligible systems will have values of 1 is strong and 0 is random.

5.3.6 Depth

Depth can be defined as the number of steps or changes in direction that need to be taken in moving from a starting line to a destination line. The definition of distance, as used by Space Syntax theory, is based on depth. It refers to the number of changes in direction a person has to make in moving from one space to another. In a perfect grid system, depth or distance from one space to another is always 1 or 0 because in this particular situation a person theoretically makes either one change in direction or none at all to reach the destination space.

The main concept behind the value of depth used in Space Syntax methodology is the number of axial lines that a person makes in moving from one line to another. If the starting line and the destination line intersect, then the depth of the destination from the starting line is one. Each line in a setting has a minimum mean line depth from all other lines within the setting. Research by Hillier and Hanson suggest that the lower the minimum line depth, the greater movement it experiences, and vice and versa [27].

The minimum mean line depth is used in calculating the integration value, which reflects its mean depth from all other lines in the setting under investigation. The integration value and the resulting integration map of a setting have proven to be very informative. The global integration value is a description of the level of ease or difficulty of getting to a certain line from all other lines in the system. It is referred to as global integration because its analysis covers the relationship of each line to all other lines no matter how far they go, as long as they are all interconnected forming a web of axial lines.
5.3.7 Relative Depth

The formula for calculating the relative depth (RD) is \[ RD = \frac{2 (MD - 1)}{k - 2}, \] where \( MD \) is the mean depth of a system (obtained by dividing the total depth by \( k \), the number of space in the system). This value of relative depth can be adjusted to eliminate the effect of size, giving a figure which varies about 1 (the average for a cross-section of urban systems), with low values indicating shallow or integrated systems, and higher values for deep or segregated systems, allowing comparisons between towns and urban areas.

5.3.8 Control Value

Control can be defined as the sum of the reciprocal of the connectivity of its neighbours. The control value is calculated by ascribing a value of 1 to each space, or axial line, then summing the reciprocal of the valences of neighbouring spaces, which will give values over 1 for spaces more connected than their neighbours and values less than 1 for less connected spaces.

5.3.9 The Deformed Grid

The grid of a town or city may be defined as the system of space of public access created by the way in which buildings are aggregated and aligned. For clarity, we may represent an urban grid by reversing usual conventions and showing the space as black and built ‘islands’ as white. This has the useful effect of bringing the grid to the foreground as the prime object of analysis. More urban grids are, and always have been deformed grids, characterised by geometric regularity. This presents obvious difficulties for analysis, because most of our special concepts are geometric. Urban grids are also by definition continuous. This creates a second difficulty. How is the urban grid to be represented as a set of discrete elements to make configurationally analysis possible [28]?

The obvious answer is to use the customary topological representation of the grid as a graph in which route intersections are the nodes and route segments the edges. There are two problems with this representation. First, it makes grids look too similar to each other [28].

The deformed grid is the most common urban space structure, especially in traditional European settlements. This grid system characterized by its deformity in two ways: firstly, it is axially deformed, that is, unlike a perfectly regular grid, the lines of sight and access do not continue uninterruptedly through the setting from one end to the other; secondly, the two-dimensionally open spaces vary in their
dimensions and shapes. Figure illustrates hypothetical examples of both forms of grid. Deformed grid settings usually result in different intelligibility from one space to another [28].

Figure illustrates the differences in integration values between the two hypothetical layouts. It can be noted that the deformed grid layout shows more diversity in integration than the regular grid layout illustrated by the colour coding. Visual examination of the colour-coded diagrams reveals more variation in colours in the case of deformed grid, hence integration values. As a result, the deformed grid provides more differentiation and, as a result, lacks the uniqueness of spaces provided by the deformed grid pattern [28].

![Figure 5.5: Hypothetical examples of a regular and a deformed grid](image)

### 5.3.10 Axial Graphs

The axial graph is the graph in which the lines of the axial map are the nodes and the intersections of the lines are the edges. The axial graph is thus a representation of the grid in which the ordering of nodes is lost. All information in the graph is of line-to-line relations, irrespective of the ordering of nodes. The axial map, however, does have information on the ordering of nodes.

### 5.3.11 Inhabitants and Strangers

Although the presence of strangers is generally accepted as being crucial in creating an awareness of others and liveliness in urban areas, they also play an important role in policing space. Unlike Oscar Newman’s defensible space theory which emphasise inhabitants policing space and excluding strangers, our research has led us to conclude that strangers police space and inhabitant police strangers, thus generating ‘automatic’ control in an area without the use of vigilante groups, electronic strangers out, and so reducing certain street crimes.
The interaction and accessibility for strangers and inhabitants are profoundly influenced by the convex and axial organisation of an urban area and its interface with the buildings.

The axial structure of the side allows strangers to enter an area, or, conversely, it keeps them out by making it difficult to get through.

The convex organisation of space and the interface with buildings—whether there are blank walls or barriers, which distance the buildings from public urban space—may equally strongly affect the relation between inhabitants and their neighbours and between inhabitants and strangers [29].

5.3.12 City of Strangers

Difference in the city is as old as the city itself, as it was known from the ancient times that, in Aristotle’s words, “A city is composed of different kinds of men; similar people cannot bring a city into existence”. Especially since the nineteenth century and the unprecedented growth of cities throughout the world, the issue of difference and diversity in the city has become a central feature of urban life.

Emphasis on the heterogeneity of urban life is evident in the discussions about strangers in the city, which have occupied a prominent place in sociological inquiries, to the extent that city life has been seen as a world of strangers [29].

The relationship of the newcomer to an approached urban society is only one aspect of the heterogeneity and anonymity of urban life. It was analysed on the basis that there is a period of transition in the experience of immigrant, from a newcomer to a more integrated member of the social group [29].

