**ISTANBUL TECHNICAL UNIVERSITY ★ GRADUATE SCHOOL OF SCIENCE ENGINEERING AND TECHNOLOGY**

# A METHODOLOGY FOR ANALYZING URBAN FORM CASE OF KORÇA

**M.Sc. THESIS**

**Egin ZEKA**

**Department of Interdisciplinary**

**Urban Design Programme**

**JUNE 2012**

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**Thesis Advisor: Assist. Prof. Dr. Mehmet Ali YÜZER**

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**İSTANBUL TEKNİK ÜNİVERSİTESİ ★ FEN BİLİMLERİ ENSTİTÜSÜ**

# ŞEHİRSEL DOKU ANALİZİ İÇİN BİR METODOLOJİ
# KORÇA ÖRNEĞİ

**YÜKSEK LİSANS TEZİ**

**Egin ZEKA**
**(519091036)**

**DisiplinlerarasıAnabilim Dalı**

**KentselTasarımProgramı**

**TezDanışmanı: Yrd.Doç. Dr. Mehmet Ali YÜZER**

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**EginZeka**, a **M.Sc.** student of ITU **Institute of Graduate School of Science Engineering and Technology** student ID **519091036**, successfully defended the **thesis** entitled "**A METHODOLOGY FOR ANALYZING URBAN FORM - CASE OF KORÇA**", which he prepared after fulfilling the requirements specified in the associated legislations, before the jury whose signatures are below.

| | | |
|---|---|---|
| **Thesis Advisor :** | **Assist. Prof. Dr. Mehmet Ali YÜZER**<br>Istanbul Technical University | ..... |
| **Jury Members :** | **Prof. Dr. Nilgün ERGUN**<br>Istanbul Technical University | ..... |
| | **Assist. Prof. Dr. Selim VELİOĞLU**<br>Istanbul Technical University | ..... |

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***To my family,***

## FOREWORD

Urban design theories, approaches or practices usually try to find new planning methods that improve the quality of life and solve the problems of cities. An urban design practice can be successful only if it is developed within the context of the local environment. One of the main representations of the local values in any city is the physical urban pattern of its traditional areas. Unfortunately, the new urban design implementations do not give sufficient consideration to the spatial organization of the traditional settlements, and in many cases they result unsuccessful. The main objective of this study is to establish a methodology of analyzing urban form and develop a design guide which tries to interpret its spatial characteristics to the design of new urban areas by adapting them to nowadays conditions. A traditional urban zone in the city of Korça in Albania was chosen as a case study for doing the morphological analyses and developing a design guide for new residential areas.

Firstly, I want to thank my adviser professor Assist. Prof. Dr. Mehmet Ali Yüzer who encouraged me for choosing such a challengeable but at the same time a very important topic and also for orientating me during the process of this study.

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**ABBREVIATIONS**

**MUK** **:** Municipality of Korça
**LAMP** **:** Land Administration and Management Project
**ISUF** **:** International Seminar of Urban Form
**I.T.U** **:** Istanbul Technical University
**IHT** **:** Institution of Highways and Transportation
**ECC** **:** Essex Country Council

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## A METHODOLOGY FOR ANALYZING URBAN FORM: CASE OF KORÇA


### SUMMARY

The city is a very complex phenomenon that is formed under the effect of different actors and their relationships with each other. Urban design, as a discipline that tries to establish the most appropriate models (methods) of city building, is also a complex field that is influenced by various factors. The main determinants that effect the urban design decisions can be summarized as: natural environment; socio-economical structure; technological innovations and the division of land ownership (plot pattern). Besides these elements, another very significant actor that should orientate the urban design decisions is the typology of existing (traditional) urban pattern and its spatial organization, since it is a manifestation of different local values (social, cultural, physical) and the identity of the city. Actually, this fact has been neglected by many urban design practices in nowadays.

In this context, this study tries to develop a methodology for analyzing (understanding) the characteristics of the traditional urban form and its elements, and implementing their spatial qualities into the design of new urban areas by interpreting them to the conditions of our days. A traditional urban zone in the city of Korça in Albania was chosen as a case study for doing the morphological analysesfor understanding the characteristics of this pattern. After that, a design guide was developed within a context that tries to interpret the spatial features of the traditional urban form into the design of new residential areas in Korça.

The thesis research consists of six sections. The first section starts with an introduction to the topic of the research; its main objectives; the scope of the study; the methodology; and the reasons for choosing the city of Korça as a case study area.

The second section deals with the definitions of the urban form, the establishment of urban morphology as a study filed and the description of the different elements of the city space. In the first part, there are some definitions of different scholars about the city and urban form, seen from different angles. Secondly, the emergence of urban morphology as a discipline is explained within a historical background by focusing more on the establishment of three schools of morphology (English, Italian and French school) and the use of new methods in studying urban form (quantitative, computer based methods). Finally, this section makes a more detailed definition and description of three main elements of urban form: street pattern, open spaces and built form.

The third section gives some general information about the city of Korça such as: its geographical features, demographic and economic profile, the historical development and the main components of the city.

The fourth section focuses on the morphological analysis on the historic district, a zone near the city center which is chosen as the study area. These morphological analyses are done in three different contexts: street pattern, open spaces and built

form. Each of these elements is analyzed in different levels (scales) by showing different characteristics of their spatial arrangement.

The fifth section consists of an urban design guide for new residential areas in Korça. The main aim of this guide is to establish some design standards that integrate the traditional urban typology to the new socio-economical conditions. Firstly, there are introduced some general urban design principles that can be also implemented in the city of Korça. After that, the concept of neighborhood unit is explained by defining criteria such as: size, population, and the scheme of spatial organization and land uses. Finally, the design guide for the specific case of Korcais developed in three different contexts. In the first part, the features of the neighborhood unit are defined (size, population, densities and land uses). Secondly, it defines the standards of the transportation system (street hierarchy, width, circulation mode) and street pattern features. After that, the guide defines the spatial characteristics of different layouts that are proposed for the new urban areas in Korça. All of these design standards are supported with images and are developed in different scales. The detailed guidelines elaborated with illustrations and explanations are given in the appendices section.

The final section, summarizes the scope of this study and makes an evaluation of the conclusions that can be obtained from this research.

## ŞEHİRSEL DOKU ANALİZİ İÇİN BİR METODOLOJİ: KORÇA ÖRNEĞİ


### ÖZET

Şehir, fiziksel ve sosyo-ekonomik faktörlerin etkisinin sonucunda oluşan bir yapıdır. Buna bağlı olarak, kentsel tasarım da, bu faktörleri göz önünde bulundurarak, insanların hayat kalitesini artıracak ve şehrin sorunlarına çözüm üretecek yeni metodlar geliştirmeye çalışan bir disiplindir.

Kentsel tasarımı yönlendiren en önmli etkenler: doğal çevre; sosyo-ekonomik yapı; teknolojik gelişmeler; mülkiyet durumu; ve tasarımcının bilgi birikimi olarak sıralanabilir. Bunların dışında, kentsel tasarım çalışmalarında, bir yol gösterici olarak, dikkate alınması gereken başka çok önemli bir konu da, mevcut (geleneksel) şehirsel dokusunun ve onu oluşturan elemanların özellikleridir. Ancak, yapılan birçok yeni kentsel tasarımlarda, bu dokunun yapısına yeterince önem verilmiyor ve bunun sonucunda birbirinden kopuk ve mekansal kurgusunda çok başarılı olmayan yerleşmeler ortaya çıkıyor.

Bu bağlamda, bu çalışmanın temel amacı, geleneksel kentsel dokusunun özelliklerini ortaya çıkarmaya ve onun mekansal organizasyonunu yeni tasarımlarda, günümüzün koşullarına uygun olarak yorumlamaya çalışan bir metodoloji geliştirmektir. Bunu gerçekleştirmek için, öncellikle, çalışma alanı olarak, Korça şehrinde geleneksel dokusunu korumuş bir bölge seçilerek, detaylı morfolojik analizler yapıldı. Bu analizler ve onların sentezi sonucunda, alanın mekansal kurgusunun özellikleri ile ilgili önemli tespitler yapıldı. İkinci aşamada ise, bu özellikleri, Korça'nın yeni gelişme alanların tasarımlarına taşıyacak bir kentsel tasarım rehberi oluşturulmaya çalışıldı.

Tez çalışması altı bölümden oluşuyor. Birinci bölümde, tezin konusuna bir giriş yapılarak, çalışmanın amacı, kapsamı, kullanılan metodoloji ve çalışma alanı olarak Korça şehrinin seçilme nedenleinden bahsedildi.

Bu araştırmada kullanılan metodoloji dört farklı aşamadan oluşuyor. İlk olarak, konu ile ilgili literatür taraması yapıldı. Bununla ilgili, kentesl morfoloji, kentsel doku ve ögelerini konu alan çalışmalar ve yazılar (kitap, dergi, makale) incelendi. İkinci aşama, çalışma alanı ve konu ile ilgili verilerin toplanmasından oluşuyor. Çalışma alanı (Korça) hakkında daha önce yapılmış çalışmalar ( kitap, rapor, proje, halihazır haritalar) elde edildi. Ayrıca, çalışma alanında çeşitli gözlemler (ölçümler, fotoğraflar) yapılaarak önemli bilgiler sağlandı. Üçüncü aşamada, toplanan verileri kullanarak, kentsel doku ile ilgili farklı analizler ve sentezler üretildi. Bu analizlerdefarklı bilgisyar programları (AutoCAd, Photoshop, SketchUp, Microsoft office) ve el çizmleri teknikleri kullanıldı. Son aşama ise, yapılan analizleri ve sentezleri değerlendirerek, Korça'nın yeni gelişme alanları için bir kentsel tasarım rehberi gelitirilmeye çalışıldı.

Korça'nın çalışma alanı olarak seçilmesinin iki önemli nedeni vardır. Birincisi, Korça, Arnavutluk'ta geleneksel şehir dokusunu korumuş az şehirlerden biri olması.

Bu durum, eski kentsel dokuyu incelemek için bir fırsat oluşturuyor. İkinci neden ise, özellikle 1990'lardan sonra, Arnavutluk'ta çok hızlı, plansız ve sağlıklı olmayan bir kentleşme süreci başladı. Diğer taraftan, Korça bu plansız şehirleşmeyi sınırlı tutmuş ve bu süreçten fazla etkilenmemiş bir şehirdir. Bu da, onun planlı ve uygun bir şekilde gelişmesi için hala bir fırsatın olması demektir.

Tezin ikinci bölümünde, farklı literatürden ve yazarlradan faydalanarak: kentsel dokunun tanımları; kentsel morfolojinin bir disiplin olarak gelişmesi; ve şehirsel mekanı oluşturan ana ögelerin özelliklerinden bahsedildi. Öncellikle, farklı yazarların değişik bakış açılardan yaptıkları şehir ve kentsel doku tanımlarına yer verildi. Burada, şehri ve onu oluşturan ögelerin: fiziksel, sosyo-ekonomik, tarihsel, yada işlevsel boyutlarını öne çıkaran farklı yaklaşımlardan bahsedildi.

İkinci olarak, kentsel morfolojinin bir disiplin (bilim dalı) olarak gelişme süreci anlatıldı. Bunula ilgili, kentsel morfoloji alanında yapılan öncü çalışmalar ve onları takip eden gelişmeler irdelendi. Özellikle, yirminci yüzyılın ortalarında, kentsel morfolojinin bir disiplin olarak kurulmasında önemli katkıları olan üç farklı okuldan (İngiliz,İtalyan ve Fransız) bahsedildi. İngiliz okulu (çalışma grubu), M.R.G Conzen'nin öncülüğünde, daha çok coğrafya alanında katkı sağlamıştır. Italyan okulu, Muratori ve onun takipçileri ile daha çok mimari form tipolojisi üzerinde çalışmalar yapmış. Fransız okulu ise farklı akademik ekollerin çalışmaları ile şehircilik ve şehrin sosyolojik boyutuna odaklanmışlar.

Tezin ikinci bölümünün son kısmında ise, kentsel dokuyu oluşturan üç temel öge olarak kabul edilen: yol, açık mekan, ve bina (yapılaşma alanları) daha detaylı bir şekilde irdelenmiştir. Burada, öncellikle bu ögelerin tanımları, sonra çeşitli sınıflandırmaları, ve son olarak da mekansal özelliklerinden bahsedilmiştir.

Tezin üçüncü bölümünde, çalışma alanı olarak seçilen Korça şehri hakkında genel bilgilere yer verildi. Ceografik, demografik ve ekonomik bilgiler verildikten sonra, Korça'nın kentleşme anlamında geçirdiği tarihsel süreç anlatıldı. Şehrin geçirdiği farklı süreçler: Osmanlı dönemi (1431-1912); 1912-1945 dönemi (iki dünya savaşı); Komünizm dönemi (1945-1990); ve Post-komünist dönem (1990-). Bu süreçler anlatılırken, her dönemde oluşan farklı dokulardan bahsedildi. Bu bölümün son kısmında ise, Korça'nın günümüzdeki şehirsel yapıdan (arazi kullanımı, ulaşım sistemi, kentsel sit alanları) bilgi verildi.

Dördüncü bölüm, çalışma alanında yapılan morfolojik analizlerden oluşuyor. Burada, yukarıda söylendiği gibi, şehirin geleneksel bir bölgesinde, farklı kentsel ögeler, çeşitli ölçeklerde detaylı bir şekilde analiz edildi. Halihazır haritaları ve alanda yapılan gözlemler ve ölçümlerle: yol, açık mekan ve bina dokuları ile ilgili morfolojik analizleler ve sentezler yapıldı. Buradaki amaç, bu ögelerin gösterdiği mekansal özellileri tespit edip, onları sentezleyerek daha anlaşılır hale getirmekti.

Yol dokusu analizlerinde: yol sistemi; hiyerarşi; topoğrafyanın ve iklimin etkisi; yollar arasındaki mesafeler ve genişlikler; oluşturdukları yapı ada formları; yol geçkisi; ve yol sınırlayıcı elemanlarının özellikleri incelendi. Bu analizler, yol dokusunun ögeleri, zengin, uyumlu ve insan ölçeğini önemseyen bir yol mekanı oluşturduğunu gösterdi.

Açık mekan dokusu analizlerinde: açık mekanların konumları; aralarındaki mesafeler; arazi kullanımları; form, boyut ve oranlar; ve yol bağlantıları gibi çeşitli incelemeler yapıldı. Ayrıca, fraktal geometri yöntemini kullanarak, farklı açık mekan

formlarının fraktal boyutları hesaplandı ve bu formlar arasında rasyonel bir ilişkinin olduğu gözlemlendi.

Son olarak, yapılaşma alanları (binalar) ile ilgili doku analizlerinde: yapı ada büyüklükleri ve formları; parsel büyüklükleri ve formalrı; doluluk-boşluk ornaları; yapılaşma düzenleri; bina-parsel-yol ilişkisi; kat adetleri; bina formları ve mimari özellikleri gibi farklı incelemeler yapıldı.

Tezin beşinci bölümünde, Korça'nın yeni gelişme alanları için bir kentsel tasarım rehberi (önerisi) geliştirlmeye çalışıldı. Yukarıda bahsedildiği gibi, bu rehberin temel amacı, günümüzün koşullarını göz önünde bulundurarak, geleneksel dokunun mekansal özelliklerini yeni tasarımlarda yorumlaması (adapte etmesi).

Bu bağlamda, öncellikle, Korça'daki yeni yerleşmelerin tasarımlarında da uygulanabilecek birkaç genel kentsel tasarım prensiblerinden bahsedildi. Bu tasarım prensipleri: yerel coğrafya ve değerlerin önemsenmesi; yeterli sosyal donatıların sağlanması; ulaşılabilirlik; kentsel yoğunluğun sağlanması; karma arazi kullanınları, sosyal yapı ve yapılaşma düzenlerinin planlanması; kaliteli bir fiziksel çevrenin oluşturulması; ve sürdürülebilirliğin sağlanması olarak özetlenebilir.

İkinci olarak, komşuluk birimi kavramı ve onun içeriği irdelendi. Bununla ilgili, öncellikle, komşuluk biriminin eski yerleşmelerin kompozisyonunda da bir ünite olarak kullanıldığından bahsedildi. Sonra, farklı araştırmacıların, komşuluk birimi için geliştirdikleri çeşitli şemalardan ve yaklaşımlardan söz edildi.

Yukarıda behsedilen genel hatları belirledikten sonra, Korça için, üç farklı bölümden oluşan bir kentsel tasarım rehberi hazırlandı. Birinci bölümde, komşuluk birimi ve arazi kullanımı şeması geliştirldi. Burada, alan büyüklüğü, nüfus, youğunluk ve arazi kullanımların dağılımları belirlendi. Korça'nın yeni gelişme alanları için mahalle biriminin bir tasarım ünitesi olarak önerilmesinin nedeni: şehrin eski strüktüründe böyle bir mekansal organizasyounun bulunmasıydı.Geliştirilen komşuluk birimi şeması: 500 m yarıçapıyla (yürüme mesafesini göz önünde bulundurarak); 50-60 ha büyüklüğünde; 5000-6000 kişilik bir yerleşme öneriyor. Arazi kullanımı şeması ise, karma kullanımları (sosyal donatılar, ticaret alanları, açık ve yeşil alanlar, konut alanları) barındıracak bir yerleşme birimi öneriyor.

İkinci kısmda, ulaşım sistemi şeması, ulaşım modu (yaya-taşıt),yol dokusu ile ilgili genel prensipler belirlendi. Buradaki amaç, yaya ve taşıt ulaşım modunun birbiri ile entegre bir şekilde gelişmesiydi. Ana meydan bölgesinde ve konut alanların iç bölgelerinde yayalara öncelik veren yollar tasarlandı.

Tasarım rehberinin son kısmında ise, önerilen farklı yapılaşma düzenlerinin mekansal özellikleri irdelendi. Bununla ilgili üç farklı yapılaşma düzeni önerildi. Anayollar boyunca 4-5 katlı bitişik apartman; meydan etrafında 3-4 katlı apartman; iç konut bölgeleri ise 1-3 katlı müstakil bahçeli konutlar önerildi.

Tasarım rehberinde belirlenen kriterler görsel şemalarla desteklenerek genel bir şekilde anlatıldı. Bu standartlar daha detaylı bir şekilde (şema ve açıklamalarla), ekler bölümmde konulan şekillerle anlatıldı.

Tezin sonuç bölümünde, kısaca çalışmanın kapsamından ve ondan elde edilen sonuçlardan bahsederek bir değerlendirme yapıldı.

## 1. INTRODUCTION

The city is a medium shaped by physical, social and economical factors. The natural features, different governmental and economical systems, social structure and the technological innovations have been the main determinants of the city space. Any change on the structure of these components has generated new formations of urban space (Lynch, 1960). Different approaches of city planning (or urban design) theories have tried to find the proper ways of city building. One of the main issues that a lot of urban design theories or implementations have failed to achieve is the integration between the old and the new city pattern. Many of urban design practices have not paid sufficient attention to the composition of existing cities.

A successful city design is that one which is developed within the local context by respecting the regional characteristics and interpreting them according to the conditions of the present. Regarding this issue, Geddes points out that the new urban developments in any city should reflect the historical and geographical values of the zone and in the meantime fulfill the needs of the present (Tyrwhitt, 1947). The way to achieve this passes through a good understanding of the qualities of traditional urban form, which represent the local values of a city. After that, these characteristics should be adapted to the new socio-economical structure of the city life by providing a harmony between the past and the future.

This study deals with the issues mentioned above by making a detailed morphological analysis of the traditional urban form in the city of Korça, and interpreting its qualities in new designs by fitting them to the conditions of nowadays. The first reason for choosing the city of Korça as a case study area is because it is one of the few cities in Albania that has conserved the traditional urban areas. This makes it easier to understand the characteristics of the spatial organization of the traditional urban pattern. Secondly, many cities in Albania, especially after 1990s, have passed through a fast urbanization process which unfortunately is not developed in a planned way. On the other hand, in the city of

Korça this kind of urbanization is kept within a limit compared to other cities. This situation provides an opportunity for the city to develop in a proper way.

### 1.1 Purpose of Thesis

There are three main objectives within the scope of this study. The first one is to establish a methodology for analyzing urban form and its components. The second aim is to generate syntheses from these analyses in order to emphasize the characteristics of the urban pattern and provide a better understanding of its spatial composition. Finally, it is in the concern of this work to develop a design guide for new urban areas (residential areas) which reflects the traditional urban form typology and interprets (adapts) it to the nowadays conditions. Though the study is done for city of Korça, the methodology established here can be also applied in the study of other settlements.

### 1.2 The Scope of the Study

This research consists of six sections. The first section consists of an introduction to the topic of the research; its main objectives; the scope of the study; the methodology; and the reasons for choosing the city of Korça as a case study area.

The second section deals with the definitions of the urban form, the establishment of urban morphology as a study filed and the description of the different elements of the city space. In the first part there are some definitions of different scholars about the city and urban form, seen from different angles. Secondly, the emergence of urban morphology as a discipline is explained within a historical background by focusing more on the establishment of three schools of morphology (English, Italian and French school) and the use of new methods in studying urban form (quantitative, computer based methods). Finally, this section makes a more detailed definition and description of three main elements of urban form: street pattern, open spaces and built form.

The third section gives some general information about the city of Korça such as: its geographical features, demographic and economic profile, the historical development and the main components of the existing city.

The fourth section focuses on the morphological analysis on the historic district, a zone near the city center, whichis chosen as the study area. These morphological analyses are done in three different contexts: street pattern, open spaces and built form. Each of these elements is analyzed in different levels (scales) by showing different characteristics of their spatial arrangement.

The fifth section consists of an urban design guide for new residential areas in Korça. The main aim of this guide is to establish some design standards that integrate the traditional urban typology to the new socio-economical conditions. Firstly, there are introduced some general urban design principles that can be also implemented in the city of Korça. After that, the concept of neighborhood unit is explained by defining criteria such as: size, population, and the scheme of spatial organization and land uses. Finally, the design guide for the specific case of Korcais developed in four different contexts. In the first part the features of the neighborhood unit are defined (size, population, densities and land uses). Secondly it defines the standards of the transportation system (street hierarchy, width, form, scale, and other elements). After that, there are developed the design principles of the open spaces by dividing them into different typologies (form, size, function). Lastly, the guide defines the characteristics of built form by showing different layouts that should be implemented in new areas. All of these design standards are accompanied with images, and are developed in different scales (for each element).

The final section summarizes the scope of this study and makes an evaluation of the conclusions that can be obtained from this research.

### 1.3 The Methodology

The methodology used in the purpose of this study consists of four main parts. Firstly, a literature research was done in the context of finding different academic writings (books, journals, articles) that deal with the explanation and evaluation of the urban morphology and its components. The second part consist of data gathering and providing information related with the study are and the research topic. The needed data was provided by gathering the materials (written and visual) of the previous works (reports, books, maps, photos) and by making observations on the study are (measurements, photos). The third part consist of analyzing the data and

making synthesis in the context of the research purpose. The analyses and synthesis (morphological)were done by using different techniques such as: computer programs (AutoCAD, Photoshop, SketchUp, and Office programs) and hand drawingtechniques. Finally, the obtained results were evaluated in the context of preparing a design guide which was one of the purposes of this thesis.

## 2. THE URBAN PATTERN AND ITS ELEMENTS

### 2.1 City Definitions

"The city in its complete sense, then, is a geographic plexus, an economic organization, an institutional process, a theater of social action, and an aesthetic symbol of collective society" (Mumford, 1937).

It is very difficult to make a precise definition of the city because of the complex nature that it has. There is not such an inclusive definition that can cover all demonstrations and describe all characteristics of a city (Mumford, 1989). The concept of the city can be seen in different contexts by, trying to explain its physical, socio-economical, functional, and historical aspects. Therefore, different disciplines like geography, economy, sociology, history and political sciences have made their own definitions of the city according to the viewpoint of their respect field (Wirth, 1938).

Those who see the city as a physical formation give more importance to its geographical and man-made features like; location, size, form etc. For example the geographer Friedrich Ratzel consider the city as a territory with a particular size, located on the main traffic lines and where people and buildings are congregated for a continuous time ( Ratzel, 1903). Another explanation which determine the city as e physical manifestation is that of Lavedan's who concentrates more on the form of the city and classifies it in two groups: the planned city which is a decision of a particular authority, and the spontaneous or organic city which is generated by people living there (Kostof, 1991).

In another context, the sociological and economical approaches are not satisfied with the definition of the city referring only to its physical characteristics. As Mumford points out, size, population or built environment are not the only elements that define a city. He claims that social issues are more important and the physical and functional arrangement of the city should serve to an effective social organization (Mumford, 1937). A sociological description of the city tries to show that the

attributes of urban form are the demonstration of the social life (Wirth, 1938).While the economical approach seeks to define the city as an economical organization where the market, industry, and other services take place and separate the city from other settlements where agriculture is dominant. According to Weber, the city is the center of the market where people live with commercial and trade activities rather than agriculture (Uddin, 2004).Marcuse (1987) is another scholar that defends the idea that the main factors shaping the city are the socio-economical and political interests. While the city planners and other professionals have a secondary role in determining the form of cities. (Moudon, 2009).

Historical context, functional aspects or the symbolism of the city are other approaches that can contribute on its definition. Urban historians have studied the city in a historical frame by trying to understand its origin, changes through time, and the facts that formed the city. The archeologist Gordon Childe focuses on first settlements in the purpose of finding the factors that caused the emergence of the city concept (Childe, 1950). Besides this, both Kostof and Mumford aim to explore the sociological and cultural reasons that formed different urban patterns during the history (Kostof, 1991; Mumford, 1989).

Defining the city in terms of functions that take place on it is another important approach. Regarding to this, the most common description consider the city as the concentration point of non-agricultural functions. Beside this, Kevin Lynch says that, the city is city is a multi-functional, changing organization, where, many people develop different functions (1960).

### 2.2 The Urban Pattern

The terms like; “urban morphology”, “urban pattern”, “urban form”, “urban fabric” or “urban structure”, are generally used for the whole physical, man-made environment that shape a city. Scholars have studied the urban form in different contexts. Some of them are concentrated on the physical features of urban pattern while, some others try to understand its meanings by searching the socio-cultural factors and other indicators that form it. There are three main theories that deal with spatial organization of the city: “the planning theory”, “the functional theory”, and “the normative theory. The first tries to explain how the urban form should be; the

second focuses more on its functional aspects; and the last seeks to find the relation between human values and the physical form of the settlement (Lynch, 1984).

The simplest definition of urban form is this that considers it as a group of buildings and spaces between them. The urban space is a three-dimensional medium surrounded by buildings. In this context, the urban fabric is consisted of two main components; the buildings and outer spaces between them (Liu Quan et al., 2010). Rob Krier goes further by making it simpler when claims that the main elements of traditional settlements are streets and squares (Krier, 1979).

The geographer M.R.G Conzen defines the urban form by dividing it in three main parts: streets, plots or lots and buildings. Streets, plots and buildings footprints refer to the ground plan or the town plan and the building fabric defines the land use and the third dimension of the urban form (Moudon, 1997; Whitehand, 2001; Kostof,1991).

**Figure 2.1 :** The urban pattern elements defined by Conzen (Kostof,1991).

Jason (1990) 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. The functions of the streets and buildings constitute a third element in city morphology.

The Italian architect SaverioMuratori has a different approach by considering the buildings and their functions as the basic unit of the urban pattern. He points out that there are the different typologies of buildings those that constitute the urban morphology (Cataldi et al., 2002; Moudon, 1997).

Kevin Lynch gives more importance to the legibility or imagebility of the urban fabric and regarding to this he divides the city in five main elements. As he claims, the main elements that make a city easily identifiable are: paths, edges, districts, nodes and landmarks (Lynch, 1960).

**Figure 2.2 :** The City Image Elements; paths, edges, districts, nodes, landmarks(Lynch,1960).

In his book "The City Shaped", Spiro Kostof explains different urban formations by classifying them as: organic patterns, the grid, the city as diagram, the grand manner and the skyline but despite this, he says that there are two different manifestation of urban pattern: the "planned" one and the "organic" form (Kostof, 1991).

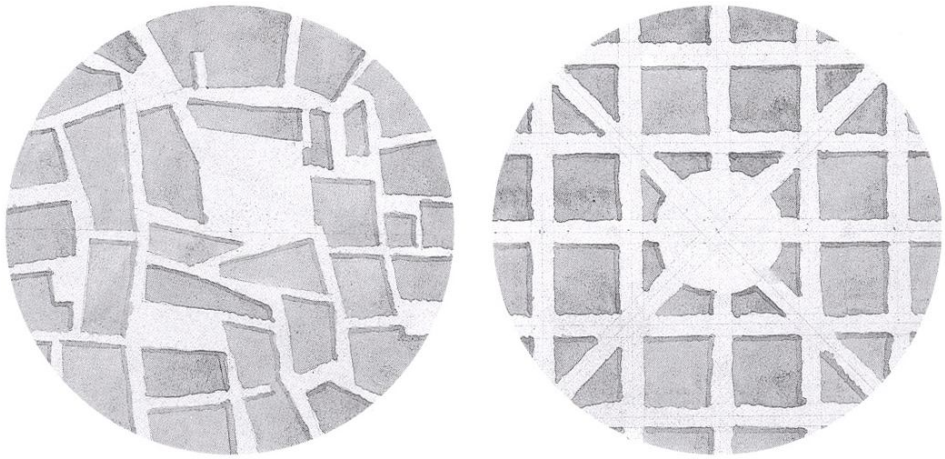


**Figure 2.3 :** The organic and the planned urban form (Kostof, 1991)

The group of architects in Francewhich is called "Ecoled`Architectureparis-la-Defense", separated the urban physical form in different elements such as: topography, street network, plots and built form and studied the "topological" and "geometrical" relations between these layers (Darin, 1998).

It is important to stress the fact that the urban form should not be seen only as physical entity but also, the socio-cultural and the process of its development must be taken into consideration. Although, the urban fabric is generally explained as the "physical environment" this is not enough because beside this there is the "living organism" that must be explored."We must see any place as a social, biological, and

physical whole, if we want to understand it completely"(Lynch, 1984). A broad knowledge about the society structures, cultures and their historical development in different regions provides a better understanding of their built environment. The study of urban form does not see the settlement only as an artifact but it tries toexplore the dynamic socio-economic factors that form it(Kostof, 1991; Moudon, 1997).

Generally, there is a tendency to see the urban form as a finished and completed medium but the city is not a static place and it is never completed. The city is a shaping process rather than a finished milieu because it changes both with the development of the society. The urban form can be understood better by studying the processes that shape it (Argan 1983; Kostof 1991;Larkham, 2002).

### 2.3 The Study of Urban Form

Urban morphology is the science (discipline) that deals with the study of the urban form. Although, mostly it concerns with physical form of the settlements also it explores the results of social and economical forces that shape the city. Urban morphology should be seen as "the study of the city as human habitat" (Moudon, 1997). It is very important to analyze the urban pattern in a broad context, by taking into consideration different factors (social, economic, physical) because there is a very strong relation and corporation between these factors in the process of moulding the urban fabric. The physical environment; people living there; and the processes that shape it are main issues in the study of urban form (Larkham and Jones, 1991).

It can be said that, as discipline (field of study), urban morphology began to be constituted in the mid of the twentieth century. By this time, different scholars were trying to establish a methodology that helps to study the physical and spatial structure of the city. However, these are not the first attempts regarding this issue because the humankind has tried to understand the urban form since the formation of first cities. During the nineteenth century, there were some studies of urban form, which opened the way for the establishment of morphology as a scientific field.

Those pioneer works were focused more on the topographic maps as a source of history (Gauthies, 2004). For example, in France,Antoine-ChrysostomeQuatremere de Quincy (1755 - 1849) realized that the maps could be useful for understanding the

history of cities and reading the development and changes of their physical pattern. While, in Germany, first studies were done by the historian Johannes Fritz, whose work "Deutsche Stadtanlagen" (1894) influenced the later scholars in Germany (Kretzschmar, Keyser, Schlüter) and France (Lavedan, Poëte). By the mid of the twentieth century the study of urban morphology was became more established and this fact contributed to the development of three "schools" of morphology in the same time; English, Italian and French. (Moudon, 1994; Whitehand, 2001; Larkham, 2002; Gauthiez, 2004).

### 2.3.1 Three schools of urban morphology[1]

The researches on urban morphology have been done in different countries but, England, Italy and France are the main countries that have more contribution to the field, especially after the mid of the twentieth century. Most of the scholars agree that the initiators of this discipline are: M.R.G Conzen (1907-2000), a German geographer who went to England before the Second World War and continued his subsequent works there; and the Italian architect SaverioMuratori (1910-1973), who worked in Venice and later in Rome. Both of them have a huge contribution to urban morphology by their studies in the respective field of geography and architecture (Moudon, 1997).

The representative scholar of the British "school" of morphology, M.R.G Conzen, had a big facilitation to the study of urban form by his works in the field of geography. However, the Conzenian thought has its bases in the morphogenetic studies of German geographers in the ends of 19$^{th}$ century and the beginning of 20$^{th}$ century. The works of Schlüter (1899), on the ground plan and geography of settlement that explore the phases of development of town plan, had a big influence on Conzen's later studies. Also, the study of Geisler on Danzig (1918), in which, the map that shows with different colours land and building uses, and the story number in residential areas; had an impact on Conzen's works, especially in cartographic representation (Whitehand, 2001). The effect of German morphogenetic tradition can be seen in his studies on the form of rural and urban settlements in northeast England (1949). In addition, the influence is evident in Conzen's study of Whitby in east

[1] The term "schools" was used firstly by Ana VernezMoudson for the three groups studying morphology (English, Italian, French).

Yorkshire (1958), where he prepared coloured maps to show the buildings' types and their utilization, and the landscape of the city (Whitehand, 2001;Kubat andDokmeci, 1994).

The most known work of Conzen is his study on the town plan analysis of Alnwick, Northumberland (1960). The main topics elaborated in this study are: developmentof urban morphology principles; the development of the city; the use of the plot as the main unit in the analysis of urban form; detailed map analyze; and finally the processes and changes in the urban structure. By this work, Conzen made the very well-known and distinctive tripartite division of the urban form: the ground plan (streets, plots, building plans); the building fabric in three dimensions, and finally land and building utilization (Möler, 1964;Whitehand,2001).

The Conzenian tradition was continued by his followers: J.W.R. Whitehand in England and M.P.Conzen in North America. Whitehand consolidated the ideas of Conzen by collecting and exploring his works. He attempted to broaden the field of urban morphology by including the economic aspect and studying the relationships between the city, its inhabitants and the building industry. In addition, he formed Urban Morphology Research Group (1974) at the University of Birmingham, which is an important institute in the research of urban form. While, Conzen's son M.P. Conzen has extended the British ideas into North America by making some important studies in urban geography (Moudon, 1997).

On the other hand, the Italian "school" of morphology had its first bases on the works of SaverioMuratori in the mid of previous century. As an architect, Muratori has a different approach to the morphology of the city. He focuses more on the typology of buildings and the processes that they go through, and the new buildings are seen as the product of learning from the old building types. According to Muratori and his followers, buildings' typologies and their uses are the main components of urban fabric. The main works of Muratori are his studies on the city of Venice (1959) and Rome (1963), which he calls "operational urban histories". These two studies form the theoretical basis of the Muatorianthoughts which he put into practice through lectures and different projects. Muratori's ideas are significant because he points out the biggest challenge for designers: learning from history and interpreting it in a contemporary way(Cataldi et al., 2002; Moudon, 1997).

The theories of Muratoriwere maintained by Gianfranco Caniggia, his colleague in the study of the city of Como in 1963. In his publications, Caniggia uses the term 'procedural typology' for his studies in urban fabric, where building types are accepted as the main unit of urban pattern. He made a lot of studies in Italian and North Africa cities with his colleagues and students. The Muratorian tradition is being continued in Italy by different scholars like; Giancarlo Cataldi, Gian Luigi, Maria Corsini and others(Cataldi et al., 2002; Moudon, 1997).

Finally, a considerable contribution to the discipline of urban morphology is done by French school. In France, some of the early studies, related to the urban form, were done by Marcel Poëte and Pierre Lavedan. Both of them were focused more on the historical development of urban settlements. Although, both of them have done very qualitative works, especially on the city of Paris, neither of them could form a school o with theoretical basis. It was in the ends of 1960s, when, after Conzen and Muratori had prepared the ground for the two early schools, another school began to appear in France. The studies were done by three different groups: Ecoled'Architectire de Versailles; Ecoled'Architecture de Paris-Belleville; and Ecoled'Architecture Paris-la-Defense. The first group was formed around Jean Castex, Philippe Panerai (architects), and jean Charles Depaule (sociologist) after they founded the school of Architecture in Versailles. Their early works were on urban transformation and expands in Paris and other cities in Europe. The works of Muratori were very important for the theoretical structure of their studies. The study of the city of Versailles is their later work and one of the best typo-morphological studies in France. This is a detailed study of the different periods of Versaille focused more on the development of urban form and housing typology. (Moudan, 1997; Darin, 1998).

The other group, conducted by Bernard Huet in Ecoled'Architecture de Paris-Belleville, have made studies in different cities like Paris, Le Creusot, Toulouse, Orleans and some cities in Sicily. Their most known study of Le Creusot consist of exploring the development of an industrial city by trying to find what are the methods of building a city in the nineteenth century. Beside this, they studied the building typologies during the nineteenth century in Toulouse, and the public housing of Paris, produced in 1920s and 1930s (Darin, 1998).

By the ends of 1970s, another formation, which now is calledEcoled'Architecture Paris-la-Defense, was constituted. The group, represented by three architects-Alain Borie, Pierre Micheloni and Pierre Pinon- made significant studies on morphology. Despite their researches on architectural compositions, their work with an urban approach exploring the development of cities is seen as the main concern. They studied the urban form by dividing it into different elements- topography, street structure, plots and built fabric- and surveyed the relationships between these components. Later, other research teams are established in Nates, by MichaëlDarin, and in Marseilles, by Jean Lucien Bonillo. It is important to stress the fact that the French school influenced by the Italian tradition, made some extra contribution to the field, by including studies on urbanism and sociology (Moudan, 1997; Darin, 1998).

The three schools had differences and common things related with their diverse concerns on their researches. The English school was developed by geographers, so it was more interested in descriptive theories of a place. Their contribution was more in theories of understanding how cities were formed, not how they should be planned. On the other hand,the Italian school was formed by architects, who are more focused on the typology of building and their architectural features. Different from English, the Italians, beside the analytical part, were interested also in developing theories of building and city design. Meanwhile, the French school was consisted of architect interested in urbanism and sociologists. Their concern was on criticizing the architectural theories of Modernism, interested both in architecture and urbanism, and including the sociological aspect in the study of urban morphology. The common issue of the three schools was that they all considered the plots and the buildings located on them as the main units in the study of urban pattern. (Moudan, 2009).To sum up, the English had more contribution on the field of geography; the Italians on architecture; and the French on urbanism and sociology.

The schools of urban morphology established three main theoretical bases:

1. The study of urban pattern in the context of descriptive theories, with the intention to produce *a theory of city building.*
2. The study of urban form in the context of developing a *theory of city planning and design*. It is more focused on how cities should be designed.
3. The study of urban form in the context of understanding the effect of past design theories on city planning (Moudan, 1997).

### 2.3.2 Recent studies in urban morphology

After 1980s, the study of urban form was introduced to the new models based more in the quantitative methods. The technological developments in those years in the field computer and information technologies created the opportunity for the integration of these models with computer-based models providing new analytical methods for the study of form and its complexity in a broad context. Many models have been developed but three of them are more distinguished in the study of morphology: Space Syntax; Fractal geometry; and Geographical Information Systems (GIS).

Space Syntax is a method developed by Bill Hillier to analyze the socio-spatial relationship of a defined space with quantitative measurements. Its main focus is on the study of the linkage of the form of the space and how it is used. The interpretation of spatial form and its relation with social issues is done by the development of derived maps. This model uses the generative syntax to understand and describe the social order. By providing a quantitative data with different measurements of the physical form, this method tries to find how the social processes and structures have shaped this form. Also, it creates the possibility of the measurement of those that are considered irregular forms. The representation of these socio-spatial analyses is done by the development of different maps focused more on the open spaces in a distinct area (Figure 2.4) (Hillier and Hanson, 1984).

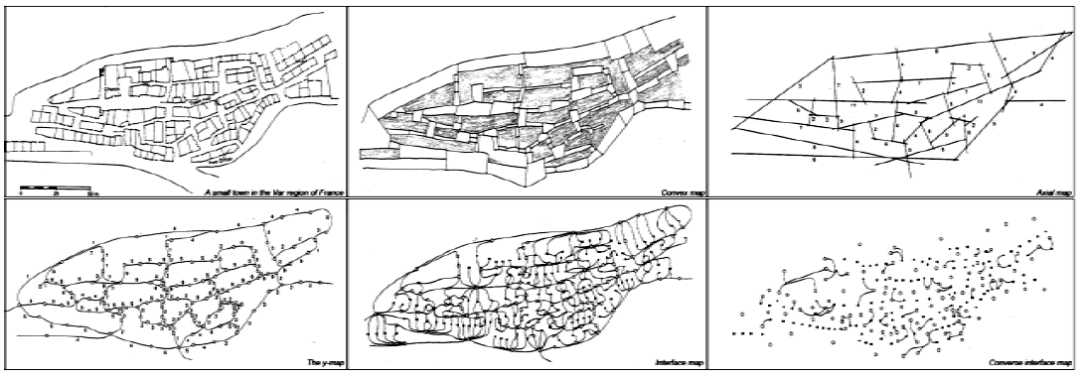


**Figure 2.4 :** Space Syntax representation maps of a town in Var region in France (Hillier, 1984)

Fractal geometry is another quantitative method for the study of urban morphology. This model uses the study of 'self-similar' frames to understand the complexity of the nature. Fractal dimension is a tool that can be used for measurement of a

structure's complexity (Bovill, 2000). The logic of the concept is in the subdivision of a structure and the similarity between subdivided forms. For the first time the term was used by Benoit Mandelbrot who later used this method to study irregular man-made and natural forms. Fractal dimension is an appropriate tool for analyzing complex forms in architectural and urban scale. It is used for studying building forms by Bovill (1996), street pattern and vistas by Cooper (2000 and 2008), urban borders by Batty and Longly (1994), the skyline by Stamp (2002) and in many other cases (Toofan and Larkham, 2010).

There are many methods for measuring fractal dimension but one of the most used is the box counting method. In the box counting method the shape is subdivided into grids in different steps. In the first step the size of one grid is given (a); the number of boxes where the shape passes is counted ($n_1$); the number of boxes in x axis is given ($s_1$). In the second step the size is (a/2); the number of boxes where the shape passes is ($n_2$); the number of boxes in x axis is ($s_2=2s_1$). So, it continues in this logic in subsequent steps (Figure 2.5).

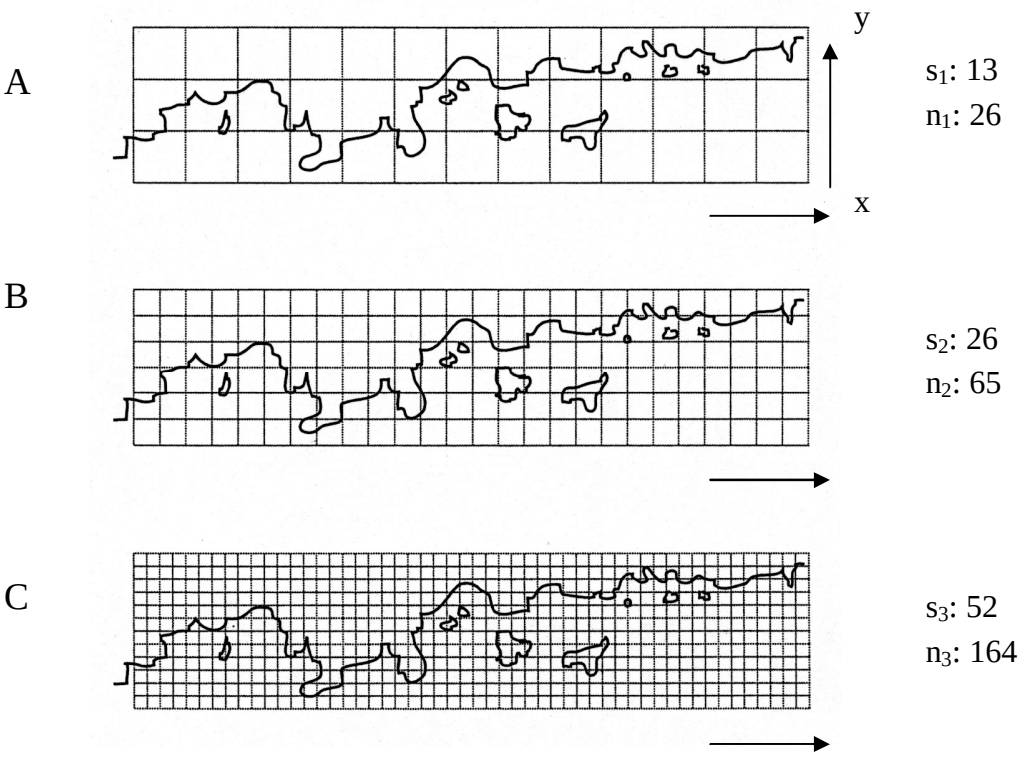


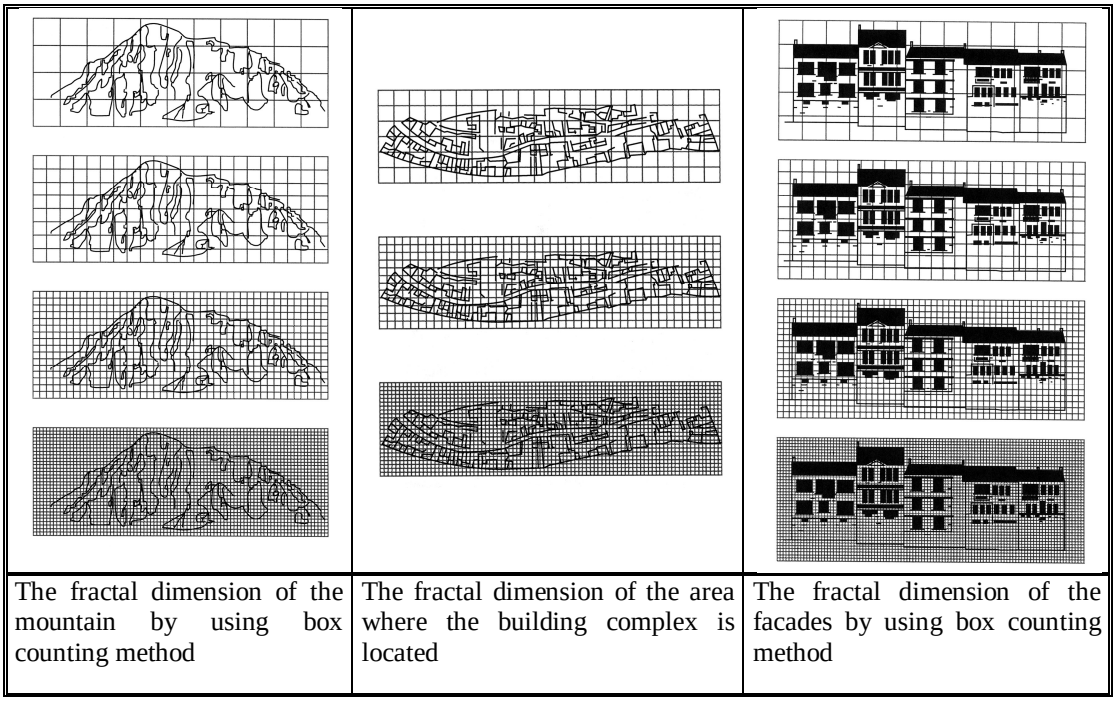

**Figure 2.5 :** Thefractal dimension of California coastline developed by Bovill (1996).

Then the fractal dimension (Db) between to scales is calculated by the formula (2.1).

$$Db= \log (n_2) – \log (n_1) / \log (s_2) – \log (s_1).$$

$$D (B\text{-}A) = \log (63) – \log (26) / \log (26) – \log (13) \quad \textbf{(2.1)}$$

Carl Bovill used of box counting method for measuring the fractal dimension of the settlement of Amasya in 1994 (Figure 2.6). The fractal dimension is calculated in the mountain behind the settlement, in the area were the settlement is located an in the facades of buildings. According to the results of this research, the fractal dimension of the mountain and buildings' facades has a high similarity. The fractal dimension of the mountain between the intervals of 50-100 m and the fractal dimension of the building complex is calculated as 1,63 and the fractal dimension of facades in the intervals of 6-3 m is 1,67. These measurements show that there is a strong relationship between the forms of those elements. The similarity between the fractal dimension of the mountain and the facades still in other intervals too but the similarity is decreased in the fractal dimension of the street pattern in the subsequent intervals (Bovill, 1996;Yüzer2001).



| The fractal dimension of the mountain by using box counting method | The fractal dimension of the area where the building complex is located | The fractal dimension of the facades by using box counting method |
|---|---|---|

**Figure 2.6 :** Theapplication of the box counting method to measure the fractal dimension of the mountain, building group and facades in Amasya (Bovill, 1996).

Another method to study the urban the urban form is by using GIS (Geographical Information Systems). GIS is a computer based program developed for different purposes but its main contribution is in the integration of different data and conversion of the numerical data into spatial representation by producing maps with different layers. The GIS provides the ability of linking spatial data with quantitative data so the physical form can be analyzed in the relation with the socio-economic

factors that shape it. For example, the demographic data of a settlement can be linked to the form of the building and the land use pattern (Moudon, 1997). In addition, the GIS can be integrated with other models like space syntax and fractal dimension by using the data produced from those models and converting it into spatial maps (Jiang and Claramunt, 2002; Toofan andLarkham, 2010).

## 2.4 The Elements of Urban Pattern

### 2.4.1 The street pattern

The street is been considered as one of the main component that forms the structure of the urban form. The definition of the street is related with two main issues; its form and function, since during the history the street has taken different patterns and functions because of many physical and social factors. The word “street” is derived from the Latin word “Via Strata” which carry a meaning of transportation and courtyard (Giritlioglu, 1998). From the simplest meaning of thisword, the function of the street can be understood as an element that connects different buildings by providing access to their courtyards. In this context, Rob Krier sees the street and the open spaces as the fundamental elements of urban space. He explains that the street is a result of the extension of a settlement whose houses were built around an open space for the first time. After the all-available area around the open space was filled, the houses spread out and so the street was developed to give access to the individual parcels and to provide a frame for the distribution of land (Krier, 1979).

Jane Jacobs is another scholar who considers the street as a prior component of the city form. According to her, streets and sidewalks are the basic elements of the city and its public life. She says that: “Think of a city and what comes to mind? Its streets. If a city’s streets look interesting, the city looks interesting; if they look dull, the city looks dull” (Jacobs, 1961).

The street is a physical element that serves to different social and economical purposes. There is a reciprocal relationship between the physical form of the street and social structure of the community. The street can affect the socio-economic activity but the social pattern also is a basic factor in the physical formation of the street. For example, in Islamic cities the spatial arrangement of the street is organized in a continuous way ranging from the private, semi-private/semi-public to public

space. The streets that serve as the main lines for vehicular and pedestrian movement in e defined area should be designed with a different approach in the quite residential areas where privacy and defensive issues are more important (Rapoport, 1977).

CamilloSitte also gives more importance to the social activities and the users of the street. He points out that the street should only serve to the human relationships. The street takes different meanings only when it is occupied and perceived by variable users in different times (Sitte, 1989). Meanwhile, Lynch also defines the street as places where people live and move regarding to their casual and occasional habits (Lynch, 1960).On the other hand, Le Corbusier has a very different approach by comparing the street with a machine or a factory. According to him the street is a "machine" or a "factory" which should be completed with its equipments working properly (Marshall, 2005).

The structure and the function of the street have gone through different changes and meanings during the history, especially after the technological developments that came with the modernism in the field of transportation and infrastructure. Those changes on the city's movement channels have pushed the scholars to make a differentiation between the "street" and the "road". Generally, the road is seen as a motorized line serving to vehicular transportation while the street is considered as a space more for pedestrian movement. One of the characteristics of the road which is not compatible with the street, is the high flow of the vehicular traffic with its engineering equipments. Whereas, the street is defined as an enclosed space or line between two buildings (Moughtin, 2003).Krier also stress the fact that the motorized transportation is a fundamental function of cities but a scenery arrangement is not required around it. He defends the idea that the street is not appropriate for vehicular movement but it is for human circulation and other social activities (Krier, 1979).

The street has served as a connector of three main physical components of the city: the circulation line, the public space and the built area. These elements correspond to different disciplines such that transport engineer is concerned more with vehicular traffic flow while the city planner deal more with the land use of the street and the architect with the third dimension of buildings (Figure 2.7)(Marshall, 2005).

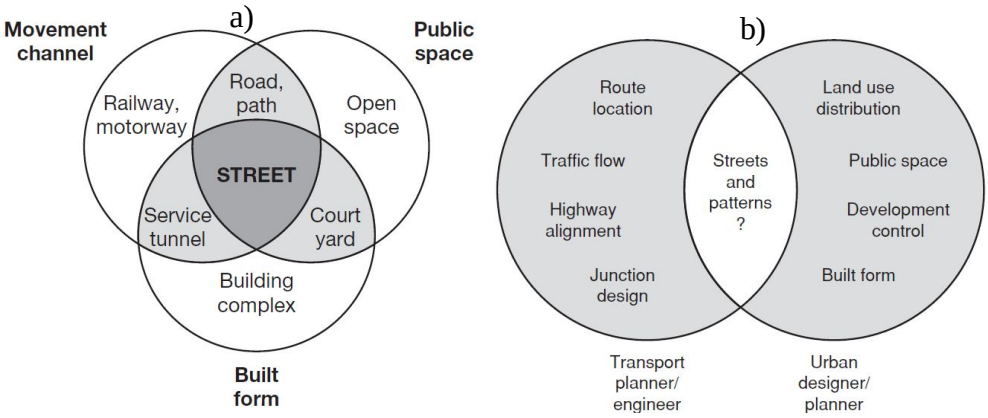



**Figure 2.7 :** Elements of the street (a) and streets and patterns as overlap or void between design professions (b) (Marshall,2005).

The modernist movement brought another organization of streets and buildings by creating a new layout that separates them from each other. Unlike the compact traditional form where the building and the street are bounded together the modernist model has a free development of street on its own linear running and the building standing alone in a undefined space (Figure 2.8) (Marshall,2005).

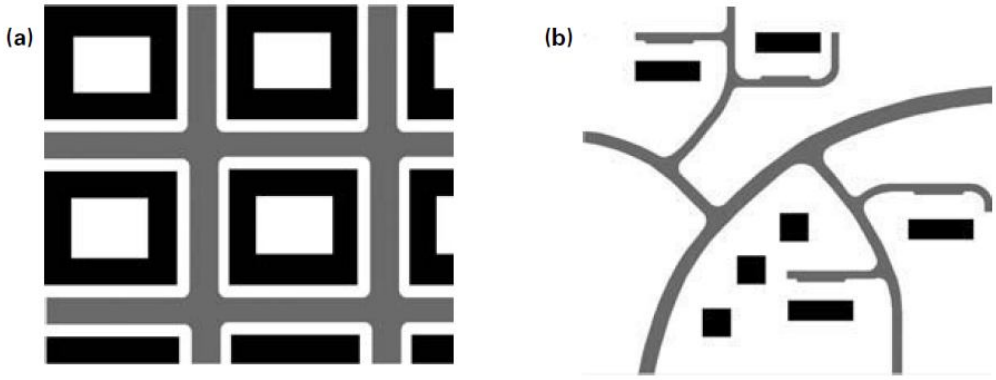



**Figure 2.8 :** Traditional versus modern layouts. Fit of roads and buildings(a), roads and buildings follow their own dedicated forms (b) (Marshal, 2005).

### 2.4.1.1 Street typology

The typology of streets is generally classified in two ways: classification related to the function of the street (road) and classification related to the physical form of the street. The functional classification is also divided into two different ways: the hierarchical classification of the street showing different circulation types (Table 2.1) and the division related with variable land uses developed in different streets (Table 2.2). On the other hand, the classification based on the physical form of the street focuses more on different pattern formations (Figure 2.9) (Marshall, 2005).

**Table 2.1:** Classification of streets related to their function (IHT,1997 p.146)

| **Conventional** | Suggested street types that combine capacity and character |
|---|---|
| **Primary distributor** | Main road – routes providing connections across the city |
| **District distributor** | Avenue or boulevard – formal, generous landscaping |
| **Local distributor** | High street – mixed uses, active frontages |
| **Access road** | Street or square – mainly residential, building lines encouraging traffic calming |
| **Cul-de-sac** | Mews/courtyard – shared space for parking and other uses |

**Table 2.2:** Theroad hierarchy of Transport in the Urban Environment (Marshall,2005).

| **Road type** | **Circulation mode** |
|---|---|
| **Primary distributor** | Fast moving long distance through traffic. No pedestrians or frontage access<br>Vehicle movements near beginning or end of all journey |
| **District distributor** | Medium distance traffic to primary network.Public transport services. All through traffic between different parts of the urban area |
| **Local distributor** | Vehicle movements near beginning or end of all journeys |
| **Access road** | Walking.Use of highway by frontages.Delivery of goods and servicing of premises. Slow moving vehicles |
| **Pedestrian street** | Walking.Meeting. Trading |
| **Pedestrian route** | Walking. Some cycling in shared space |
| **Cycle route** | Cycling |

The classification of street typology according to its form is shown in figure 2.9. Here, different street patterns represent different urban areas regarding to their location on the city. Also they demonstrate the different stages of the city development ranging from its historical core to the periphery.

The **A-type** is a typical organic pattern that can be seen in the center area of many historic cities. The network of the streets consists of different lines oriented in many directions which are intersected in diverse angles with each other and form a very compact settlement.

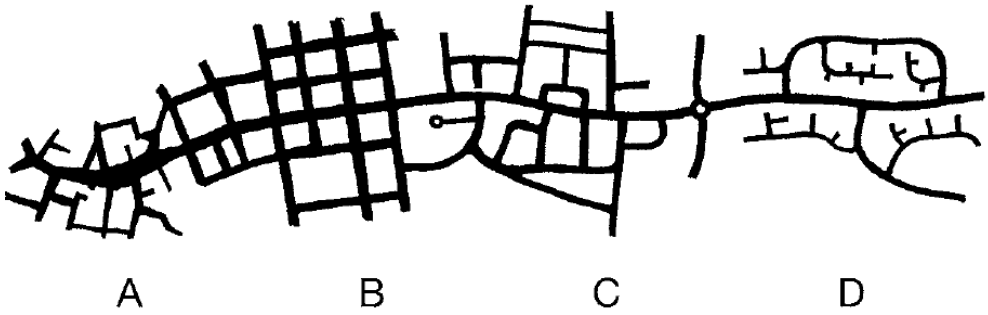



**Figure 2.9 :** Different street pattern typologies regarding to their form (Marshall, 2005).

The **B-type** represents the extensions of the settlement that are developed in a planned way. This type of street pattern is consisted of a grid structure with routes that intersect in a perpendicular way by forming orthogonal blocks.

The **C-type** is the kind of pattern that can be found generally in the suburban expands of the settlement. This pattern type has a network of arterial streets that have a kind of hierarchy between them and are distributed along the settlement by forming rings in different sizes.

The **D-type** the model developed in modernism for the suburban residential areas. Its hierarchical layout is developed in a curvilinear form with collector, distributer and cul-de-sac streets that shape 'looping' and 'branching' patterns (Marshall, 2005).

The figure 2.10 shows examples from urban areas in different cities representing the variable street patterns mentioned above. A-type(a), shows the angular and irregular streets of the 'Medina' in Tunis. B-type(b),shows the gridded extension of Blythswood in Glasgow. C-type(c), illustrates the street pattern of the suburban area of East Finchley. D-type(d), is a 'distributory' arrangement, giving a clear impression of a hierarchical structure, with a bristling of cul-de-sacs in Thamesmead.

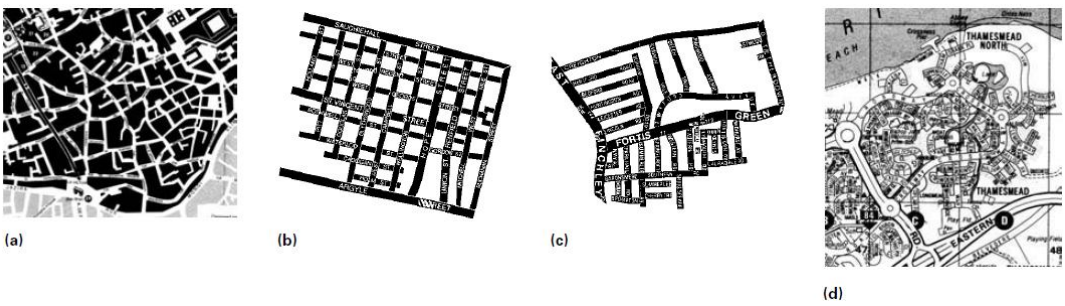
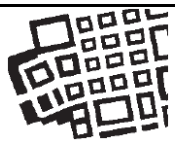



**Figure 2.10 :** Examples of ABCD street patterns(Marshall, 2005).

**Table 2.3:** Urban associations of ABCD types (Marshall,2005).

| Type | Example pattern | Typical location | Frontages | Transport era |
|---|---|---|---|---|
| **A-type *Altstadt*** | | Historic core | Built frontages | Era of pedestrian and horseback |
| **B-type Bilateral** |  | Gridiron (central, or extension, or citywide) | Built frontages | Era of horse and carriage |
| **C-type Characteristic/ Conjoint** | | Anywhere; including individual villages or suburban extensions: often astride arterial routes | Built frontages or buildings set back in space (‘pavilions’) | Any Era of public Era of public |
| **D-type Distributory** | | Peripheral development: off-line pods orsuperblock infill | Buildings set back in space, access only to minor roads | Era of the car |

### 2.4.1.2 The spatial features of the street

The street’s physical form is a result of different factors effecting its composition and the activities that happen around it. Physical factors like topography and climate, social structure and technological developments can be considered as the main determinants of the street pattern. In this section the focus will be on the explanation of some important elements and features of the street form and its design.

**Topography***:* The natural landscape or the topographical condition of an area is one of essential determinants shaping the street pattern. Generally in the hilly terrains the street layout should be developed in a way that fits to the topography. The curvilinear streets follow the topographical lines by giving access to different locations in variable heights and creating panoramic views.

**Climate**: The climacteric conditions affect the street’s form in the context of protecting the settlement from different weather conditions. For example, in hot climates the streets are oriented in a position provides an exposition of the area to the local winds. Also the narrow streets surrounded by high buildings prevent the sunlight access. While in cold climates is required the opposite situation.

**Hierarchy**: The hierarchy in the street layout (Figure 2.11) has two basic purposes: the organization of different circulation systems and the location of different land uses. These two issues are related strongly to the street hierarchy. The pedestrian and

vehicular traffic can be arranged in a proper way by the hierarchical system. In addition, the land use planning can be organized by locating the commercial uses in the main routes and the residential areas in quieter local streets (Marshall, 2005).

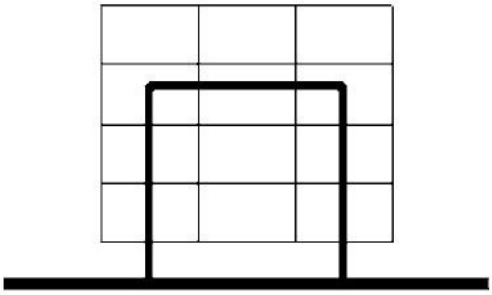


**Figure 2.11 :** Diagram demonstrating layout of three types of route (Marshal, 2005).

**Scale**:Scale is an important feature in the perception of the street space. The sizes, which are near the human scale,can be observed and read easier and clearly. The main components that assess the scale are the sizes of border elements of the street like buildings or walls and their proportion to the street width. Belt courses, cornices and other design devices can also be helpful in defining street scale and pace. Beside this, location of pausing points or nodes in particular intervals can be useful in determining the street scale(Hedman and Jaszewski, 1984).

**Proportions***:* In its broadest mean the concept of the proportions includes the relationship of the street parts to each other and to the dimensions of the whole composition. The ratio of the height of the bordering element to the street width is essential for good street design. If a street is wide and surrounded by low buildings the sense of space enclosure is lost(Moughtin, 2003). The Essex design guide accepts proposes that for an ideal pedestrian space in the street width should be equal or less to the height of enclosing elements (Figure 2.12) (ECC, 1973).

**Figure 2.12 :** Proportions for a pedestrian street space (ECC, 2005).

If a street has a 1:4 ratio of height to width the sense of space and enclosure is very weak because the within the normal range of vision there three times as much sky as wall. When the ratio is 1:2 the visible sky and wall are equal. This ratio provides sufficient enclosure for a three-dimensional space. If the street is designed with 1:1 ratio a stronger spatial definition can be provided. In this case the visibility of the sky is very limited and the viewer is focused more on the surrounding buildings. When the street wall height to width ratio is increased to 3:2 or more the sky is no more visible without a change of the vision angle. This section creates a very enclosed space (Figure 2.13)(Hedman and Jaszewski, 1984).

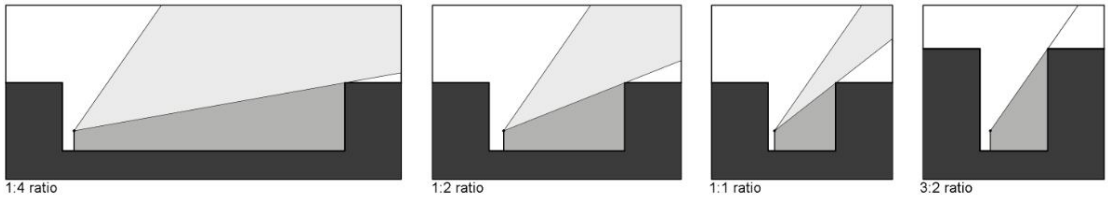



**Figure 2.13 :** Different proportions of the height –street ratios (generated from Hedman and Jaszewski, 1984).

**Length**:Defining the length of the street is very important in the contexts of providing a human scale, reducing the feeling of infinity and creating a sense of space. The topographical features or curvilinear street layout are significant determinants of the street length but beside this other space arrangements can be used (Hedman and Jaszewski, 1984).). For example the location of different uses or nodes in particular intervals (200-300m) can be good devices in defining the horizontal scale of the street (Marshall, 2005).The Essex design guide recommends that the apparent length of a street can be reduced using offsets in the border elements of the street (ECC, 1973). While Hegemann and Peets suggest the use of gates: 'The strong Gothic and Renaissance gates with their deep shadowed arches formed effective terminating features(Hegemanand Peets, 1992).

**Unity**:Unity is another requirement in the street design. There are a lot of elements that contribute to the unity of the street but possibly the characteristics of the buildings along the street are the most important. Their form, size, materials, height or architectural elements can be designed in a way that provides unified street space. For example, the application of a common roofline and the use of repetitive bays can create a unified frame of the street space (Marshall, 2005). In the context of unity in

street space,Gibberd says that: ‘The street is not building frontage but a space about which dwellings are grouped to form a series of street pictures’ (Gibberd, 1955).

What is important here is to establish a balance between unity and diversity. The use of the very similar features can create monotony, while, the use of very different characteristics may bring out a very fragmented space.

The figure2.14 illustrates some of the ‘good form qualities’ developed by Lynch that can be implemented in street design. These are:Continuity (a); Clarity of joints(b); Directional change(c); Dominance or contrast (d); Motion awareness (e); Time series-rhythm (f); The sense of whole (g).

**Continuity (a)**: Features that provide continuity are important because they create interrelated spaces and enforce the space identity. Continuity or unity can be obtained continuous edge surface; proximity of parts (buildings); repetition of rhythmic intervals (street corners); similarity or harmony between forms, uses or surfaces.

**Clarity of joints(b):** Joints are significant parts of the structure of the street and they should be emphasized to provide a better perception. High visibility, clear relations and interconnection are basic issues in the clarity of joints.

**Directional change(c):** Changes of the street direction are necessary for generating picturesque street spaces. Curvilinear lines with diverse angles and the variation of topographic levels create directional changes along the street and provide space diversity.

**Dominance or contrast (d):**Beside the unity or harmony, the space needs some dominant or contrasting elements for a better perception and clarity of space and for breaking the monotony. Those elements are dominant in terms of size, intensity or interest and are more visible from other parts.

**Motion awareness (e):** An essential issue during the movement on the street is that the observer should have the sense of motion. The motion awareness can be increased by: improving the clarity of slopes or curves; provide different perspective street views; continuing direction changes and by making the distances intervals visible.

**Time series-rhythm (f):** are the kind patterns that are sensed over time. The issue here is to develop a pattern which is perceived in a continuous way and has its rhythmic elements that are emphasized in a gradual form within a particular sequence.

**The sense of whole (g):** In this context the harmony and the interrelation between different elements that constitute the whole pattern is the fundamental matter. A common language should be developed to interconnect the different components of urban form (Lynch, 1960).

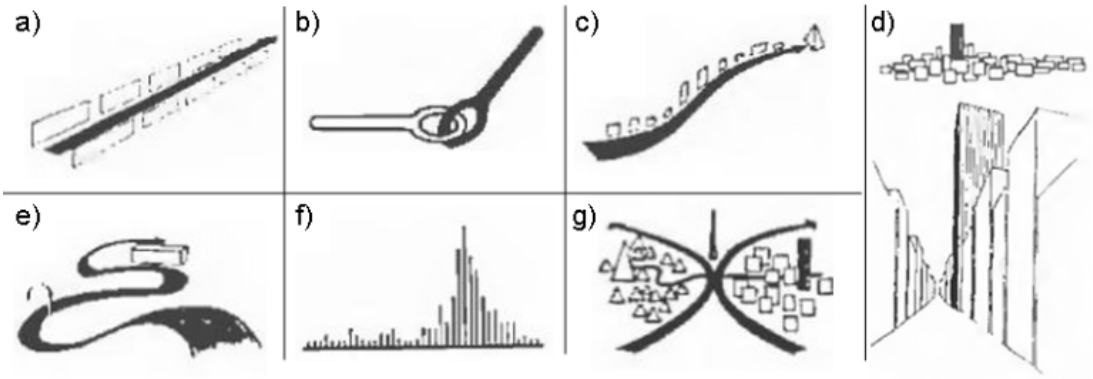



**Figure 2.14 :** Different form qualities developed by Kevin Lynch (1960).

Finally, the physical features of the border elements (walls, buildings) are very crucial because they affect the street space in a different ways. Figures from 2.15 to 2.18 show some different form qualities of the border elements.

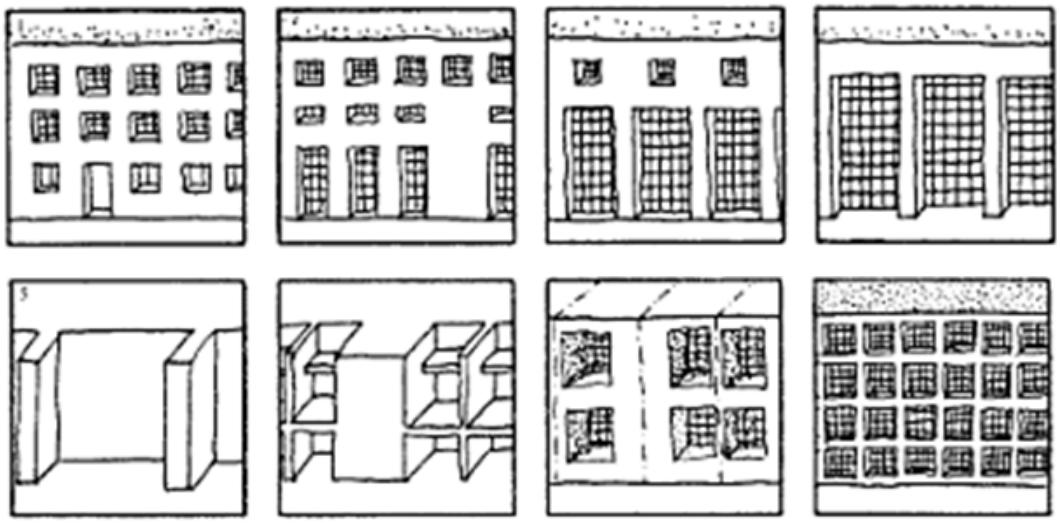


**Figure 2.15 :** Different arrangements of void and solid areas on the building's facade (Krier, 1979).

- The proportions between void (glazed) and solid areas in the facades of enclosing elements (Figure 2.15) affect the relationship between the inner and outer spaces. The vertical or horizontal lines on the border elements make the space to have a dynamic or a static view (Krier, 1979).
- The vertical lines or the use of the same materials on the enclosing buildings increase the depth of the street space (Figure 2.16.b).
- The use of concave and convex surfaces on the street lines decreases the length of the street space, reduces the viewed area and creates surprising spaces (Figure 2.16.c).

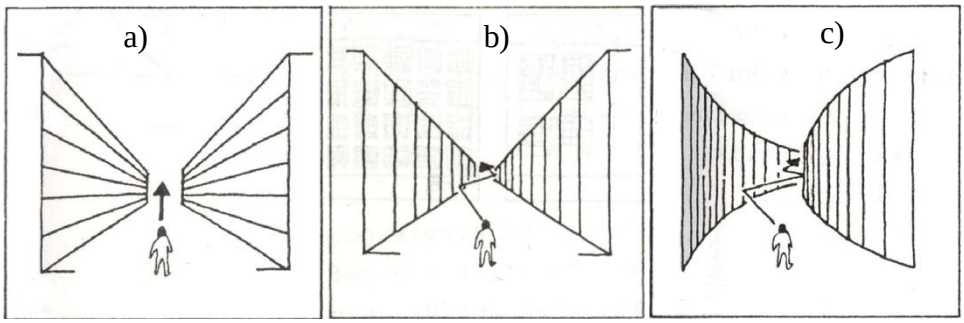



**Figure 2.16 :** Different compositions of street border elements ( Giritlioglu,1998).

- The offsets (extension/setbacks) on the facades of surrounding buildings and vertical platforms decrease the depth in the street space and increase the sense of stability (Figure 2.17.a).
- The use of different design elements like bays, materials, colors on the horizontal and vertical surface of buildings affects the development of interesting, attractive and diverse street space (Figure 2.17.b).
- The narrow and high buildings along the streets enhance the sense of height on the street space (Figure 2.17.c).

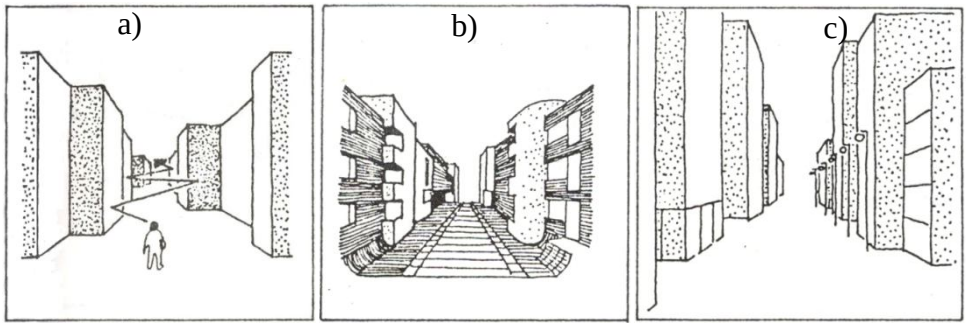



**Figure 2.17 :** Different compositions of street border elements ( Giritlioglu,1998).

- The location of connection structures between buildings in particular interval can provide variable street depths and compositions (Figure 2.18.a).
- The use of the similar materials, colours and architectural elements on the buildings located near intersections increases the perception of the intersection and make it more visible (Figure 2.18.b).
- The vertical and horizontal changes (setbacks) on the first floor provide a human scale while the setbacks on the upper floors create a sense of a wider space (Figure 2.18.c) (Giritlioglu, 1998).

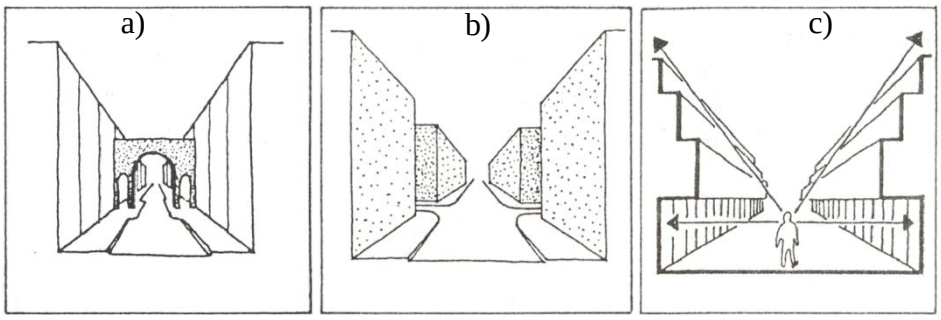



**Figure 2.18 :** Different compositions of street border elements ( Giritlioglu,1998).

### 2.4.2 The open spaces

The open spaces are among the most important elements within a city. These spaces are generally defined as squares or plazas. The term 'Plaza' takes its mean from the Latin word 'Platea'- which refers to the widened street (Giritlioğlu, 1998). These kinds of spaces are used since the formation of the first settlements. According to Krier, these places - where man began to use the urban space- were formed firstly by the grouping of some houses around an open space (Krier, 1979). However, the first examples accepted from the scholars as the real square or plaza is the Greek Agora- the center of public life-where people were gathered for different activities. Then, the square can be defined as the central area within the city where the public life is concentrated with a variety of activities and where the greatest civic art is located (Moughtin, 2003). There are many dimensions that the open spaces can be elaborated but, the main method is analyzing them according to two basic criteria - function and form or shape.

The functions that take place in squares are very important because they affect the vitality and the aesthetic values of this place. It is impossible to develop some universal design principles regarding the functions of the plazas because these issues

are related with specific conditions of a place and cannot work in the similar way in every city. However, generally open spaces are used for public life activities such as: meeting places; entertainment areas and cultural activities with theatres, cafes, restaurants; ceremonial activities or as space for shopping facilities with markets and retail shops. The most useful open spaces are those that have a variety of uses in the buildings around them, although they may have a dominant activity by which are identified (Moughtin, 2003).

Regarding to the functional aspects of squares, Rob Krier says that a good square is that which is enclosed with 'meaningful functions' and is located in the right place with suitable approaches within the overall city structure. He also supports the idea of mixed uses in open spaces by stressing the fact that the squares should have functions that produce activity during twenty-four hours. This can be achieved by locating different functions like: cultural, commercial and entertainment activities without excluding residential uses (Krier, 1979).

CamilloSitte tries to explain the importance of the functions on open spaces by protesting the modern approaches, which- as he says- have imprisoned the public life in the enclosed halls. According to him, the squares or plazas of Antiquity, Medieval and Renaissance were the heart of the public life and were used for practical functions forming a harmonious composition with the enclosing buildings around them (Sitte, 1889).

Another fundamental purpose of the open spaces is that they are important elements in structuring and clarifying the urban pattern by emphasizing some parts of the city. As Unwin points out, the proper way to create a good composition in urban planning is by having 'definite centers' (Unwin, 1909).In this way, open spaces work as a regulator by forming a structure where different parts of the city are connected to form a whole composition. The grouping of important civic buildings around some particular locations creates a more identifiable and unified urban pattern.

Finally, squares or plazas are important for their symbolic meanings. This is done by the location of significant artistic elements like sculptures, monuments, buildings that carry different symbolic meanings. Beside this, the squares are the symbols of important events on the history of the city they are located.

### 2.4.2.1 The form of open spaces

Another categorization of the open spaces (squares) can be done according to their physical form or shape. The works of Paul Zucker, CamilloSitte and Rob Krier are among the most distinctive studies regarding the form of open spaces and their compositions.

In his study of squares, Zucker defines five different typologies regarding the form: the 'closed square'; the 'dominated square'; the 'nuclear square'; 'grouped squares' and the 'amorphous square'(Zucker, 1959).

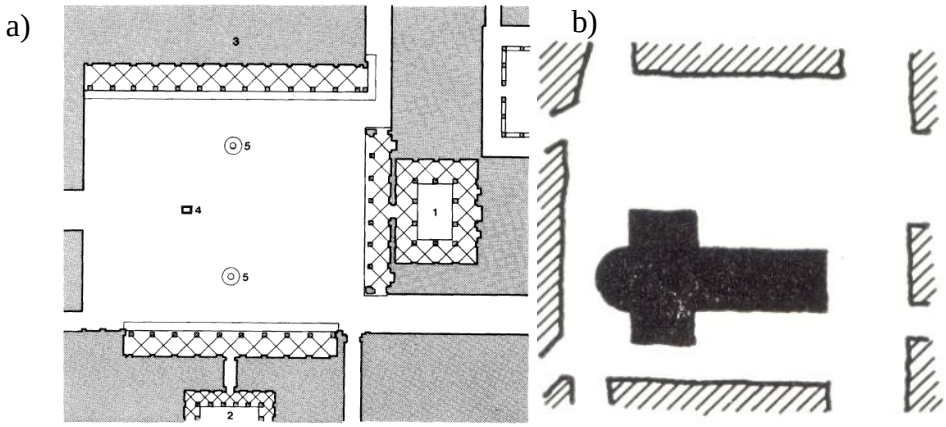



**Figure 2.19 :** Square forms defined by Zucker: (a) Closed square (Piazza Annunziata, Florence), and (b) dominated square (San Michele Lucca).

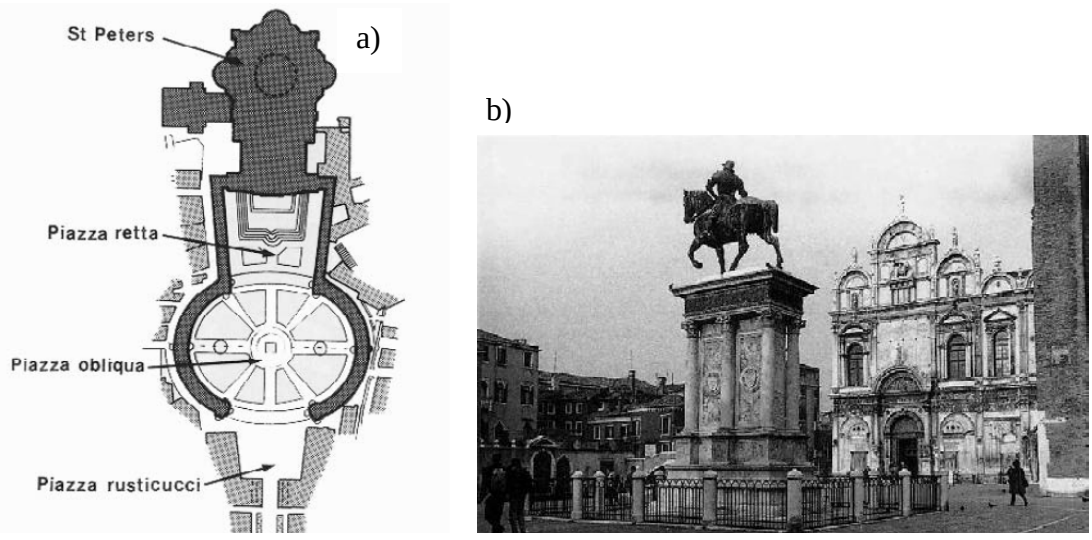



**Figure 2.20 :** Square forms defined by Zucker: (a) Grouped squares (San Peters square), (b) nuclear square (Piazza di S.Giovanni e Paolo, Venice) (Moughtin, 2003).

The closed square is constituted of a self-organized space with buildings that creates an enclosed area around it. In the dominated square the space is oriented and organized toward a main building which is emphasized more than others in terms of

form, function or architectural features. The nuclear square is a space composed around an element located on the center and the surrounding buildings are not very important. The grouped squares are contained of some squares in different sizes that are linked together within a defined area and form a kind of open spaces network. Finally, the amorphous square is an open space which does not have a well defined form (Zucker, 1959).

Sitte classifies only two main types of public open spaces in the aspect of physical form: the ‘deep’ and the ‘wide’ square, both related to the features of enclosing elements, especially the dominant building. The distinguishing of a plaza whether it is wide or deep can be done by looking at the building that dominates it; if it is located on the narrow side it is a ‘deep’ square, if located on the wide side is defined as‘wide’ (Collins, G. and Collins C., 1986).It can be said that this categorization of Sitte does not include the squares that have rectangular shape with equal sides.

For the deep square Sitte gives the example of piazza of Santa Croce in Florence (Figure 2.21.a) where the dominant element is the church and other components are arranged related to its direction. Sitte says that in the deep piazza the dominating building should similar dimension with the space on its direction so that it can be effective(Collins, G. and Collins C., 1986).

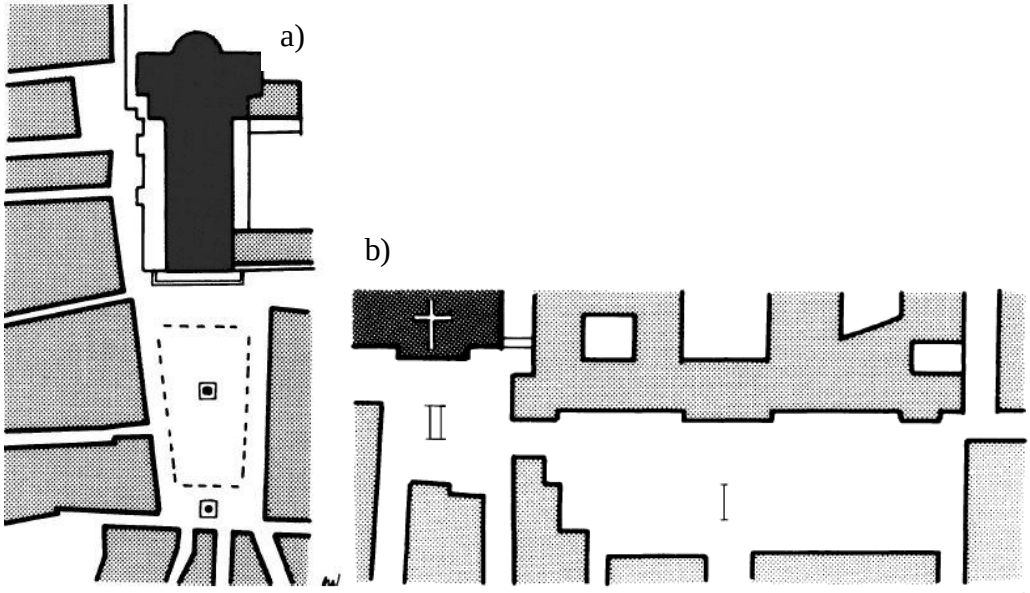



**Figure 2.21 :** Square forms defined by Sitte:deep plaza (a), and wide plaza (b).

On the other hand, the wide plaza is represented by the Piazza Reale in Modena (Figure 2.21.b). In this case the open space is dominated by a palace with a long

horizontal façade that faces the wide side. The mass of the building has similar proportion to the plaza. In the adjacent side there is the Piazza S. Domenico which is a deep square dominate by the church (Collins, G. and Collins C., 1986).

Rob Krier distinguishes three main shapes of spaces that generate different forms of open spaces: rectangular, circular, and triangular (Figure 2.22). All forms of squares are developed around these main shapes (Krier, 1979).

**Figure 2.22 :** Three main shapes of urban open space defined by Krier (Krier, 1979).

The figure 2.23 shows variable forms of open spaces that are generated from the three main geometrical shapes mentioned above. Krier was also interested in the enclosing elements en their effect on the character of the urban space. Beside this, he studied the street-square relationships by trying to find how different arrangement of these two elements effects the composition of space in plazas (Figure 2.24). The number of streets that are opened to the square, their angles, location and the way that they are connected to it affect the issues such as: the enclosure of the square, the distribution of activities, the movement within it and the formation of different perspective views(Krier, 1979).

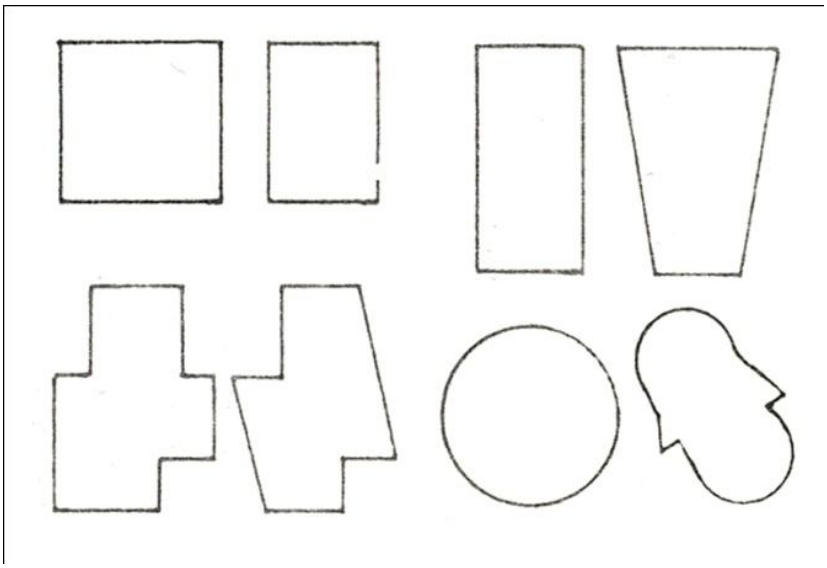


**Figure 2.23 :** Different open space forms developed by Krier (Krier, 1979).

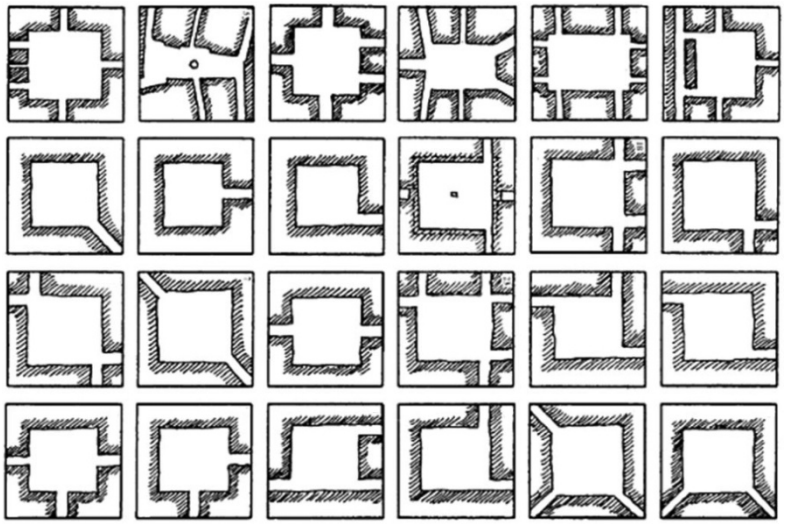


**Figure 2.24 :** Different street-square intersection types (Krier, 1979).

### 2.4.2.2 The spatial features of open spaces

**Enclosure**

The enclosure is possibly the most important issue that should be taken into consideration in the spatial organization of open spaces. The quality of space in squares is related directly to the characteristics of enclosing elements. The square can be considered as an outside room like the room its most fundamental quality is the pattern of enclosing elements(Moughtin, 2003).Sitte compares the 'complete' and 'incomplete' squares respectively with 'furnished' and 'unfurnished' rooms. According to him, "The essential thing of both room and square is the quality of enclosed space" (Sitte, 1889).

The corners of the square are essential in forming a good enclosed space. The opened corners decrease the sense of enclosure while if they are closed with building the space around them is more completed. The number of street-square connections, their location, width and angles has also an effect in the enclosure of the open space. For example if the streets are opened to the corner areas the sense of enclosure is lower. This was an issue treated both by Krier and Sitte in their studies of open spaces. Krier developed variable compositions of square-street intersections showing their relations while Sitte claimed that, only one street opened to each side of the square would be more appropriate for creating a enclosed space (Krier, 1979;Collins, G. and Collins C., 1986).

Another method for treatment of enclosing buildings and especially corners is by using arcades, portals or columns. Besides creating a good enclosed area, these

elements are also important for their ornamental features and constituting continuity in space by connecting the ground floor of different buildings with a continuous structure (Vitruvius, 1960). Palladio said that: “Arches give a very great ornament to piazze that are made at the head of streets, that is, in the entrance into the piazza” (Palladio, 1965).In ancient times, these elements were used more frequently in open spaces and streets. Columns with portals were used as enclosing elements in public open spaces while arcades were the ornamental elements of surrounding buildings (Figure 2.25) (Sitte, 1889).

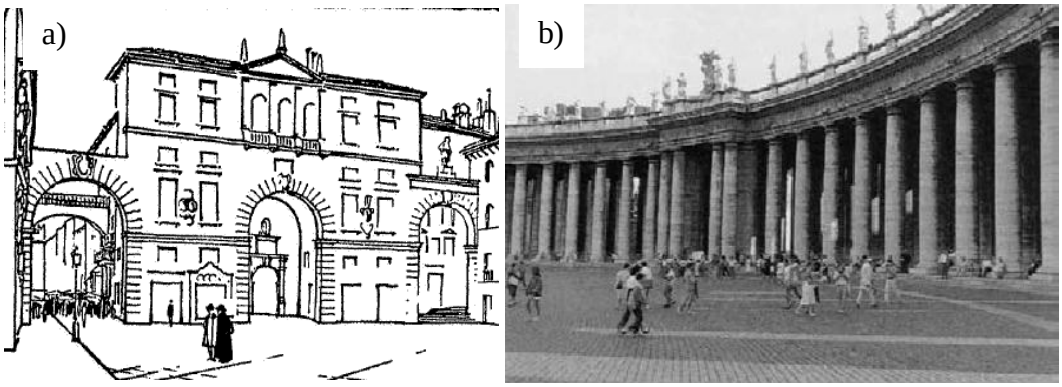



**Figure 2.25 :** The use of arcades, portals and columns in squares, Piazza of the Signoria (a) San Peter’s Square (b) (Sitte,1989;Moughtin, 2003).

The character of the roofline in the surrounding buildings is another basic issue for enclosure in open spaces. This is important not only for enclosure but also for creating a unity and continuity in the border buildings. If the top line of surrounding buildings is kept within an uniformity and not very fragmented with different heights the sense of enclosure and continuity is strengthen more. On the other hand, if the enclosing buildings have very different heights, the unity and enclosure of space is lost (Figure 2.26). To achieve a good composition on open space, the variation of height change on the surrounding buildings should not be more than 25 percent (Hegeman and Peets, 1992).

In addition, a high building or another element can be necessary in open spaces to break the monotony, make contrast and serve as a landmark object (Figure 2.27).

**Size and proportions**

The proportion between the height and the surface size is another fundamental issue that defines the character of an open space. It not possible to determine a common

proportion that can be implemented in all squares because this is related to the specific condition of any place. However, different studies have shown that there are some proper ratios for a good space composition in plazas.