The way urbanities deal with the city, make sense of it, and manage public encounters with strangers in large numbers, is a major, but neglected, aspect of sociological inquiry. The way persons relate or fail to relate to each other in anonymous public settings is a central concern of urban social psychology and being urban [28].

5.3.13 Movement in the Urban Environment

Cities can be perceived in two ways: physically and functionally. Physically, they are assemblies of buildings connected by space and infrastructure. Functionally, they facilitate economic, social, cultural, and environmental processes. The physical aspects of cities act as means, while the functional aspects act as ends. Planners are concerned, for the most part, with analysis and control of social and economic
processes that run the city, while urban designers are concerned generally with the physical and spatial synthesis in the city. Bill Hillier, Space is the Machine [15]. The lack of communication and understanding between the two parties has resulted in a gap between the physical and functional aspects of the city and, consequently, the production of the type of contemporary cities that we know today.

In presenting his reasoning for Space Syntax theory, Hillier’s most fundamental argument is that all functions (taking place in urban environment) relate to the form of the city through two generic functional factors: how we as individuals find the city intelligible, and how we move around in it. His argument revolves around the fact that all other functional aspects, such as economical, social, and aesthetic, have to go through these two functional factors and consequently, influence the urban form.

Movement in the urban environment is the most fundamental factor influencing all other factors as it usually dictates the generation of the city’s spatial configuration, though that movement is mostly determined by the existing spatial configuration. This fact was determined through rigorous research studies conducted by Hillier and his assistants, which revealed that the structure of the urban grid considered purely as a spatial configuration, is in itself the most powerful single determinant of urban movement, both pedestrian and vehicular.

5.4. Urban Morphology Studies through the Use of Space Syntax

Space syntax is such a methodology for representing the morphology of buildings and streets developed by Hillier and Hanson. The classification of fields based on these measures must be a prerequisite to the proper analysis of architectural and urban morphologies. The syntactic variables of Space Syntax analysis develop a mathematical model of the morphological structures of the cities.

5.4.1 The Morphological Characteristic of Anatolian Fortified Towns

In the study is presented of morphological characteristics of nine Anatolian fortified towns, Antalya, Ankara, Bursa, Erzuru, Diyarbakır, Iznik, Niğde, Trabzon and Urfa, all of which are located in Anatolia which makes up the greater part of present-day Turkey. This peninsula has always been a centre towards which East and West gravitate and a junction between Europe and the immense Afro-Asian continent.

The fortified towns selected as sample areas have distinct urban patterns derived from Roman, Byzantine, Arabic, and Turkish traditions and still reflect the characteristics and segmented labyrinthine urban texture that bear the marks of the
ottoman period. The selected fortified towns reflect the richness and density of their social, economic, and cultural environment. It is hoped therefore that the examination of the typological variety of the urban layout and the identification of the specific and distinctive characteristics of these towns will considerably to present-day knowledge of urban design.

In the study, the pattern of Anatolian settlements shaped under the influence of several cultures is examined comparatively from the point of view of their identity, including their mathematical interpretation. The methodology adopted in the study, which makes use of a model for analyzing the morphological structures of the Anatolian fortified towns and of the findings from the economic, social, and cultural values that make up their urban structures, will be a source of inspiration for urban designers, especially in creating new syntheses which will reflect the traditional characteristics of historical settlements [30].

**5.4.2 Introducing the third dimension on Space Syntax:**

**Application on the Historical Istanbul**

The study presents the two aspects of the extended version of space syntactic idea in order to analyse urban forms with their topographical characteristics. The historical core of Istanbul that has topography rich in height variation is selected as a sample. Axial lines are extended to incorporate the height change by introducing “extended axial lines”. Moreover, a weighting function is introduced to represent the overlapping nature of inter-visible points between two neighbouring axial lines. Space syntactic indices related to local centeredness are calculated and compared to indices representing actual urban activities. The results indicate that the extension of space syntactic indices to the third dimension are strongly related with the concept of the amount of buildings and commercial activities along roads, whilst they have weak relations with the concept of experts’ indication of local centres. The space syntax approach emphasises the mutual visibility, which may not be the principal factor in forming traditional cities, such as Islamic cities. This result, therefore, suggests that another principal factor should be sought in the building of a powerful analyzing tool for such traditional cities. Compared to the extension to the third dimension, the introduction of the weighting function for intersecting angles of extended axial lines does not contribute significantly to the improvement of this analysis.

The results show that extended version of space syntactic indices well capture the local centeredness in Istanbul, when it comes to the modern nature of local centres,
such as amount of buildings and commercial activities along the road. Another feature of local centeredness that seems well rooted from the historical and cultural background is not, however, well captured by the method. This result is suggested by the low correlation coefficients between experts’ indication of local centres and space syntactic indices. In Islamic cities, the straightness of roads is a fundamental factor in forming cities. Nonetheless, the symbolic buildings, such as mosques, stand out in traditional Islamic cities by constructing such facilities taking the topographic factors into account. This may imply that a notion of visibility other than that along public space should be developed to analyse such a feature in the urban form. The results also show that the introduction of weighting function for angles of directions of neighbouring extended axial lines does not contribute significantly in improving the analysis, while the extension to three-dimensional space does [31].