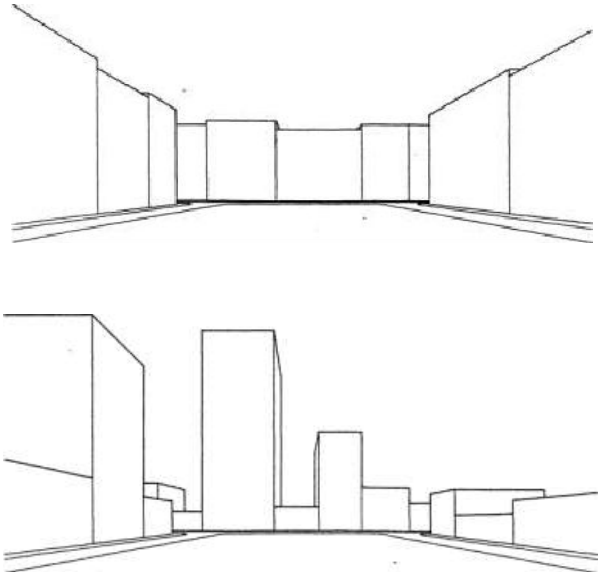


**Figure 2.26 :** The character of the roofline in sorrounding buildings of the square (Hedman and Jaszewski, 1984).

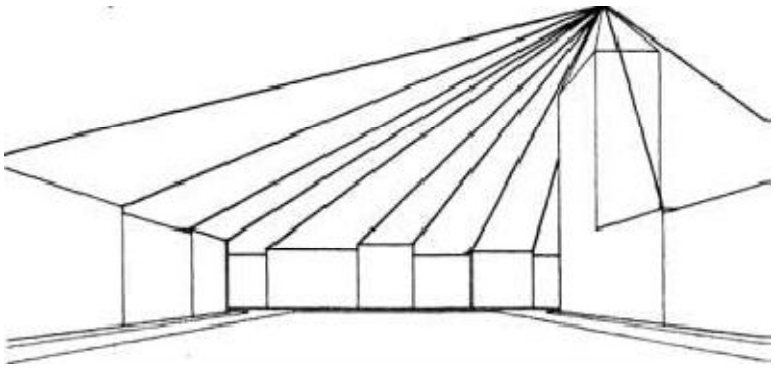


**Figure 2.27 :** The landmark buildings in squares (Hedman and Jaszewski, 1984).

According to Spreiregen the minimum width of a square is that which has a 45° from the roofline. This corresponds to a 1:1 height-width ratio. Nevertheless, the building can be perceived better at a doubled distance of its height or at an angle of 27°. While, to have sufficient view of all buildings as a composition, the distance should be three times more than the height. If the distance is increased more the buildings lose their clarity and the sense of enclosure is decreased (Spreiregen, 1965).Sitte has similar evaluations for the height-width proportions of squares. He says that the size of the plaza should be at least as the height of its dominant building. Meanwhile, the proper dimension of a plaza that has a good effect on the space is the doubled size of the height. Regarding the average size of the open spaces Sitte found out that in cities

the dimensions of plazas were around 57 m X 143 m (Collins, G. and Collins C., 1986).

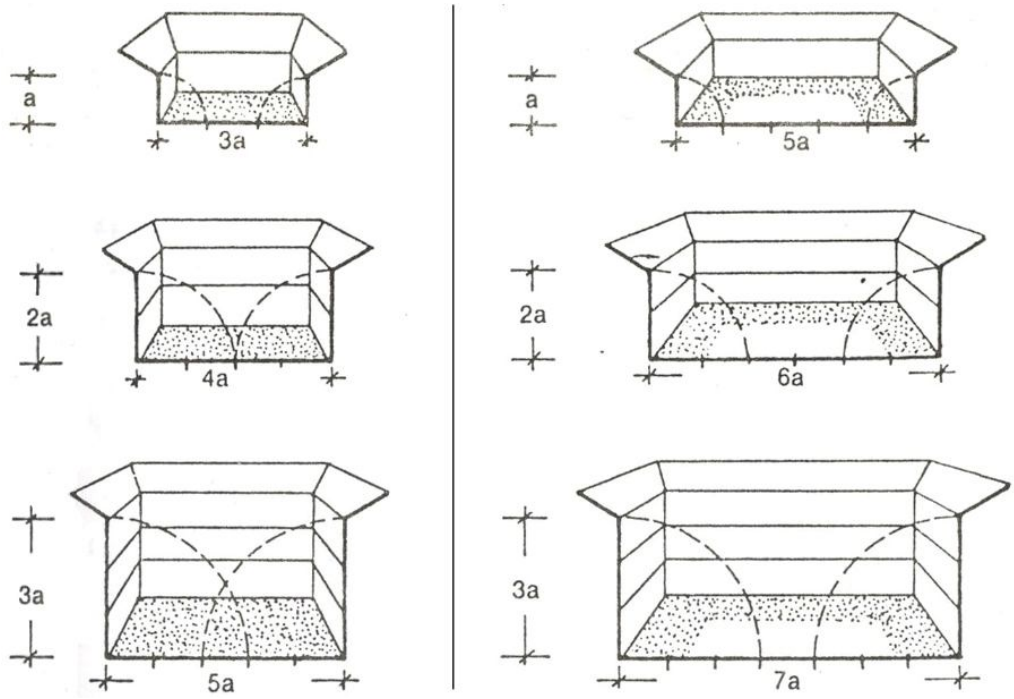



**Figure 2.28 :** Different proportions of height to width in squares (Giritlioğlu, 1998).

Alberti recommends the 1:6 height-width ratio as the maximum in the dimensions of the square but accepts the 1:3 ratio as the most appropriate(Alberti, 1986).The Essex design guide also considers the height-size relationship in squares as a key factor in creating a harmonious space. It suggests that the maximum proportion of height to width can be pushed to 1:4 (CCE, 1973). As can be seen from these different studies the 1:3 ratio of height to width is accepted as the most appropriate one.

Regarding the proportion of length to width Sitte says that: “overly long plazas in which the ratio of length to width is more than three to one already begin to lose charm”. While Alberti proposes of 2:1 length to width as the ideal shape and Vitruvius recommends the dimension of 3:2 (Alberti, 1986; Vitruvius, 1960; Sitte, 1889).

Other important features in the open spaces can be the ground materials and their design; the slope and its orientation or the ground leveling . The level of the ground is a significant factor for increasing or decreasing the effect of objects or enclosing elements. As can be seen from the figure 2.29 the objects located in the upper level

of the square are more emphasized while their effect is decreased if located in the low part (Giritlioğlu, 1998).

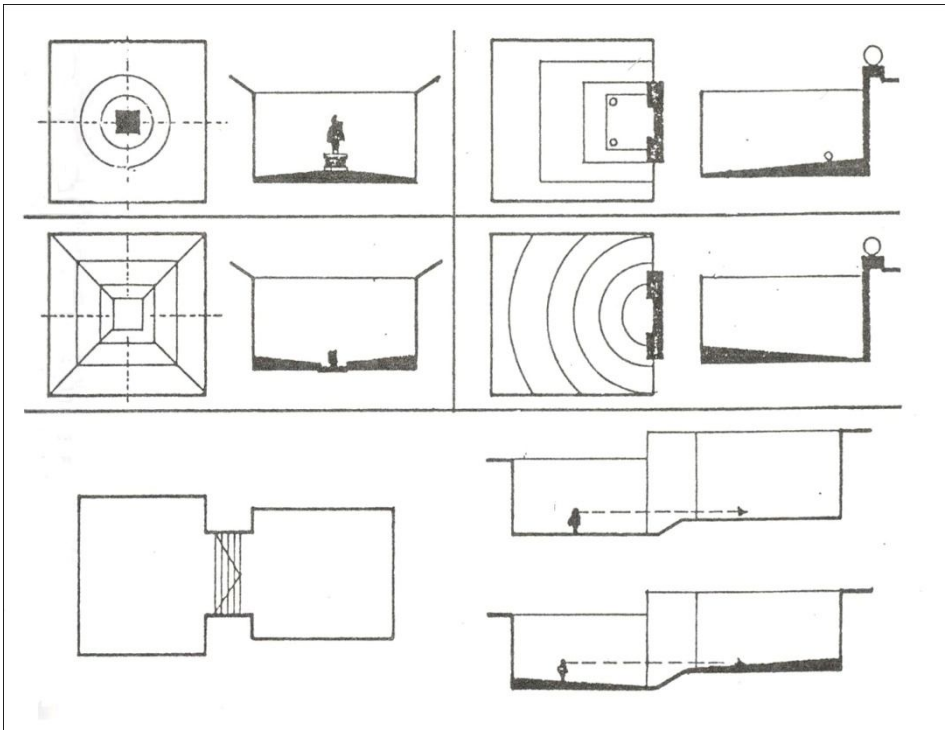


**Figure 2.29 :** Arrangements of the ground level in squares (Giritlioğlu, 1998).

### 2.4.3 The built form

As mentioned before, the buildings and spaces around them are defined as the main elements of the urban pattern. Some studies are concentrated on analyzing the composition of space around the buildings while some others are focused on studying the built form and its layout. However, these two elements cannot be separated because they work together in the formation of urban space and have an interrelated relationship. “Irrespective of general architectural form, whether the city is composed of buildings sitting in space or of spaces formed within building mass, urban design aims at a cohesive and unified composition”(Marshall, 2005).

Looking from another point,it can be said that the urban pattern is consisted of public and private spaces and the buildings stands as interface elements between these spaces (Figure 2.30). Meantime, these two spaces can be defined as ‘framework’ elements (streets and open spaces), and ‘infill’ elements (buildings and courtyards) which respectively refer to public and private areas (Lewis, 2005; Biddulph, 2007).

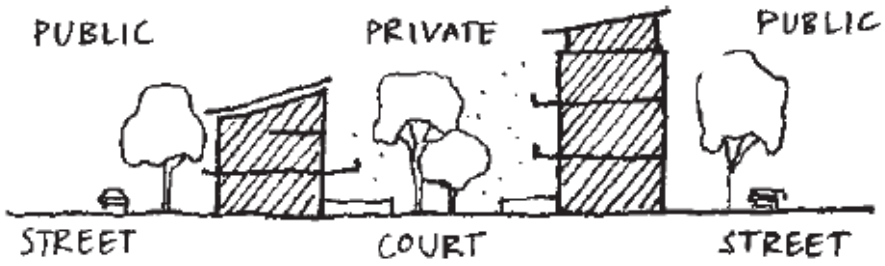



**Figure 2.30 :** The composition of private and public space (Lewis, 2005).

This section will deal with the study of built form by focusing more on the pattern of residential areas. The form of buildings, their configuration and the layout and the space that they form by different arrangements are the main concerns in of this part. These components can also be called "building blocks" of the urban pattern and are organized within different forms and geometries (Peterek, 2003). The reason for choosing the residential building layouts as a subject of study is because as Biddulphsays: "Housing environments take up the majority of developed land and we spend long periods of our life within them" (2007).

The residential building layouts can be categorized according to different criterions like: property type; dwelling number; storey number and the location or the arrangement of buildings (Giritlioğlu, 1998).

*Property type*: The building layouts categorized in terms of property type are classified into private and collective buildings. In private property the buildings are managed and used by private owners. While in collective property, the buildings and their facilities are developed by a cooperative, the government or other groups or individuals and are given to different users. In these types of buildings the private dwellings are organized around common spaces (stairs, elevators, other facilities).

*Dwelling number:* In terms of dwellings number there are two types of buildings: single-family houses and multi-family. In single-family dwellings building is occupied by only one family while in multi-family houses, the building is used by more than one family.

*Storey number*: The building layouts can be developed within a variety of heights. The low-rise development is consisted of 1-2 storey buildings; the medium-rise can go until five floors; and the high-rise layouts are consisted of buildings with more than five floors.

*Buildings layout*: The way that buildings are located on the parcel and their arrangement with each-other can composite different layouts like: detached buildings; semi-detached building; row buildings and block buildings (Giritlioğlu, 1998).

It is important to stress the fact that it is not possible to make a very exact and definite classification of building layouts because there are a lot of different forms around the world which are developed within the effect of variable factors like: social structure, climate, technological innovations etc. However, the classification of building layouts according to the dwelling units located on them is maybe the clearest one for understanding the different formations. So, as mentioned above there are two different house types: single-family and multi-family houses. Within each category there is also a variety of layouts depending on the organization of buildings with each other.

#### 2.4.3.1 Single-family houses

The single-family houses with courtyard can be developed within three main layouts: detached houses; semi-detached; and attached row houses. In the detached layout (Figure 2.31.a), the houses are placed separately from each-other by having space in all directions of the parcel. The advantageous side of this layout is that it provides comfortable individual residential areas with more courtyard space, more access of sunlight, and more private space. On the other hand, it has a character of rural housing organization and generally it lacks the ability of creating a compact urban and community space. This kind of housing layout is implemented in peripheral areas, especially in suburban neighborhoods of American cities.

The semi-detached houses consist of two or more residential buildings that are attached toeach-other side by side (Figure 2.31.b). Compared to detached housing layout, this type of organization makes a more efficient use of the land and composites a higher dense and compact urban space. It also can decrease the infrastructure costs by using common facilities in attached buildings. While, the negative side of this layout is that it reduces the access of sunlight into the inner space of the building since, one or two sides of the building are totally closed by solid walls.

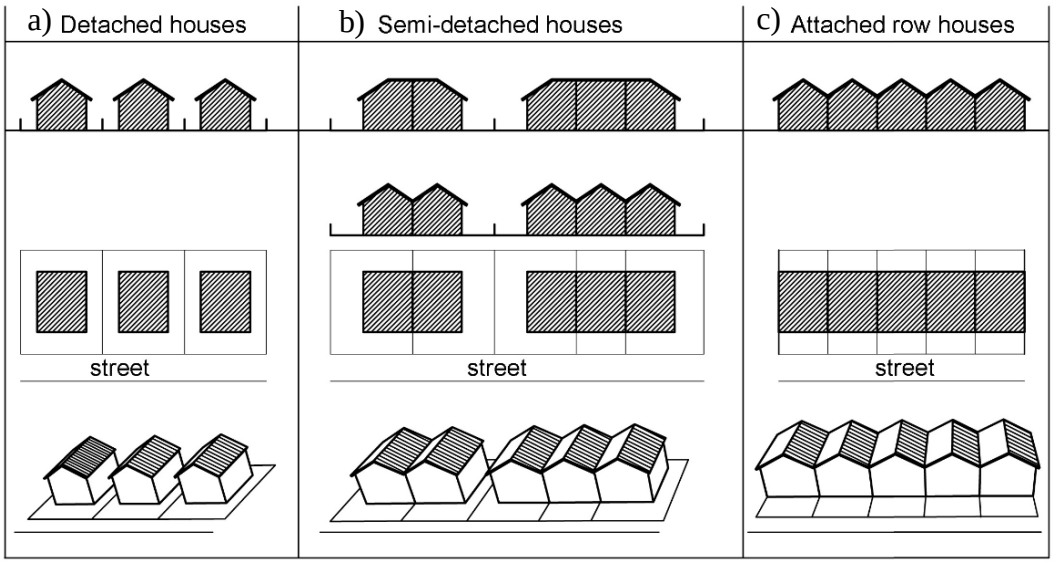



**Figure 2.31 :** Different layouts of single-family houses.

Finally, the single-family houses can be developed within a frame with attached row buildings (Figure 2.31.c). In this type of layout all the buildings along the street are attached to each-other and do not have space in their sides. This can be a proper layout for small and long parcels that face the streetwhere it is not possible to built detached houses. This mode of organization creates a higher dense and a more compact urban space then the previous layouts mentioned above. Also it creates a strong street pattern and composition. While, on the other hand, it can be a very monotonous space if the buildings do not have a variety and diversity in their designs. Besides this, the access of sunlight and wind into inner spaces is less than in previous layouts.

The location of the building within the parcel is another important determinant that forms different courtyard housing layouts. The positioning of buildings within the parcel is related to different specific conditions of the local area like: social issues, climatic conditions, orientation of the parcel and the topographical features. Therefore, different layouts are suitable or not in different situations. However, some general evaluations can be done for variable arrangements of houses within the parcel. The figure 2.32 shows some different organizations of housing layouts regarding the location of building within parcel (back, front, side, L-building, middle-courtyard).

It can be said that the houses with front yard, settled back from the street (Figure 2.32-I) do not make a strong definition of the street and as a result it is hard to form a compact urban space. In addition, it decreases the privacy of activities in the

courtyard if it is surrounded by transparent elements or is not enclosed. On the other hand, it has some positive sides like: it provides more quite space and privacy inside the building since, it is located back from the street; the access of the front yard to the street makes it suitable for parking within the parcel; and finally, the use of different plantings in the front garden can increase the green environment along the street.

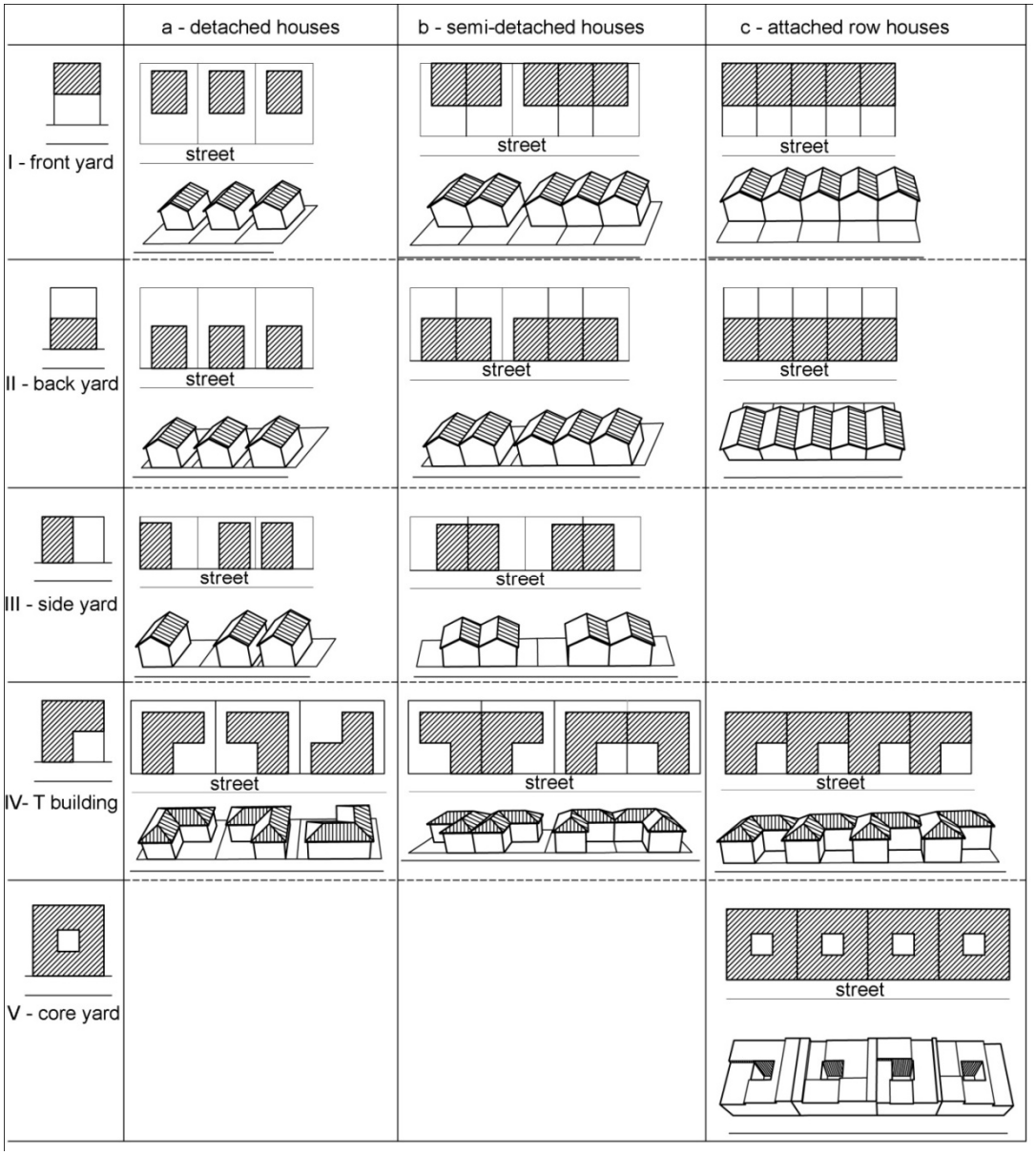



**Figure 2.32 :** Building-parcel-street arrangement and different housing layouts.

If the building is located on the side of the street and has a back yard (Figure 2.32-II), it has opposite effects of the previous layout. Therefore, it makes a better definition of the street space and composites a more compact urban area. In addition, the privacy and quietness is increased in the back yard but it is decreased in the inner

space of the house which is located near the street. Moreover, this type of organization does not provide parking opportunity within the parcel if it has not access from the street. Both of these layouts (front or back yard) are proper for designs with narrow long parcels along the street which produce a higher dense settlement.

The placement of the building on the side of parcel (Figure 2.32-III) can create a more diverse layout. This type of arrangement can be used in detached or double housing layouts. The positive issue of locating both the building and the yard near the street is that the building participates more in the composition of a defined urban space while the yard with access to the street is suitable for parking use. The number of parcels along the street is reduced since they have to be designed wider to provide a side yard. Theses wider parcels increase the distances between buildings which is positive for sunlight access and negative in the sense of enclosure in the street space.

Another courtyard organization can be produced by the design of L-buildings (Figure 2.32-IV). The use of this building shape can create diversity along the street space by different arrangement of these buildings (front, side or back yards).

Finally, the use of enclosed buildings with a courtyard in the middle (Figure 2.32-V) is another type of housing organization within the parcel. In this layout the building fits all of the parcel area except the open space or the courtyard in the middle. It is a typical layout which is used in some traditional Islamic cities with hot climate. These types of buildings are almost totally enclosed to the street and the activities oriented to the inner spaces. This housing layout provides a very high privacy in the inside spaces, which is a very important issue in Islamic culture. In addition, the enclosed houses attached to each-other make a very strong street space enclosure-which can have both negative and positive effects- and provide shadow along the narrow paths.

#### 2.4.3.2 Multi-family houses

Another mode of housing organization is developed by the construction of multi-family apartment buildings. The growth of cities and the process of urbanization especially after the industrial revolution brought up the need of new large amount of housing areas. Combined with new technological developments, the new settlements were developed within a new context with multi-storey apartment buildings where more than one housing unit (family) could be settled (Giritlioğlu, 1998).

The main issue in these new layouts was to locate more housing units by using less land and providing high density residential areas. The construction of these high- rise apartment buildings- developed in deferent forms-was proper for decreasing the housing and infrastructure costs by locating or grouping more housing units in one building. On the other hand, it had some negative effects on different issues like: the arrangement of inner uses; the organization of spaces around buildings; the problems on social relationships; the loose of human-scale proportions; and the destruction of human-building-nature relationship (Giritlioğlu, 1998).These apartment buildings can be grouped in three main forms regarding their spatial organization: free–standing (detached) apartments; linear blocks; and enclosed blocks with an open space in the core.

**The free-standing apartment buildings**: are used as form of housing layout in many cases especially after the beginning of twentieth century(Biddulph, 2007).In this layout the apartment blocks are located separately with long distances from each-other and the spaces around them are used as common areas for parking or green areas (Figure 2.33).

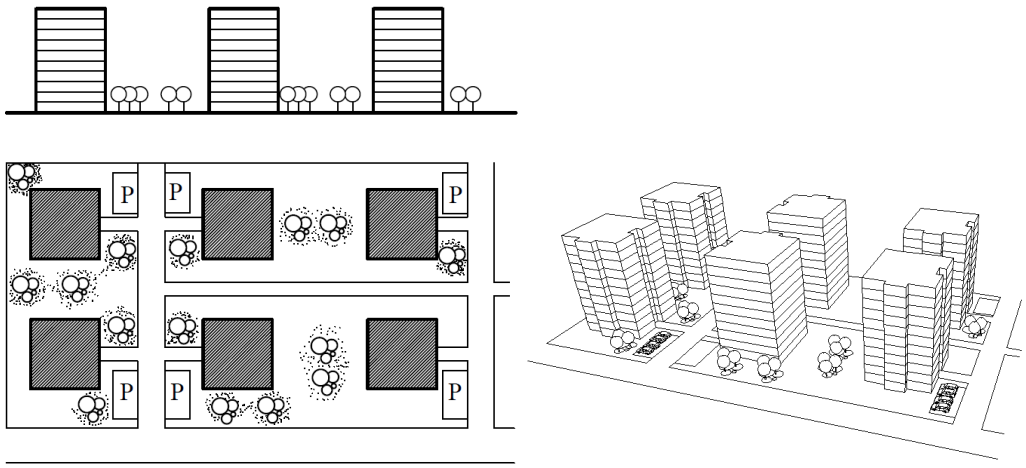



**Figure 2.33 :** Free-standing apartment blocks layout.

For those who defend this type of space arrangement the reasons are to provide: more light and air in residential areas; free spaces that are different ‘from depressing street environment of the nineteenth century’; more open and green areas around the buildings; and parking areas near the residential areas (Biddulph, 2007).

However, there are also many negative issues of this mode of organization. It is very hard to make a well defined space composition and create spaces with special characteristics. Also, it is difficult to group the buildings by forming rational space

compositions. Moreover this type of layout breaks the relationship with the outside environment and weakens the social relationships (Giritlioğlu, 1998).

**The Linear blocks**: are housing layouts (Figure 2.34) that began to develop during the twentieth century and still being used in nowadays. These housing arrangements are used mainly in continental Europe. The essential point here is to provide sunlight access to the living spaces (Biddulph, 2007).In addition, this type of attached buildings creates a more defined street space and more compact urban environment. Moreover, it can be used by improving the street activities and increase the vitality by locating commercial and other uses in the first floors.

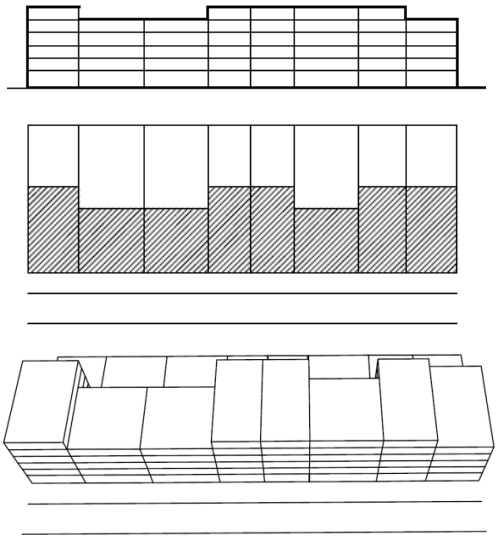


**Figure 2.34 :** The linear apartment blocks.

**The Enclosed blocks**: are housing layouts that form an enclosed block surrounded by streets in all sides and have an open space in the middle (Figure 2.35). These blocks can be developed within a variety of configurations. For example, the buildings can be located immediately on the street side or can be setted back by leaving an open area between the street and the houses (Figure 2.36). In the first one the focus is more on the public street life by making a stronger definition of street space and locating commercial uses in first floors. While in the second, the aim is to provide more quietness in living spaces and obtain parking or open areas around the residential buildings.

Regarding the organization of the open space in the center of the block, it can be arranged in three different ways (Figure 2.37).In the first one the open space is divided into private courtyards for each building (a).

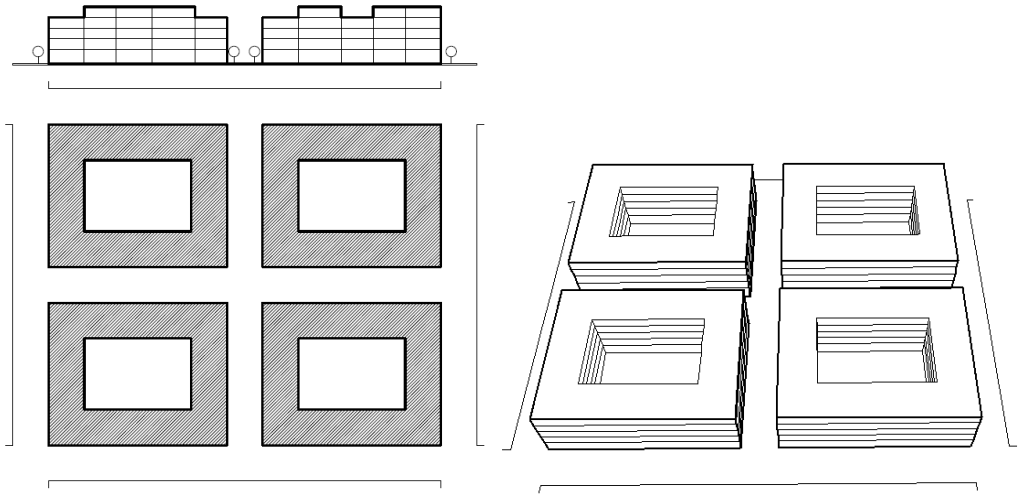


**Figure 2.35 :** Blockapartments layout.

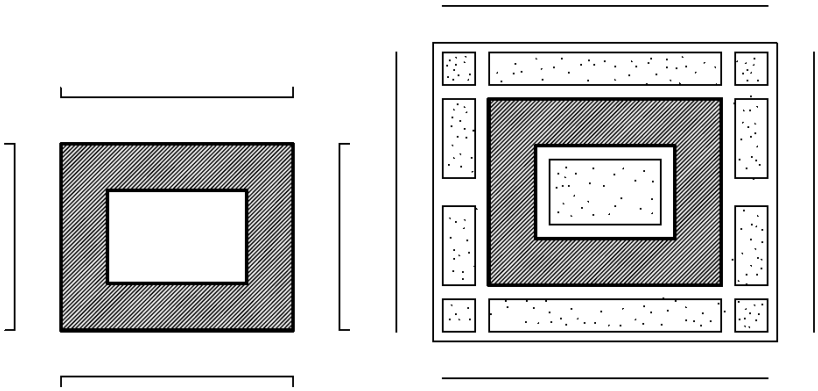


**Figure 2.36 :** Block-street relationship.

In the second one, the open space is consisted of private courtyards and a shared semi-private space that is used by all the residents around it (b).In the last composition, the open space between buildingsis designed as a common area (c) (Biddulph, 2007).

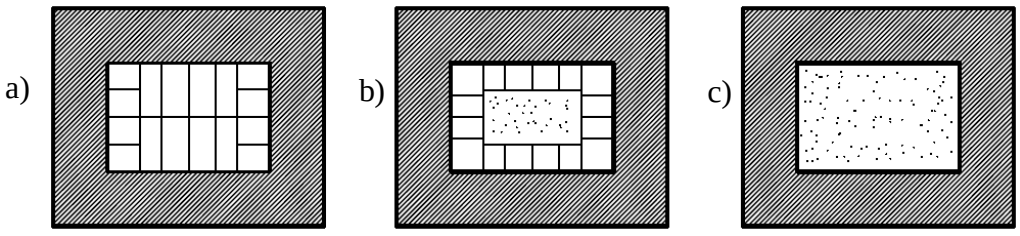



**Figure 2.37 :** The arrangement of the open space in the center of the block.

Regarding the enclosure of the open space in the middle, it can be done by different building arrangements (Figure 2.37). If the block is enclosed in all sides the open space in the core is not connected to the street and the access to it is provided only from the buildings. It can be said that this is not a very healthy arrangement. Another

composition is by opening only one side, or two sides of the block to the street and making it more accessible. Finally, the block can be opened to the street in all sides with enclosed corners, or opened corners. All of these compositions can be used according to the specific design conditions.

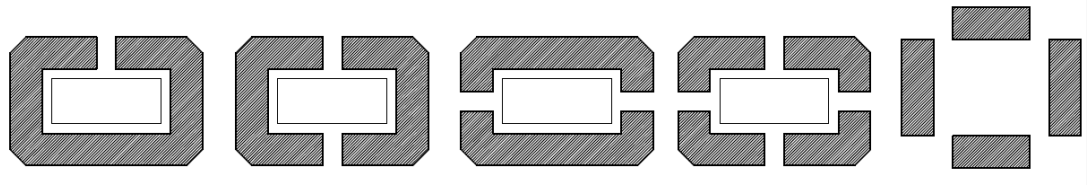


**Figure 2.38 :** Different types of block enclosure.

The main aim in this type of arrangement is to provide open and green space near the apartment buildings. These layouts are also suitable for families with children since they provide playing spaces for them near the living places (Giritlioğlu,1998).

The negative effects of high-rise building developments can be reduced by combining them with low–rise housing layouts (Figure 2.39).So, by this mixed-arrangement, the change between different scales is done gradually by providing a human scale environment. Moreover, by this combination of layouts more diversity and variety can be obtained in spatial organization of the residential areas (Giritlioğlu, 1998).

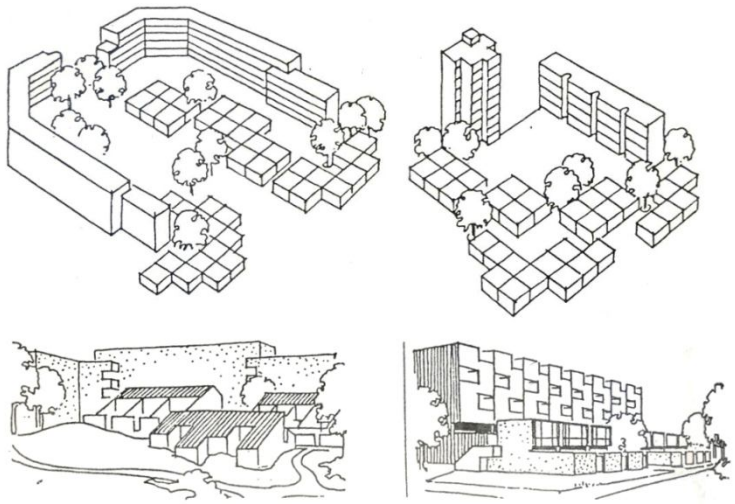


**Figure 2.39 :** Mixed housing layouts (Giritlioğlu, 1998).

### 2.4.3.3 Other design principles inhousing layouts

There are also some other important issues in the organization of housing layouts like: the topography of the site and its orientation; the relationship between the

position of the parcel and the street; the relationships between buildings regarding their heights and distances; and the organization of the space around the buildings.

The topography of the site is one of the main components in the design of residential areas and it should be analyzed and evaluated carefully to achieve a good space arrangement. The topographical features are essential because they affect the infrastructure and construction costs; the comfort level of living areas; the social relationships; and the user-nature relationships.

The slope of the site is a basic determinant of the character of the settlement and the construction costs. The slope between the intervals of 4%-10% is considered as suitable for decreasing the construction costs and providing a comfortable residential environment. While, if the slope is above 30% the costs are increased since some special arrangements (terrace houses) are needed to make the site usable (Giritlioğlu, 1998).

The physical form of the settlement should be developed in a way that follows the topographical lines of the site. This is very important because it provides a harmony between natural and built environment. By designing buildings that rise gradually according to the slope the topographical and natural features of the site can be emphasized more (Figure 2.40.a). While, if the buildings are developed on the contrary way, by ignoring the topography, it is not possible to achieve successful designs (Figure 2.40.b) (Giritlioğlu, 1998).

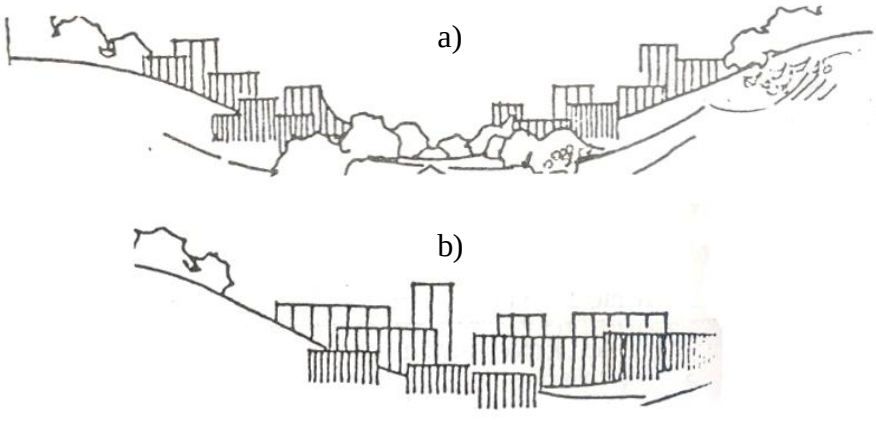



**Figure 2.40 :** The topography and the settlement layouts (Giritlioğlu, 1998).

Besides the slope of the site, its orientation is also very significant. So, the most suitable situation is when the site is oriented to the south direction and the less proper

one is if buildings are located on the north side (Figure 2.41). This issue is related with the access of the natural light to the living spaces (Giritlioğlu, 1998).

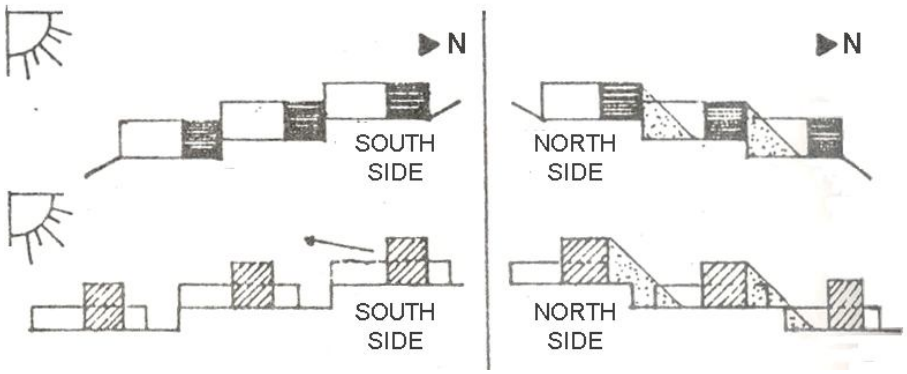



**Figure 2.41 :** The effect of site orientation on the housing arrangement (Giritlioğlu, 1998).

Another important factor is the location of the parcel and its relation with the street. The most favorable situation is if the street is located on the north of the parcel. The location of the street on the east or on the west of the parcel can be also suitable. While its location on the south of the parcel needs some special arrangement of the space within the parcel (Figure 2.42-43).

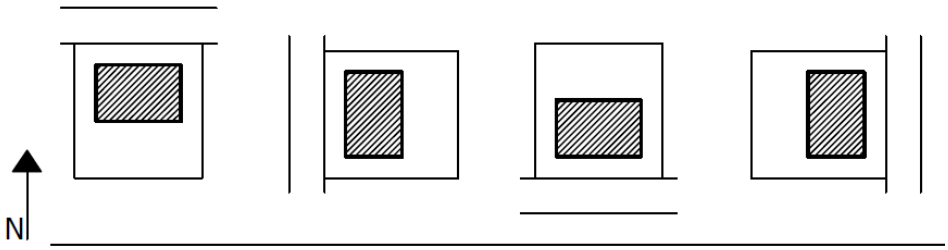



**Figure 2.42 :** Building-parcel-street relatonship.

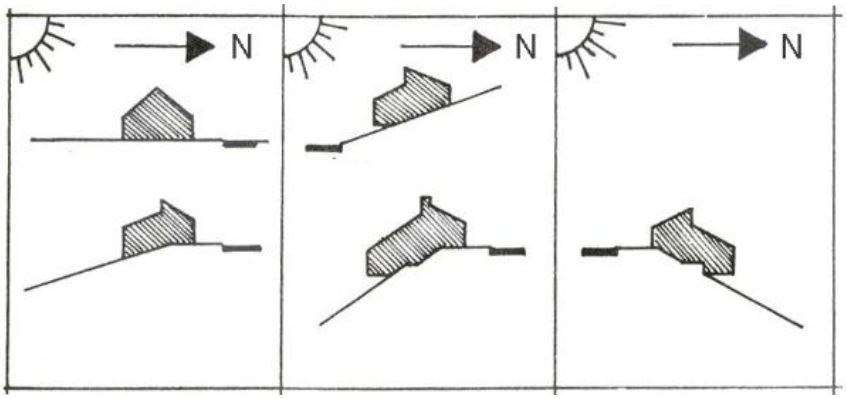



**Figure 2.43 :** Parcel-slope-street relationship.

The organization of the space around the buildings is related with three main purposes: sunlight and wind access, privacy, and view of landscape. The

arrangement of distances between buildings, their heights and their positions are very fundamental in this context.

Regarding the sunlight access, the best design is to locate higher buildings on the north side and the lower one on the south. In the opposite, the higher building will prevent the access of light into the houses behind them (Figure 2.44). Moreover, as shown in figure the distance between buildings and their positioning is also very crucial for access of the light (Biddulph, 2007).

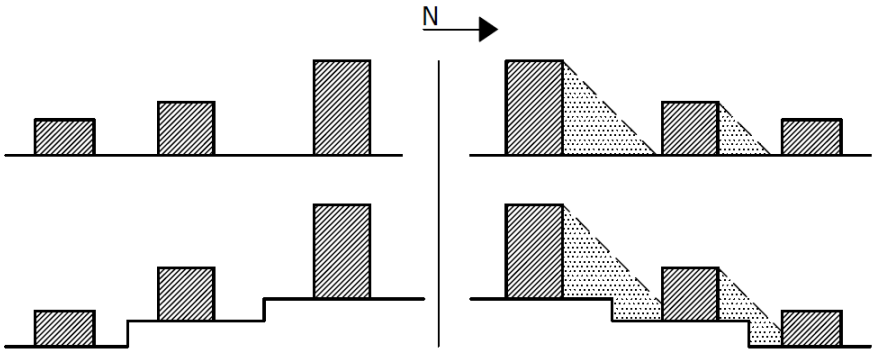



**Figure 2.44 :** Access of Sunlight on different site orientations.

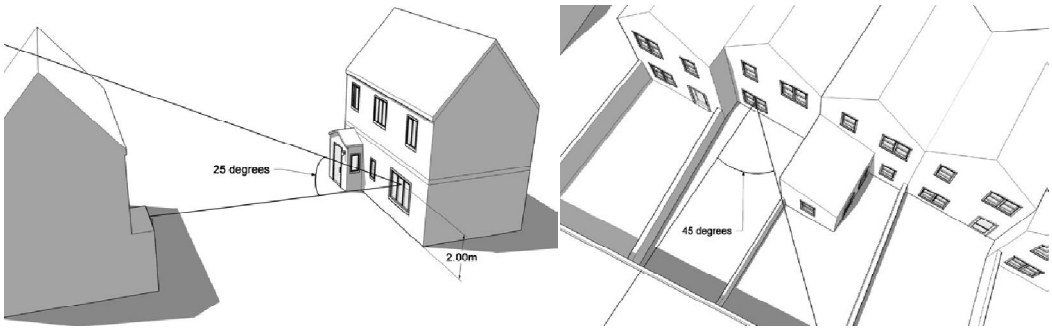



**Figure 2.45 :** Light access and distances between buildings (Biddulph, 2007).

Another significant issue that should be taken into consideration in arrangement of the space around the buildings is the providing of privacy in internal (room) and external (courtyard) spaces. There are some different modes of arrangements to achieve the privacy requirement. For example, the location of buildings within a suitable distance between each-other can be an efficient method (fig…). It is not possible to define an exact distance because it is related to particular conditions, but a distance between 20-25m is accepted as an appropriate one Another way to provide privacy is by placing the buildings at an angle greater than 30° (fig…). In this case, the distance between houses can be reduced(Biddulph, 2007).

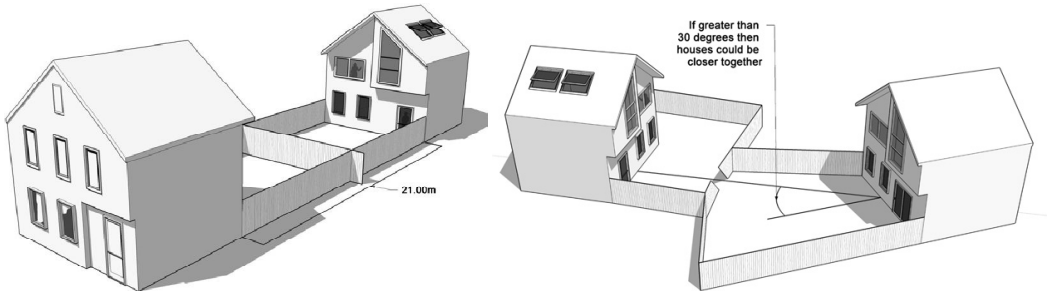



**Figure 2.46 :** Privacy created by remoteness and by the the location of the houses at an angled position(Biddulph, 2007).

The privacy in the indoor spaces of house located near the public streets can be obtained by raising the first floor above the eye level of the people passing through the street (Figure 2.48).

Besides this, in the buildings located nearer to the street the looking to the inner space is less than in those that are setted back from the street because, if the distance between the building and the sidewalk is increased the passers will have more time and field of vision for looking into the house (Figure 2.48) (Biddulph, 2007).

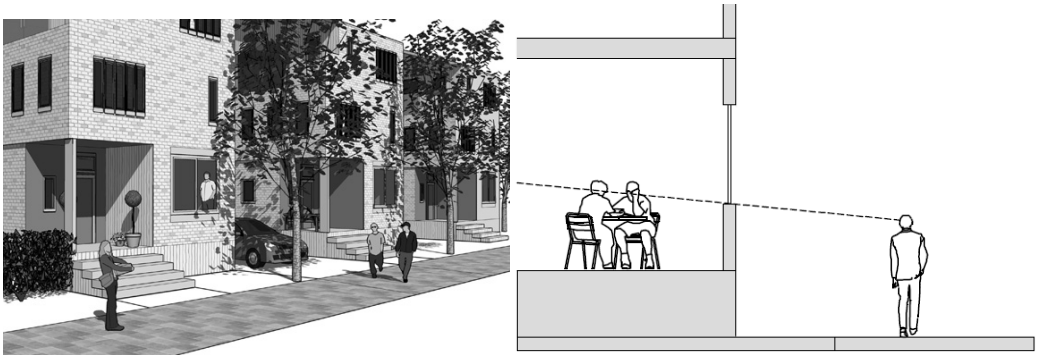


**Figure 2.47 :** Privacy created by raising the floor level (Biddulph, 2007).

**Figure 2.48 :** The change of privacy level according to the location of the sidewalk (Biddulph, 2007).

The obtainment of privacy in external (courtyard) space can be done in two ways: by screening or covering method, and by using the different levels of topography (if

there is one). The enclosure of the view into the courtyard can be achieved by locating it in the back of the house-in this case the building play the role of preventing the view from the street- or by using border elements (walls, fences, hedges) that rise above the eye level (2m high) (Figure 2.49)

If there is a change in topographical levels between two different spaces the overlooked area can be reduced, especially in the space that is in the higher level (Figure 2.49) (Biddulph, 2007).

**Figure 2.49 :** Privacyon the courtyard provided by screening or leveling (Biddulph, 2007).

Finally, another concern on the arrangement of the space around the buildings is the view that they have to the natural landscape. The organization of houses should be done in way that the view is not prevented. This can be achieved by arranging the heights in a gradual manner, locating the lower buildings on the side of the view (Figure 2.50) (Giritlioğlu, 1998).

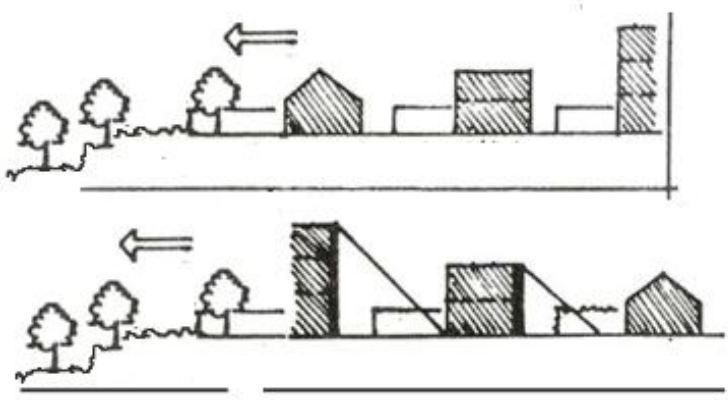


**Figure 2.50 :** Therelationship between buildings' height and the view (Giritlioğlu, 1998).

## 3. THE CITY OF KORÇA

### 3.1 General Information

The city of Korça is located on southeast part of Albania and is the center city of the region, which includes four districts: Korça, Pogradec, Devoll and Kolonja. The adjacent regions are the region of Elbasan (northwest), Berat (west), and Gjirokaster (southwest). In the northeast, it has borders with Macedonia and in southeast with Greece (Figure 3.1) (RDA, 2011).

**Figure 3.1 :** Korça Region in national context

The region of Korça has a mountainous relief with hills and mountains that cover approximately 75% of its total are. While the Korça district is located on a large basin which is 850m above the sea level and is surrounded by mountains of Morava (1800m) on the east, Mali iThate (2262m) on the north-east, hills of Grabovica on the north, mountains of Gora, Voskopoja and Vithkuq on the west and mountain of

Qarrit on the south. The city of Korça is located on the south-east of the basin and has a low slope rising to the east of the city (LAMP, 2010; Thomo, 1988).

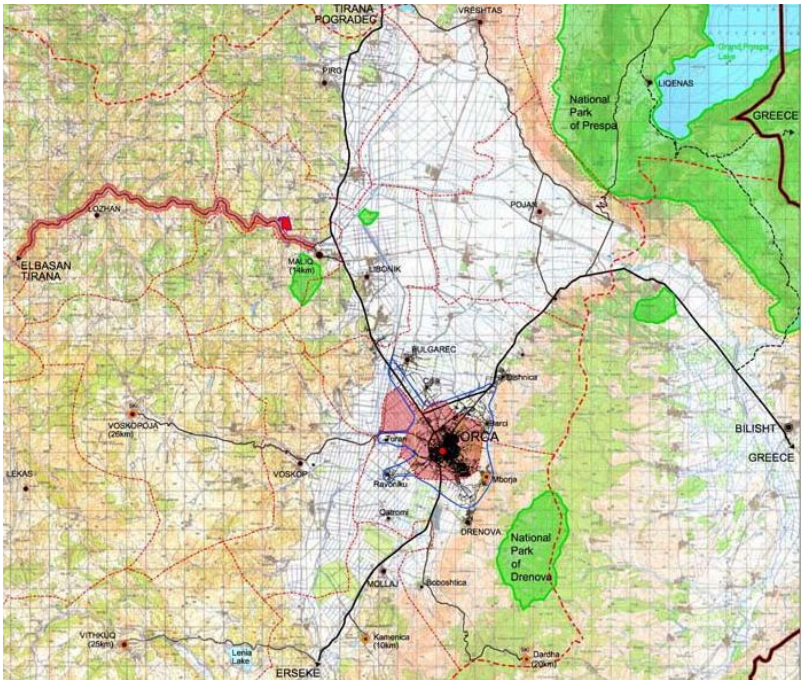



**Figure 3.2 :** The city of Korça located on a large basin (LAMP,2010).

### 3.1.1 Demographic features

Korça is the central and the biggest city in the region with a population of 87,000, while Pogradec is the second largest city with 40,000 inhabitants. Both of the districts (Korça and Pogradec) have almost 80% of the region's population located on their territories (Table 3.1).

**Table 3.1 :** Distribution of Population in Korça Region (Korça Region,2008).

| Municipalities/Communes | Population (2008) | % |
|---|---|---|
| Korca Municipality | 86,443 | |
| Maliq Municipality | 6,247 | |
| Korca Communes | 107,936 | |
| **Korca District** | **200,626** | **55** |
| Pogradec Municipality | 40,138 | |
| Pogradec Communes | 51,664 | |
| **Pogradec District** | **91,802** | **25** |
| Devoll Municipality | 9,945 | |
| Devoll Communes | 33,327 | |
| **Devoll District** | **43,272** | **12** |
| Erseka Municipality | 12,840 | |
| Erseka Communes | 13,695 | |
| **Kolonja District** | **26,535** | **7** |
| **Total Region** | **362,235** | **100** |

The emigration to the other countries (mainly Greece) and the migration to other cities within Albania that began after 1990s have decreased the region population about 15% in total. In the other hand population in the urban centers has grown by the population flow from rural zones. The urbanization rates are higher in Pogradec and Bilisht and less in Korça. The Region's datea shows that urban population has grown from 34% to 43% from 1989 to 2008 (Table 3.2) (LAMP, 2010).

**Table 3.2 :** Demographic trends in Korca Region, 1989-2001(Korca Region, 2003).

| District | Population (1989) | Population (2001) | Change (%) |
|---|---|---|---|
| Korca | 177,127 | 142,909 | -19 |
| Pogradec | 71,446 | 70,471 | -1 |
| Devoll | 38,094 | 34,641 | -9 |
| Kolonja | 24,781 | 17,161 | -31 |
| Total Region | 311,448 | 265,182 | -15 |

### 3.1.2 The economic profile

The main sectors of Korça Region's economy are: agriculture, light industry, construction and services. The agricultural production covers approximately 30% of the Region's economy. In the last years the cultivation of fruit trees and vegetables have shown a growth in the rapport with the cultivation and production of cereals and industrial crops which is reduced. Another important sector is the light industry which is concentrated more on food processing and provides a large amount of products. Garment manufacturing is also a main branch of the local economy. The garment manufacturers are located commonly on Korça city. While, the sector of construction is a branch in growing based on the extension of urban areas especially after 1990s. Lastly, the sector of tourism which is increasing rapidly is also a fundamental component in the economy of the region. The region has a lot of natural, historical and cultural values which attract a large amount of tourists (LAMP, 2010).

## 3.2 The Historical Urban Development

Korça is one of the oldest cities in Albania and is a place where the traces of different periods can be seen. The history of Korçacan be divided in four important periods that brought different architectural styles and formed their characteristic urban patterns. These periods are: Ottoman era (1431-1912), period of two World Wars (1912-1944), Communism era (1945-1990) and Post-Communist Period (After

1990). All of those periods had different economic, socio- cultural and technological conditions and as result different architectural and urban forms were developed.

### 3.2.1 The Ottoman era

Before the Ottoman evasionKorça was a small settlement around a castle with about 26 houses. In the south-east part there was the village of Mborje (70 houses) and in the west the village of Peshkopi (71 houses). After Ottomans took this region (1431, 32) they formed a province and Korça became the administrative center of this province. This is an important moment in the history of the city because after that, Korça began to have an economical and cultural development and gained the characteristic of an urban area. In this period the city began to spread outside the castle and the district took the name Varosh (suburb). In the end of 15$^{th}$ century Sultan Bayazit II gave the village of Peshkopi to IliazBeyMirahor and the this village became his property (Thomo, 1988; MUK, 2008).

In 1496IliazBey built a mosque, an imaret and a school and transferred the bazaar from village of Mborja to Peshkopi. Those were very important steps in the context of economic and cultural life and in the urbanization of the area. In a short period the village of Peshkopi became the part of the city. At this time Korça consisted of three main districts;Varosh, Kasaba and the Bazaar. Varosh was the oldest part of the city and was the district where christians lived. Kasaba was the muslim's district and was located around the mosque and the Bazaar. The two districts were separated by the river of Mborja, Varosh district located on the east part and Kasaba with the Bazaar on the west. The urban area consisted of a typical Ottoman settlement with organic narrow streets and detached 1-2 storey buildings with courtyards surrounded by walls. The agriculture land was outside the city. Though all the developments, Korça had a limited growth until the 19$^{th}$ century. In the beginnings of 19$^{th}$century the settlement consisted of approximately 450 houses (Thomo, 1988).

The mid of 19$^{th}$ century was an important phase in the economical and cultural development of Korça. The city used its geographical position and the opportunity of being the center of the province to have an economical growth by developing the trade and the sector of handicraft. This development brought a considerable migration to Korça, especially from rural zones. At this time the population reached about 10.000 people. All of these developments triggered also new transformations

on the urban structure. The need of housing for the increasing population and the adaption to the new economical and social conditions brought up some new arrangements in the city pattern. In the first phase there was an adaption of existing typology to new conditions. The filling of vacant spaces in courtyard with new buildings created a more compact urban space. New treatments of buildings' outside and inside spaces, changes in architectural and decorative elements were some crucial interventions. This was a transition phase which served as preparation to the second phase because it had some efforts for a new organization of buildings and urban structure (Thomo, 1988).

In the second phase- as the migration continued- the city spread out in new areas on the north-east and north. Those new areas were completely different from the old districts in the context of their street system. For the first time, an orthogonal structure with straight streets was applied in Korça. The new areas were connected to RepublikaBoulevard which was opened at this time and was one of the main arteries of the city. Beside this, the typology of buildings, their location on the parcel, relation to the street, organization of courtyard and some architectural and decorative elements passed through some changes to adapt to the conditions of that time (Thomo, 1988).

During this time, the Bazaar was as also reconstructed by having a grid street structure with new buildings constructed with more stable material such as iron, brick, stone etc. Also, it had e new organization of the commercial and handicraft functions. Though these changes, the bazaar was not sufficient to supply the needs of new economical and social organization. As a result some new units with commercial functions and other services were located near the residential areas. Moreover, commercial, cultural and public functions were also spread to the buildings along the main boulevards. After all these developments, Korça had e new structure in the organization of urban life and urban structure but although these changes, there was a harmony between the old and the new pattern (Thomo, 1988).

### 3.2.2 Korça between 1912-1944

In 1912, Albania was declared as an independent state and was separated from Ottoman Empire. During this period until the end of First World War Albania did not

have a stable state and development because it was always threatened by the invasion of foreign neighbor countries. In 1920's there were some efforts for creating a stable

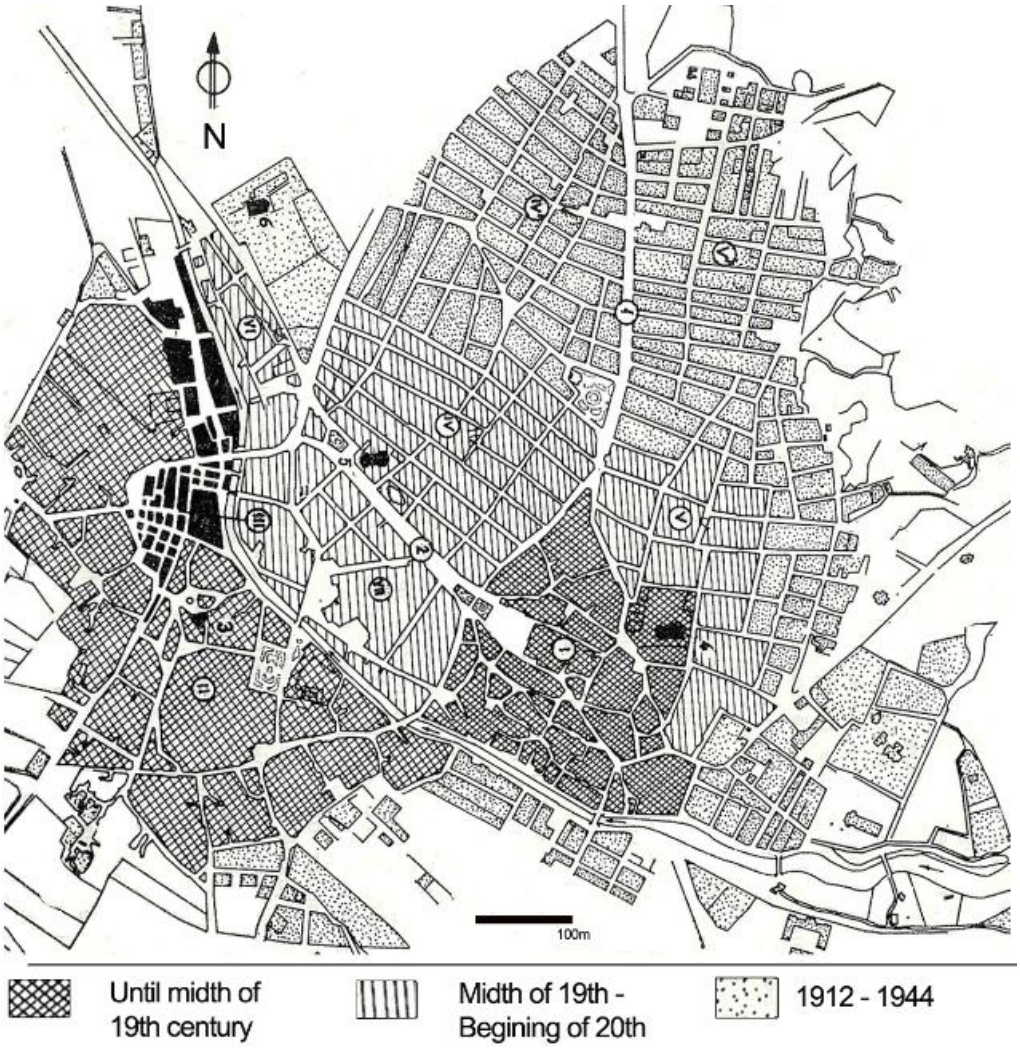



**Figure 3.3 :** The urban development of Korça until 1944 (Thomo, 1988).

state, while in 1924 Albania was declared a Monarchy and AhmetZog became the king. During the period until the Second World War, Albania had a development in different fields like industry, infrastructure, urbanization etc. At this time Albania was very dependent to the western countries (especially Italy). The influence of western architecture can be seen clearly in urban plans and buildings that were designed in this time (Miho, 2003).

Korça did not have a dramatic change in this period but some new developments and processes took place in terms of urban planning and architecture. The city continued to spread out in the north part with the same orthogonal street scheme. Some new changes were made in the arrangement of buildings such as: new organizations

within the parcel; changes on the architectural styles and elements; the use of more decorative elements; and the use of more transparent courtyard bordering elements (railings). The influence of western architects can be seen in some public and residential buildings designed by them in neoclassical and eclectic styles. The land use compositions had also some new transformations by increasing the buildings with both commercial (first floor) and residential functions. Also, new buildings with public, commercial, cultural and administrative functions were developed along the main boulevards. These new land use developments increased the importance of the main boulevards on the socio-economic and cultural life of the city (Miho, 2003; Thomo, 1988).

### 3.2.3 The period of communism

After the end of the Second World War (1944), the communist regime, under the leadership of EnverHoxha, took the government of Albania. EnverHoxha had the absolute authority to rule the country until his death in 1985. The new government made very radical reforms by establishing new rules that transformed the economical system totally. All properties, industries, banks and other commercial entities were nationalized and managed by the central state. During this period, Albania had one of the most dictatorial communist regimes in the world. The relationships with other countries were very limited and the country was governed under a total isolation (Nase, 2007).

During the communist period, Korça had a large extension of urban areas. The city developed to the vacant zones on the north, west and south. Also, a ring road that divided the city from the agricultural land was constructed at this time. New residential, industrial, commercial, educational and administrative uses were developed in the extended urban areas. The residential areas were developed mostly on the south and west part, while the industries were located on the periphery of the city (LAMP, 2010).

Administrative, cultural, commercial and other public functions were developed mainly along the wide boulevards, in many cases by demolishing the old buildings. Although migration to cities was very limited and controlled by the government the population had a growth, so new residential apartment blocks with 4-5 floors were constructed during this period.

### 3.2.4 The period of post-communism

In 1990, the Communist regime was collapsed and a new multiparty democracy was established in Albania. The establishment of the new government system and liberal economy brought a lot of changes in economical, cultural and social life in Albania. After these years Albania faced a massive migration to foreign countries and from rural zones to urban areas. As a result a fast urbanization process began in almost all cities in Albania but unfortunately it was not developed within an urban plan. Generally, three different building types can be seen in this period; high rise apartment blocks (8-9 storeys) inside and in periphery of the cities, 1-2 storey informal single houses in suburb areas and formal single houses developed according to a plan. These developments can be seen in Korça too although it had a limited urbanization (LAMP, 2010).

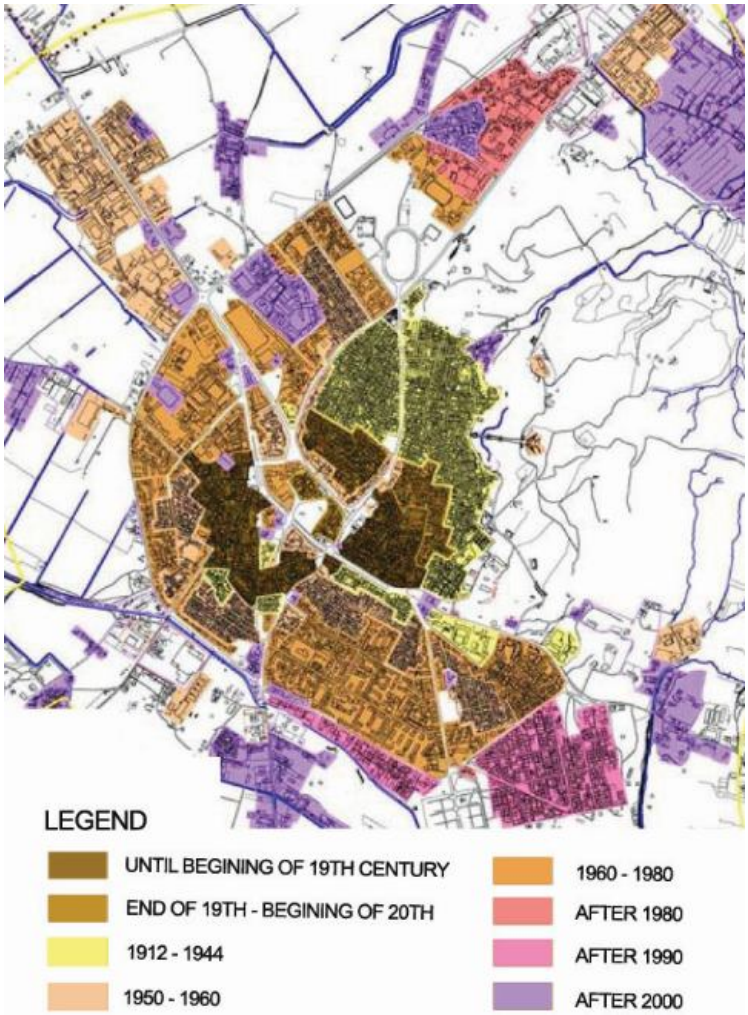



**Figure 3.4 :** The urban development in different periods (LAMP,2010)

### 3.3 The Urban Structure

Korçais one of the few cities in Albania that is developed within a certain structure, mostly in a planned way. Commonly, the various urban patterns that represent different historical periods and still exist in nowadays form very rich and diverse urban spaces. The actual structure of the city reflects mostly the developments during the 19th and 20th centuries. Korça is a compact city that is developed in a kind of semi-circular layout, bordered by the Rinia Park and Sport complex to the north, the ring road to the west and the south and the Morava hills on the east. The farthest distances between the poles of the city are 2.5 km (north-south) and 1.5 km (west-east). The urban area is mostly consists of the residential zones and the city canter with the major public facilities (LAMP,2010).

#### 3.3.1 The conservation areas

The most part of the city is accepted as a cultural heritage by a decision in 2005 (455/2005). These zones consist of the 'Historic Center' and the 'Urban, Architectural and Traditional Ensemble. The 'Historic Center', which is under total protection, includes the traditional residential areas around the center, a part of the zone along the Republika Boulevard and the Bazaar. The traditional residential areas are located in two different zones: the first one is developed around the Orthodox Church, raising to the Morava hills and the other is positioned around Mosque and the Bazaar. These areas are characterized by 1-3 storey dwellings with courtyard, small plots and narrow cobblestone streets forming an organic structure. The Bazaar is another zone within the heritage areas with important cultural values. The Bazaar was reconstructed in 19th century, and though the buildings are obsolete, mainly its physical form has not changed since then. It still maintains the function of the central market area of the city.

The other zone within the cultural heritage is the 'Urban, Architectural and Traditional Ensemble' which mainly consist of residential areas developed between the late 19th to the mid of the 20th centuries. These zones are constructed with an orthogonal street system, and 1-3 storey courtyard houses (LAMP,2010; Thomo 1988).

### 3.3.2 The land uses

#### 3.3.2.1 City centre

The city center, constructed after 1950s, is located between the traditional zones and covers a considerable area with wide streets, squares, green spaces and buildings of the socialist period, located along the main boulevards. The most of the commercial, cultural, and recreational functions, both with the administrative and other public facilities that serve to the whole city are located on the city center and along the main boulevards. Besides a few small-scale shops for daily needs and some public facilities located in different areas, there are no other sub-centers that make a decentralization of the city.

#### 3.3.2.2 Residential areas

The residential areas can be grouped in two categories: single-family courtyard houses and apartment buildings. The single-family houses appear in various typologies, developed in different periods such as: traditional residential areas (until the beginning of 20$^{th}$ century); residential quarters of socialist area; and the residential expansions after 1990s. The single-family houses of socialist period were constructed around the traditional city after 1950s. They consist of small parcels with narrow streets and small open spaces. While the detached single-family houses of post-communist period (after 1990), developed in the periphery of the city, and are constructed within a formal plan or in an informal way.

In the other hand, the apartment buildings are constructed during the communist period and after 1990s. The collective residential apartment of the socialist era, with 4-5 floors and open spaces around them, were constructed on the southern part of the city. While, in the late communist period some new clusters with free-standing apartment blocks (6-storey) were developed on the north-east zone of the city. The use of new building technologies and materials after 1990s brought up the construction of high-rise, mixed-used apartment buildings, which were developed on the north part of the city, and along the Fan Noli Boulevard and 28 Nentori Street (LAMP, 2010).

#### 3.3.2.3 Industrial zones

The main industrial area was developed during the socialist period on the north of the city. Other zones with industrial functions are developed along the Bilisht road (northeast), behind the Cemetery (southeast) and near the Polena road (southwest). After 1990s the industrial activities has gone through deterioration by creating large abandoned and derelict buildings. In recent years, the deteriorated industrial zones are going under a transformation, and replaced by new functions such as: commercial, cultural or residential uses.

#### 3.3.2.4 Public facilities

The educational, health care, sport, and cultural facilities are distributed in different part of the city by serving on local or city level. The educational institutions from pre-school to high school level cover mostly the local needs. There are also nine professional schools that provide qualifications in different fields like: industry, technology, construction, agribusiness, foreign languages and music. Moreover, Korça has two universities that attract students from the whole region. Regarding the health facilities, the city has nine health centers at the local level and a regional hospital which is located on the south part. The sport areas are located around the Skenderbeou Sport Complex on the northeast of the city. The cultural activities such as museums, library, theatres, and cultural center are located on the center of the city.

#### 3.3.2.5 Transportation and green areas

The city of Korça has a clear structure of road network which is developed within a hierarchy. There are three main entrances to the city from different directions: on the northwest (road to Tirana), on northeast (Bilisht), and south (Erseka). These points are interconnected by a ring road that bypass the city and divides it from agricultural lands. In the inner part of the city there are some main boulevards, constructed in different times, which connect different districts to the city center. These boulevards are important for the vehicular traffic flow and pedestrian movement. The wide sidewalks, planting elements and the location of commercial and public activities, increase the pedestrian activities along the main arteries. The street pattern in the inner parts of the city, is commonly developed in an orthogonal system, except the traditional areas that have an organic street form.

Regarding the green areas they can be categorized into: city level parks and neighborhood level green areas. The ‘Rinia’ park and the ‘Skenderbeu’ sport complex on the north east are large green open spaces that serve to the whole population of the city. The ‘V. Mio’ park on the city center can be also classified as an urban level green area. The other small open spaces are positioned in different locations by serving to the local districts.

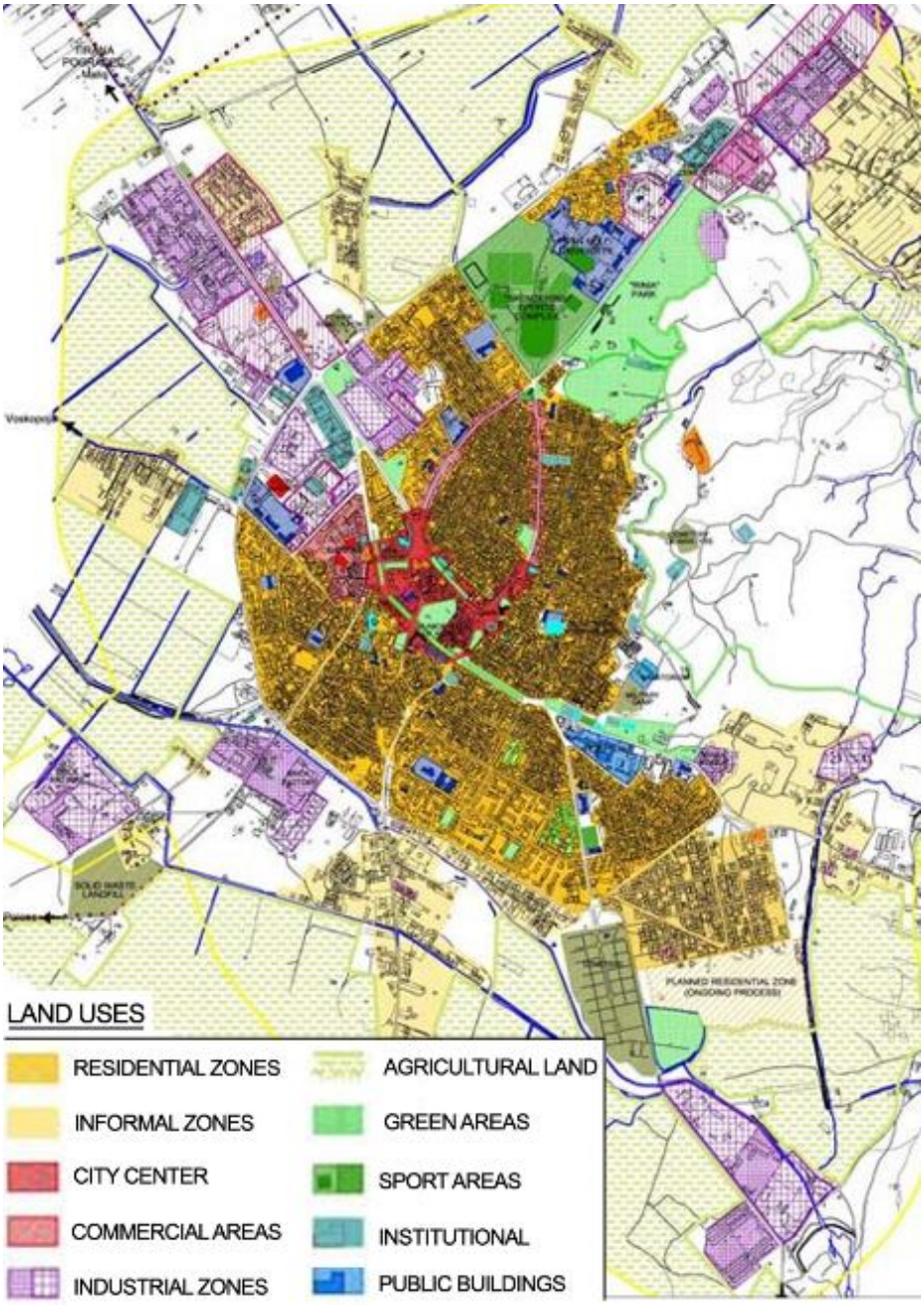



**Figure 3.5 :** Existing land uses (LAMP, 2010)

**Figure 3.6 :** Transportation system and green open Spaces.

# 4. MORPHOLOGICAL ANALYSIS IN THE STUDY AREA

## 4.1 The Study Area

The study area is located on the south-east part of the city of Korça (Figure 4.1). This area located beside the city center, is developed in the early ottoman period and is the oldest district in the city. As mentioned before, the reason for choosing this zone as case study area is because it has mostly preserved its original pattern, especially the street structure. This fact creates the opportunity to make morphological analyses on a traditional settlement and generate a typology of different patterns. In the first view it may be seen as an irregular pattern without a systematic organization but the observations done later has shown that this zone has a rational spatial organization in the context of street structure and arrangement of open spaces and building layouts.

The area consists of an organic street frame which is continuous and forms variable shapes of settlement blocks. The intersections of streets form small open spaces with particular shapes and sizes. Regarding the buildings layout, generally it consists of low rise private courtyard houses (1-3 storey) that form a very compact and dense settlement.

The figure 4.1a shows the location of the study area in the urban context and its relations with public buildings (schools, institutions, cultural buildings etc.) and green open spaces. Since Korça is a small city, it can be said that these public spaces can be accessed easily from the area. The study area covers approximately 11.5 hectares and has a population around 1200 people with a density of 100 people per hectare.

The figures 4.1b and 4.1c show the urban pattern of the study area in closer view. The image on the left (b) represents the old pattern while the map on the right (c) shows the actual situation. As can be seen the most part of the area has not changed except the zone on the northwest. This zone has changed after some interventions on the later periods where the boulevard on the northwest was

widened and a considerable mass of buildings were demolished and replaced by some institutional buildings (the area where now the cathedral and prefecture building are located). In addition, some changes are done in the southwest part by the construction of Fan Noli Boulevard and some new buildings and very limited changes are done in the inner part of the area. The old pattern (b) is used as the base for the most part of the morphological analyses done in this study (especially for street pattern analyses). The analyses are done in three different contexts: analysis of street pattern, open spaces and building layouts. All of these analyses are elaborated in different levels (or scales) by starting from the upper scale (the whole study area) and going into detailed analysis of different elements.

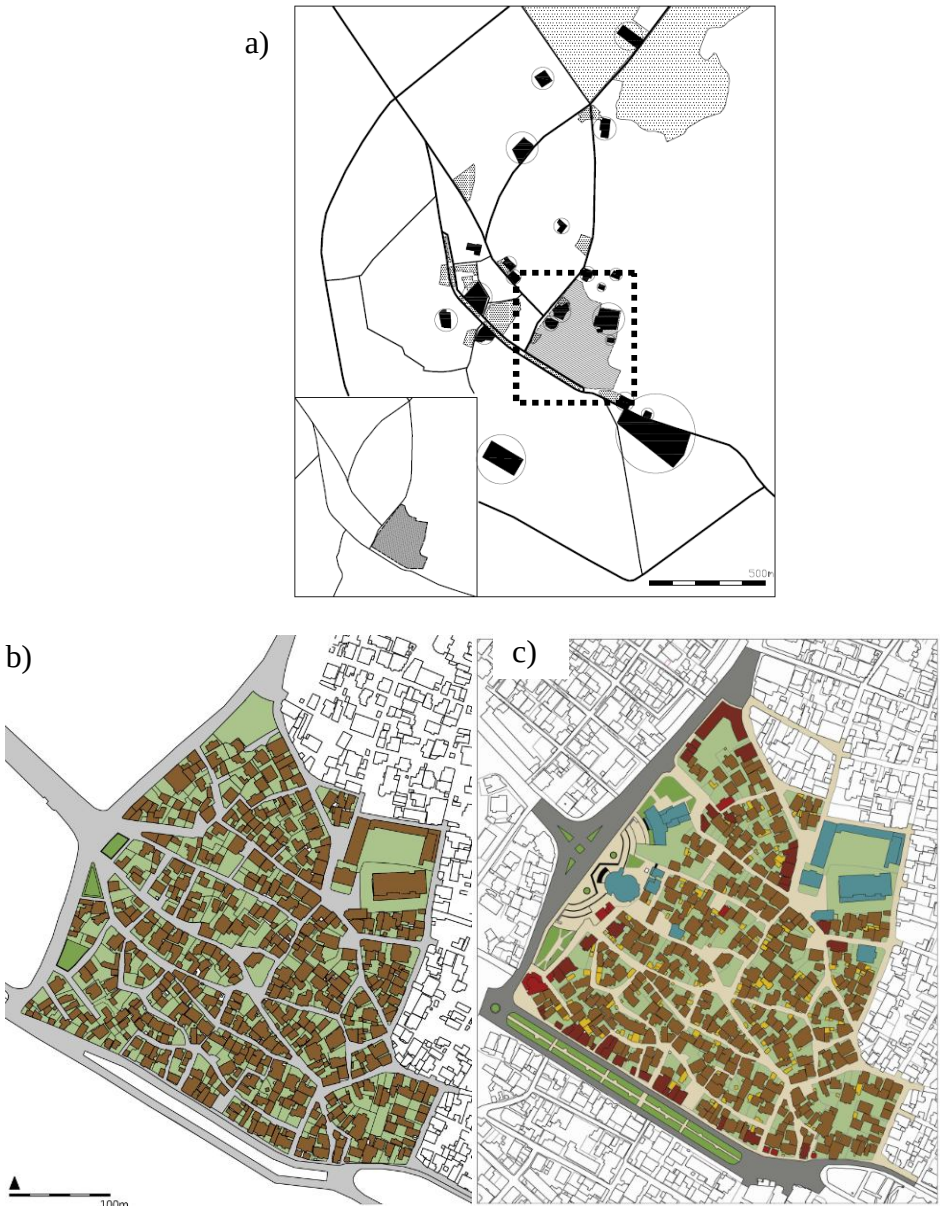



**Figure 4.1 :** The location of the study area, (a), the old pattern, (b), existing situation(c).

### 4.2 The Street Pattern

As mentioned before, the old street pattern (Figure 4.2bb) is mostly preserved, except of the area in the northwest part where some changes are done by the interventions on this zone. As a result, the part which can be seen in the old street pattern, where paths are continuous and connected to the boulevard, is now replaced by a larger open space which cuts the continuity and where the streets end up in a undefined form. The southwest part has also gone under some transformations by the construction of new boulevard while the inner part did not have considerable changes. Though these transformation, generally, the traditional street pattern is conserved.

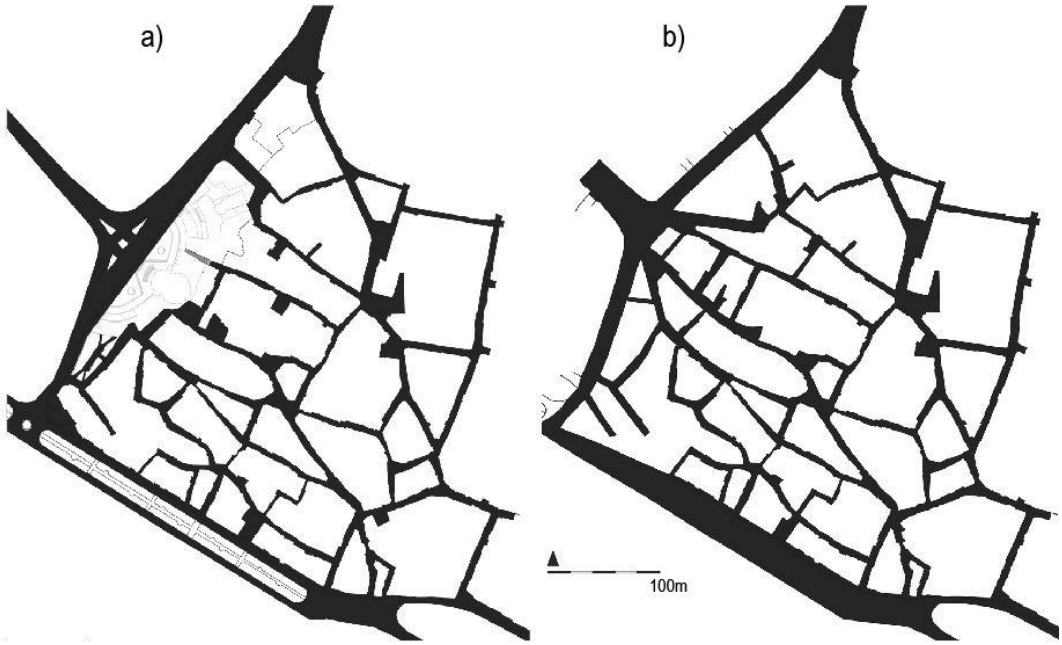



**Figure 4.2 :** Street pattern, existing situation (a) and old pattern (b).

The organic structure of the street makes it difficult to do very definitive observations and measurements. Despite this, by trying to find the logic and rational basis of this arrangement, some systematic relations can be found between the street pattern and the factors forming it. For example, the effect of climate can be seen in street orientation. The streets are oriented in northwest-southeast direction to take the local winds coming from this side and are intersected with other streets in northeast-southwest direction in particular intervals. The topography does not have a considerable effect on the street form and its orientation because the area has e very low slope arising from the west to the east. The difference between the lowest and

highest point is approximately 10 meters in a distance about 400 meters which means that the slope is nearly 2-2.5%. (Figure 4.3).

**Figure 4.3 :** Site section showing the topography.

If a schematic abstraction of the street system is done (Figure 4.4), some spatial organizations can be seen in the street pattern. Despite the organic texture, small rings are formulated by shaping different blocks, which grow gradually in size and have variable shapes that can be grouped into some main forms.

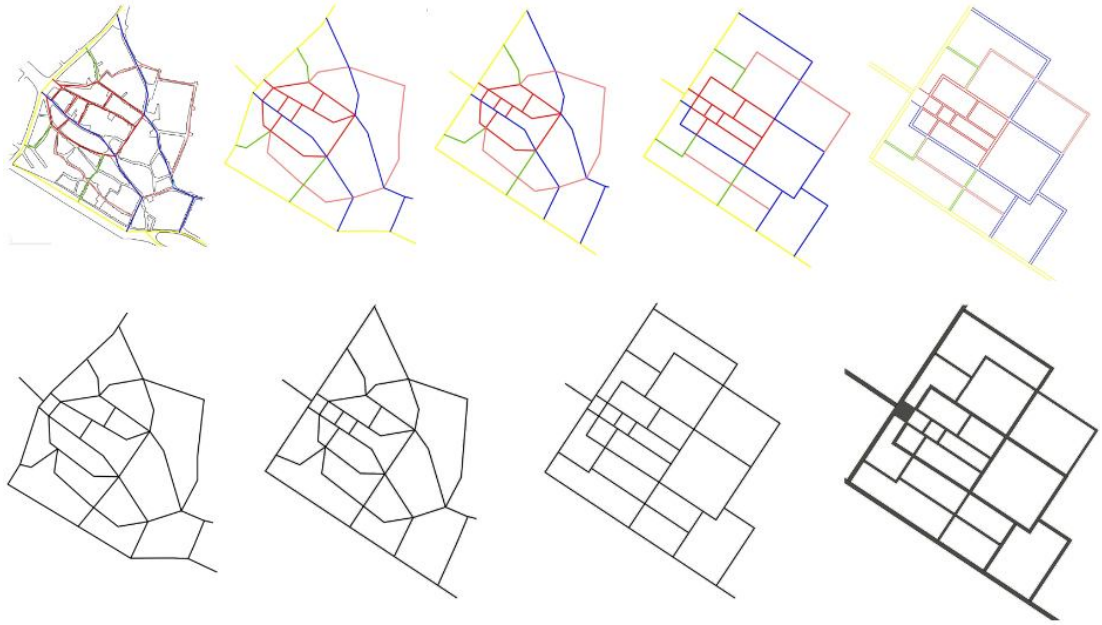


**Figure 4.4 :** Schematic abstraction of the street network.

There are some dead-end streets but they are not very noteworthy in the whole structure. Moreover, a little symmetry can be seen in the middle of the area and in the side streets that are connected to the boulevard on the northwest side, however, this is not a total geometry that can affect the variety of arrangements and create monotony. Some of the streets are wider than others and this forms a kind of hierarchy and some main routes in the street system. However, the most of the area does not have a hierarchy between streets. This is an organic pattern which has a consequent spatial arrangement with streets that form a variety of spaces with different characteristics.

The figure 4.5 shows the two main streets that border the study area and the connections of inner streets to them. As can be seen from the figure the area has four connections to the northwest boulevard with distances that vary from 90m to 110m.

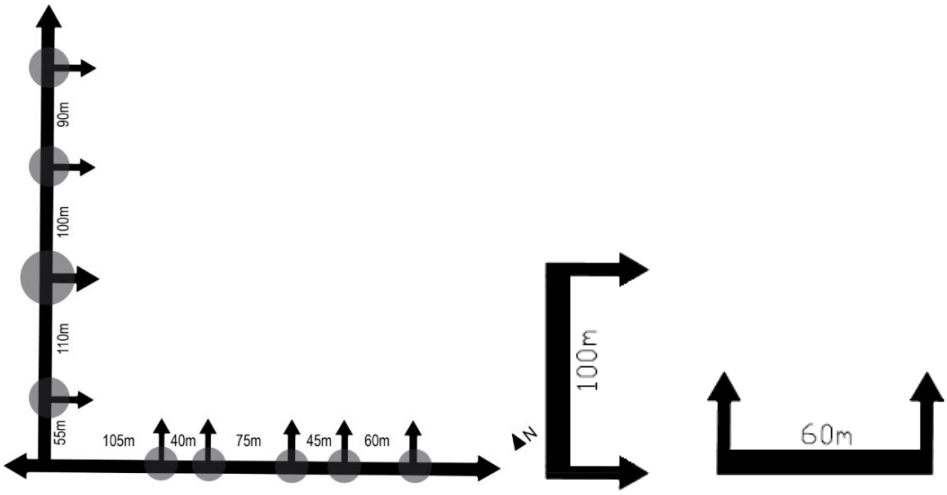



**Figure 4.5 :** Connections to the main streets.

So the average distance between the streets that connect to this side can be accepted as 100m. While in the southwest part the connections are more frequent. There are 5 main connections with distances between 40m to 105m. The average distance can be accepted as 60 m.

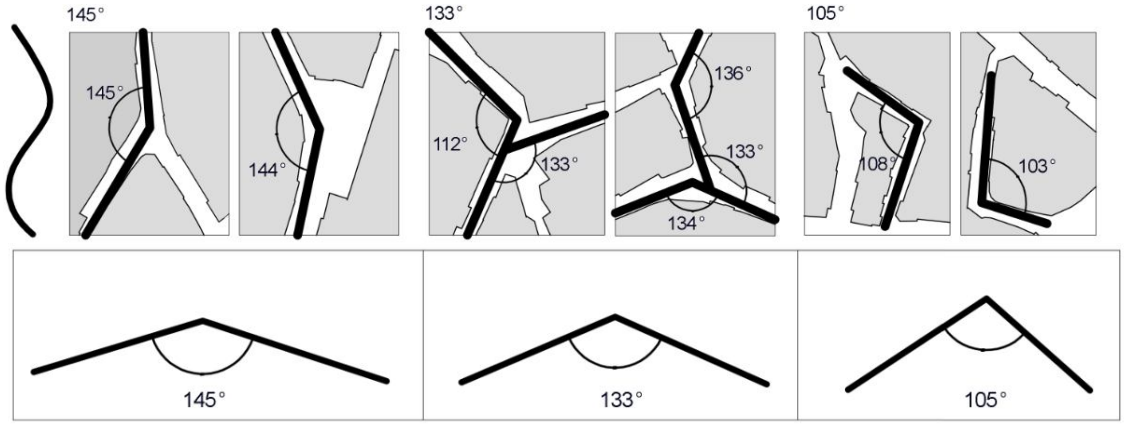



**Figure 4.6 :** Directional changes on street lines.

The street lines have a variety of directional changes in distinctive intervals as shown in figure 4.6. The directional changes have different angles that vary between $90^o$ to $150^o$. The most common angles are: $105^o$, $133^o$ and $145^o$ but the most repeated is the directional change with an angle of $133^o$. The change of the direction generally occurs on street intersections or near them. The distances between two changes of direction vary from 30 to 70m. These changes during the street line are important because they provide more definite and human scale street space by fragmenting it within a particular frequency. Another effect of orientation change within these angles is on increasing the diversity in street space and maintaining the continuity

inthe same time. Finally, they contribute on creating rich perspective views along the street space.

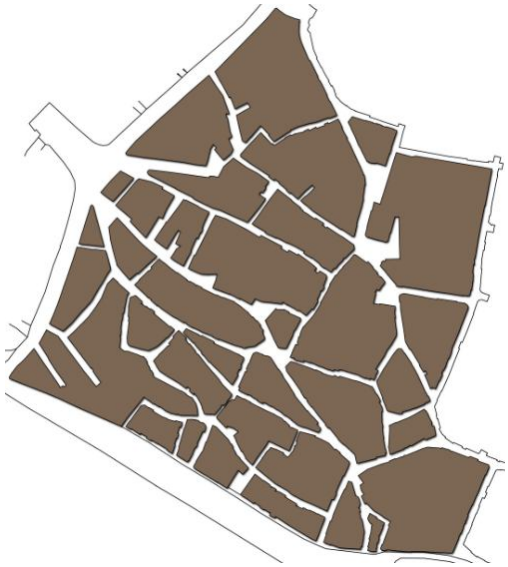


**Figure 4.7 :** Different block types formed by streets.

It is very difficult to define exactly the distances between the streets because they are developed within a very diverse structure by forming variable different block shapes and sizes (the term “block” refers to a settlement island surrounded by streets on all sides). The figures 4.7 and 4.8 show different blocks formed by streets.

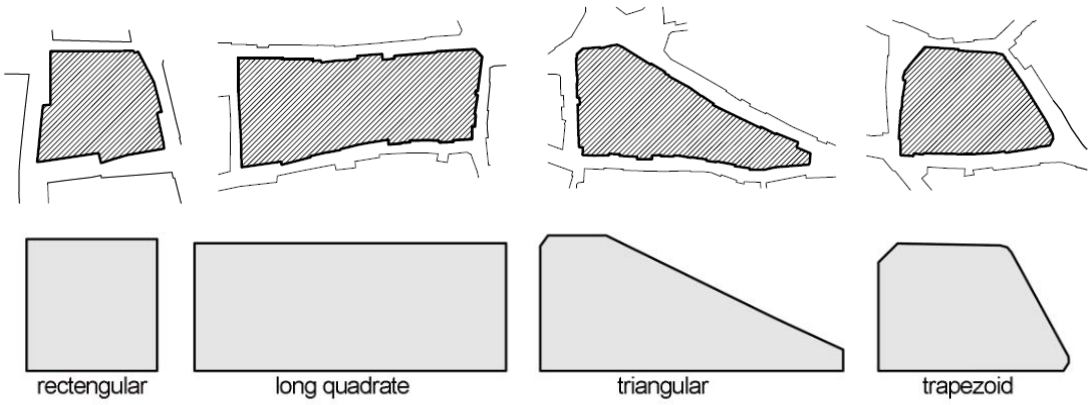



**Figure 4.8 :** Main block shapes formed by streets.

This kind of structure creates different distances between streets. However, some average values can be obtained. So, the average distance between the streets located on the northeast-southwest direction is around 65-75m (long side of the block) and 35-45m between the streets on northwest-southeast direction. (Figure 4.9).

Regarding the width of the street it is also not possible to define it exactly because of the widening and narrowing of the street in different parts (Figure 4.10).

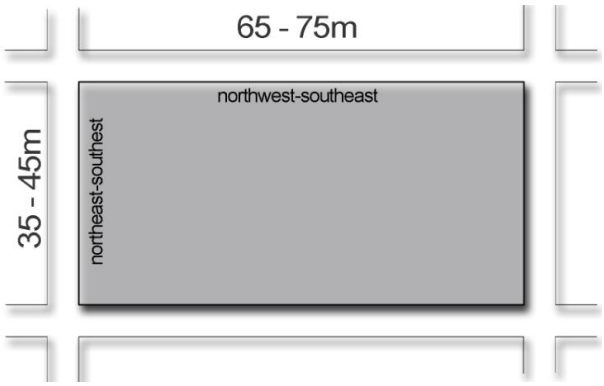



**Figure 4.9 :** Average distances between the streets.

This characteristic of the street have some positive effects such as: creating more dynamic space; fragmenting the space, breaking the monotony and absolute symmetry; decreasing the depth of the street, providing diversity; encouraging the pedestrian slowness; and obtaining a better integration of buildings with the street space. But, these changes on the street line (widening and narrowing) should be within a particular frequency. Otherwise, it may have some negative effects like: reducing the sense of continuity; formation of very fragmented space and decreasing the clarity of space perception. The measurements show that the width of the streets within the district are developed within a wide variety that changes between 1,5m to 9m. The width of 3m, 6m and 9m have a high frequency but the most used width is between 5-6m. While the broadness of the main boulevards on the northwest and southwest side varies between 12-15m.