5.4.3 Morphological Analysis of Built Environment In Trabzon

The purpose of this work is to study the spatial analysis techniques of the Space Syntax to inquire in what ways these techniques are used, and to search for various studies that have been accomplished in the light of these techniques, and to assess and interpret their capabilities and limitations, based on the findings of those studies. This study attempts to formulate, in a concrete way, with the help of these techniques, the various spatial patterns which have been formed throughout the history of the city of Trabzon, both at the settlement and building scales, and to do a comparative analysis of the different models observed, based on the data derived [32].
6. STUDY

6.1 International Housing Database & Vivacity 2020 Project

For the past year, Professor Julienne Hanson from University College London has been working closely with Dr. Edja Trigueiro, from the Universidade Federal do Rio Grande do Norte, Brazil, to develop a simple and robust working methodology for comparing the spatial layouts and social attributes of residential districts from different parts of the world. The objective has been to see if differences in spatial and architectural variables such as housing density, built form, the syntactic layout of the buildings, the arrangement of private and shared open spaces, the design of pedestrian and vehicular routes, and how the dwellings relate visually and permeably to the public domain can provide a useful indication of how vulnerable the area will be to crime, how secure residents will feel in their own homes or when moving around their neighbourhood, and how likely it is that particular parts of the neighbourhood will be targeted by vandalism or anti-social behaviour.

A methodology has been developed for gathering and representing qualitative and quantitative data, which has been successfully piloted by students across eighteen residential districts in Clerkenwell, London. Examples of the housing schemes studied range from early 19th century street layouts to Modernist housing estates and Postmodern mixed use urban blocks. They are now seeking to extend this collaboration to the wider space syntax community, by inviting individuals and institutions with an interest in housing design and layout to try out the method on residential districts that have interesting spatial and / or social characteristics in order to contribute data on housing from different parts of the world to an International Housing Database that will be "owned" and managed by the research community as a central reference point for comparative studies in housing morphology.

6.2 Terminology

The study data have been gathered according to International Housing Database at different urban scale; the super-neighbourhood, the urban block or blocks in which the residential district that is under scrutiny is embedded and the individual dwelling
units that make up the residential district. To avoid ambiguity, the meanings given to the different scales of development in the International Housing Database are defined below.

Super-neighbourhood: this is the 3-kilometre area that surrounds and contains the study area in which all residential districts in quarter of Süleymaniye, located in Istanbul, at historic Peninsula. In the case of a small study of an individual cluster of houses or one small housing estate, it will not be necessary to consider the super-neighbourhood but just the neighbourhood.

Neighbourhood: This is the immediate area in which cases are located, in this study is Süleymaniye.

Urban block or blocks: This is the actual residential district under scrutiny, plus any additional plots and buildings that are contiguous with the housing and surrounded by the adjacent grid of streets. In the case of a housing estate the whole of the urban block could well be zoned for housing and so be mono-functional, though this is not invariably the case. A large housing estate may spread out over several adjacent urban blocks. In the case of a traditional streets and squares layout, the urban blocks are more likely to be clearly delineated, but to contain a mix uses and so be polyfuctional.

Residential district: Because this may be traditional urban streets and squares layout, a housing estate or a mixed-use scheme that contains a mix of housing and non-residential uses, has decided to refer to individual case study examples as residential district. Depending on the characteristics of each residential district, it can also be refereed to by its more common name, such as a housing estate; because that implies that the thesis is not equally interested in traditional and vernacular layouts.

6.3 Quantitative Analysis

As with the development of space syntax itself, a major challenge that has to be overcome before a comparative housing database can be assembled is the issue of size. Some residential districts in the database can be assembled may contain only a small number of dwellings; others could extend too many thousands of homes. Data therefore have to be compared proportionally, rather than by reference to metric areas.

Quantitative data on individual case studies are stored and represented in these ways: proportionally, as a map, as a pie chart, and numerically, as a table. For
example, the proportions of different road types in a residential district are shown as a pie chart. Integration values for the super-neighbourhood are in which the residential district is embedded are shown in a table.

6.3.1 Neighbourhood and Super-neighbourhood Scale

This level of the study collects standardised information about land uses, axial maps, road types and other supporting data, such as a quantitative table of values and a description of the history and morphological character of the area under scrutiny. There data are supported by photographs of the area and its housing. Figure 6 illustrates urban blocks of Süleymaniye.

Figure 6.1: Süleymaniye’s urban block

6.3.2. Land Use Classification

A detailed land use map of study plot enabled us to show the mix of uses at ground level, first floor level, and on a typical upper floor for buildings with three or more storeys for an area immediately around each residential district.
6.3.2.1. Ground Floor Using

![Ground floor land use in Süleymaniye](image)

**Figure 6.2:** Ground floor land use in Süleymaniye

Growth of the district’s population causes change of the physical layout. Population growth is also inflates the demand for commercial activities. The demand for commercial activities leads to the expansion of commercial establishments already in places. The residential characteristic quarter started to have a commercial zone identity by the retails, depots and wholesale centres. In recent years, the low-density squatter settlements that house the overwhelming majority of immigrants. This map shows a mixed pattern of ground floor land use in Süleymaniye. Expansion of commercial sectors creates more employments and these employees require a lot of residential land. In every housing block more than one families or workers group live together.

The ground floor land use classification prepared, comprises 25 different uses. The proportion of land uses present at super neighbourhood scale. There is a remarkable density of commercial facilities along the Kirazlı Mescit Street at ground floor land use. Through the Ayrancı Neighbourhood the residence density at ground
floors takes place the commercial facilities. Figure 6.3 illustrates the proportion of the ground floor land use.

![Pie chart of ground floor land use](image_url)

**Figure 6.3:** Ground floor land use proportion as a pie chart

### 6.3.2.2 First Floor Using

The first floor land use classification prepared, comprises 17 different uses. The proportion of land uses present at super neighbourhood scale. Figure 6.4 illustrates the proportion of the first floor land use.

![Pie chart of first floor land use](image_url)

**Figure 6.4:** First floor land use proportion as a pie chart

First floor land use major element is residence. There is also an idle housing stock. The empty units can be used by immigrants for temporary periods. The inner plans of the houses are reorganized according the users requirements. Another important first floor using is the depots of commercial facilities.
6.3.2.3 Upper Floor Using

The upper floor land use classification prepared, comprises 17 different uses. The proportion of land uses present at super neighbourhood scale. Figure 6.6 illustrates the proportion of the ground floor land use.