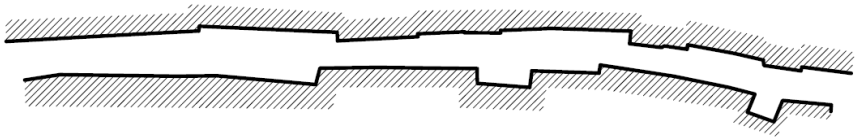


**Figure 4.10 :** The changes of the width along the street line.

The section of the street is a fundamental tool in analyzing its pattern in third dimension. The drawing of the sections can help to understand the characteristics of street border elements and the relationships between the vertical and horizontal lines.
The figure 4.11 shows different typologies of the street sections in the study area. Therefore, there are three different section types: in the first, the street is bordered by buildings in both sides; in the second, the buildings are settled back and the walls of courtyard border the street; and in the third type, one side is bordered by a building and the other by the wall. The buildings facing the street have straight facades or extended bays in the upper floors. It is important to mention that the height of the

buildings and the different characteristics of the facades or other surrounding elements provide a human scale environment and creates diversity in space perception.

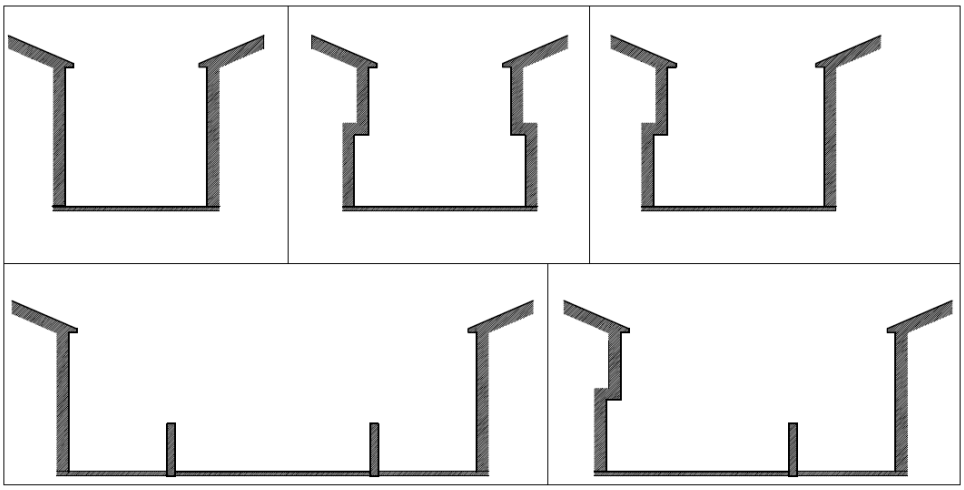


**Figure 4.11 :** Street section typology.

The figure 4.12 illustrates some different examples from the study area that represent the section types mentioned above. As can be seen it shows different features like: the relation of the buildings with the street, their orientation (side, front or back), the location of the courtyard and the dimensions of the street width, buildings and courtyards.

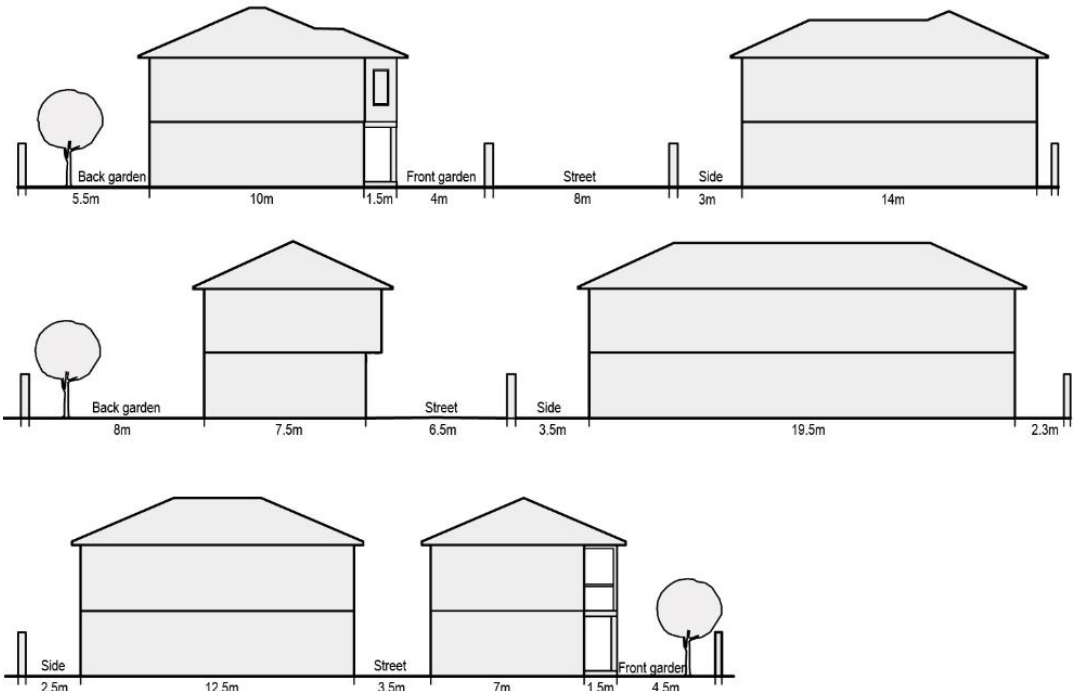



**Figure 4.12 :** Examples of street section from the study area.

The proportion of the height to the street width is another significant factor the effect the perception of the street space. The figure 4.13 shows the different ratios of the height to the street width. They are grouped in three main street widths: 9m, 6m, and 3m streets. The most common proportions are those shown in the 6m street. While the proportions shown in the 9m and 3m streets are not very frequent and can be seen only in few parts of the street. In the 9m street the ratios of height to street width are 1:1.5 and 1:3 which decreases the sense of enclosure. The 6m streets have a higher sense of enclosure in the ratios of 1:1 and 1.5:1 (height: street). While, in the 3m streets, the sense of enclosure is even higher especially when it is bordered by 2 or 3 storey buildings.

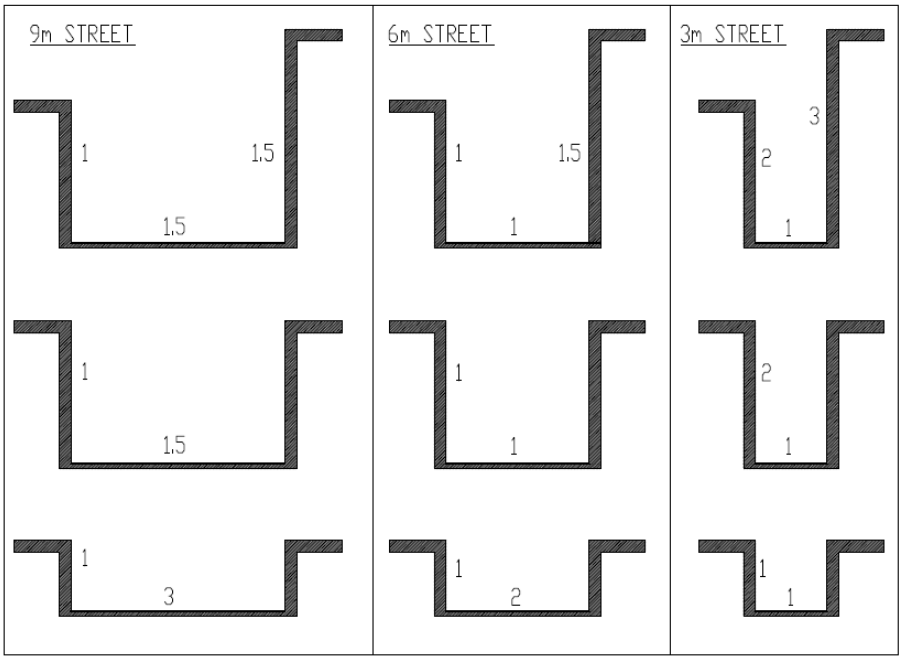



**Figure 4.13 :** The proportions of height to street width in different streets.

The border elements of the street and their features are the most fundamental determinants of the street space characteristics. In the study area there are three main border elements: walls and gates; rails or fences; and building facades. All of these components are seen along the street in different forms and combinations which create a very rich street space.

The wall is the most used surrounding element which separates the street space from the courtyard area. Generally, it has a height of 2m from ground and is constructed by using different materials like: stone, brick, concrete, tile and wood. The use of the wall as border element can have both positive and negative effects on the space composition. Its positive impact is on: well defining of the street space; increasing

the sense of unity, continuity and enclosure along the street; increasing privacy and the sense of security in the inner spaces (courtyard and house); protecting from cold winds in winter; and creating harmony with the buildings by using the same materials and colours (roof tiles, stones etc.) In the other hand, the use of the wall has some disadvantages such as: reducing the expose of the building's architectural features; preventing the view to the street from inside spaces; preventing the access of winds into the courtyard in summer; and sometimes can create a monotonous space if it is very long and not fragmented by other elements. The figure 4.14 and 4.15-show some features of the walls thatwere mentioned above.

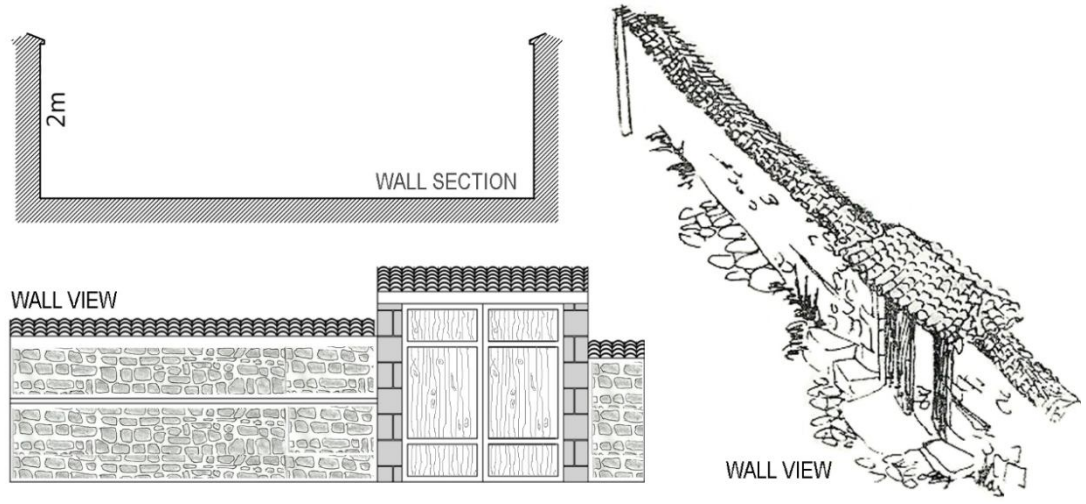



**Figure 4.14 :** Ilustrations of courtyard sorrounding walls.

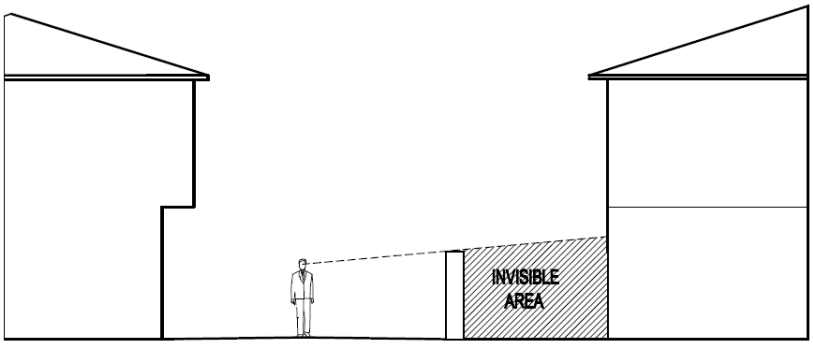



**Figure 4.15 :** The wall provides privacy in inner spaces.

The gates are also important elements in the street pattern. This element, which connects the internal spaces of the house with the street can be located on the courtyard or in the building façade. In the first one the access is given from the yard, while in the second the house has a direct access to the street. The figure 4.16 shows some examples of different gates mentioned above. The gates have some

considerable impacts on the street space and its perception like: creating monumentality by being higher than the walls; providing a better street definition and diversity in the third dimension; fragmenting the horizontality in certain sequences by creating a rhythmic street composition; and reducing the longitudinal dimension of the street and the sense of infinity.

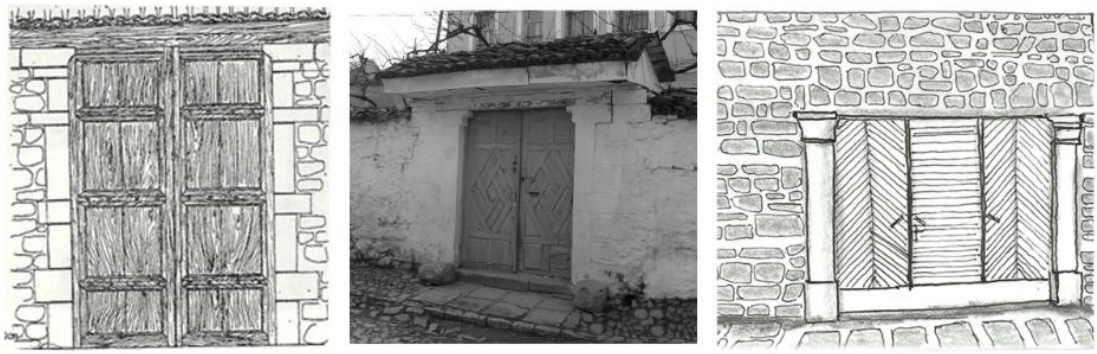


**Figure 4.16 :** Examples of different traditional gates.

The gates are built by using different materials like: wood, stone, brick, concrete, roof tile, and iron. The figure 4.17 shows the main elements of the gate that have different functions such as: emphasizing the entrance; creating harmony with surrounding elements; and providing spaces for sitting.

**Figure 4.17 :** Elements of the gate (Thomo, 1988).

Another issue that should be mentioned is the location of the gates along the street and the position with each-other. As can be seen from the figure 4.18, the gates are located in different frequencies, generally in a diagonal position with the opposite

sides. One of the main reasons of this kind of arrangement is to prevent the view to the internal spaces and provide privacy when both of the gates are opened.

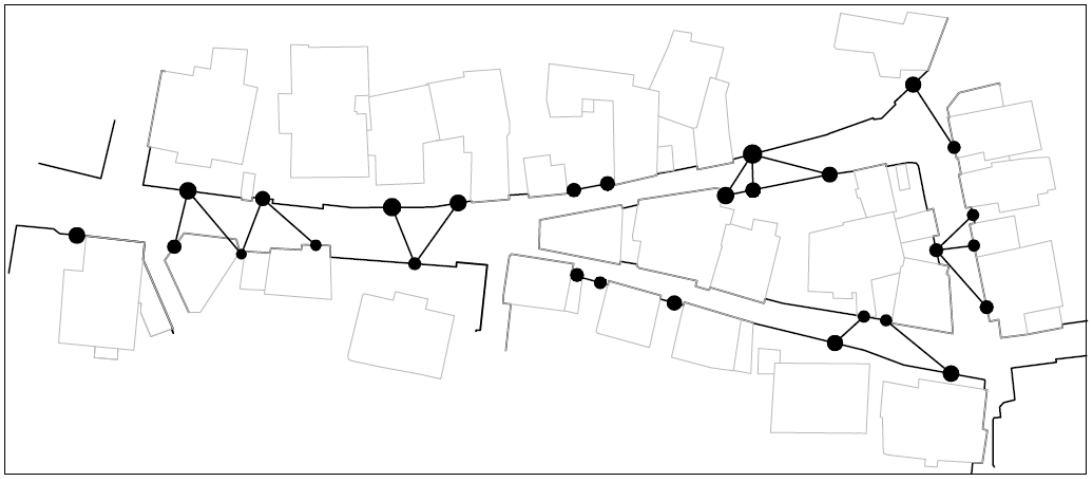


**Figure 4.18 :** Location of the gates along the street and realtionship with each-other.

In some cases the iron fences (rails) are used as courtyard surrounding elements (Figure 4.19). This type of construction combines both the wall and the rails. Generally, the wall (stone, brick or concrete) is raised 0.5-1m upper the ground level and the other part (1-1.5m) is completed by using railing structures.

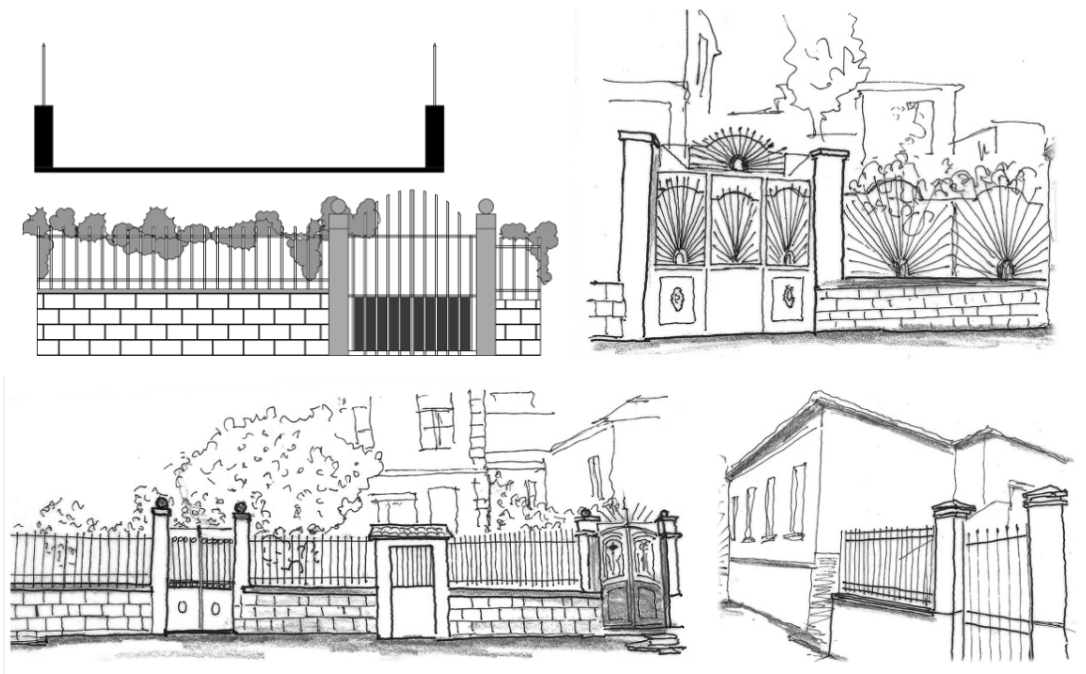


**Figure 4.19 :** Examples of railings as border elements.

It can be said that the use of railings has the opposite effects of the use of wall as a border element. Therefore, it has some advantages like: being more decorative than the wall by different designs; being a transparent element, it provides more view to

the buildings architectural features and different plantings in the courtyard; creating a stronger integration between internal and external spaces; and obtaining more wind access in summer. In the other hand, it has some negative sides such as: decreasing the privacy in internal spaces; reducing the sense of continuity and enclosure along the street; taking cold winds; not enclosing and defining the street as well as wall does; decreasing the sense of security in inner spaces. It can be said that the use of wall provides more advantages for private activities in internal spaces while the use of railings has more advantageous for street users (outside).

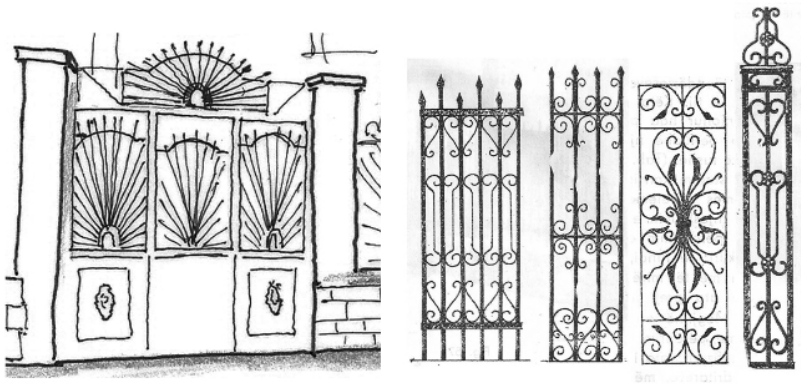


**Figure 4.20 :** Details from gate and railing designs.

The gates constructed by using rails have different designs with a lot of decorative motifs as can be seen from the figure 4.20. The use of these decorative elements on the surface of the gate and on the columns makes the entrance more visible and emphasized.

The most important border elements of the street space are the buildings located along it, which create a very rich pattern with their diverse façade compositions. Regarding the location of the building along the street – as can be seen in the figure 4.21- they are positioned in three different ways: the front façade faces the street (with bay window); the side of the building; or the back façade oriented to the street.

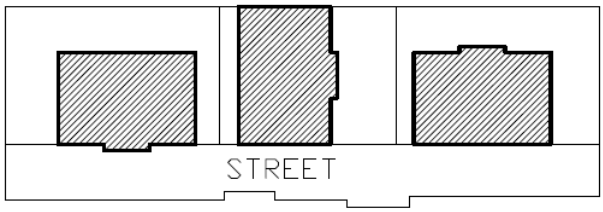



**Figure 4.21 :** Different positionings of buildings on the street side.

The facades facing the street are designed within a wide variety but the can be grouped into three main types: straight facades; facades with bay windows; and

facades where the whole upper floor is extended toward the street (the whole façade is a bay). The figure 4.22 illustrates an example where the three typologies can be seen.

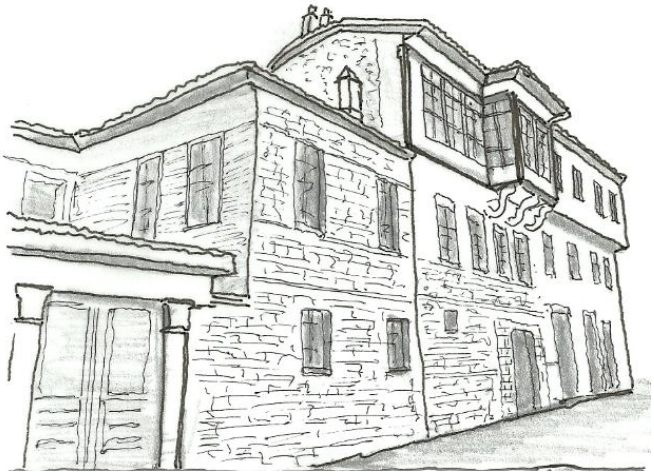


**Figure 4.22 :** Three different types of facades facing the street.

The facades with bay windows in the upper floors (second or third) can be seen frequently along the street in the study area. Bay windows, high frequency of narrow windows, decorative elements (wood, stone, marble) in the second floor have a high contribution to the street pattern and create a very rich texture. The repetition of this kind of structures along the street provides a rhythmic street compositions and rich perspective views from different points (Figure 4.23).

**Figure 4.23 :** Facades with bay windows on the second floor.

The bay windows are positioned on the middle or on the side of the façade and have an extension of 50-120cm and a width between 3-5m. They have windows in all sides which provide street views from inside the house. The windows continue also along all façade in high a frequency. In some cases a continuous wood cornice connects all the windows by strengthening the unity of the façade composition. Also the bay has a wood cornice on its corners which makes it more emphasized. The bay

windows that are located on the second floor provide a more human scale while those located on the third floor have more monumentality. The figure 4.24 shows two examples of bay windows details.

**Figure 4.24 :** Examples of baywindows

Another type of façade is formed when the entire second floor is extended toward the street and forms a kind of bay. This form appears as e result of the need to enlarge the space on the second floor. As shown in figure 4.25 the extensions on the second floor are developed in two forms: in the first one the upper floor is extended in parallel with the ground floor; and in the second one it shifts its direction by forming a triangular extension. The reason of the second arrangement is because the ground floor does not have a geometric rectangular shape resulting from the parcel form. Therefore, the shape is rearranged into a rectangular form in the upper floor.

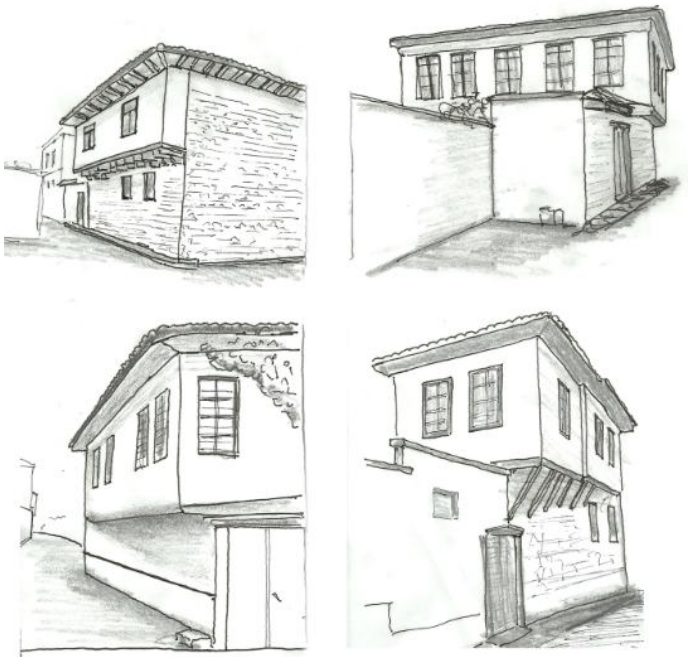


**Figure 4.25 :** Examples from extensions of the upper floors

Another issue that would be notable to mention about the facades facing the street is that, the ground floors are generally not elaborated architecturally as much as the upper floors. They have only some small windows opened to the street side. Regarding the texture of the facade, in some cases it is not plastered (especially the ground floor) so the stones on the façade create a harmony with the texture of the groundcover stones.

The typology of corner buildings is another topic that should be taken into consideration in the analyses of street pattern. In the study area, the corner buildings can be grouped into three main types: rounded, chamfer, and right-angle corners. These different corner types create very rich urban textures within the district.

The figure 4.26 illustrates some examples of rounded and chamfer corner in the study area. These types of buildings can have different impacts on the composition of urban space and its perception. For example a rounded or chamfer corner can increase the integrity between the two streets where it is located since the change of direction is done more smoothly. Moreover, they provide more continuity in space; are suitable for forming functional space between two streets intersecting in a narrow angle; provide more open space in intersections; and can be good landmarks and obtain rich perspective views.

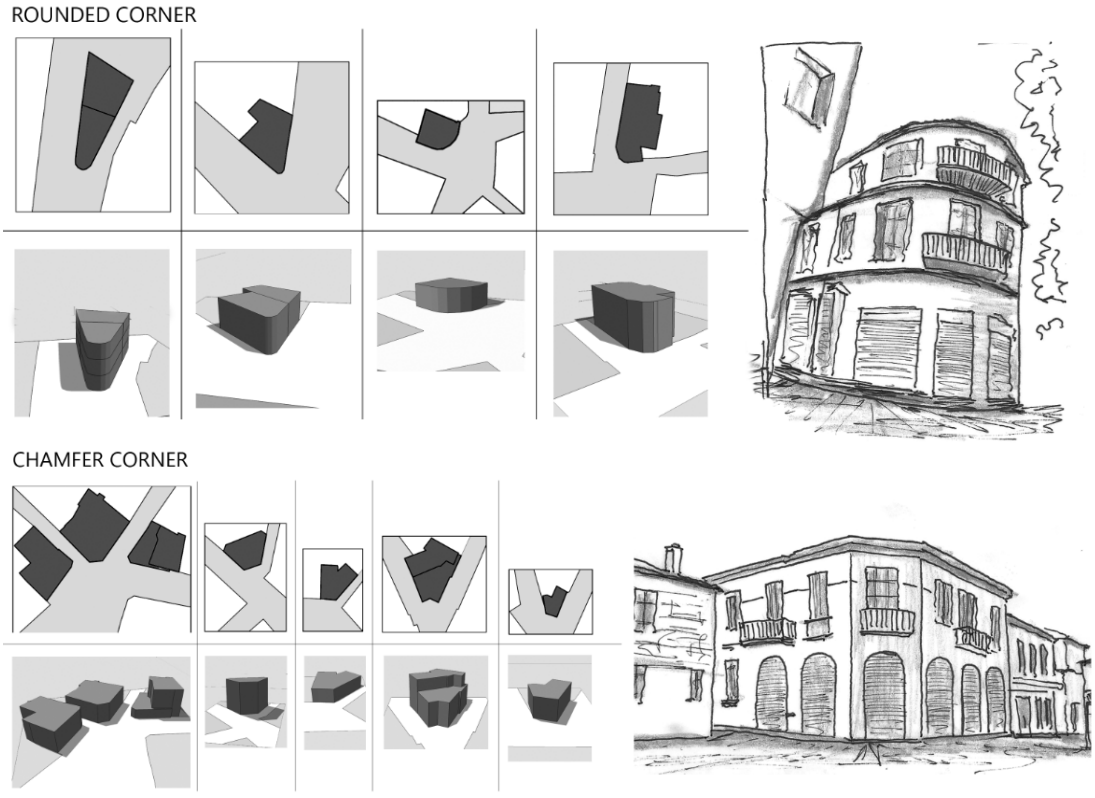



**Figure 4.26 :** Rounded and chamfer corner typologies

While, the right-angle corners (Figure 4.27) have some other effects on the urban space. Located on the perpendicular street intersections, they can make the division between two spaces more distinctive by providing more quite and private spaces. Also, the sharp-turns formed by these corners discourage the vehicle use which is positive for the pedestrian circulation. Finally, these types of corners can also be good landmarks if their facades are well-elaborated with different decorative and architectural elements (bays and windows in the second floor).

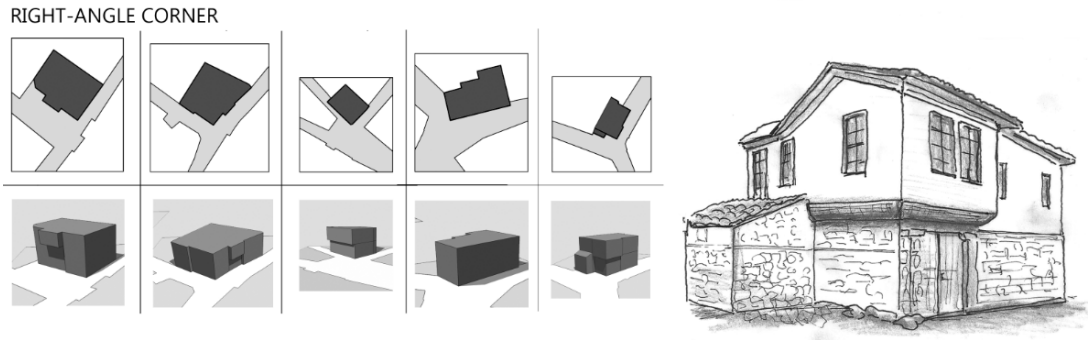



**Figure 4.27 :** Right-angle corner building typologies

The figure 4.28 shows the distribution of buildings along the street (buildings that have at least one side located on the street) in the whole study area. As can be seen in some parts the buildings located near the street have a higher frequency that creates a strong street pattern and composition.

**Figure 4.28 :** Distribution of buildings along the street

By making a more detailed analyze, it is possible to understand the different arrangement forms of buildings in the relation to the street. As shown in figure 4.29, there is a common organization of buildings regarding their location. In the larger settlement blocks, buildings standing on the street side are generally located on the corners of the block and the others are setted back. While in smaller blocks, almost all of the buildings are positioned on the street side. The reason for this is because there is no much space to in the back yards.

**Figure 4.29 :** Different distribution forms of buildings along the street.

Another factor that affects the perception of space along the street is the ratio between the solid and void spaces in the third dimension. The more are the solid spaces the larger is the sense of enclosure in the street. In the opposite, if the void spaces are more than the sense of openness and the amount of the sky-view from the street is increased. The important fact in this context is to develop designs that make a balance between these two issues. The figure 4.30 shows the void and solid spaces along the street (it does not show the void spaces within the block). As can be seen in some parts the solid areas are more than the voids and in some other parts there is the opposite situation. In certain areas, the amount of void spaces is

increasedconsiderably by creating some pauses and fragmentations on the street space. This happens around the open spaces or in the parts where some buildings are setted back.

**Figure 4.30 :** Solid and void spaces in the third dimension along the street

A formula can be generated to measure the rapports between the solid and void spaces along the street in a more detailed way.

$$\mathbf{L = S+V;\ \ S/L = s\ ;\ V/L = v} \qquad \mathbf{(4.1)}$$

**L**: The total length of the street line.
**S**: The value of the aggregation of solid spaces (horizontal length).
**V**: The value of the aggregation of void spaces (horizontal length).
**s**: The percentage of solid spaces (%).
**v**: The percentage of void spaces (%).

The figure 4.31 shows some different examples and the calculations that show the proportions or percentages of solid and void spaces in different building layouts. The calculations are done in different sides of the street and as can be seen, in some cases the percentage of solids is larger and in some other parts the void spaces are more. The average ratios are around 60% to 40 %.

The final illustration about the morphological analyses of the street pattern (Figure 4.32) shows some different fragments of the street spaces in the study area. These images can help to represent some characteristics of the street pattern and the relation of different elements (streets, buildings, walls, gates, yard etc.) mentioned in the analyses shown the earlier pages.

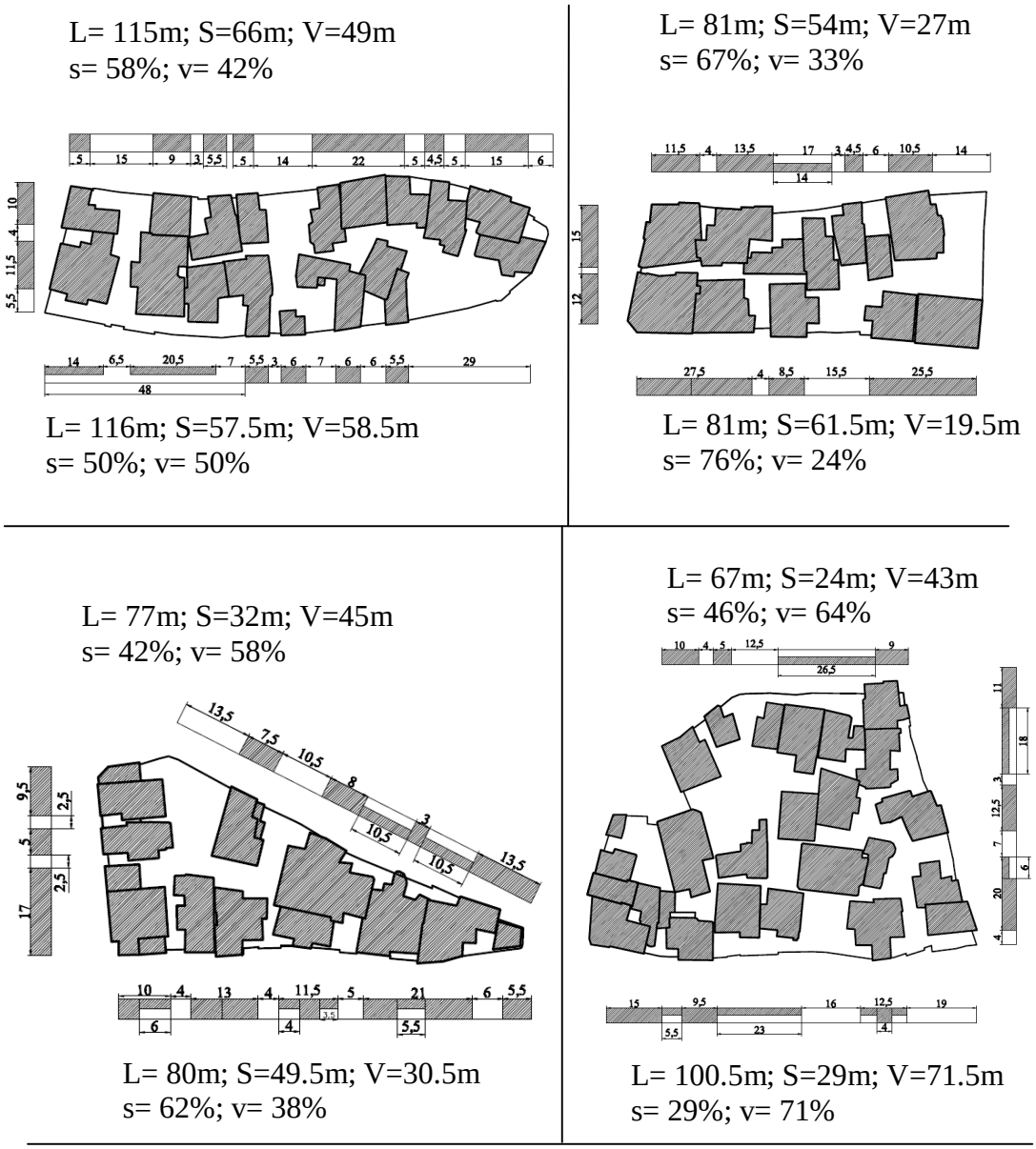



**Figure 4.31 :** Calculations of the percentage of solid an void spaces along the street.

### 4.3 fThe Open Spaces

This section will deal with the morphological analyses of the open spaces in the study area. The term “open space” here does not refer to large urban squares or green areas (parks). It is used for the description of small open spaces formed by the widening of the street in different parts, especially in the intersections with each-other.The surveys here deal more with the physical characteristics and the spatial organization of these spaces rather than their functional aspects. Except of some open spaces that are larger than others, most of them do not have the features of an open public space

in the context of their size and land uses around them. However, these spaces are very important elements in the spatial arrangement of the urban space because they have very positive effects on its perception.

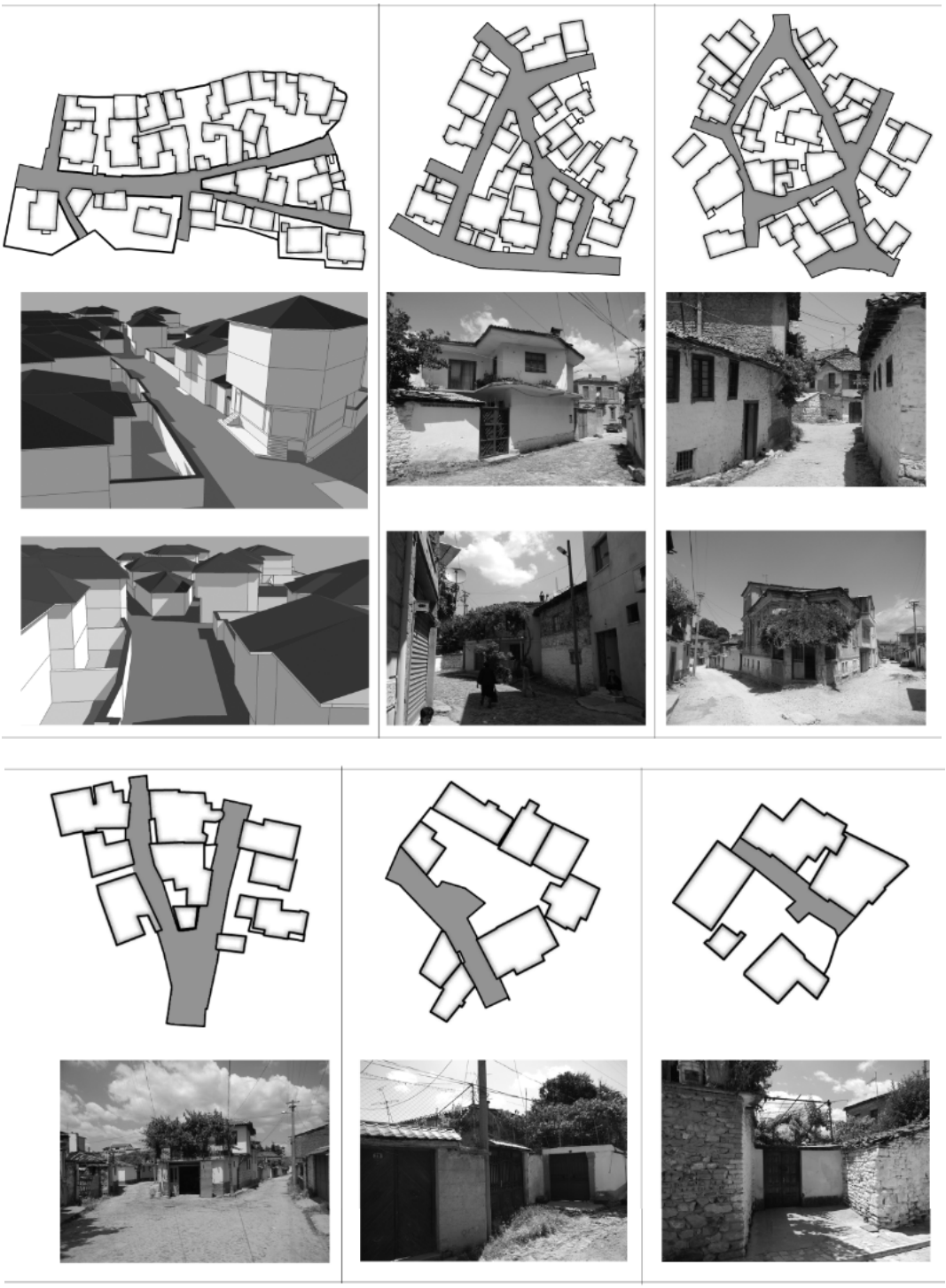


**Figure 4.32 :** Examples from different street fragments in the study area.

The analyses of open spaces start firstly in the upper scale by making some surveys regarding the organization of these spaces within the whole structure. The aim here is

to understand different features such as: the location of open spaces; their relation with each-other; their distribution within the area and the distances between each other; their hierarchical system and influence areas. After that, more detailed morphological analyses are done regarding the typology of these open spaces by examining different characteristics like: their sizes and shapes; their functions; border elements and the sense of enclosure: and the proportions in horizontal and vertical dimension.

The figure 4.33 shows some different configurations of the organization of the open spaces in the study area. The map on the upper left side (a) shows the general pattern of streets and open spaces. The figure (b) is generated from this map and makes a configuration by emphasizing only the open spaces. From this image some observation regarding the features of spatial arrangement can be done. There are about twenty-seven open spaces in different sizes and locations. Commonly, the larger open spaces are located on the intersections of the main streets. The orientation of these spaces is similar with the street where they are located (northeast-southwest or northwest-southeast). The distances between the main open spaces vary from 25-100m. The images on bottom side of figure 4.33are generated to make a simpler and clearer configuration of the system of the open spaces.

The map on the left bottom shows the sizes and the hierarchy of open spaces in a more readable way. While the map on the right bottom makes a grouping of the main open spaces by showing their influence areas. As can be seen the two circles shown in the darkest black color are the main squares of the district and their influence is on the whole area. The other spaces shown by dark grey color represent the second level open spaces that are located on different parts and have a smaller influence field.
Regarding the typology of the open space they can be classified into four main groups: the main square; the second level open spaces; small open spaces on the street intersections (3 or 4-5 streets); and small pockets. This categorization is done according to different criteria such as: size, form, location, relation with the street, and functions.

The figure 4.34 shows the main square which is located on the northeast part of the study area and is consisted of two linked open spaces. It is the largest open space of the district (referring to the old pattern) and is the area where some public buildings (school, church), commercial and residential functions are located.

The spatial characteristics of the main squares such as: shape, size, proportions, and street connections are shown in the figure 4.35.

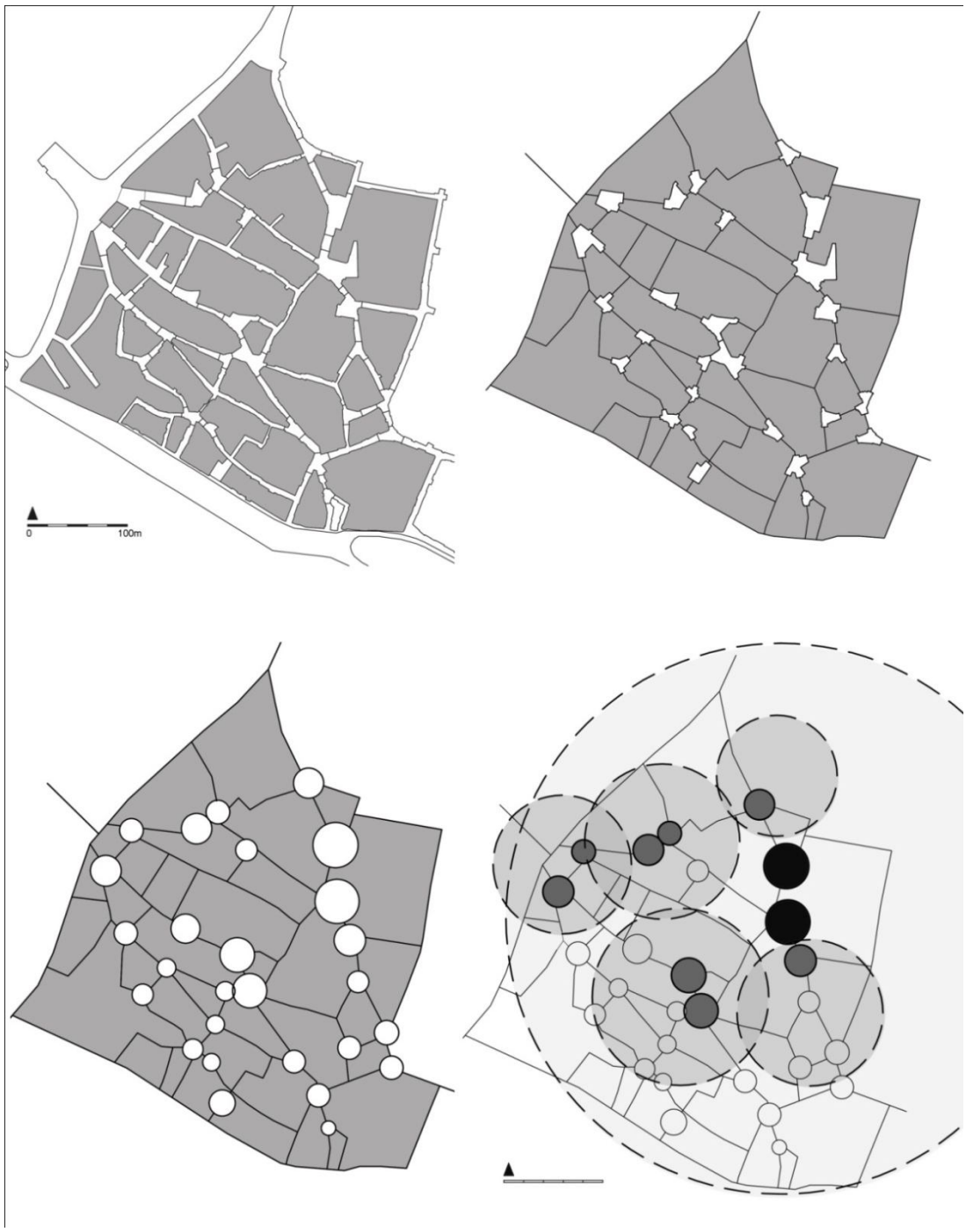



**Figure 4.33 :** The organization of the open spaces.

As can be seen, a configuration is done step by step to show different features like: the main shape (a), length-width dimensions (b), street connections (c), and finally the reshape of the space in a more systematic way. So, the open space shown in the first row (I) has a trapezoid form with five sides. The longest dimensions of length to

width are 45-35m (I-b) and the ratio 1.3:1. Three of the corners are opened to the streets (I-c) and the other two corners are enclosed by buildings and walls. While, the open space shown in the second row (II) has long trapezoid form with four sides and dimension of 34-24m (II-b) and the ratio 1.4:1. Except one of the corners, the others are opened to the streets (II-c). The forms and sizes of these open spaces have positive effects on creating diversity in urban space and providing human scale environments.

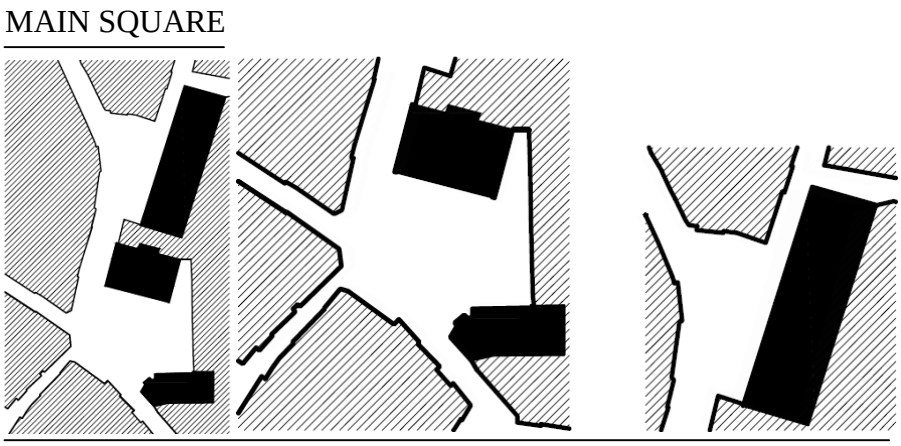



**Figure 4.34 :** The configuration of the main square.

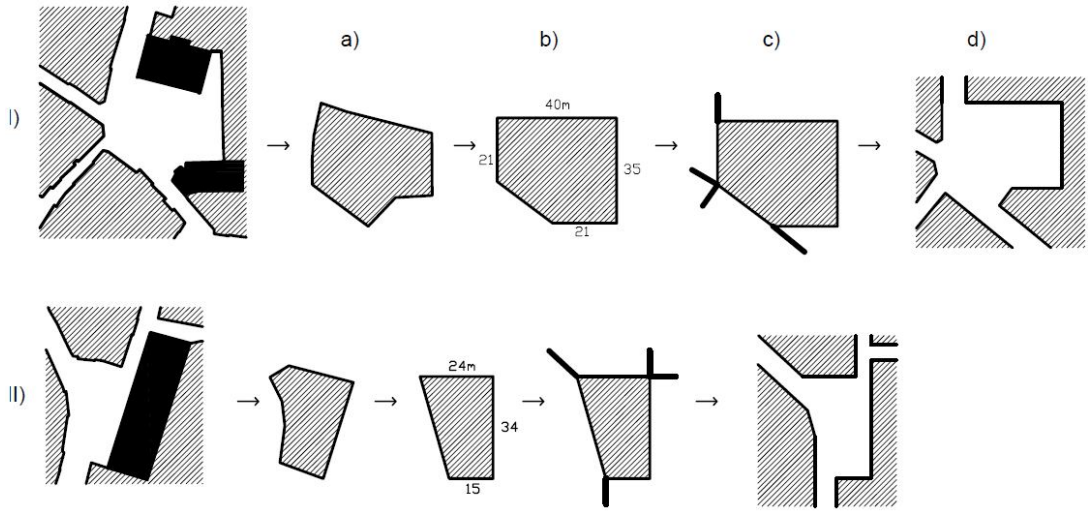



**Figure 4.35 :** Different spatial features of the main squares.

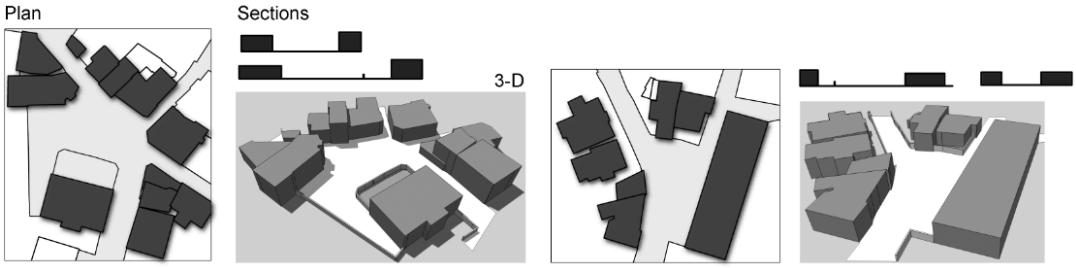



**Figure 4.36 :** The enclosing elements on the main square.

The enclosure on the main squares is provided mostly by buildings and surrounding walls in some parts (Figure 4.36). The attached buildings creates a good sense of enclosure in the horizontal dimension but it is difficult to say the same thing for the third dimension because the height of buildings (2-3 storey) is not enough to provide a well enclosed space. In the first square, the approximate proportions of height to width are 1:9 and 1:6 in the long side and 1:4, 1:3 in the narrow side. While the second square has a higher sense of enclosure by the ratios around 1:5, 1:6 in the long side and 1:3 in the narrow side. Moreover, the squares are dominated by buildings that have public functions and are larger than others in size but they do not create sufficient effect as landmark elements. Another issue that reduces the sense of enclosure is the connection of the streets to the corners of the squares.

Finally, fact that should be mentioned about the main open spaces is that they do not have enough landscape arrangements. The lack of landscape elements such as: groundcover designs; plantings, lighting elements, furniture, water and sculptural elements reduce the quality of these public spaces.

Referring to the classification done above, the other type of open space consists of smaller spaces (second level) that are placed in different locations. These open spaces are mostly surrounded by residential uses except of some small groceries located on the corner buildings that serve to the neighborhood around them. The figure 4.37 shows some different examples of this type of open spaces.

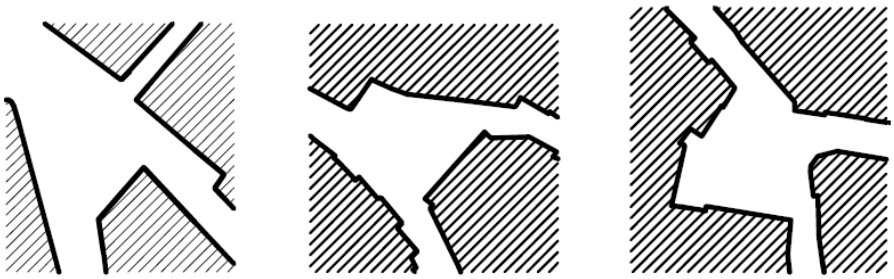


**Figure 4.37 :** The second level open spaces.

Regarding the spatial form characteristics, these spaces show similarities with the main square in the context of their shape, proportions and street connections. As shown in figure 4.38, they commonly have trapezoid forms with four or five edges (a). The sizes of these open spaces are close to each-other with dimensions that vary from 25:17m – 28:27m (b) and ratios of 1.5:1 and 1:1 (length to width). Generally, the connections to the streets are done from the corners of the open space.

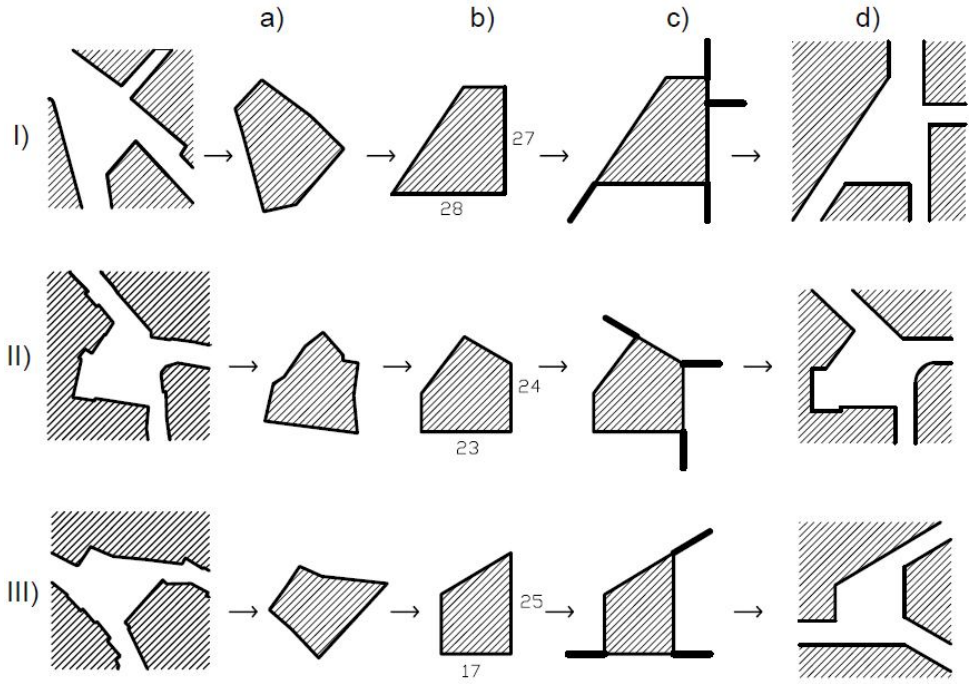



**Figure 4.38 :** Different features of second level open spaces.

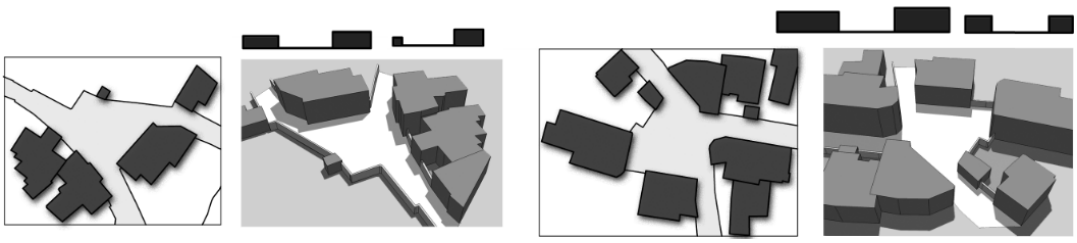


**Figure 4.39 :** The enclosing elements of second level open spaces.

The enclosure in these open spaces is done by a combination of buildings and courtyard walls. In some cases the buildings are more frequent and form a good sense o enclosure while, in some others the wall is not sufficient as an enclosing element (Figure 4.39). The storey of enclosing vary from 1-3 and the ratios of height to width are 1:3 ,1:4, and 1:6 in the left image and 1:3, 1:2.5, 1:3,5 on the right image.

Another type of open space is that which is formed on the intersections of the streets. Actually, they are very small spaces that are formed by little widening of the street or sett backs of the buildings on the intersection points. The reason for classifying them as open spaces is to analyze the characteristics of their physical form. There are two most common types of intersections that can be seen in the study area: the intersection of 4-5 streets and intersections of 2-3 streets.

The figure 4.40 shows some examples of the open spaces formed on the intersections of four or five streets. The connections of streets in different angles and their

widening on the intersection point produce very variable forms. These open spaces create a reach pattern and diversity in the urban space by their amorphous forms. The configuration illustrated in the figure 4.42 shows how these organic forms can be rearranged in a more geometric form to understand their main shape. The dimensions of these spaces change from 16:10m to 24:19m and the ratios 1.5:1 and 1.3:1.

**Figure 4.40 :** Open spaces on street intersection (4-5 streets).

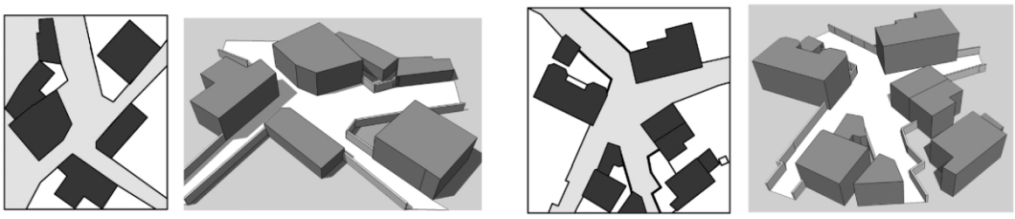


**Figure 4.41 :** The enclosing elements on the street intersections (4-5 streets).

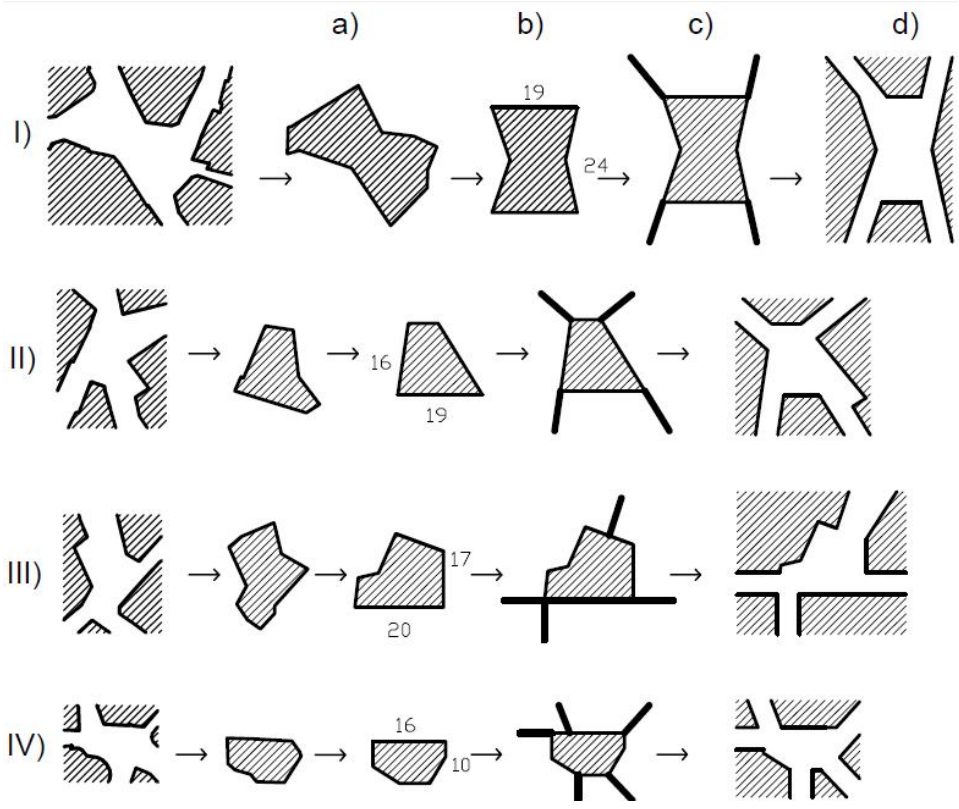



**Figure 4.42 :** The features of the open spaces on the intersections (4-5 streets).

The other junction type is when two or three streets are intersected and form a small open space (Figure 4.43). These are characteristic space which can be seen very frequently in the study the pattern of the study area. These kinds of spaces create small pauses along the street spaces by fragmenting its longitudinal dimension.

**Figure 4.43 :** Small open spaces on street intersections (2-3 streets).

As shown in figure 4.44 the form of these spaces is a kind of triangular – trapezoid shape that is formed by the streets coming from different directions. The approximate size has the dimensions of 20 to15m and a ratio of 1.3:1.

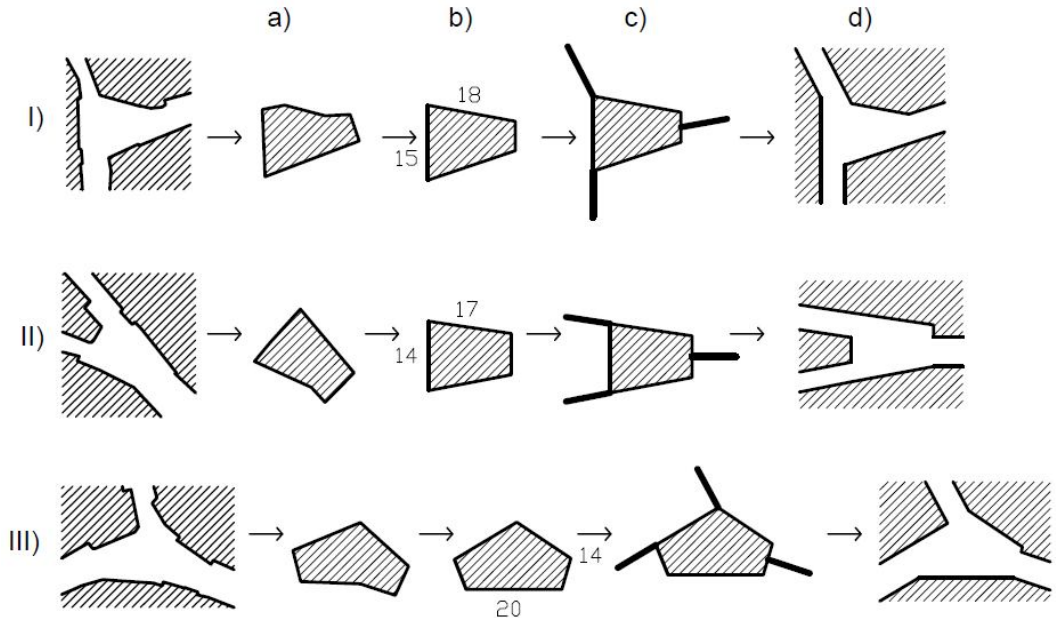



**Figure 4.44 :** features of the open spaces on the street intersection (2-3 streets).

Regarding the enclosing elements it is important to mention that the buildings positioned on the corners provide o good definition of the space that they surround (Figure 4.45). The building located on the corner where two streets are divided is the most significant element defining the space and strengthening the character of the

intersection. This building can serve as a landmark element if it is elaborated with architectural and decorative elements.

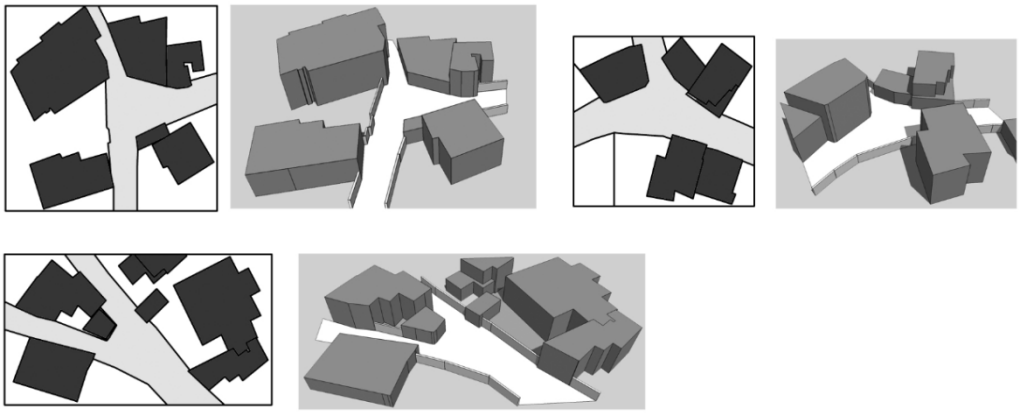


**Figure 4.45 :** Enclosing elements on street intersections (2-3 streets).

The final categorization of open spaces typology consists of the small pocket spaces that are formed by the widening of the street in one or both sides (Figure 4.46). These types of spaces are organized around the entrances of two or three buildings and create a kind of semi-private area. These spaces with the gates (courtyard or building) opened to them are very important neighborhood relations because they provide an area for them to interact with each other.

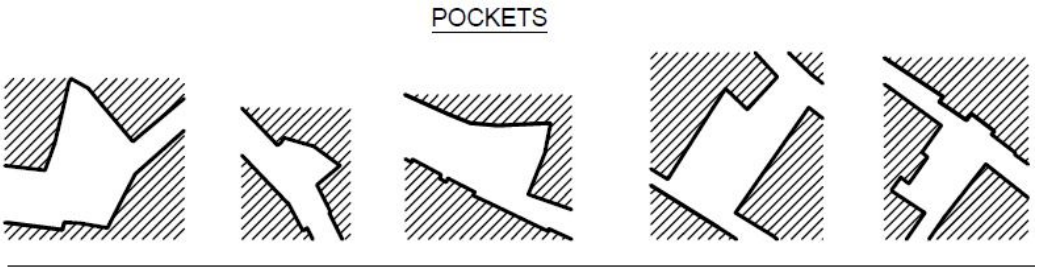



**Figure 4.46 :** Different types of small pocket spaces.

The figure 4.47 shows some varied formations of pocket spaces by illustrating their different features. These spaces have trapezoid or rectangle shapes developed in different sizes with dimensions that change from 10:10m to 23:16m. Commonly, they are formed by the widening of the street on one side, but there is also a case where the street is broadened in both sides. The enclosing elements of these spaces are shown in the figure 4.48.

The figure 4.49 shows the main shapes that can be generated from the analyses above. The trapezoid form with different sizes and configurations is the most common shape of the open spaces. It appears in different formations such as: with

four or five edges, narrow or right angles; equal or different proportions; and different sizes. In few cases the rectangular form is also used in small pocket spaces.

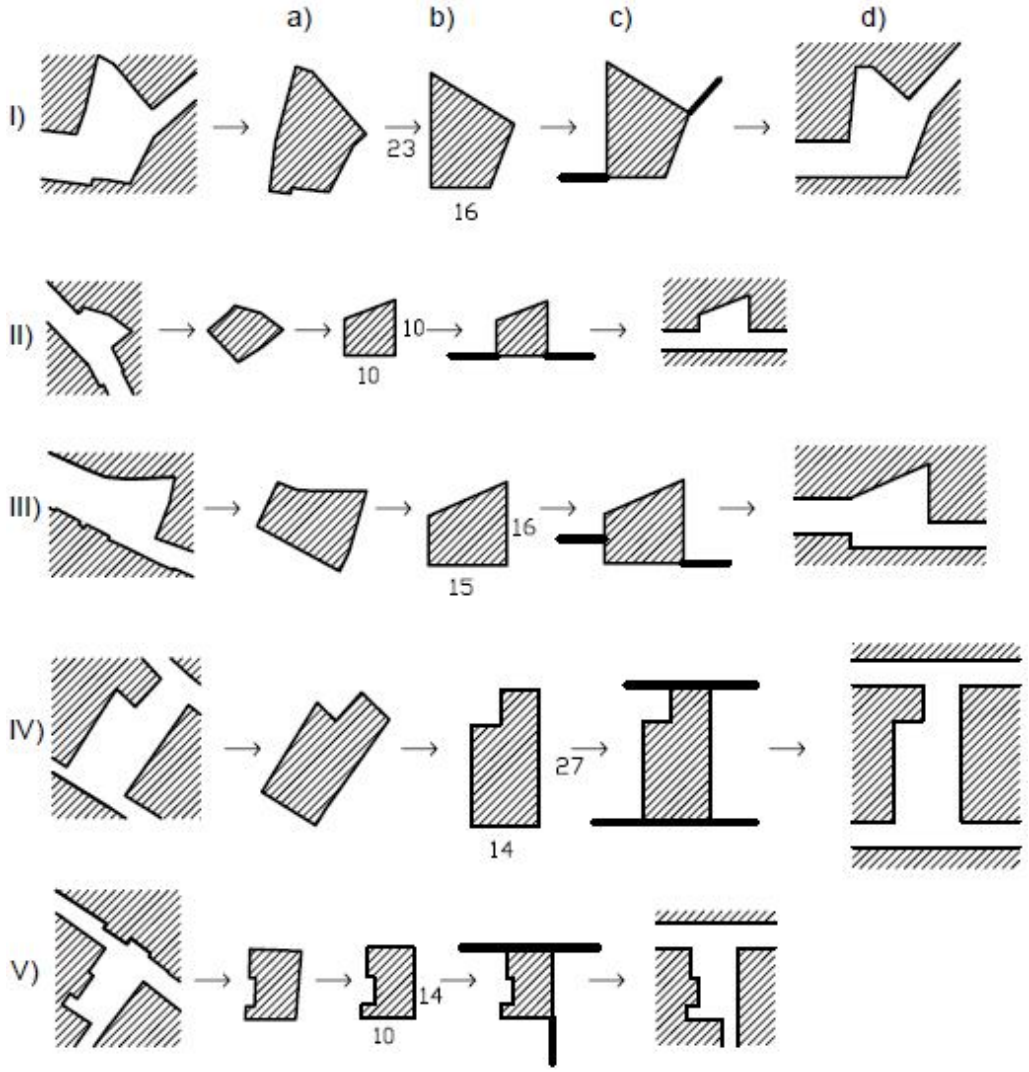



**Figure 4.47 :** The features of the pocket spaces.

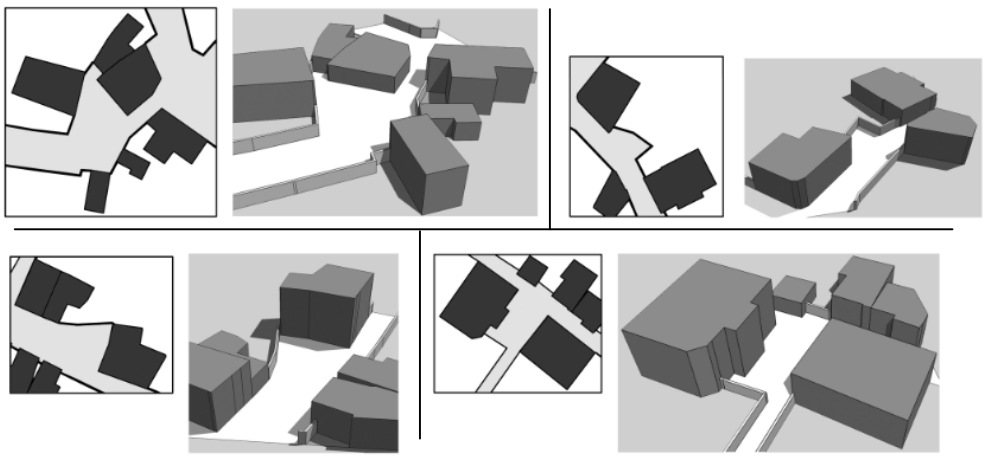


**Figure 4.48 :** The enclosing elments of the pocket spaces.

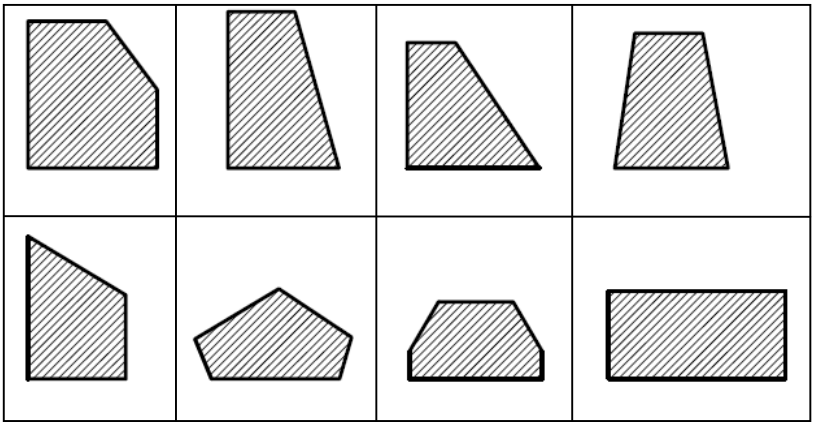


**Figure 4.49 :** The configuration of main shapes of the open spaces

### 4.3.1 The fractal dimension of the open spaces

The fractal dimension was metioned in previous sections as a quantitative method for calculating different values of the physical form and finding if there is a rational and harmonic relations between different forms. There are choosen four different open spaces to calculate the fractal dimension of their shape by using the box counting method. The comparison is done by grouping the shapes two by two (a-b, c-d). Each shape is subdivided into quadrates in three different steps: 5 x 5m , 2.5 x 2.5m and 1.25 x 1.25m. After the calcualtions were done, it was obsereved that shappes have proximate values. The calculation are done by using the formala below:

$$D = \frac{[\log (N(SII)) - \log (N(SI))]}{[\log (1/SII) - \log (1/SI)]} \qquad \textbf{(4.2)}$$

**D**: Shows the fractal dimension's value.
**N (SI)**: The number of boxes where the shape is located in the first step (I).
**N (SII)**: The number of boxes where the shape is located in second step (II).
**N (SIII)**: The number of boxes where the shape is located in third step (III).
**1/SI** : The number of boxes in x axis in the first step.
**1/SII** : The number of boxes in x axis in the second step.
**1/SIII** : The number of boxes in x axis in the third step.

The fractal dimension of the shape (a) is calculated below:

$$D[a(II-I)] = \frac{[\log (N(SII)) - \log (N(SI))]}{[\log(1/SII) - \log (1/SI)]} = \frac{[\log (55) - \log (27)]}{[\log (16) - \log (8)]}$$

$$D[a(II-I)] = \frac{(1.740 - 1.431)}{(1.204 - 0.903)} = \frac{0.309}{0.301} = 1.026$$

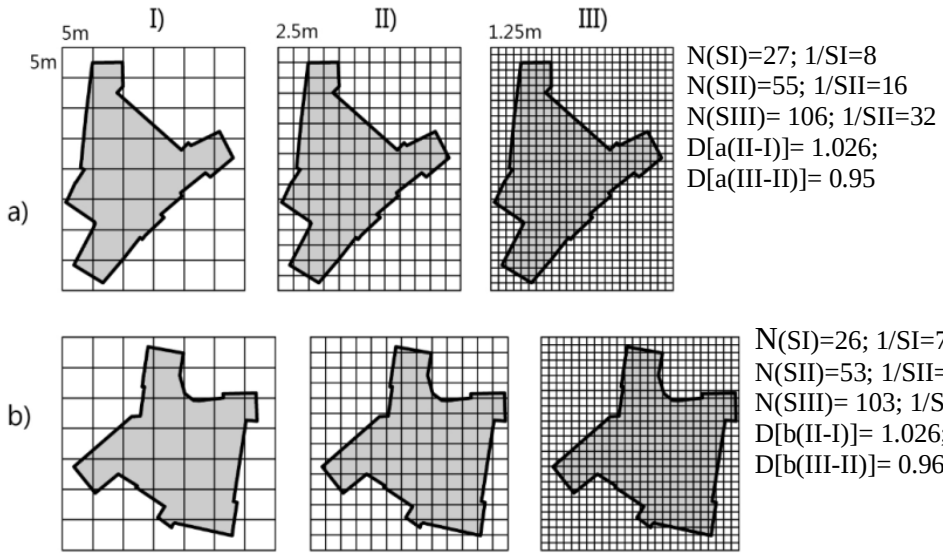



**Figure 4.50 :** The use of box counting method for the calculation of fractal dimensions of the open spaces (a) and (b).

$$D[a(III\text{-}II)] = \frac{[\log (106)-\log (55)]}{[\log (28)-\log (14)]} = 0.95$$

The same calculations are done also for shape (b) and the values both shapes are as below:

D[a(II-I)] = 1.026 ; D[b(II-I)] = 1.026
D[a(III-II)] = 0.95 ; D[b(III-II)] = 0.96

As can be seen the two shapes have the same values in the interval of 2.5-5m and very proximate values in the intervals of 1.25-2.5m. This fact shows that there is a very strong harmonic relationship between the forms of these two open spaces though they have different shapes.

A comparison of the fractal dimension values is done also between two other spaces that are larger in size (Figure 4.51). The calculations has shown that the values still be proximate to each other but are not as close as in the first example.

D[c(II-I)] = 1.64 ; D[d(II-I)] =1.91
D[c(III-II)] = 1.8 ; D[d(III-II)] = 1.83

### 4.4 The Built Form

The final unit of the morphological analysis done in this study is the analyzing of the built form. The study of built form will be developed in three levels: analyzing of

block pattern, parcel pattern, and building layouts. This approach will provide a contextual analyzing of built pattern by exploring it in different scales.

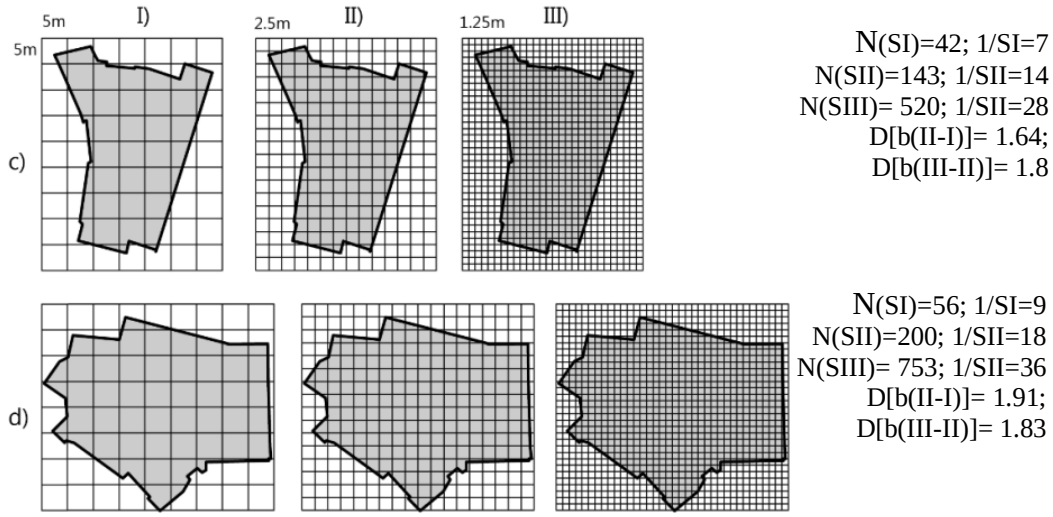



**Figure 4.51 :** The use of box counting method for the calculation of fractal dimensions of the open spaces (c) and (d).

### 4.4.1 Block pattern

The 'block' is the settlement unit, whichis surrounded by streets in all of its sides. The study area has a rich texture of block forms that creates a high diversity of space compositions regarding the street pattern, open spaces and building layouts. The form of the block, its size, and the composition with the other blocks are important factors effecting the formation of different building layouts. The figure 4.52 shows the pattern of block forms and their arrangement within the area. The image on the right (b) shows the location of blocks with similar characteristics (form and size) and their arrangement within the area.

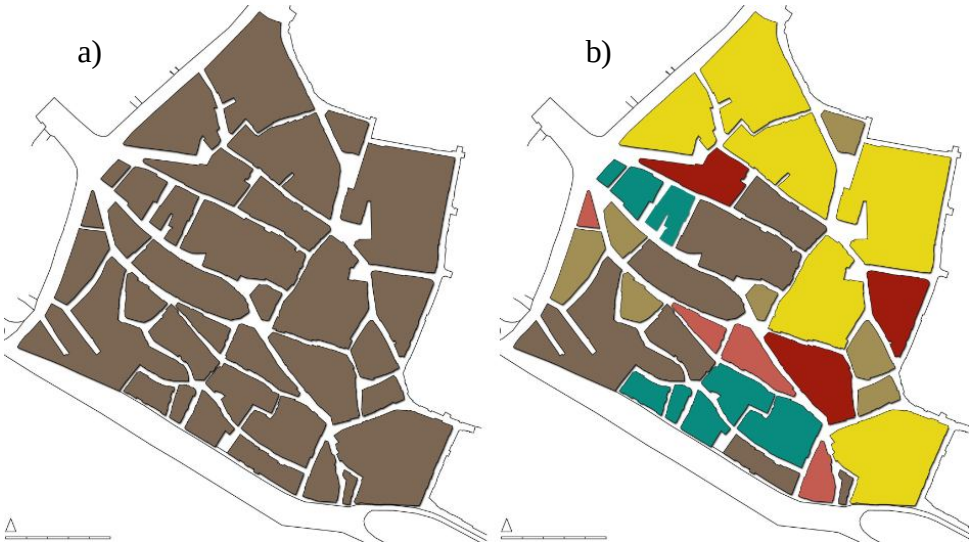



**Figure 4.52 :** Block Pattern (a), blocks with similar characteristics (b).

As mentioned above the blocks have very diverse forms and sizes but they can be grouped in some main forms (Figure 4.53). The examples shown here make a categorization of block forms by grouping them in four main shapes: trapezoid, triangular-trapezoid, long rectangular, and small quadrate blocks. The images on the left side represent some real examples from the study area and the ones on the right are generated to make a more geometric configuration for a better understanding of their form.

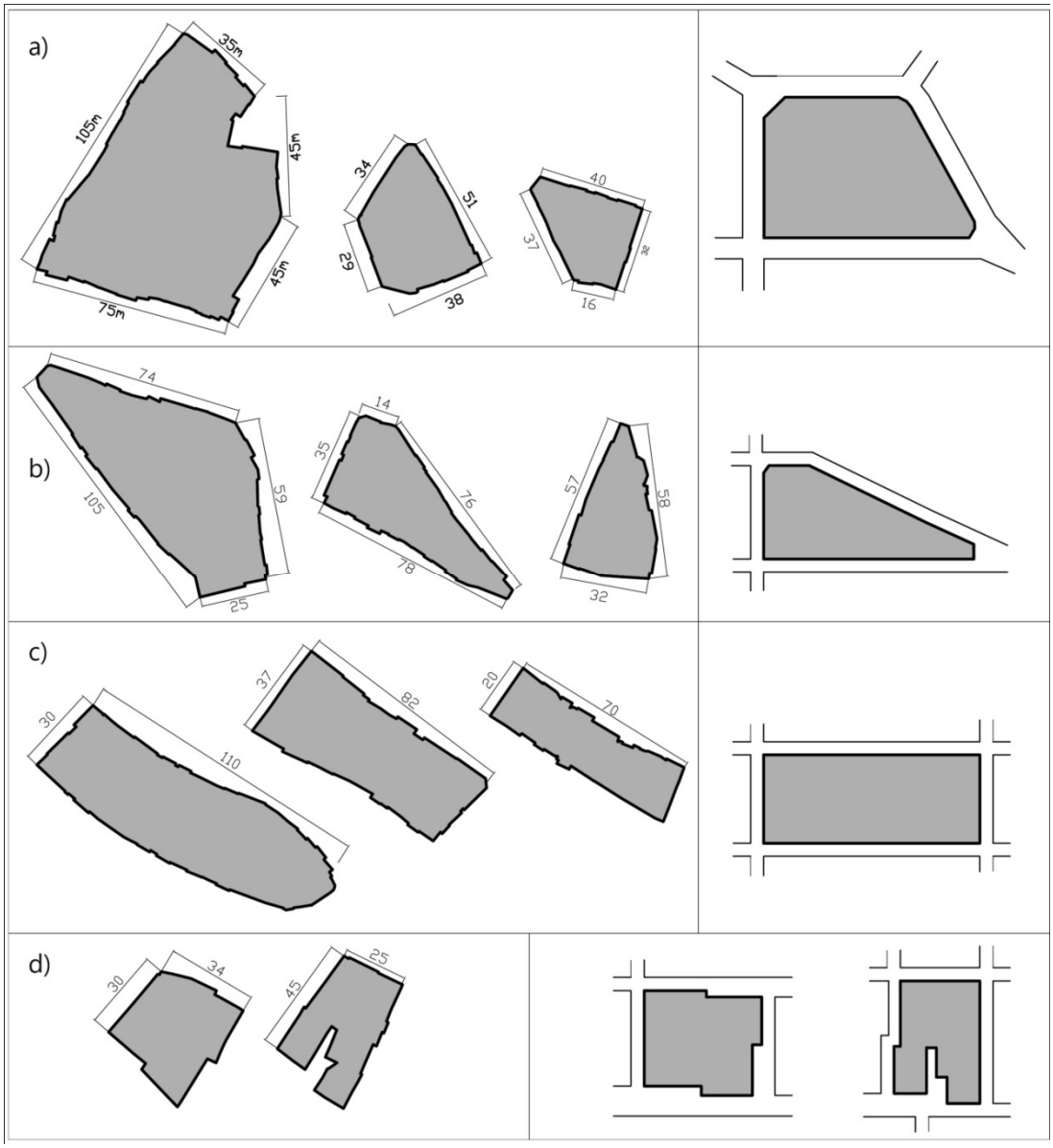



**Figure 4.53 :** The typology of block forms.

The figure 4.54 illustrates some examples that show the spatial organization of blocks with each other. Each block composition is elaborated in some steps to show its different characteristics. In each line, the first image (a) shows the real form of

block pattern; the second one (b) shows its parcel division; and the other three illustrations (c, d, e) make a gradual abstraction of the form to provide a final arrangement that is generated in a more geometric shape. As shown in the figure, there are some different arrangements of blocks that creates characteristic patterns such as: the organization of large trapezoid block and their relation with each other (I); the space composition created by large and small trapezoid blocks (II and III); blocks that form a kind of greed pattern (IV); and the organization of small triangular or rectangular blocks (V and VI).

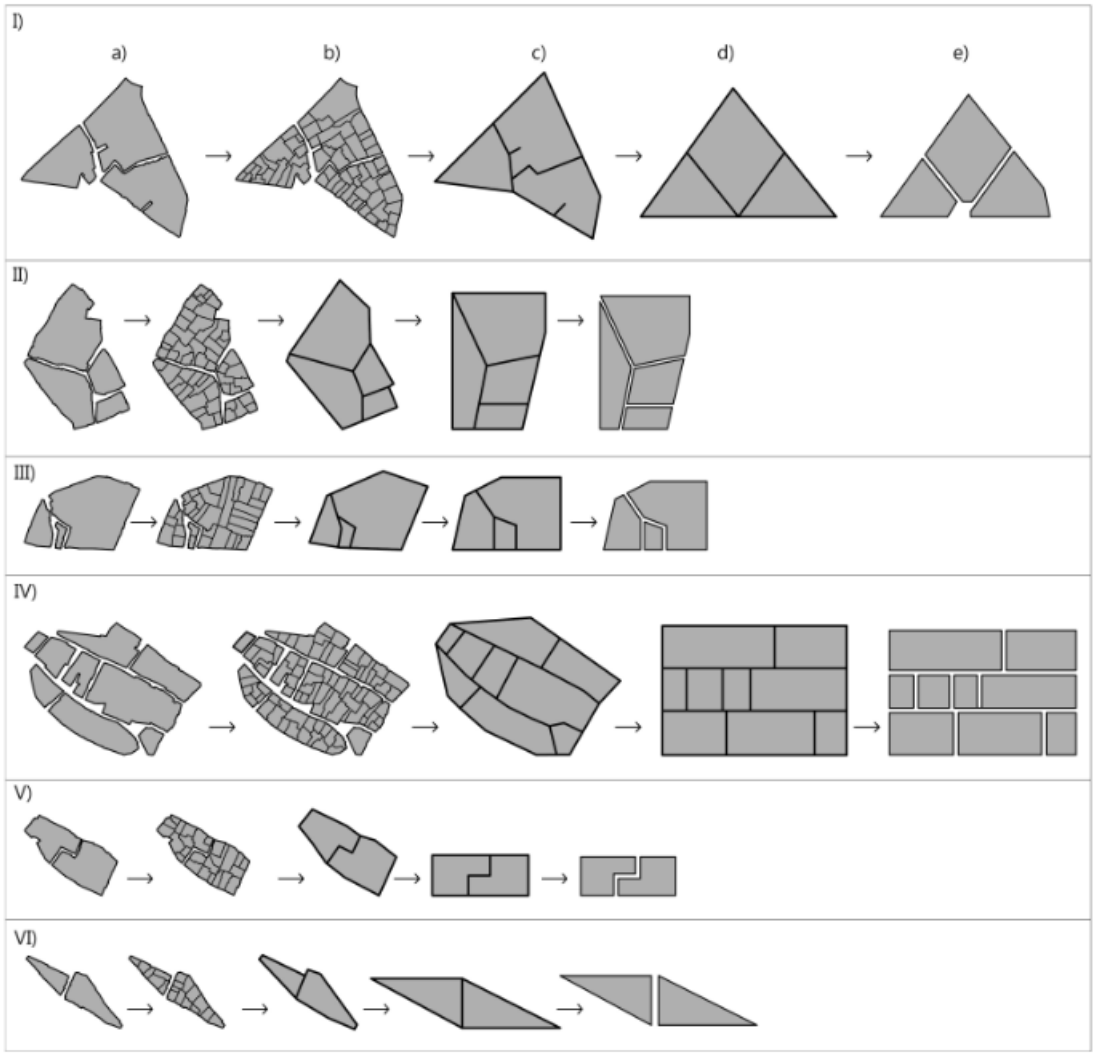



**Figure 4.54 :** Different patterns formed by block arrangements.

### 4.4.2 Parcel Pattern

As mention in previous sections, many scholars accept the parcel (lot) as a basic morphological unit in the study of urban form. Some of them go even further by claiming that the lot is the most important factor effecting the formation of urban

pattern. The parcel's features such as its form, size, dimensions, orientation, location and the relation with the street have fundamental impacts on the arrangement of urban space. The parcel pattern affects both the composition of external space (streets and open spaces) and the internal space (built form). The forms of the parcel, the block, and the street have reciprocal impacts on the pattern of each other. Therefore, the form of the lots affects the form of the block and this shapes the street pattern and via-versa.

The figure 4.55 shows the parcel pattern on the whole study area. The parcels in different forms and sizes are arranged according to the features of the blocks and the street pattern. Generally the narrow side of the parcel faces the street side (provide a more efficient use of the land), but in some cases the opposite of this can be seen. In the narrow and small blocks there are two rows of lots located on both sides, while in larger blocks there are also parcels located on the middle of the block with a narrow path giving access to the street.

**Figure 4.55 :** The parcel pattern in the study area.

The figure 4.56represents some of the common parcel forms that are distributed within the area and their relationship with the street. The first row represents the real forms of the lots while in the second line (bottom) makes a more geometric configuration of their shapes. The most common form of the parcel is the long

rectangular one with its narrow edge on the street side (a). Besides this there are also other forms such as: rectangular shape with the broad edge on the street side (b); quadrate with equal edges (c); and the t-parcels with a narrow access to the street located generally on the middle of the block (d).

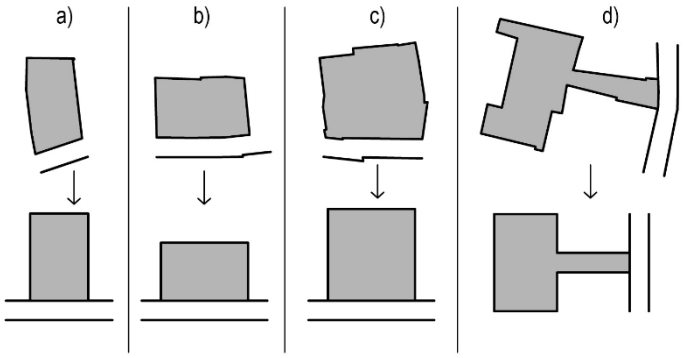



**Figure 4.56 :** Main parcel forms.

The figure 4.57 shows the typology of parcels located on the corners of the block where the streets are intersected. In the corners with a narrow angle (the separation of two streets) the parcel's form has a kind of triangular shape with rounded or chafer corner (a, b). While in the streets intersected with a right-angle the corner parcel has rectangular form, in some cases with a chamfer corner (c). It is important to stress the fact that the shape of the parcel is basic determinant of the building's form.

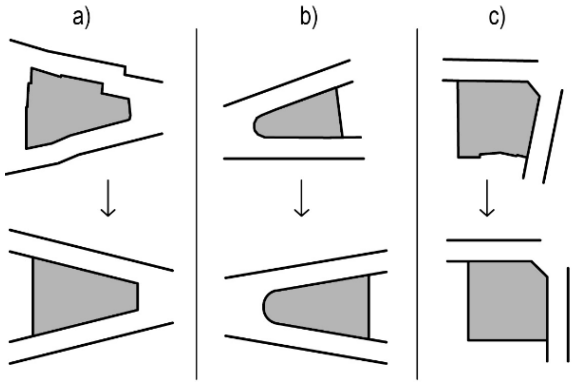
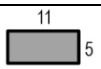
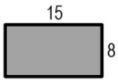
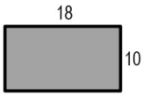
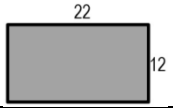
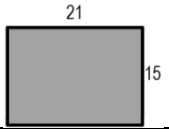
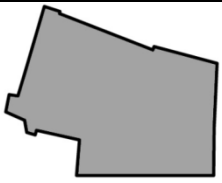
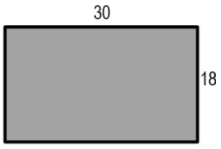



**Figure 4.57 :** The typology of corner parcels.

Regarding the size of the parcels in the study area, they are developed within a wide variety that changes from 55m$^2$ (min) to 600m$^2$ (max). The table 4.1 makes a detailed classification of parcel sizes by grouping them in certain interval and showing their sizes, dimensions, and their total number and percentage in the whole area. The small parcels below the 100m$^2$ do not have a high frequency (9%) within the whole area - the smallest parcel is 55m$^2$ with dimensions 5:11m. The most common parcel size is between 200-300m (27%) with an average dimension of 15:20m. the residential

parcels above 500m$^2$ are very rare (3%) except of some parcels where public functions are located. The maximum size of residential parcel is 600m$^2$. The figure 4.58 shows the distribution of parcels and their sizes by making a gradual coloring.