Figure 6.5: First floor land use in Süleymaniye

Figure 6.6: Upper floor land use proportion as a pie chart
6.3.3 Axial Map and Integration

In the plot study, the thesis followed good practice by embedding SÜLEYMANİYE in a larger urban hinterland stretching 3 kilometres away from the actual study area. This was to minimise any 'edge effects' when calculating integration measures for the area. Axial analysis was carried out at his super-neighbourhood scale, on the basis of radius-radius integration. The axial map checked for accuracy before calculating integration values for the area. A basic data table at the neighbourhood scale records the number of axial lines, the mean global RRA, mean local RRA, mean integration radius-radius, mean depth from most integrated line and the number of dead end lines.
Figure 6.8: Süleymaniye’s axial map

As shown figure 6.8 Süleymaniye axial maps is very fragmented and situated lots of short lines.

Figure 6.9: Süleymaniye’s open space map

As shown figure 6.9 the street layout has a deformed grid form.

Figure 6.10: Süleymaniye integration map

According to the Süleymaniye integration map, the most integrated zone is constituted by the axes trough the külliye. The residential zone of the quarter has lot of fragmented short axes. This zone is more inverted and less integrated with the whole system.
Süleymaniye has an integrated core along the Kirazlı Mescit Street where the pedestrian movements are concentrating. The configuration of the streets reinforced Islamic organic characteristic; in urban blocks formation there is no geometry and no common proportion. The major linear axis that the urban blocks passes through the fragmented urban blocks south to north divides the organic pattern. The külliye of Süleymaniye is well integrated with the whole quarter and his civic centre is the integrated core of the quarter.
6.3.4 Road Types

During the second half of the 20th century, theories of zoning led to propositions about street hierarchies that differentiated arterial roads from local distributors and pedestrian routes. The different levels in the hierarchy were zoned for different urban uses. The new urban forms of urban space have led to new typologies for classifying pedestrian and vehicular routes. The typology of roads differentiates through roads used by both vehicles and pedestrians, cul de sac used usually by pedestrians, and pedestrian paths. The proportion of different road types are showed as a map, as figure 6.12 provided that the road typology is restricted to the urban bloc or blokes that will study in the next level down in the urban hierarchy and its immediately surrounding streets.

6.3.5 Open Space Analysis

This typology differentiates between roads, paths, vertical access, car parks, common green areas and hard landscaped spaces, private yards and gardens, areas of restricted Access that no one can use buildings and other spaces. The proportions of each type of space in residential district are calculated and presented as a pie chart and as map.
Cemeteries are situated in the residential blocks. There is not any open area that has square’s characteristic between residential urban blocks. Privacy is the major defining elements for situating open space texture. Private gardens, yards take place at the residential urban blocks. Another remarkable open space element is the parking. By destroying the urban fabric, civic architecture has been demolishing; at the end of the process parking takes place at the ruined buildings. The külliye of Süleymaniye is the main public meeting places. After the külliye construction, this great civic centre created the main and the most integrated axe of the quarter. The külliye of Süleymaniye is not only a Friday mosque; The külliye of Süleymaniye is also a great civic centre that has an education, health, and commercial functions together.

6.3.5.1 The Külliye of Süleymaniye

Various sources state that Sinan was the architect of around 360 structures which included 84 mosques, 51 small mosques ("mescit"), 57 schools of theology ("medrese"), 7 schools for Koran reciters ("darülkurra"), 22 mausoleums ("türbe"), 17 Alm Houses ("imaret"), 3 hospitals ("darüssifa"), 7 aqueducts and arches, 48 inns ("Caravansarai"), 35 palaces and mansions, 8 vaults and 46 baths. Sinan, who held the position of chief architect of the palace, which meant being the top manager of
construction works of the Ottoman Empire, for nearly 50 years, worked with a large team of assistants consisting of architects and master builders.

The development and maturing stages of Sinan can be marked with three major works. The first two of these are in Istanbul - Sehzade Mosque which he calls his apprenticeship period work, Süleymaniye Mosque which is the work of his qualification stage, and Selimiye Mosque in Edirne the product of his master stage. Sehzade Mosque is the first of the grand mosques Sinan has created. Mihrimah Sultan Mosque which is also known as the Uskudar Quay Mosque was completed in the same year and has an original design with its main dome supported by three half domes. When Sinan reached the age of 70, he had completed the Süleymaniye Mosque and its Complex. This building, situated on one of the hills of Istanbul facing the Golden Horn, and built in the name of Süleyman the Magnificent between 1550-57, is one of the symbolic monuments of the period.

The Süleymaniye is the largest square based semidomed mosque (3100m²) to have been designed by Sinan. The two semidomes are situated in the direction of mihrab, a plan we see in Saint Sophia and later in Beyazid Mosque. Sinan had a very strong desire to surpass Saint Sophia, which was very much admired by the Turks. It may have been at the sultan’s request that he opted for a plan similar to that of Saint Sophia. However, if the two buildings are indeed similar in terms of their general plan, the Süleymaniye is superior to Saint Sophia in terms of proportions, space and the rationality of the bearing system, as well as both its interior and exterior perception. The differences between the two religions in their approach to space have also had its impact on the building.

The transition between the central and lateral naves is provided by two small and one large arch. The same rhythm can be noticed on the lateral façade and the cupolas covering the lateral naves. In the flanks, the arches supporting the dome end in a series of graded steps. The arches were filled with a partition wall pierced with windows. At a lower level, the lateral naves are covered by a rhythmic succession of large and small cupolas. Sinan claims he was the first to implement such a design. With all these gradations, the mass of the mosque takes on pyramidal external proportions.

On the sides, two-storeyed eaved porticoes are situated between the dome supporting piers that gradually descend to the ground. This new solution, first implemented in the Şehzade Mosque, is repeated in its two-storeyed version in the Süleymaniye and the Selimiye Mosque. Such external porticoes or galleries, met
with great success, and would continue to be used in large mosques after Sinan. Water taps, for ritual washing were installed below the porticoes at the basement level. The mihrab façade on the other hand does not exhibit the same level of achievement, appearing as a mere buttressed retaining wall. As for the minarets, they are situated at each of the four corners of the courtyard. The two nearest to the mosque are 76 m. high and decked with three balconies, while on the other side of the courtyard are 56 m. high and have two balconies. The main portal of the courtyard is very high and furnished with three rows of windows, giving a palatial appearance to the façade, an effect which Sinan did not try to achieve in his later works [34].

6.3.6 Urban Blocks

Like space syntax morphologist, traditional urban morphologists also conceive of the city as a fabric composed of continues street grid that surrounds a set of discrete urban blocks (insulate), which in turn comprise plots, on which stand the buildings. The grain of the urban fabric can be described as loose or tight knit, depending on the density. Urban morphologists compare urban fabrics systematically, by measuring shape and form properties of urban block.

Unlike many previous studies of residential districts, the urban has been selected in preference to the site as the basic unit for analysis in the IHD. This is because the premise derived from previous syntactic studies at the urban scale is that in an organic, bottom up urban system, similar land uses aggregate along axial lines but land use differs on the different faces of the urban block. If we look at the grid of streets as a basic urban element, the same land uses tend to continue along an axial line and to change when the angle of alignment of the line changes.

At this level in the study format, a series of representations are showed as maps of different land uses at ground, first and upper levels respectively of the urban block or blocks under consideration, maps of construction styles, building ages and building floors number, and an analysis of the open space of the block or blocks, the location and type of primary and secondary boundaries for buildings and open spaces in the block or blocks, the location of building entrances. A table is also provided, in which to record the type of housing, the total site area, building footprint area, residential density as dwellings/ha. And people/ha, number of car parking space etc. There is usually space left to include additional descriptive data and photographs.
6 urban blocks are selected and examined according their morphological and land use characters. Three of these urban blocks chosen from Ayrancı mahallesi, the others selected from Kirazlı Mescit Street, which is the main axe of the quarter.

![Selected urban blocks](image)

**Figure 6.14:** Selected urban blocks

### 6.3.6.1 Block I

![Ground Floor, First Floor, Upper Floor Land Use Map of the Block I](image)

**Figure 6.15:** Ground Floor, First Floor, Upper Floor Land Use Map of the Block I

Figure 6.15 shows the high density of housing stock and residential use. The block I has three private garden-yards which are still used. There is only one grocer as the commercial facilities. It is a typical Süleymaniye residential block.
Figure 6.16: Building Construction Style, Building Floor Number, Building Ages of the Block I

According the analysis most of the buildings of the block I are made by stone or wood. There are some important civic architecture examples which are averagely 50-100 years. The heights of the buildings are not the same; this feature gives a rhythmic silhouette.

Table 6.2: Land use proportion of block I

<table>
<thead>
<tr>
<th>BLOCK I</th>
<th>m²</th>
<th>ha</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Block Area</td>
<td>1243</td>
<td>1.243</td>
<td></td>
</tr>
<tr>
<td>Building Footprint Area</td>
<td>654</td>
<td>0.654</td>
<td>53</td>
</tr>
<tr>
<td>Open Space Area</td>
<td>589</td>
<td>0.589</td>
<td>47</td>
</tr>
<tr>
<td>Private Garden-Yard</td>
<td>140</td>
<td>0.14</td>
<td>0.11</td>
</tr>
<tr>
<td>Car parking</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Common Area</td>
<td>235</td>
<td>0.235</td>
<td>0.19</td>
</tr>
<tr>
<td>Path</td>
<td>214</td>
<td>0.214</td>
<td>0.17</td>
</tr>
<tr>
<td>Total Construction Area</td>
<td>2146</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Residential Area</td>
<td>1583</td>
<td></td>
<td>74</td>
</tr>
<tr>
<td>Number of car parking</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>People</td>
<td>96</td>
<td>77.2</td>
<td>p/h</td>
</tr>
</tbody>
</table>

6.3.6.2 Block II
Figure 6.17: Ground Floor, First Floor, Upper Floor Land Use Map of the Block II

Figure 6.17 shows the high density of housing stock and residential use. The block II has lots of private garden-yards which are still used. There is only one grocer and a depot as the commercial facilities. It is a typical Süleymaniye residential block.

Figure 6.18: Building Construction Style, Building Ages, Building Floor Number, of the Block II

According the analysis most of the buildings of the block II are made by stone or wood. At block II there are also three building made by R.C. which have some commercial function. There are some important civic architecture examples which are averagely 50-100 years. The R.C. buildings are the highest buildings. The heights of the buildings are not the same; this feature gives a rhythmic silhouette.