**Table 4.1**: The sizes of parcels, their dimensions and their percentage in the whole area.

| **Area interval (m$^2$)** | **Examples** | **Parcel dimensions** | **Number** | **%** |
|---|---|---|---|---|
| < 100 (min 55) | |  | 35 | 9 |
| 101-150 | |  | 83 | 21 |
| 151-200 | |  | 92 | 23 |
| 201-300 | |  | 109 | 27 |
| 301-500 | |  | 68 | 17 |
| > 500 (max 600) |  |  | 11 | 3 |
| Total | | | 397 | 100 |

### 4.4.3 The Building Layouts

The final elements of the morphological analyses are the buildings and their characteristics. The buildings are the components that define the urban pattern in both second and third dimensions. The buildings layout refer to the compositions or the arrangement of some buildings and their relationship with each other and their environment.

The study area consists of dense residential settlement with private courtyard houses (1-3 floors) that creates a very compact urban pattern. The housing layout is developed within a variety of arrangements with detached, semi-detached or attached

buildings. The figure 5.59 shows the building pattern (a) and the courtyard pattern (b) in the whole area.

**Figure 4.58 :** The distribution of parcels with different sizes.

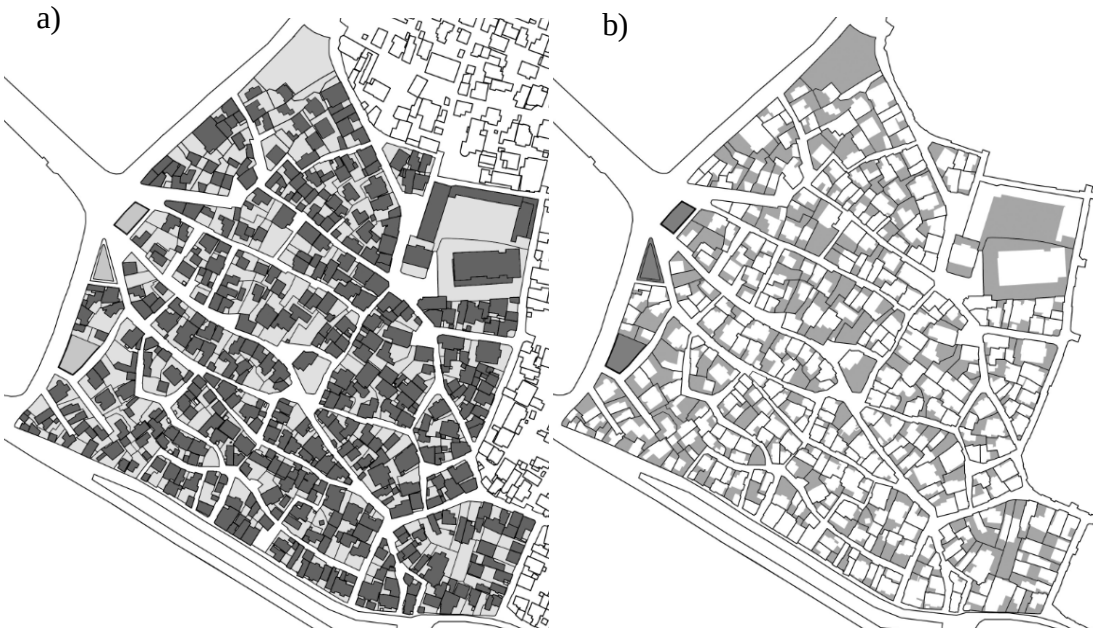



**Figure 4.59 :** Built pattern (a) and courtyard pattern (b).

The figure 4.60 illustrates some housing layouts in a more detailed way by showing their configuration on different block and street types. As can be seen, the built-up area covers more land than the courtyards. This fact is proved by the measurements

of the plot cover ratio (PCR) which in all cases shown in the figure… is above 0.5. The average PCR can be accepted as 0.57. While the floor area ratio is approximately: 0.57 x 2 = 1.15 (since the buildings are generally two floors). This types of building arrangement create a compact and dense settlement.

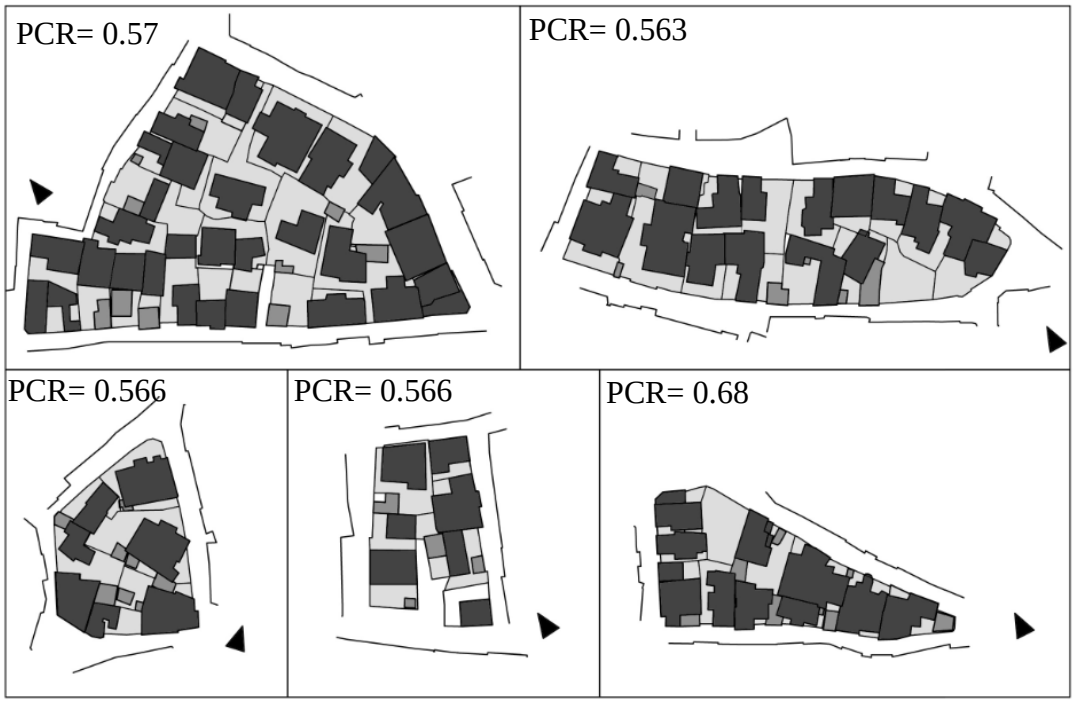



**Figure 4.60 :** Different housing layouts and their PCR calculations.

As mentioned before, the housing layout appears in three different arrangements: attached, semi-detached and detached building (Figure 4.61). In the attached layout the buildings are located along the street and have back yards except some cases where L-shaped buildings have also front yards (Figure4.61a). The semi-detached buildings have back or front courtyards and narrow setback on their sides (Figure 4.61b). Both of attached and semi-detached layouts are suitable for narrow plots where there is not much space for side yards. While the detached buildings are located in broader parcels and are separated from each other (Figure 4.61c). This type of organization is more advantageous in the sense of having more light an air access to the buildings.

Another characteristic element on the housing layouts is the presence of small, one storey buildings located on the corner of the courtyard (Figure 4.62). These units can be seen in almost all houses and are used as storage or cooking spaces.

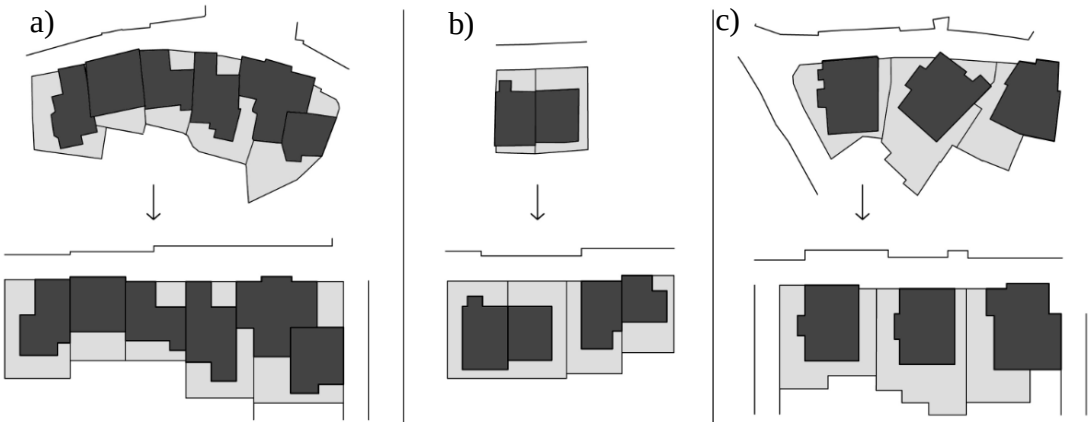



**Figure 4.61 :** Different housing layouts: attached (a), semi-detached (b), detached (c).

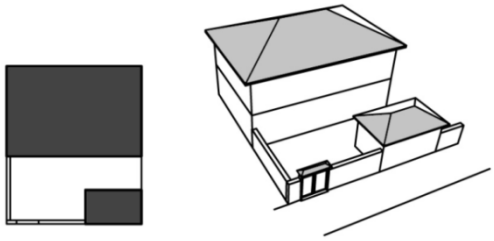


**Figure 4.62 :** The house and its small outbuilding located on the courtyard.

The location of the building on the parcel and its relationship with the street is another basic issue in the formation of housing layouts. The study area has a wide variety of building-parcel composition by forming different layouts. The figure 4.63 makes an illustration by representing almost all of different building-plot arrangements. The two images on the left side show position of the parcel in the relation with the street: the parcel with its narrow edge on the street (a), and the other with the wide edge (b). The illustrations on the right that show the building-plot organization are generated by using the narrow parcel but the same can be done for the wide parcel. In the first line (I), there are shown the parcel arrangements where three or four edges of the building overlap the border lines of the plot. In these types of organizations: the building fits the entire parcel (no yard); has a setback from the border line just in one side (front, back or side yard); or the L-shaped buildings have setbacks from the middle of the border line in two sides of the plot (front or side yard).

These modes of building-parcel arrangements are more proper for attached or semi-detached housing where the parcels are not very broad. The second row (II) shows the layouts where two edges of the buildings overlap with the plot border lines. These kinds of houses have front, side or back courtyards and are more suitable for

semi-detached building layouts. Another plot organization- shown in the bottom line (III) - is when only one side of the building overlap with the parcel border line or it has setbacks in all sides. This form of compositions creates detached housing layouts with front or back gardens.

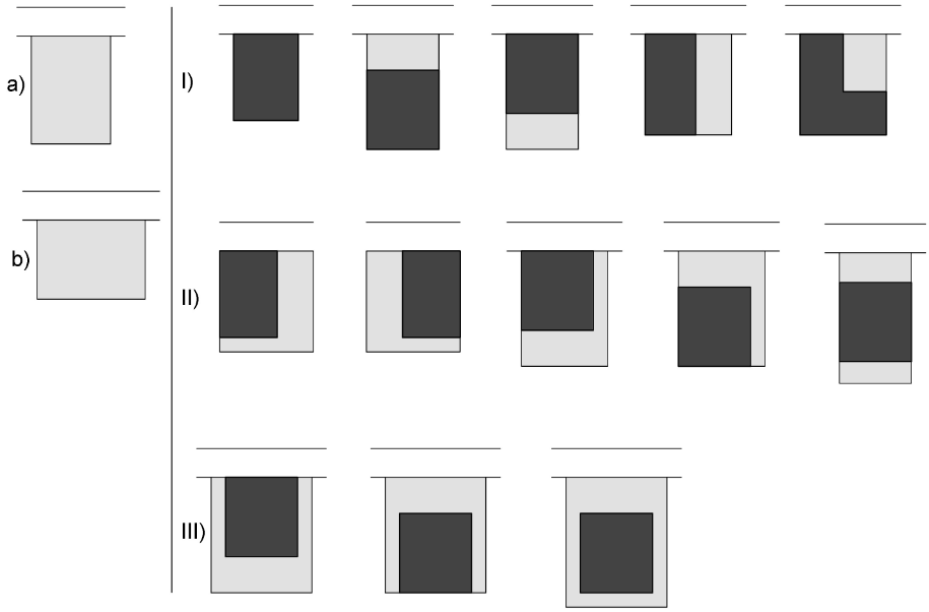



**Figure 4.63 :** Different compositions of building-parcel arrangements

The final analysis regarding the built pattern is about the forms of the buildings, by exploring them in the second and third dimension. It is not in the scope of this study to make detailed analyses about the architectural features of the buildings. Another study should be done by focusing more on the architectural scale analyses such as: architectural style; arrangement of the indoor spaces and their functions; architectural elements (façade, roof, windows, doors etc.); the forms of architectural elements and their relationship with each-other (proportions, dimensions, scale, size); building materials (stone, brick, concrete, wood, glass etc.); the characteristics of decorative elements etc. While, the focus of this study regarding the buildings' features is more on the surveys like: form of the building, its dimensions (length: width), size, and the number of floors.

The figure 4.64 shows some examples that demonstrate different forms of the buildings in the study area. They can be categorized into three main groups: rectangular buildings; building with directional shifting on their facades; and corner buildings. The rectangular buildings can have straight facades or bays that are extended on the middle or on the corner of the façade. The other types of buildings are those with right-angle directional changes on their facades that form L-shaped

buildings or other shapes. The distances between the directional changes vary from 1-6m by providing different orientation of the façade. The corner buildings have rectangular, quadrate or trapezoid forms with rounded or chamfer corners on the side of the street intersection.

The size of the basement area on the buildings shown in examples changes from 70-200m$^2$ but they can be grouped into: smaller buildings (70-80m$^2$), medium buildings (100-120m$^2$), and large buildings (150-200m$^2$). There are different length/width dimensions such as: 7-8m / 10-12m, 10/10m, and 10-12m/12-15 m. The narrows façade is about 4.5m and the longest one is around 16m.

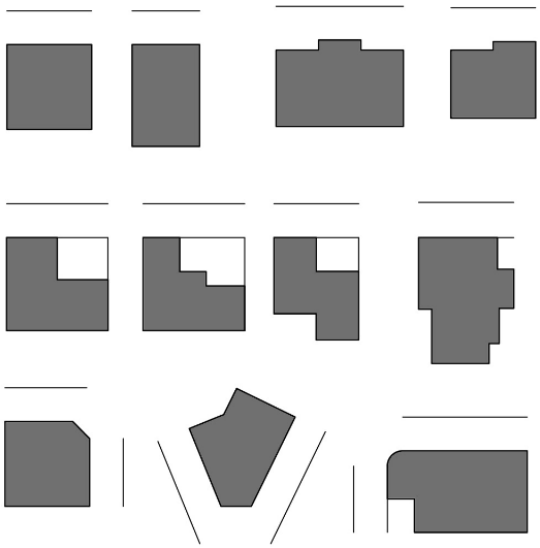


**Figure 4.64 :** Different building form typologies

The storey number varies from 1-3 floors with heights between 3-9m. In some cases the buildings have basement rooms (cellars) under the first floor which are sunken about 1m under the ground level and have small windows opened to outside. The figure 4.65 shows the different heights and floors of the buildings in the study area. While, to have a better understanding of buildings' architectural features some examples are shown in the figures 4.66 and 4.67. The plans, sections and views of the buildings show the arrangement of the indoor space and the composition of different architectural elements.

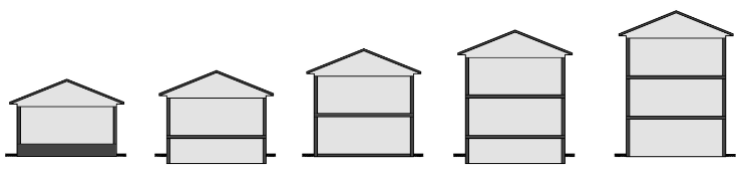


**Figure 4.65 :** Buildings in different heights with 1-3 floors and basement rooms.

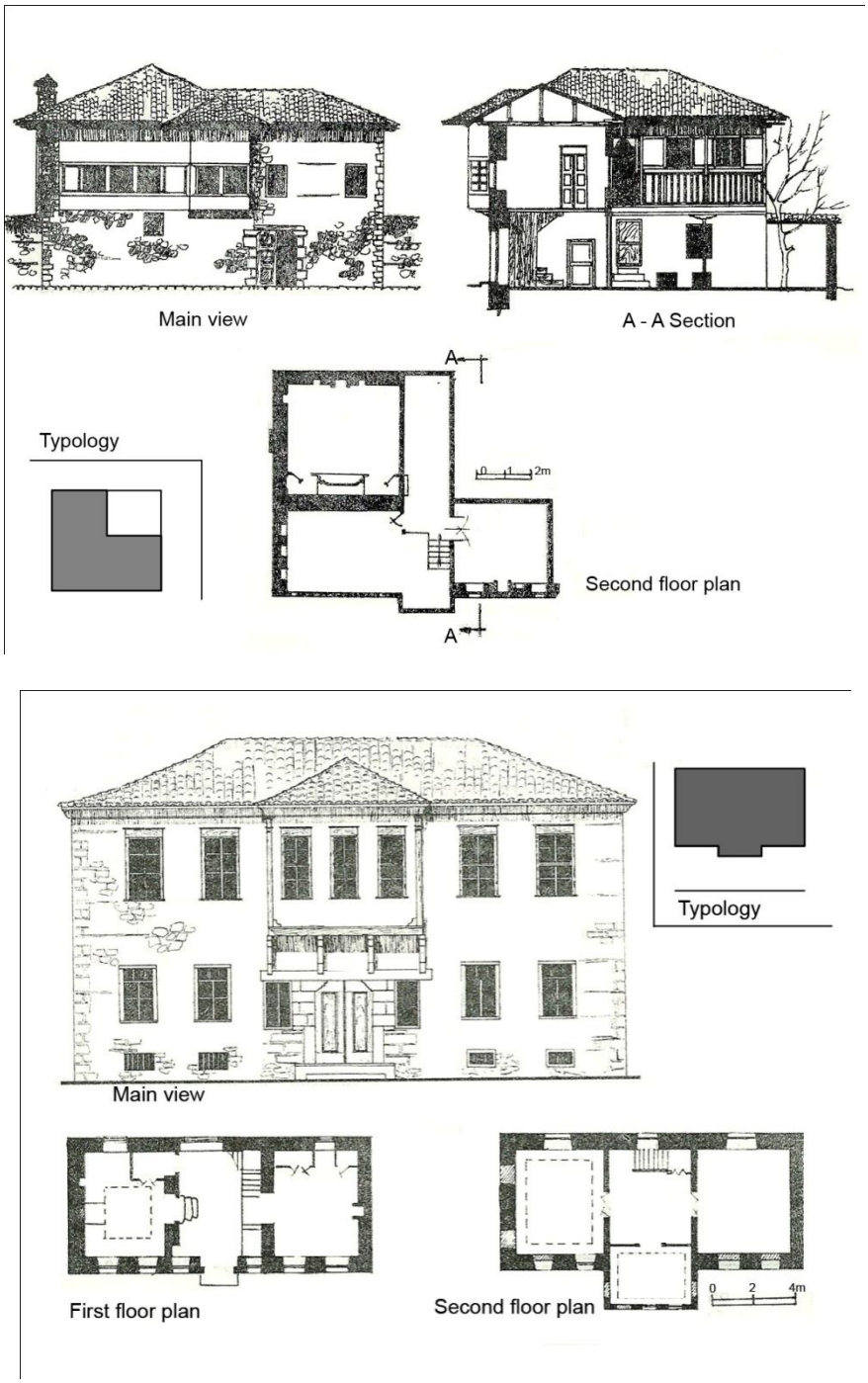
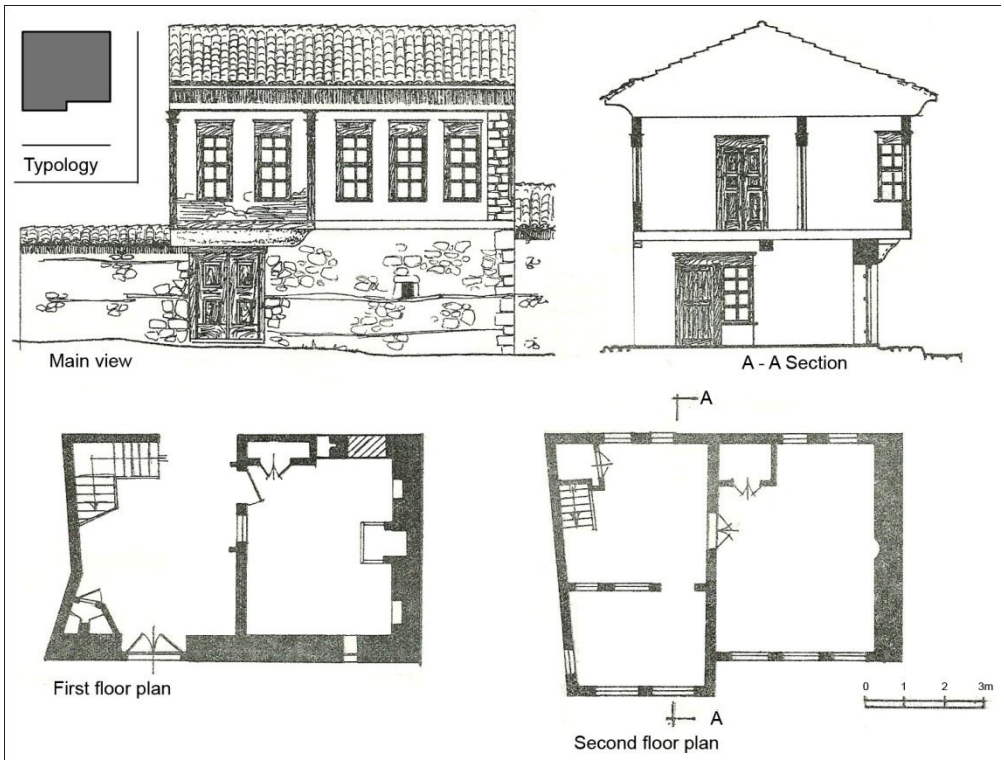



**Figure 4.66 :** Examples from house typologies (Thomo 1988).



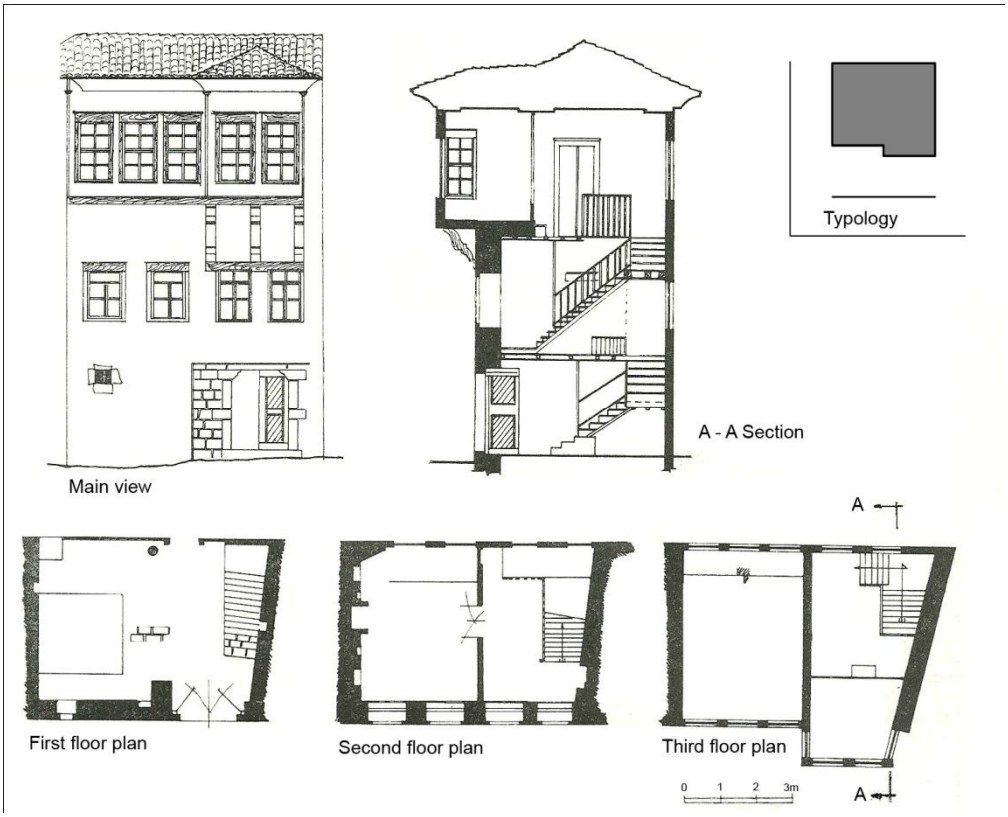




**Figure 4.67 :** Examples from house typologies (Thomo 1988).

## 5. A DESIGN GUIDE FOR NEW RESIDENTIAL AREAS IN KORÇA

The final section of this study will deal with the establishment of some proposals that can be used as a guide for the design of new residential areas in Korça. The main aim here, is to develop a design guide which reflects the characteristics of the traditional urban pattern and interprets them to the conditions (needs) of the nowadays. It is important to mention that the morphological analysis of the traditional urban form in Korça, presented in previous sections, have shown that there is a rational spatial organization and a coherent relationship between different elements such as: street, open spaces and built form. Moreover, this pattern is developed within the local context by reflecting different characteristics of the natural, physical and socio-cultural environment.All of these attributes are very important in creating spaces with spatial, visual and social qualities that increase the standard of urban life. The implementation of these qualities in the design of new areas in Korça is one of the main concerns of this study.

The adaption of the traditional urban form's features to the new designs, is a challenge and at the same time a duty for planners and architects. As Moudon says: "The architect's role is to carry on the tradition and to introduce change with modesty, moderation, and based on clues that we (society and its different people) may need change" (2009). Besides this, the ability of designers to identify the particular qualities of a place and incorporate them to new designs is called a 'special gift' and an act of professionalism by Kostof (1991). Based on this idea, the design proposals, developed within the scope of this work, try to employ the spatial characteristic of the traditional urban pattern and integrate them to the needs of the present conditions.

The design guide for new residential areas will be developed in four different levels: Neighborhood unit, transportation system (street pattern), open spaces, and built form (building layouts). Firstly, the concept of 'Neighborhood Unit' will be used as a framework for the design of new development areas. The 'Neighborhood Unit' defines different features like: the size of the district, land uses, and the scheme of spatial organization of the settlement. Secondly, the design principles of

transportation system and its features will be defined. Another concern is about the design of open spaces (plazas) by determining their typology, function, location etc. Finally, the study will be focused on establishing some proposals for the design of building layouts.

### 5.1 General Urban Design Principles

It would be very useful to introduce some general urban design principles before focusing on the specific case of Korça. These design policies (principles), that can be also implemented in the design of new residential areas in Korça, are summarized as below:

**- Respecting the local context and character:**It is very important for the new development areas to fit the context of the natural (climate, topography), physical (built form, materials) and socio-cultural environment (lifestyle, social structure) of the local area. These characteristics will provide an environment that reflects the regional identity and values.

**- Providing sufficient public spaces and activities:** A priority should be givento public realm by providing public spaces and services that fulfill the needs of the community and increase the vitality of urban space. Different outdoor (plazas, parks, playgrounds) and indoor (service, cultural and social buildings) public spaces should be sufficient and accessible.

**- Ensuring accessibility:** Accessibility is an issue that depends on land use planning and transportation system. The land use plan should organize the different activities (functions) within an accessible scheme. Besides this, the transportation system must obtain accessibility to different users such as: car users, pedestrians, children, elders and people with disabilities.

**- Efficient transportation system:** The transportation system should be developed in a way that provides accessibility for all different users by integrating the pedestrian and vehicular circulation. Firstly, the priority should be given to pedestrian movement and public transport. The streets must have all the standards that facilitate the pedestrian circulation such as: wide sidewalks, signs, landscape elements (groundcover, planting, lightening and other furniture), and land uses that encourage the pedestrian activities along the street. Another important issue is the equipping of street with elements that ensure accessibility for elders and people with

disabilities (ramps, signs). In addition, the public transport should be encouraged by providing efficient routes and accessible station points within the settlement. Finally, the transportation system should not ignore the vehicular movement. The streets should be designed with proper standards that accommodate the car movement and parking areas.

**- Providing intensity and density:** One of the main characteristics that divide urban areas from rural zones is the high level of intensity and compactness. This can be achieved by an efficient use of land in the context of functions and physical form. The highest intensity should be around public areas and most accessible places. However, the residential areas also must have a compact pattern that increases the sense urban place and the neighborhood relationships.

**- Mixing activities and tenures:** The urban space should maintain diversity in three different contexts: land uses (functions), physical form, and social content. The land use plan must consist of different activities (residential, commercial, offices, public uses) in horizontal and vertical dimension (ground and upper floors). Besides this, the variety on the built environment is also important. This can be achieved by designing buildings and spaces with different forms, sizes and architectural features that provide diversity and unity in the meantime. Finally, residential areas must obtain affordable housing for different groups of society. The success of a community design depends on its social diversity which includes people with different income, religion, age, social status and cultural background.

**- High quality in physical environment:** The quality of physical environment is depended on successful architectural and urban design. Firstly, the architectural design should provide good quality by functional, aesthetic and durable buildings. After that, their arrangement in urban scale and the landscape design are important in increasing the quality of space. Besides a good design, the maintenance of these qualities is also a basic issue that should not be neglected.

**- Sustainability:** The concept of sustainability is related with three main issues: environmental protection and maintenance; social and economic stability; and good quality of physical space. The sustainability regarding the environmental issues can be achieved by protecting and improving the natural environment (resources, ecological areas, forests, agricultural lands) and by minimizing the resource consumption (renewable energy, good insulation, recycling etc). While in socio-economic context, the sustainability means the establishment of social equity

thatprovides sufficient public services; employment areas; social and cultural activities; and public participation in decision making processes. Lastly, the sustainability of physical space is related to the quality of built form (which was mentioned above) and level of flexibility. The new settlements should be designed with an open-ended order that is flexible and gives opportunity to the subsequent changes (Lewis,2005;Towers, 2005; Neal, 2003; Walters, 2007).

### 5.2 The Concept of Neighborhood Unit

One of the main components of the city's structure is the neighborhood unit. The neighborhood can be defined as an urban zone that has some particular homogenous features, which emerged by the growth of the cities (Gallion and Eisner, 1957). Actually, the neighborhood unit is not a new concept because it can be seen also in the composition of old cities. For example, in ottoman settlements, this type of organization is applied successfully by dividing the city into smaller quarters which are called "mahalle". The old city of Korça had also an urban arrangement that is developed within neighborhood units. The city was consisted of two main neighborhoods (mahalle): the "Varosh" was developed around the orthodox church and the "Kasaba" was formed around the bazaar and the mosque.

The use of the neighborhood as a basic design unit has its roots on the movements that emerged in the late of 19$^{th}$ century, especially in England and United States, which try to reestablish some human values of cities broken by the massive development of industrialism (Gallion and Eisner, 1957). One of the earliest scholars that developed a detailed definition of the neighborhood is Clarence Perry. In his work 'Regional Survey of New York and Its Environs' (1929), he describes the neighborhood as an urban area with a population between 5,000-6,000 people, which is developed around an elementary school that has a capacity of 1,000-1,200 pupils. The residential layouts are defined as single-family dwellings with a density of 10 families per acre (100 people per ha). The neighborhood covers an area of about 160 acre (65 ha) and is developed in form where the largest distance that a child has to walk to the school is around one-half mile (800m). About 10% of the total land is designated to recreational areas. The other uses, located within the neighborhood are: shopping facilities, religion buildings, library and a community center (Gallion and Eisner,1957; Walters, 2007 ).

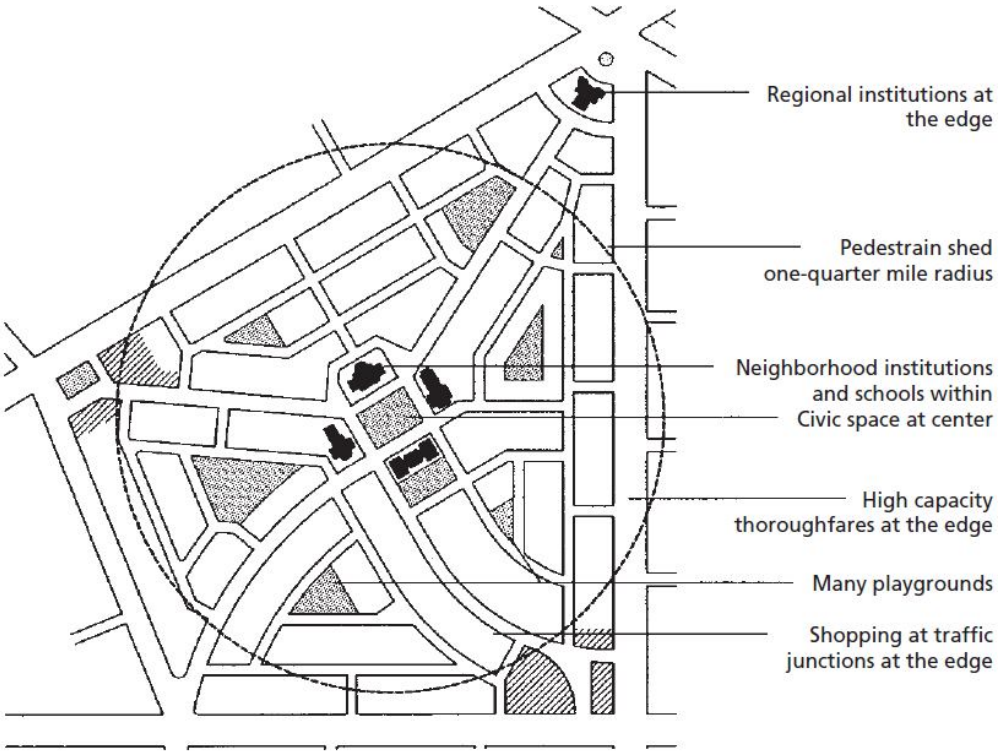



**Figure 5.1 :** The neighborhood unit developed by Clarence Perry (Walters, 2007).

There are also many other studies regarding the spatial, functional and social organization of the neighborhood. One of them is the study of N.L Engelhardt who developed a scheme of the neighborhood unit in a broader context. According to his work, the neighborhood unit has an elementary school, a small shopping district and a playground, all located on the center of the settlement and the distance between the dwellings and these facilities does not exceed one-half mile (800m). By the merging of two units (3,400 families) a secondary school and a recreation center will be needed. These additional facilities are located on the intersection area of two neighborhoods and the largest distance to them does not exceed one mile (1600m). While the grouping of four of these units (6,800 families) form a community with a population around 24,000 people that requires a senior high school, a commercial center and a large neighborhood park (Gallion and Eisner, 1957).

The elements that should be defined clearly in the design of the neighborhood are: the size (area, population), boundaries (arterial streets), internal street system, open spaces, institutional facilities and commercial functions (Walters, 2007). To summarize, the neighborhood unit can be defined as ‘self-contained’ settlement, which is developed around a center with commercial, institutional, public and recreational facilities (Towers, 2005).

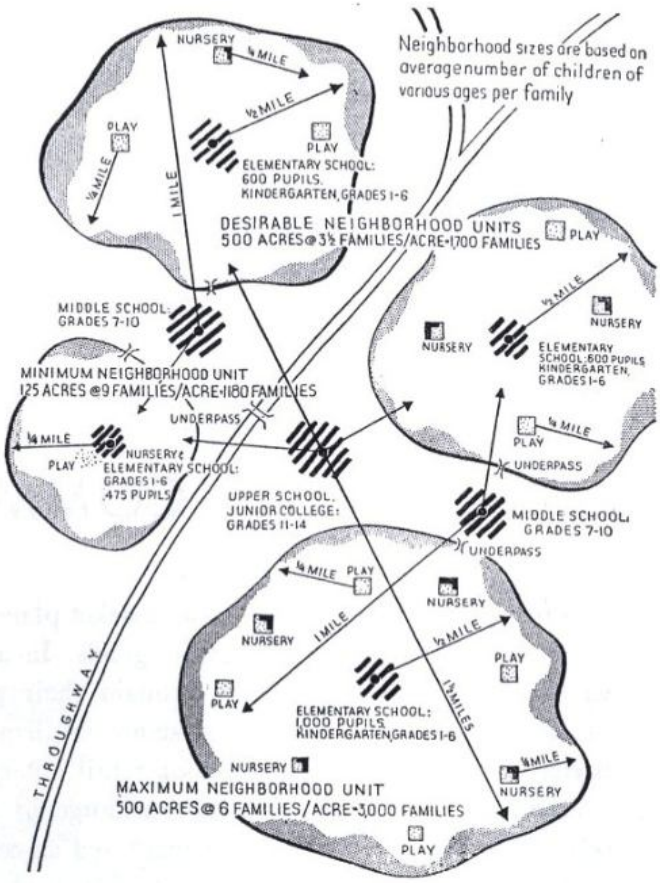



**Figure 5.2 :** The organization of neighbourhood elements suggested by Engelhardt(Gallion and Eisner, 1957).

### 5.3 The Design Guide for Korça

The design guide for the city of Korça-as mentioned before- is developed in some different levels and contexts. Firstly, it starts from the upper scale by defining the parameters of the neighborhood unit and the scheme of land use planning. Secondly, it deals with the developing of the transportation system, street pattern and the open spaces. The final part consists of the guidelines for the spatial organization in different layouts proposed for this zone. This section introduces the main principles of the design guide, while, the detailed guidelines that illustrate and explain the spatial characteristics and the design standards for the new urban areas of Korçaare given in the appendices section.

#### 5.3.1 The neighborhood unit and land use planning

As mentioned before, the main reason for using the neighborhood as a design unit is that it aims to develop a settlement, which is self-sufficient, creates identifiable urban

structure and provides a walkable area with accessibility different services (public, commercial, recreational). Besides this, another reason for this is thatKorça has already used the neighborhood unit in the composition of traditional urban areas. In this context, by considering the theoritical bases of neihgborhood unit concept and the charactersitics of the neighborhoods in the city of Korça some parameters are defined. The size of one neigborhood is determined as unit with a maximum distance of 500 m from the center by providing a walkable distanced to different services (Figure 5.3). The area cover approximately 50-60 hectares with a population of 5000-6000 inhabitants and a density of 100-120 persons/hectare. Theneighborhood's structure consist of a main square on the center where the main public and commercial services are located and the sub-districts whith a small plaza and a market place in the center.

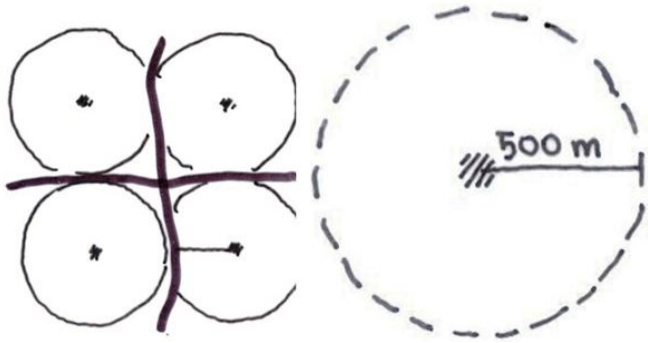



**Figure 5.3 :** The neighbourhood unit suggested for Korça (500m radius).

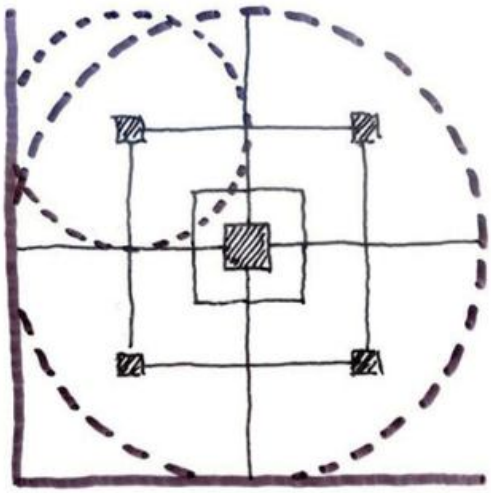


**Figure 5.4 :** The structure of neighbourhood unit.

Regarding the land use arrangement in the neighborhood, the guide intends to establish a mixed-use settlement not only in functional aspect but also in social and physical environments. The land use scheme (Figure 5.5) proposes a mixed-land use

composition with various activities located in different parts of the neighborhood (center, main boulevard, sub-districts) and a mixed land use layout in horizontal and vertical dimension (ground and upper floors). The public uses, consisting of: a nursery and a nine-year school; health center; community center; religious buildings (mosque, church); and a governmental unit, are mainly located around the main square in the center of the neighborhood. While, the commercial activities are distributed in three different regions: the region of the main square, along the main boulevards and in smaller sub-districts.

The commercial uses located in the area of the main square consist of: a neighborhood market; retail shops; restaurants; cafeterias; motels; and offices. These functions are distributed along the pedestrian streets around the square and are located mainly in the ground floors. Thecommercial activities positioned on the ground floors along the main boulevard, mainly consist of retail activities, offices and coffee bars. Finally, the commercial activities, located on smaller sub-districts, consist of a small market place in each one that serves to the inhabitants living in those areas.

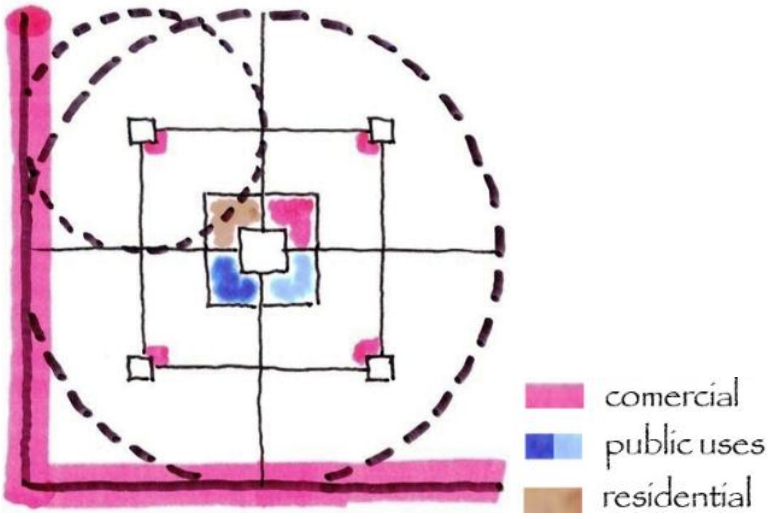



**Figure 5.5 :** The scheme of land use planning.

Another important issue in the land use plan of the neighborhood is the design of open spaces system. The open spaces consist of hard surface plazas and green open spaces. The hard-surface plazas are planned in a kind of categorization that refers to the organization of these spaces in the traditional area. They start from: the main square (located on the center); small district plazas (sub-district); open spaces formed on street intersections; and small pockets located in front of a cluster of buildings.

The green open spaces consist of: a neighborhood park, sport areas and children playgrounds.

Finally, the residential areas that are distributed in the whole neighborhood consist of three different layouts: attached apartment buildings along the main boulevard (4-5 floors); attached apartments around the region of the main square (3-4 floors); and single-family courtyard houses distributed in inner parts of the neighborhood (1-3 floors).

### 5.3.2 The transportation system and street pattern

The transportation system is planned within a model that integrates the vehicle and pedestrian circulation by providing accessibility for different users. While, the street pattern is proposed within a form that takes its references from the traditional street structure. The illustration on the figure 5.6 shows the scheme of transportation mode by defining the hierarchy and the classifying the streets regarding to the circulation type. On the two edges (sides) of the neighborhood there are located the main boulevards that connect it to the other parts of the city (urban roads). These boulevards have a total width of 15-19 m which carry the most vehicle traffic flow and have also wide sidewalks elaborated with different landscape elements that encourage the pedestrian movement and activities.

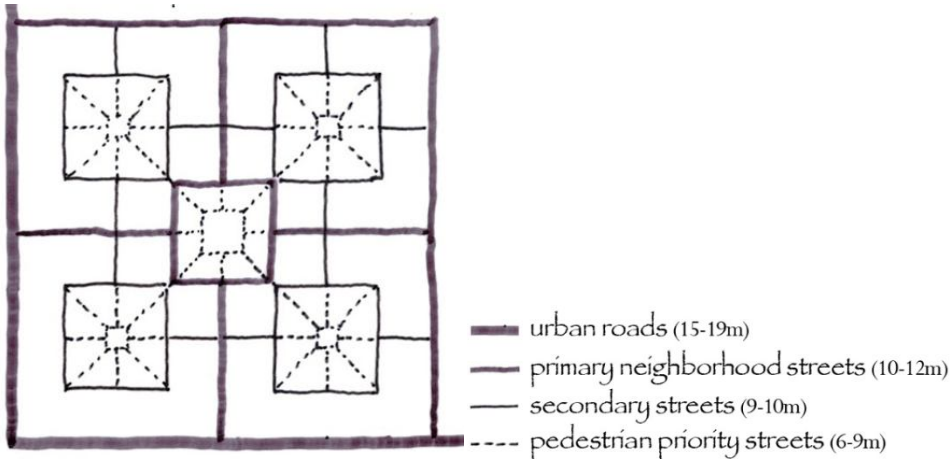



**Figure 5.6 :** The scheme of circulation system.

The street system in the inner part of the neighborhood is planned within a hierarchy of three levels: primary, secondary and third level streets. The primary neighborhood streets, which give access to the sub-districts, are designed in a width of 10-12 m, with a double vehicle lane (5m) and same-level sidewalks (2-3m). The second level

streets, that give access to the inner part of the sub-districts, are designed in a width of 9-10 m, double vehicle lane (5m) and same-level pedestrian sidewalks (2-2,5m). The third level streets, which give access to the smaller residential clusters, are planned as pedestrian priority streets with a width of 6-9m, one-way vehicle (3m). While, the streets around the main square are designed totally for pedestrian circulation with a width of 9-12m.

Regarding the street pattern, as mentioned before it is developed within a form that takes its references from the traditional pattern by forming different block shapes (trapezoid, triangular, rectangular) and sizes and creating a diversity along the street space (Figure 5.7). In addition, in different intervals the streets are fragmented by small open spaces in various forms that enrich the character of street space.

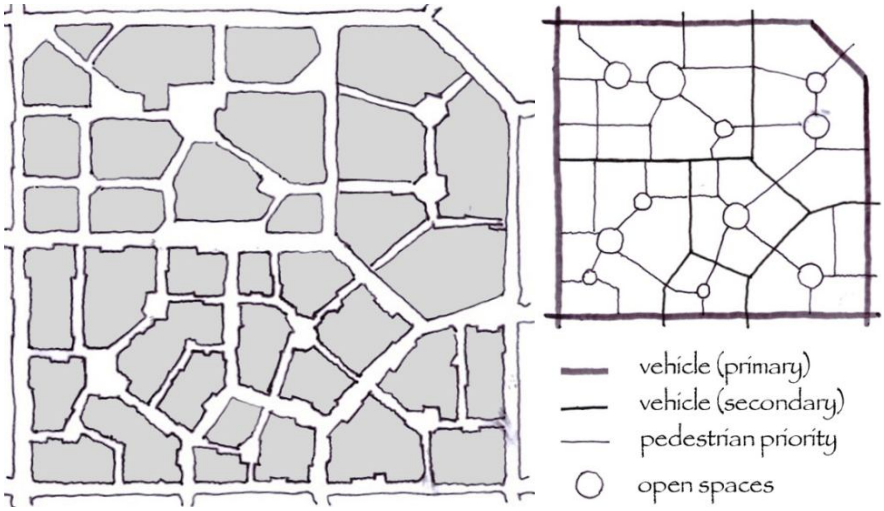



**Figure 5.7 :** Thestreet pattern scheme and the circulation mode in a part of neighbourhood.

### 5.3.3 The design guidelines for different layouts

This section deals with defining the main guidelines for the spatial arrangement in different layouts proposed in this study. As mentioned before the design guide proposes three different layouts located in different parts of the neighborhood: the layouts along the main boulevard; around the main square; and the inner residential areas. The buildings layouts along the main boulevard are proposed within a mixed layout that consists of attached apartment buildings (4-5 floors) located on the boulevard side and single-family courtyard houses in the back part (Figure 5.8). The ground floor in the apartments is used for commercial activities while the upper floors are mainly for residential use (in some cases for offices). Each building has its own back garden that can be used as a common space by the dwellers in the

apartment, while the dwellings located on the top of the building are proposed to have their own roof garden arranged in a way that provides privacy (Figure 5.9). The underground floor of the whole building complex is used for parking areas.