Table 6.3: Land use proportion of block II

<table>
<thead>
<tr>
<th>BLOCK II</th>
<th>m²</th>
<th>ha</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Block Area</td>
<td>1886</td>
<td>1.886</td>
<td>67</td>
</tr>
<tr>
<td>Building Footprint Area</td>
<td>1266</td>
<td>1.266</td>
<td>67</td>
</tr>
<tr>
<td><strong>Open Space Area</strong></td>
<td>620</td>
<td>0.620</td>
<td>33</td>
</tr>
<tr>
<td>Private Garden-Yard</td>
<td>239.26</td>
<td>0.239</td>
<td>13</td>
</tr>
<tr>
<td>Car parking</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Common Area</td>
<td>172.93</td>
<td>0.173</td>
<td>0.09</td>
</tr>
<tr>
<td>Path</td>
<td>207.81</td>
<td>0.208</td>
<td>0.11</td>
</tr>
<tr>
<td><strong>Total Construction Area:</strong></td>
<td>4088</td>
<td>4.088</td>
<td></td>
</tr>
<tr>
<td>Total Residential Area</td>
<td>3943</td>
<td>3.943</td>
<td>96</td>
</tr>
<tr>
<td>Number of car parking</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>People</strong></td>
<td>95</td>
<td>50.3 p/h</td>
<td></td>
</tr>
</tbody>
</table>
6.3.6.3 Block III

Figure 6.19: Ground Floor, First Floor, Upper Floor Land Use Map of the Block III

Figure 6.19 shows the high density of housing stock and residential use. It is a typical Süleymaniye residential block.

Figure 6.20: Building Construction Style, Building Floor Number, Building Ages of the Block III

As Figure 6.20 shows block III has lots of wood building which have nearly 100-150 years. Most of the buildings of the block III are made by stone or wood. There are some important civic architecture examples. The heights of the buildings are not the same; this feature gives a rhythmic silhouette.

Table 6.4: Land use proportion of block III

<table>
<thead>
<tr>
<th>BLOCK III</th>
<th>m²</th>
<th>ha</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Block Area</td>
<td>1328</td>
<td>1.328</td>
<td></td>
</tr>
<tr>
<td>Building Footprint Area</td>
<td>1021</td>
<td>1.021</td>
<td>73</td>
</tr>
<tr>
<td><strong>Open Space Area</strong></td>
<td>307</td>
<td>0.116</td>
<td>27</td>
</tr>
<tr>
<td>Private Garden-Yard</td>
<td>205</td>
<td>0.205</td>
<td>0.16</td>
</tr>
<tr>
<td>Car parking</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Common Area</td>
<td>41.10</td>
<td>0.041</td>
<td>0.031</td>
</tr>
<tr>
<td>Path:</td>
<td>61</td>
<td>0.061</td>
<td>0.046</td>
</tr>
<tr>
<td><strong>Total Construction Area</strong></td>
<td>2468</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Residential Area</td>
<td>1711</td>
<td></td>
<td>69</td>
</tr>
<tr>
<td>Number of car parking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>People</strong></td>
<td>122</td>
<td>107.3 p/h</td>
<td></td>
</tr>
</tbody>
</table>
6.3.6.4 Block IV

**Figure 6.21:** Ground Floor, First Floor, Upper Floor Land Use Map of the Block IV

Block IV is situated on the one of the most integrated zone where there is very important density of functional diversity. According the Figure 6.21 the façades on the Kirazlı Mescit Street are used for commercial activities.

**Figure 6.22:** Building Construction Style, Building Floor Number, Building Ages of the Block IV

As Figure 6.22 shows block IV has a mixed building construction style. Most of the buildings have lost their traditional character and transformed to R.C. buildings.

**Table 6.5:** Land use proportion of block IV

<table>
<thead>
<tr>
<th>BLOCK XVII</th>
<th>m²</th>
<th>ha</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Block Area</td>
<td>3525</td>
<td>3.525</td>
<td></td>
</tr>
<tr>
<td>Building Footprint Area</td>
<td>1379</td>
<td>1.379</td>
<td>40</td>
</tr>
<tr>
<td><strong>Open Space Area</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private Garden-Yard</td>
<td>284</td>
<td>0.284</td>
<td>8.17</td>
</tr>
<tr>
<td>Car parking</td>
<td>353</td>
<td>0.353</td>
<td>10</td>
</tr>
<tr>
<td>Common Area</td>
<td>1199</td>
<td>1.199</td>
<td>34</td>
</tr>
<tr>
<td>Path</td>
<td>276</td>
<td>0.276</td>
<td>7.83</td>
</tr>
<tr>
<td><strong>Total Construction Area</strong></td>
<td>4433</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Residential Area</td>
<td>1607</td>
<td></td>
<td>36.25</td>
</tr>
<tr>
<td>Number of car parking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>People/ha</td>
<td>144</td>
<td>40.88</td>
<td></td>
</tr>
</tbody>
</table>
6.3.6.5 Block V

Figure 6.23: Ground Floor, First Floor, Upper Floor Land Use Map of the Block V

Figure 6.23 shows that the block V has a diversity of land use. It is situated on the Kirazlı Mescit Street, so there is a high commercial activity. There is a mixed land use character.

Figure 6.24: Building Construction Style, Building Floor Number, Building Ages of the Block V

Table 6.6: Land use proportion of block V

<table>
<thead>
<tr>
<th>BLOCK V</th>
<th>m²</th>
<th>ha</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Block Area</td>
<td>2891</td>
<td>2.891</td>
<td></td>
</tr>
<tr>
<td>Building Footprint Area</td>
<td>1127</td>
<td>1.127</td>
<td>39</td>
</tr>
<tr>
<td>Open Space Area</td>
<td>1764</td>
<td>1.764</td>
<td>61</td>
</tr>
<tr>
<td>Private Garden-Yard</td>
<td>61</td>
<td>0.61</td>
<td>2</td>
</tr>
<tr>
<td>Car parking</td>
<td>516</td>
<td>0.516</td>
<td>16</td>
</tr>
<tr>
<td>Common Area</td>
<td>1045</td>
<td>1.045</td>
<td>36</td>
</tr>
<tr>
<td>Path</td>
<td>142</td>
<td>0.142</td>
<td>5.6</td>
</tr>
<tr>
<td>Total Construction Area</td>
<td>2849</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Residential Area</td>
<td>1109</td>
<td></td>
<td>39</td>
</tr>
<tr>
<td>Number of car parking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>People/ha</td>
<td>133</td>
<td>46 p/h</td>
<td></td>
</tr>
</tbody>
</table>
6.3.6.6 Block VI

Figure 6.25: Ground Floor, First Floor, Upper Floor Land Use Map of the Block VI

Figure 6.25 shows that the block VI has a diversity of land use. It is situated on the Kirazlı Mescit Street, so there is a high commercial activity. There is a mixed land use character.

Figure 6.26: Building Construction Style, Building Floor Number, Building Ages of the Block VI

Table 6.7: Land use proportion of block VI

<table>
<thead>
<tr>
<th>BLOCK VI</th>
<th>m2</th>
<th>ha</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Block Area</td>
<td>1723</td>
<td>1.723</td>
<td></td>
</tr>
<tr>
<td>Building Footprint Area</td>
<td>1562</td>
<td>1.562</td>
<td>90</td>
</tr>
<tr>
<td><strong>Open Space Area</strong></td>
<td>161</td>
<td>0.161</td>
<td>10</td>
</tr>
<tr>
<td>Private Garden-Yard</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Car parking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common Area</td>
<td>134</td>
<td>0.077</td>
<td></td>
</tr>
<tr>
<td>Path</td>
<td>27</td>
<td>0.023</td>
<td></td>
</tr>
<tr>
<td><strong>Total Construction Area</strong></td>
<td>2849</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Residential Area</td>
<td>3345</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>Number of car parking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>People/ha</strong></td>
<td>89</td>
<td>51.65</td>
<td>p/h</td>
</tr>
</tbody>
</table>
6.3.7 Analysis of Primary and Secondary Boundaries

At this level in the study, the building façade and secondary boundary of selected urban blocks are examined, with reference to its height, transparency or opacity, and permeability with respect to doors and windows.

Primary (building) boundaries are differentiated according to whether they are active (shop) frontages, doors and Windows, just doors or just Windows, upper level visibility only, or blank walls.

Figure 6.27: Analysis of Boundaries of Block I

The building’s ground floors of the block I have just a door, the first and seconds floors have windows. The situation of the ground floor gives an introversion and emphasis the privacy comprehension. The relation with the streets is provided by the others floors windows.

Figure 6.28: The Location of the Block I at Axial Map
Block I is a residential urban block. Each building front façade is situates at roads. The transparent elements proportion on the facades is balanced. There is not a decomposition of the ground floor land use.

**Figure 6.29: Analysis of Boundaries of Block II**

The building's ground floors of the block II have just a door, the first and seconds floors have windows. There is only on building which has a door and the windows at the ground floor. The situation of the ground floor gives an introversion and emphasis the privacy comprehension. The relation with the streets is provided by the others floors windows.

**Figure 6.30: The Location of the Block II at Axial Map**

Block II is a residential urban block too. Each building front façade is situates at roads. The transparent elements proportion on the facades is balanced. There is not a decomposition of the ground floor land use. It is less integrated with the whole system and it is also inverted.
Figure 6.31: Analysis of Boundaries of Block III

As shown figure 6.31 the building’s ground floors of the block III have just a door, the first and seconds floors have windows. The situation of the ground floor gives an introversion and emphasis the privacy comprehension. The relation with the streets is provided by the others floors windows.

Figure 6.32: The Location of the Block III at Axial Map

Block III is another residential urban block too. Each building front façade is situates at roads. The transparent elements proportion on the facades is balanced. As shown figure 6.32 there is not a decomposition of the ground floor land use. It is less integrated with the whole system and it is also inverted.
Figure 6.33: Analysis of Boundaries of Block IV

As shown figure 6.33 Block IV is situated trough the Kirazlı Mescit Street. Each building front façade is situates at roads. The transparent elements proportion on the facades is balanced. There lots of active frontage at ground floors, so there is a mixed used land use at block IV. It has also a commercial characteristic.

Figure 6.34: The Location of the Block IV at Axial Map

As shown figure 6.34 there is a more integration with the whole system and it is not so inverted.

Figure 6.35: Analysis of Boundaries of Block V
Figure 6.36: The Location of the Block V at Axial Map

As shown figure 6.35 Block V is situated trough the Kirazlı Mescit Street. Each building front façade is situates at roads. The transparent elements proportion on the facades is balanced. There lots of active frontage at ground floors, so there is a mixed used land use at block V. It has also a commercial characteristic. At this block there is morphological demolition. Lots of building is ruined, for this reason it starts to lose its urban characteristic.

Figure 6.37: Analysis of Boundaries of Block VI

As shown figure 6.37 Block VI is situated trough the Kirazlı Mescit Street. Each building front façade is situates at roads. The transparent elements proportion on the facades is balanced. There lots of active frontage at ground floors, so there is a mixed used land use at block VI. It has also a commercial characteristic.
6.3.7.1 The Facades Characteristics in Süleymaniye

Following factors have been effective to determine the façade characteristics of Süleymaniye buildings:

- Climatic conditions
- Geographic conditions
- Socio-cultural and socio-economic conditions
- Religious conditions
- Possibilities of materials
- Constructive possibilities
- Human scale

These factors exposed following clear features on the façade of traditional civic architecture:

- Wood coating with equal width on the façade
- Hipped roof
- Tile covertures
- Windows arrays symbolizing a module or a rhythm
- Wood laths encircling the floors windows
- Iron fences at ground floors windows
- Entrance door with double leafs
• Ornaments on the windows and doors borders.
• Rectangular formed cumbas

At the quarter of Süleymaniye, houses are closed to the outside because of the privacy comprehension. The house consists of rooms situated around a hall (sofa) at an elevated floor. The extraversion of the houses is provided thanks to jumps of the uppers floors rooms. The unique relation contacting with the street is the entrance door of the buildings. Houses which take places in the gardens are separated from the street by their high garden wall.