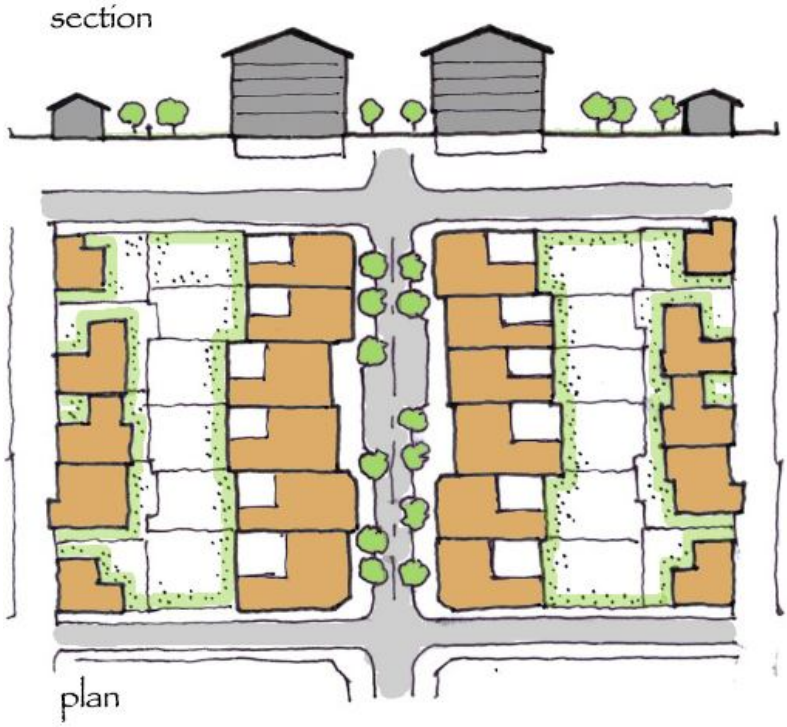



**Figure 5.8 :** The layouts along the main boulevard.

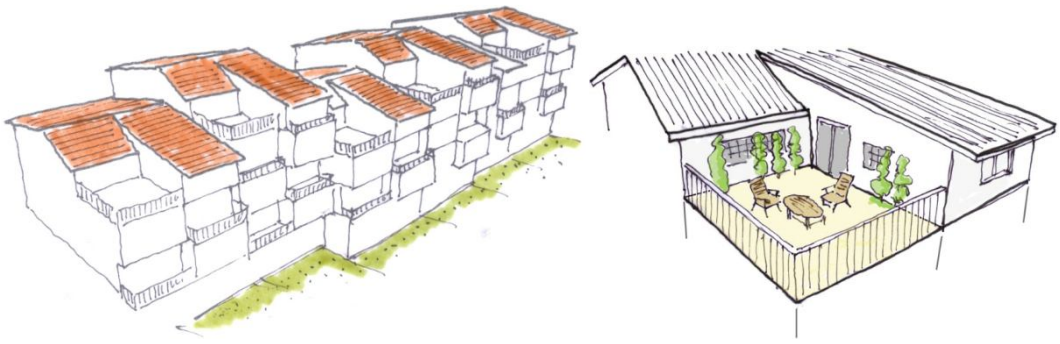


**Figure 5.9 :** The roof gardens in apartment buildings.

Regarding the design of the street space along the main boulevard, it is proposed within a framework that integrates the pedestrian and vehicle traffic. The street has a total width that change from 15-19 m, with a 7 m vehicle lane and two sidewalks (4-6 m each) in both sides (Figure 5.10). The spatial and functional arrangement should encourage the pedestrian activities and increasing the quality of space. In this context, the ground floors of buildings are designed with retail commercial uses that can attract a lot of users. The facade frontage, especially the ground floor, should be

elaborated with different elements. The ground floors of the shops should have a level changing from the ground (40cm) for the purpose of exposing the shop windows in a better way. Other elements like awnings, shop billboards, bays should be designed in a way that creates a human scale environment, diversity and coherence along the ground floors. The sidewalk should be levelled from vehicle lane and equipped with landscape elements such as: trees that provide shadow; other plantings (shrubs, flowers); lighting elements (pedestrian and vehicle lane); andsitting elements (cafeteria frontage, benches). The vehicle traffic lane is a planned with a double-way and pocket parking areas along it. The crossroads should be equipped with horizontal and vertical signs for pedestrians and designed within the universal criterions (for people with disabilities).

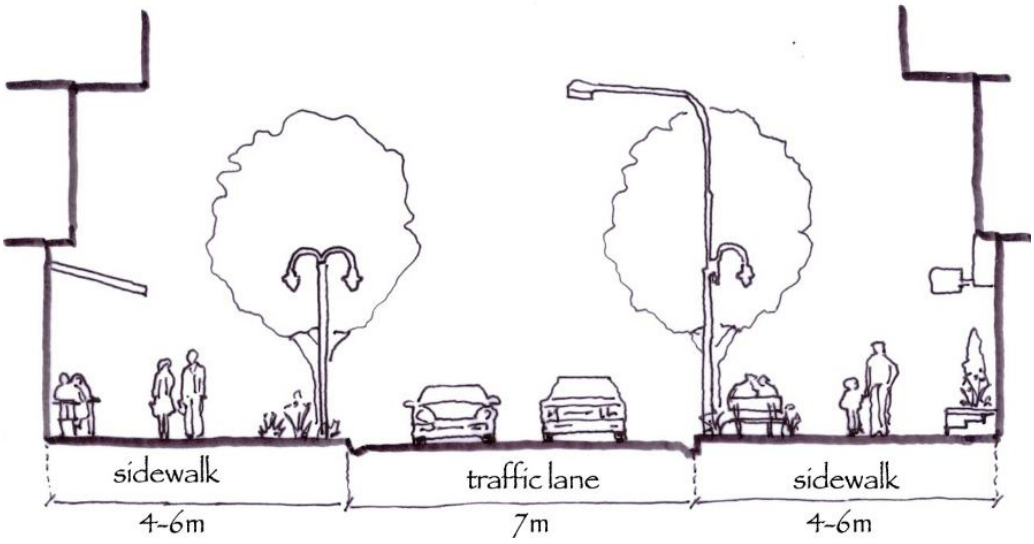



**Figure 5.10 :** The section of the main boulevard.

Another different layout is proposed for the area around the main square. Regarding the traffic circulation mode, the area has a kind of a outer ring road for vehicle and pedestrian traffic with parking areas that are connected to this line and the inner streets are designed only for pedestrian circulation (Figure 5.11). The street pattern has a form that refers to the traditional pattern with street lines that form different block shapes and sizes and have open spaces on the intersections (Figure5.12).

The blocks around the main square are designed in form of attached (3-4 floors) attached buildings with mixed land uses (Figure . The retail commercial activities are located on the ground floor and the residential areas in the upper floors. In addition the public buildings are also located in this area.

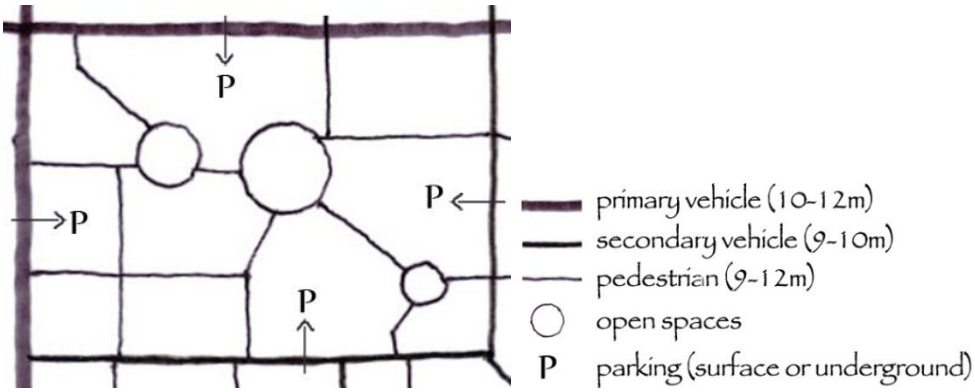



**Figure 5.11 :** The street scheme in the region of the main square.

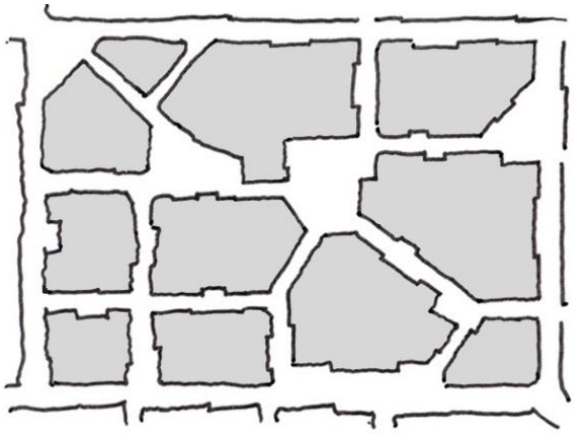


**Figure 5.12 :** The street pattern in the region of the main square.

**Figure 5.13 :** The building layouts around the main square.

The open spaces in the middle of the building blocks (back part) can be used as common public spaces (community garden, children playground, parking areas) ; as a combined semi-public spaces with private yards or totally as a private area (with private gardens).

The street space (Figure 5.14) and the main square should be designed with different landscaping elements that encourage the pedestrian activities (shop windows, awnings, sitting elements, plantings, lights, and groundcover).

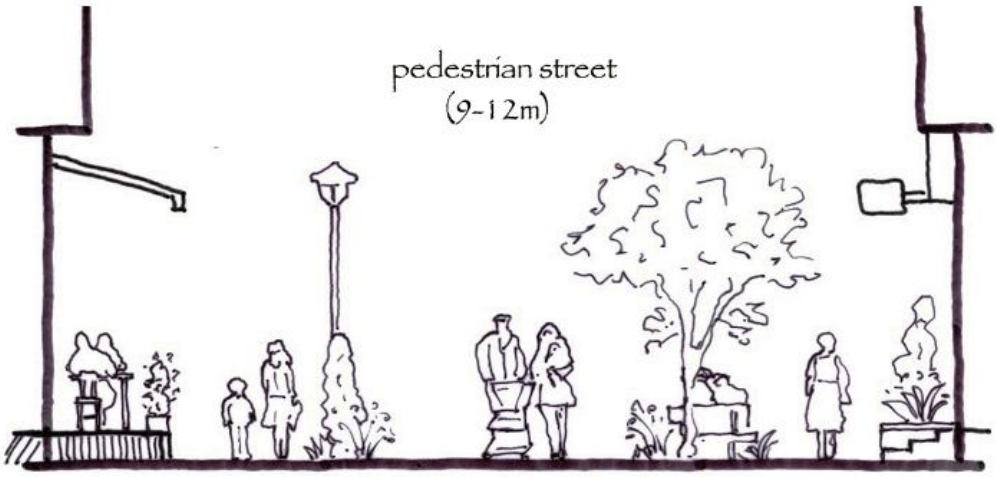



**Figure 5.14 :** The street section in the region of the main square.

The final layout, proposed in this guide, is that one that shows the spatial arrangement of the residential layouts in the inner part of the neighbourhood. This type of layouts cover the most part of the area.

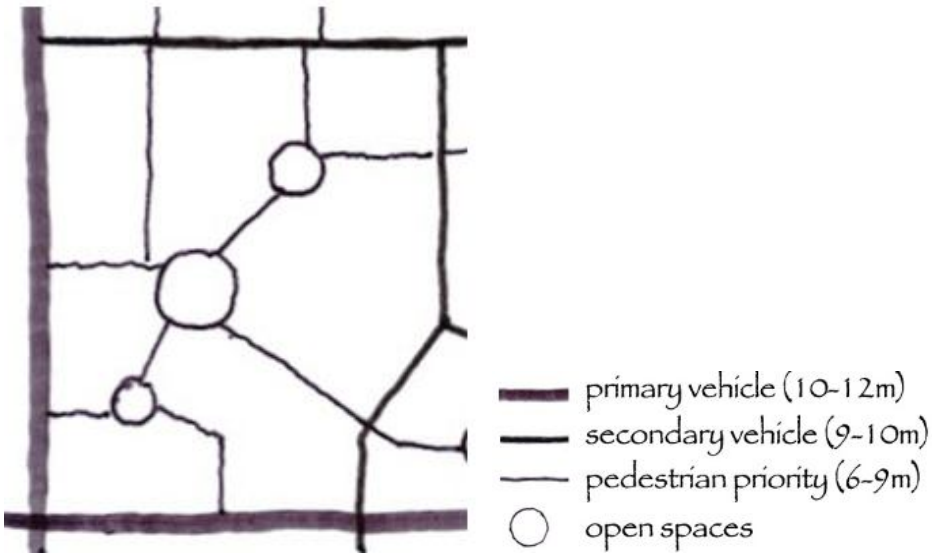



**Figure 5.15 :** The street scheme and circulation mode in the residential areas.

As shown in figure 5.15, circulation system is planned with a scheme that integrates the pedestrian and vehicle movement. The small residential districts are surrounded by wider (9-12m) streets that accommodate the vehicle traffic (Figure 5.16) while, the streets in the inner part have a character that gives the priority to pedestrian circulation (Figure 5.17). This streets are planned with one-way vehicle line which is designed with directional changes traffic calming elements for discouraging the use of the car.

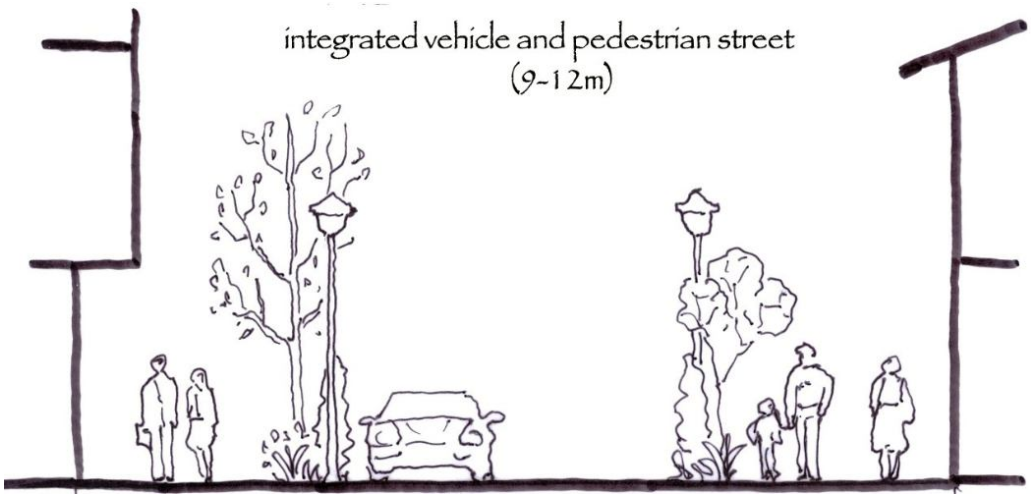



**Figure 5.16 :** The section of integrated (vehicle –pedestrian) in residential areas.

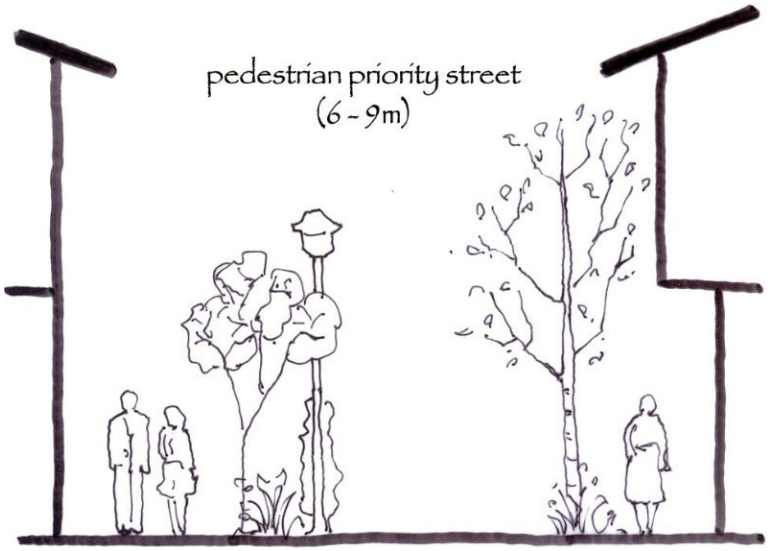



**Figure 5.17 :** The section of pedestrian priority streets in residential areas

The street pattern (Figure 5.18) is proposed in a kind of organic form with street lines that form small trapezoid blocks and have small open spaces in different shapes and sizes on their intersection. The street space is surrounded by buildings, courtyard walls or fences and gates that connect the private yards to the street.

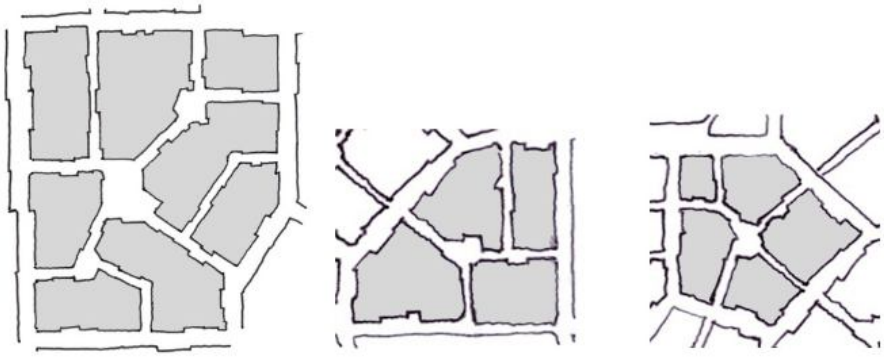


**Figure 5.18 :** Examples of street patterns in residential areas.

The residential districts consist of single-family (1-3 floors) courtyard houses that are developed in detached or semi-detached layouts (Figures 5.19-20). Most of the buildings are located along the street and have their rear or side yards, while, in some cases they are settled back and have a front yard. The more detailed guidelines about the standards of spatial arrangement in of the different layouts mentioned in this section are given in the appendices section.

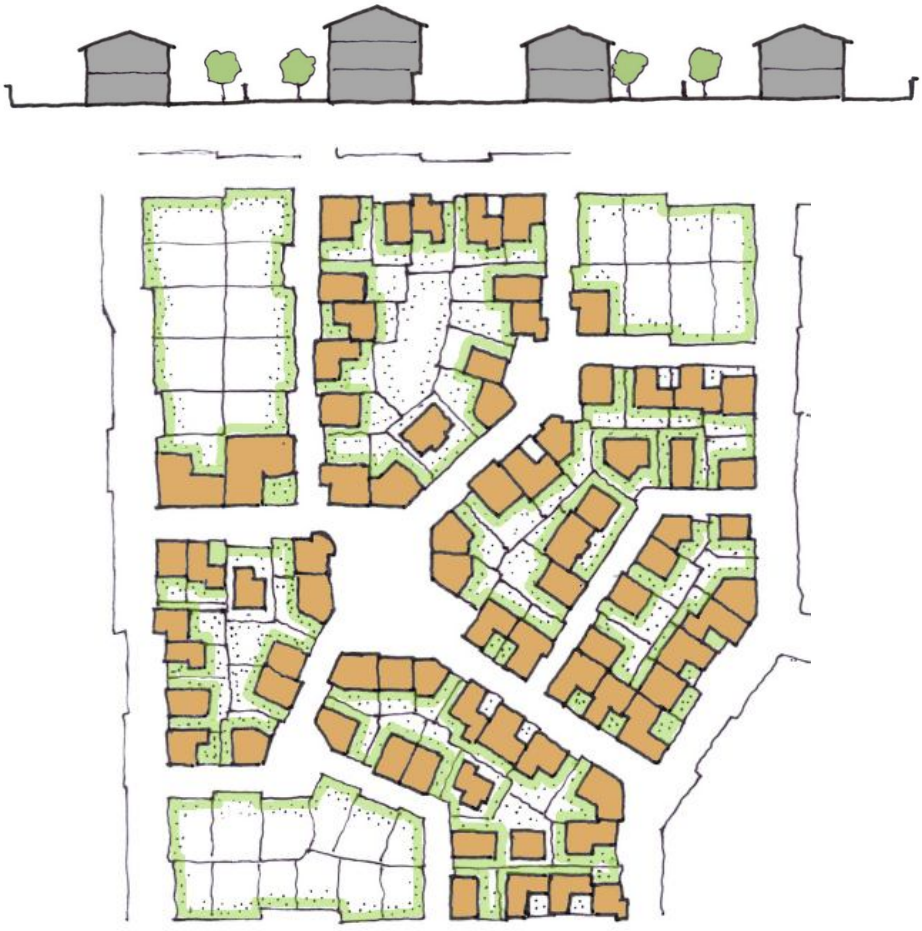


**Figure 5.19 :** The proposed housing layouts in residential areas

**Figure 5.20 :** Different views from proposed residential layouts

## 6. CONCLUSIONS

The main objective of this study was to develop a methodology for analyzing urban form, in this case, the traditional pattern. A clear methodology would provide a useful framework for understanding the qualities of the spatial organization of the urban space, which was the second aim of this work. Finally, the implementation of these qualities in the design of new urban areas, by adapting them to the conditions of the nowadays, consist another basic purpose of this research. In this context, a traditional urban zone in the city of Korça, was selected as a study area. By considering the three objectives that are mentioned above, the study was developed in three main parts.

In the first part, it deals with the definitions (descriptions) of the urban form and its elements, and the evolution of the urban morphology as scientific discipline. This section highlights the fact that the city space is a product of different factors such as natural environment, socio-economic structure and technological innovations. Any change in these determinants, has a direct affect on the transformation of the urban space. However, an important issue in this context is that the changes on urban structure should consider the existing pattern and develop harmoniously with it. Moreover, the three main elements of urban form- streets, open spaces and buildings- were evaluated in a detailed way by describing different characteristics of their spatial organization.

The second part was focused on establishing a method for analyzing the urban pattern by the morphological analysis done in the study area. The analyses were concentrated on three main elements: streets, open spaces and buildings. The detailed surveys on these components, done in different levels(scales), were very helpful for understanding and defining the characteristic of the traditional urban pattern in Korça. These analyses and their synthesis have shown that:

- The traditional urban space in Korçais developed within rational system that provides a coherent spatial arrangement of different components.

- It is developed within a contextual form by respecting the local features of physical and social environment. For example the arrangement of different elements (street directions, building orientations, materials, distances etc.) takes into consideration the climatic factors (wind, sunlight access). Besides this, spatial organization of private (internal spaces, courtyards) and public space (small open spaces, streets) reflect the characteristics of the social life (the sense privacy, neighborhood relationships, public activities).

- Finally, this pattern consist of a lot of qualities that provide a successful arrangement of urban space such as human-scale environment, functional spaces, diversity, unity, rhythm and aesthetic values.

Though the morphological survey has shown that the traditional urban area possess the qualities mentioned above, it may not fulfill some of the needs of the social life in nowadays. For these reason, the design guide, developed in the last part, tries to establish some standards that can make an adaption of the traditional typology to the present conditions. The design guide for the new residential areas in Korça is akind of framework that draws the main lines for the design of the different urban elements (streets, open spaces, building layouts) by interpreting the design principles of the traditional pattern. Finally, it is important to mention the fact that though this study was done for the city of Korça, the methodology that is developed here can be also used in the same studies for the other cities.

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**APPENDICES**

**APPENDIXA.1 :**The design guidelines for neighborhood unit, land uses and transportation system.
**APPENDIX B.1 :**The design guidelines for the main boulevard.
**APPENDIX C.1 :**The design guidelines for the areas around the main square.
**APPENDIX D.1 :**The design guidelines for residential areas.
**APPENDIX D.2 :**The design guidelines for residential areas.
**APPENDIX E.1 :**The design guidelines for open spaces.

**APPENDIX A.1**

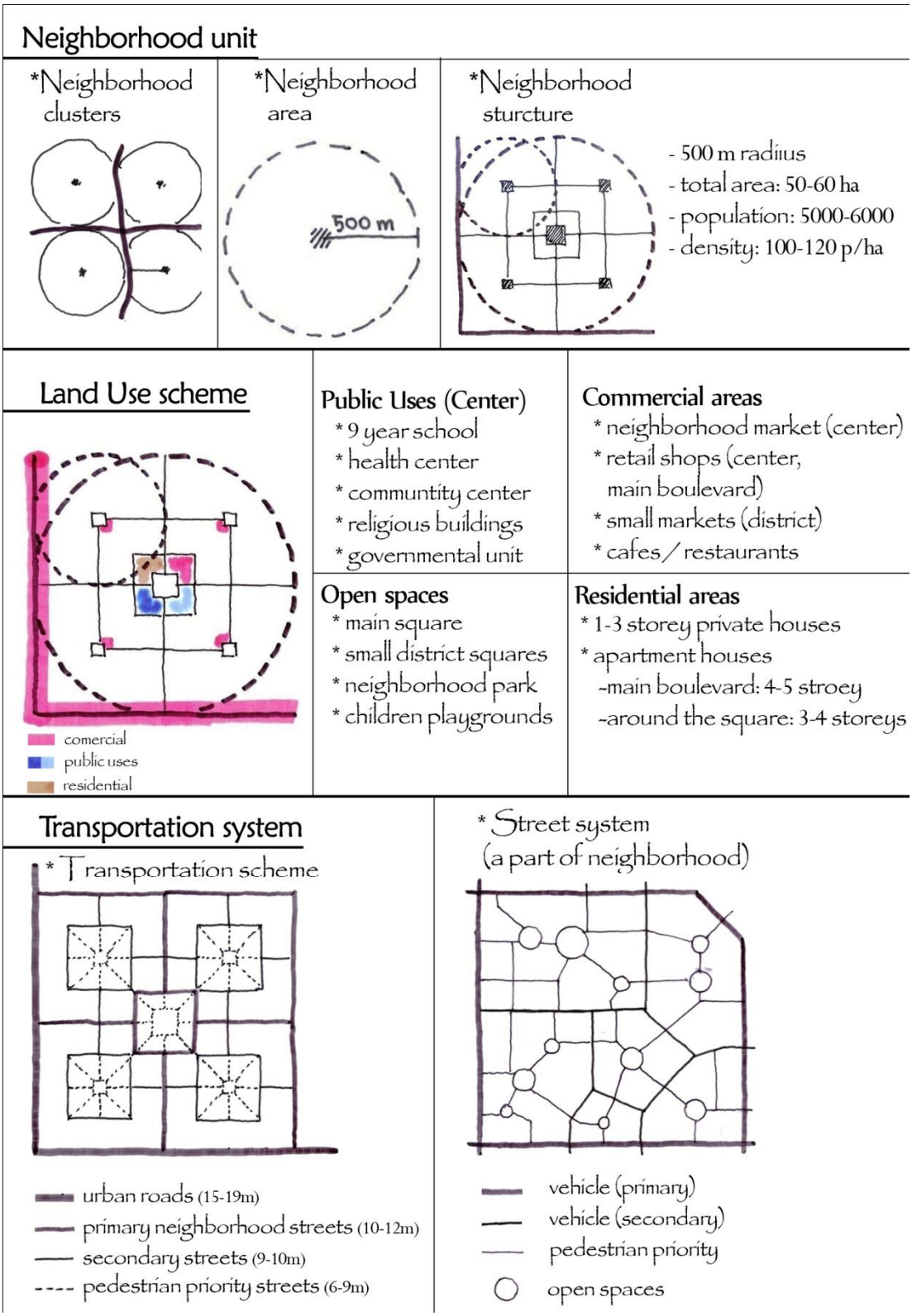


**Figure A.1:** The design guidelines for neighborhood unit, land uses and transportation system.

**APPENDIX B.1**

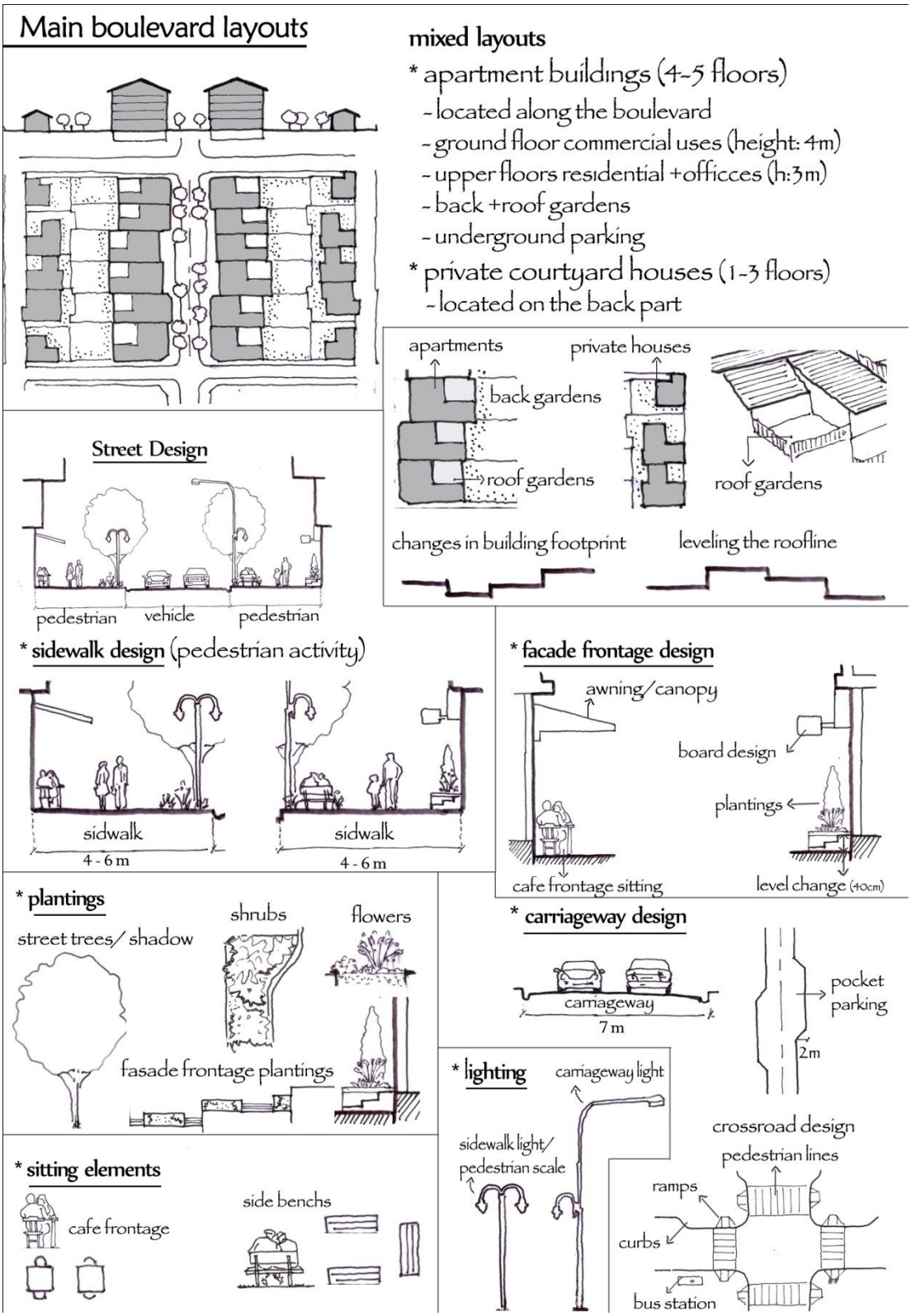


**Figure B.1:** The design guidelines for the main boulevard.

**APPENDIX C.1**

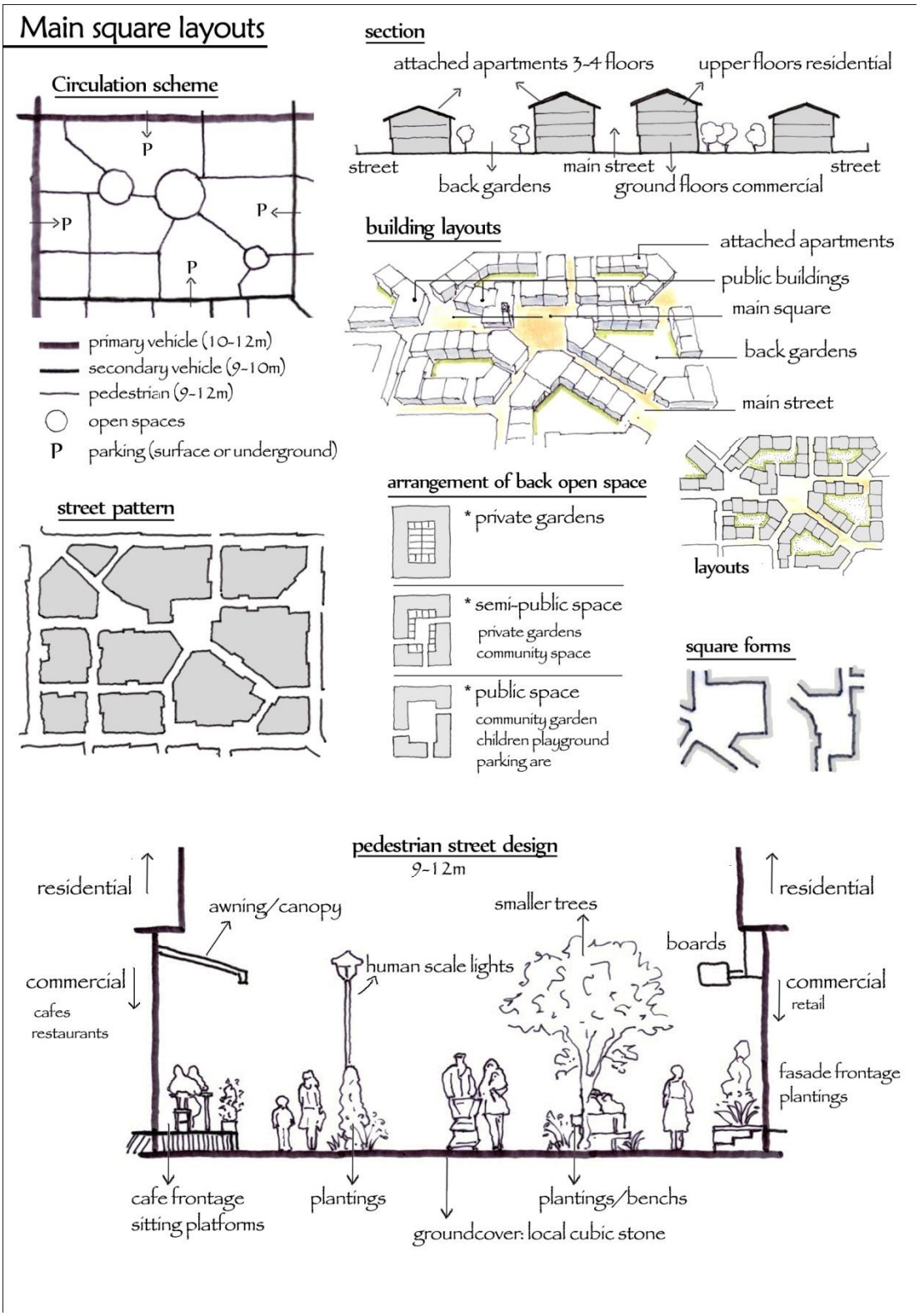


**Figure C.1:** The design guidelines for the areas around the main square.

**APPENDIX D.1**

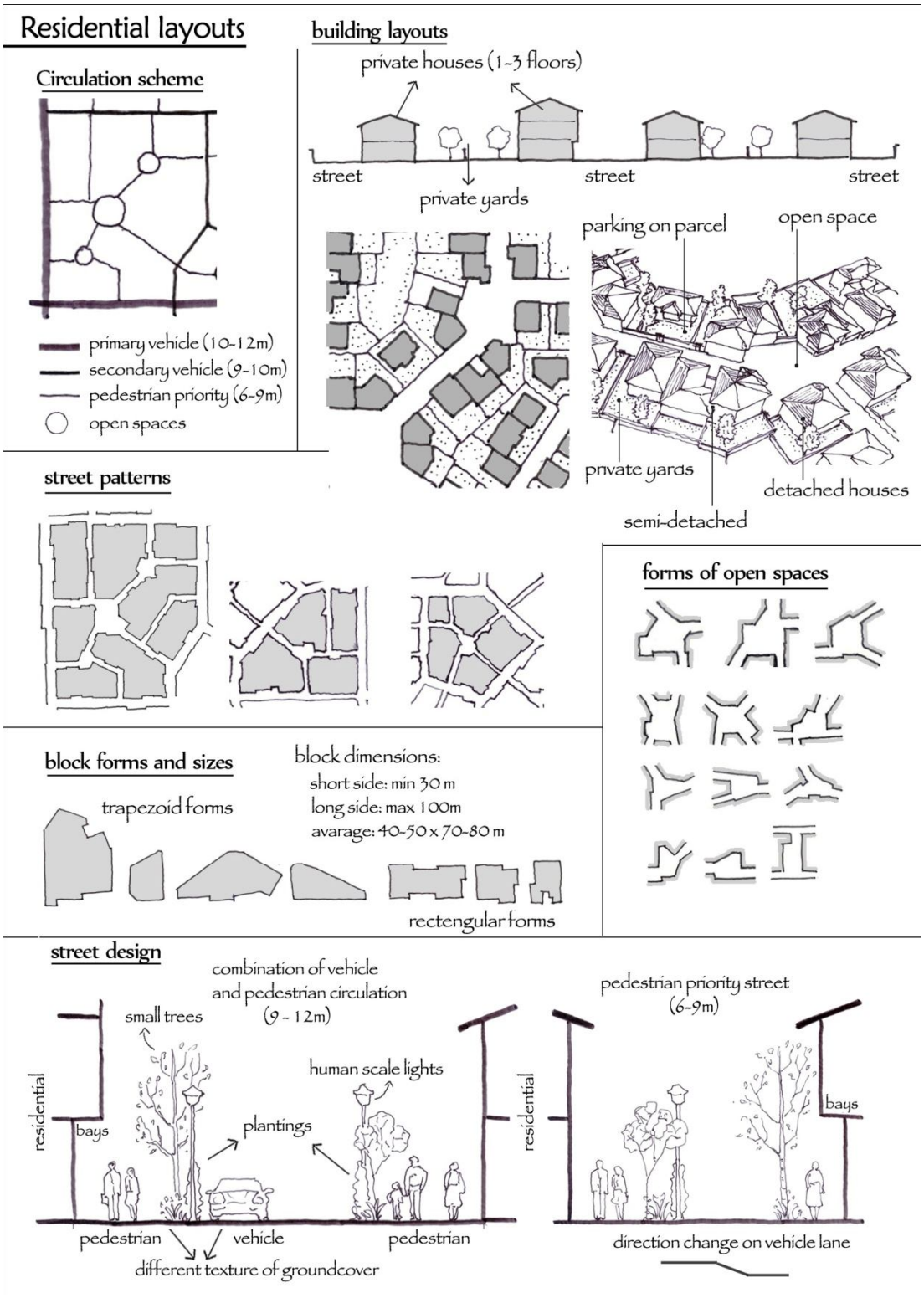


**Figure D.1:** The design guidelines for residential areas.

**APPENDIX D.2**

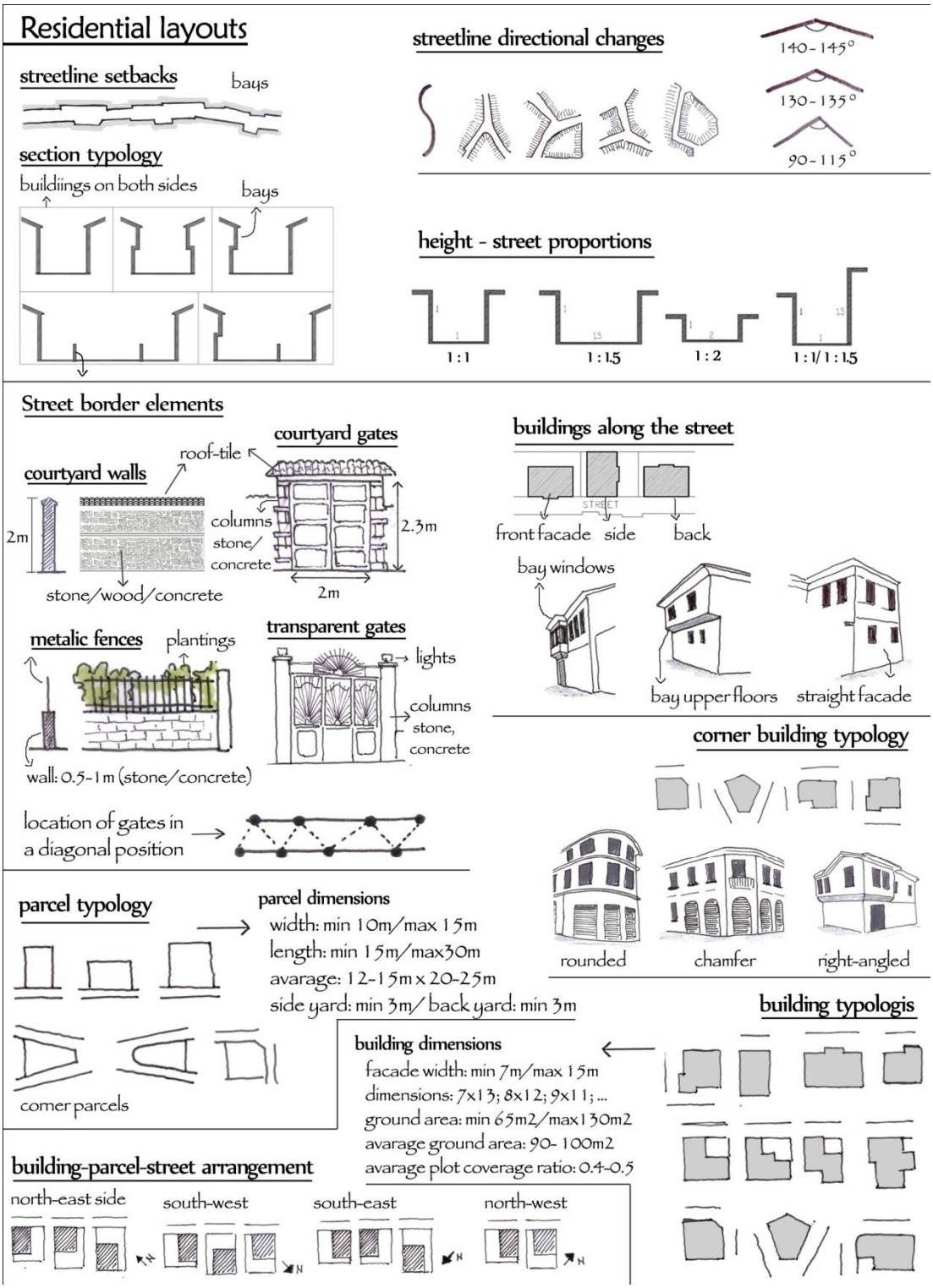


**Figure D.2:** The design guidelines for residential areas.

**APPENDIX E.1**

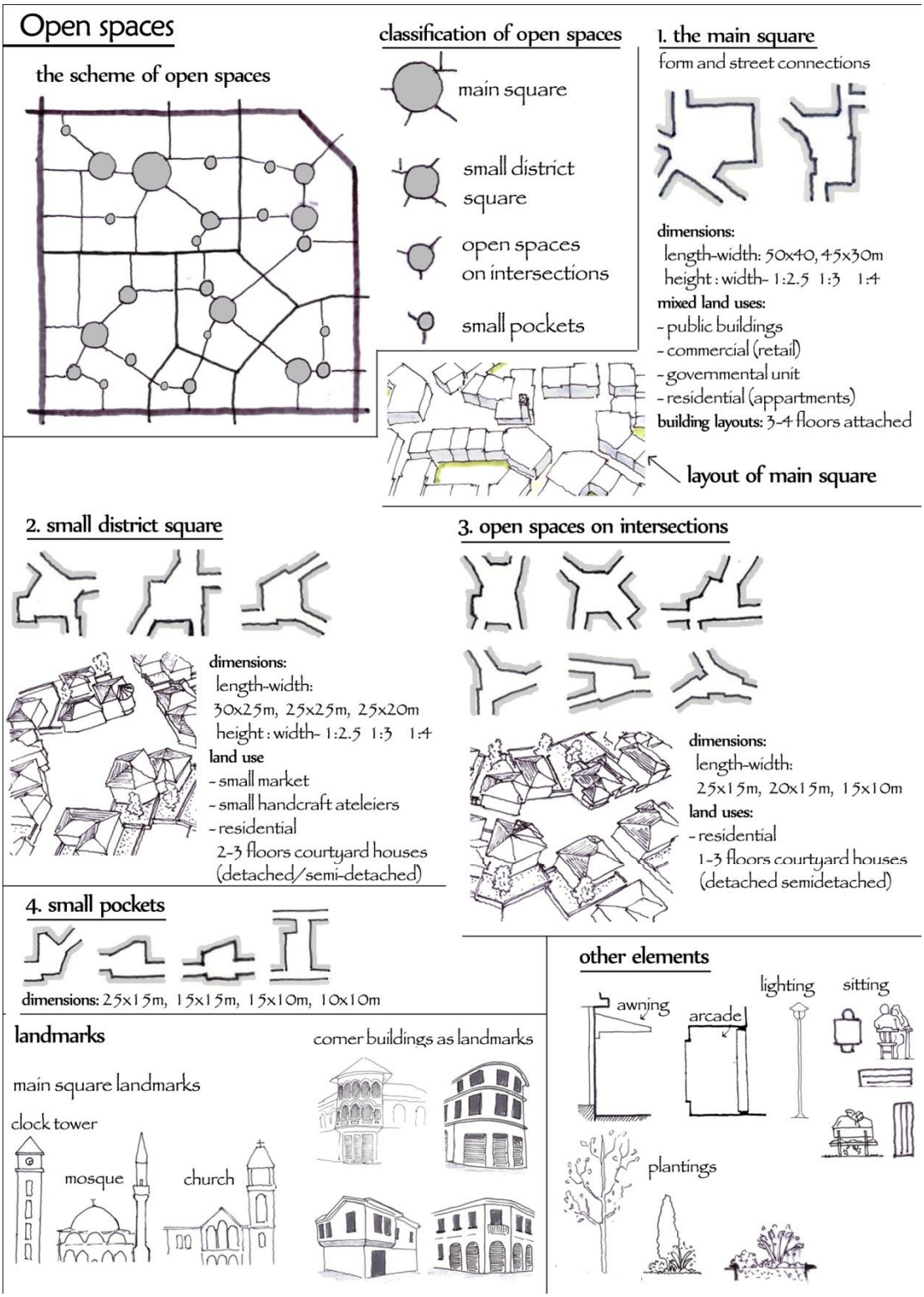


**Figure E.1:** The design guidelines for open spaces.

**CURRICULUM VITAE**

**Name Surname:** **Egin Zeka**

**Place and Date of Birth:** **Pogradec-Albania**

**Address:**

**E-Mail:** **eginzeka@hotmail.com**

**B.Sc.:** **I.T.U Urban and Regional Planning**

**M.Sc.:** **I.T.U Urban Design**

**Professional Experience: Research Assistant at Epoka University**