6.4 Social Structure of Süleymaniye

The site was a place where the rich and elegant society of Ottoman administrative class were living in 17th century, unfortunately, in the 20th century, the structures were left to worker immigrants and their families from eastern regions of Turkey in order to be used for housing, manufacture or wholesale ateliers with the industrialization and development competition of Istanbul metropolis. This situation brings new discussions of gentrification in the case that the original social layout has changed completely as in Süleymaniye.

The existence of Istanbul University in the core of the planning area gives an important impact on social restructuring. The student population brings new socio-economic functions and creates a socially active environment indirectly. This potential cannot be ignored when considering development in socio-cultural dimensions.
7. CONCLUSION

Cities and urban life were a central concern in Ottoman culture. In the administration of the empire, cities were the nodes through which Istanbul’s dominance was enforced and culture ideas were disseminated. Ottomans reshaped cities, layered them with architecture, and produced a literature, which described, represented, categorized and praised cities and urban life. Süleymaniye was one of these stories.

The Islamic urban principles inherent in the traditional model are viable and pertinent to a contemporary setting and constitute the performance criteria necessary for the development of appropriate urban design guidelines applicable in the modern urban environment.

The Ottoman quarter of Süleymaniye was conducive to the needs and aspirations of its inhabitants through a legacy of built form and urban layout. The morphology of the quarter followed religious precepts, provided for all levels of man’s psychological development and motivations, and ranked high in terms of a good city form. The interaction between regional, geographic, historical, and cultural factors and urban form created a distinct urban pattern unique to Ottoman cities, Islamic quarters. In this sense, Islamic and Ottoman urban form principles constitute the valid foundation for contemporary buildings and quarters, and are a viable tool in achieving functionally efficient and coherent built environments. The quarter model includes a centralized civic centre, a socio-cultural, socio economic and religious centre, market, residential neighbourhoods, and irregular, narrow streets. According to the analysis the features of the Külliye are conspicuous: The Külliye of Süleymaniye has constituted its own centralism although it has not been construed in a central point in the city and near the main route axes. Süleymaniye has been taking places at the Istanbul city silhouette as a natural part of the urban topography. The külliye is the most integrated zone of the whole system of the quarter, but its own structure seems a semi-separated centre which is introvert and not to much integrated with the quarter streets. Strangers are oriented to the külliye.

The urban landscape and open common spaces were planned to satisfy the needs of its inhabitants and were full of respect to the design principals concerning privacy. With modern aims in mind, it is thus possible to create contemporary, functionally
efficient cities or elements thereof, based on Ottoman design principles inspired by historical precedents while incorporating modern technology and contemporary needs as well. Hence, and in light of the pressing need to establish an authentic urban vocabulary linked to tradition.

The entire system of open space is lined with entrances to the building, active frontages which create a direct interface between the closed and the open part of residential areas. Irregular narrow streets layout and residential housing zones are introvert and less integrated in the whole system. The high percentage of the resident façades’ visibility is low. The relation between the houses and the street is contribute thanks to the door, the ground floor are usually constituted by blind wall.

There is a major axe; some changes of axial steps are needed to reach the civic centre and the core of the quarter Suleymaniye kulliye-. The most integrated lines are the longer lines at the core that reflect the major public movement and shelter the commercial and religious buildings. The most integrated lines which are longer liens at the core reflecting the major public movement and shelter the commercial and religious buildings. When the quarter is examined morphologically, the organic urban pattern is still actual in the quarter and the axial map demonstrates deformed grid layout. This axial pattern shows the quarter is similar to the European medieval age organic cities, with their narrow streets and cul de sac and a very important central land mark as the church and around the church the market area around it. The housing texture which reflects the organic deformed grid residential zone completes the syntactic organisation.

The facade and the construction styles of the houses in Suleymaniye could still be preserved even though their inner space organisation has been deformed by the intervention. Due to this intervention, the healthy syntactic values have been changed and the housing stock has been transformed to an inert sheltered mass.

The length and the width of the convex segments and their variety are spatial characteristics of traditional Ottoman towns. Axial lines pass through several convex segments. There are 234 convex spaces in the quarter. This ensures the much admired local articulation of vernacular space and an awareness of the local parts’ integration into the city’s whole structure.

Traditional Suleymaniye quarter is characterised by an irregular non-orthogonal pattern, in which the urban grid is deformed so that it generates a rich and varied spatial quality. It is difficult to see any intelligible spatial order in such urban pattern quarter. Moreover, Suleymaniye gives a living joy to its inhabitant’s and passengers.
The temptation for the passengers is to perceive and to live the apparent three dimensional disorders by comprehending a subtle two-dimensional spatial pattern.

The axial map of Suleymaniye consists of the fewest and longest straight lines that cover the entire surface of the quarter. The axial organisation of Suleymaniye is very fragmented, with a high percentage of short axial lines placed organically to each other. Enclosure and definition which provides the continuity of the street frontage and the enclosure of space is promoted by this deformed grid network. The human scale, the degree to which the size, form and design of buildings, streetscapes and space relates to human proportion is supported by this syntactic organisation.

The living conditions of physical environment are damaged with the advent of migration. In order to regain the historical continuity via the integration of the inhabitants, I, as a designer, should understand the design and the social layout of Suleymaniye. The quarter’s degree of adaptability is enough to transform Suleymaniye by responding to the changing social, aesthetic, technological and economic conditions.

I have been prepared an urban and architectural morphological analysis for IHD. Süleymaniye where different civilisations have been embodying during centuries and has taken its last character by Islamic neighbourhood physical features provides diversity for IHD. This thesis becomes a study to comprehend and comment how the Istanbul cultural diversity and social life have been shaping open space and civil architectural plan organisation.

This study is a starting point for thinking about Suleymaniye for designing and planning more living, more integrated, and more democratic builted environment for people.
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