

Fringe belts in the process of urban planning and design: Comparative analyses of Istanbul and Barcelona

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Abstract

Throughout history, many heuristic approaches have been used to maintain an efficient development in urban planning. One of these approaches is urban morphology. Urban morphologists and geographers have been studying urban fringe belt concept since the last half of the century; however, it is not a well-known concept in planning and design scales. Understanding the effects of different planning policies on fringe areas, their locations and functions are crucial to grasp the value they redound to the city. In this study, several concepts were evaluated by a scoring system to understand these effects; and by this method, fringe belts of Istanbul and Barcelona have been determined and compared. Urban fringe belts are the urban entities, which have been created between the building cycles at urban periphery, then embedded within the city during the urbanization process. Fringe belts are usually urban heritages and ecologic corridors which also have tourism potential and importance in terms of the traditionalism and sense of permanency. Besides, these areas are the buffer zones which protect nature and rural areas from the negative effects of the city. However, as a result of the rapid population increase and need for new development plots, especially inner fringe belt areas which locate at the city center have been seen as new development areas. This situation which is called fringe belt alienation has taken as the main problem and evaluated in this study. For a well city development, these areas should be taken into consideration as urban entities in urban planning and design processes and should have enforcement on decision makers. Protection of the fringe character can create an urban quality, an inheritance to be left in the future.

Keywords

Urban fringe belt, Urban morphology, Urban planning, Urban design.

1. Introduction

Urban fringe belts are the urban entities, which have been created between the building cycles at urban periphery, then embedded within the city during the process of urbanization. These areas are different from the other urbanized parts of the city according to their pattern and usage.

Changes in land prices due to national and local economy effect the investments and the formation of these areas. In contrast to densely built up areas, fringe belts are the breathing spaces where people can be freshen up and they can be utilized by several alternative usages and be protected.

Recently, several planning policies have been developed for these areas like *green belt planning*.

However, as a result of the rapid population increase and the need for new development plots, fringe belts have been seen as new development areas.

Market garden lands, which open up to be development areas, are example for this case. Historical and unique characteristics of the fringe areas and historical identity of the city have been destroyed in this process called *fringe belt alienation*.

Use of the fringe belt concept as a planning tool can help in the formation of more integrated planning and design policies, and in the management of future urban development (Gu, 2010) and prevent fringe belt alienation. In this study, fringe belt alienation has been taken as the main problem and fringe belt locations in the urban fabric, their potential, importance and effects on development are searched by the reviewing of the previous studies and determinations and comparisons between Istanbul and Barcelona cities. In this process, physical reflections of the formation and modification of fringe areas to the urban landscape, along with the similarities and differences in international levels have been determined.

Urban fringe belt areas are under the pressure of government policies, advices from different disciplines, and development, renewal and conservation plans. This concept is proper for today's conditions and for better coor-

dination of the decision-making processes in planning. Discussion of the fringe belt idea as an integrated planning approach, the place of fringe belts in urban design management and their significance for urban ecology and sustainable development is being systematically examined by urban morphologists, especially in the UK (Gu, 2010).

Fringe belt is a zone of extensive urban land use formed at the edge of an urban area during a period when the built-up area is either not growing or growing slowly (Whitehand & Morton, 2006). First comprehensive definition for these areas has been made by M.R.G. Conzen (1969) as "A belt like zone originating from the temporarily stationary or very slowly advancing fringe of a town and composed of a characteristic mixture of land-use units initially seeking peripheral locations" (M.R.G. Conzen, 1969).

M.R.G. Conzen (1969) has accepted fringe belt concept as an entry to the complexity and variety of urban evolution. Existence of these areas is important to understand the evolution of an old city which has remarkable ruins (Barke, 1990).

The idea of fringe belt formation at times of economic stagnation or slight growth is accepted and equated with periods of slump in the building cycle. As geographical consequences of the cities with a long history, concentric fringe areas emerge with a fractional dynamic and usually separated from residential districts (M.P. Conzen, 2009).

For scholars, fringe belts are signatures of the pulsations of urban growth, and a reflection of urban space needs beyond those of the residential and retail sectors; for planners, they merit recognition for their cultural and natural attributes and beg the question whether they should be regulated given their broad social value; and for designers, they present opportunities to design/re-design at lower densities, for more mixed environments, and face the challenge of retaining their inherent character (M.P. Conzen, 2009).

2. Emergence of the fringe belt concept

The development of research on

fringe belts can be divided into three stages. The first stage was from 1936 to the mid-1960s when the fringe belt phenomenon was identified and articulated by European geographers. Herbert Louis (1936) first recognized fringe belts in a study of Berlin (Figure 1).

The fringe belt phenomenon and associated processes of urban growth were further explored by M.R.G. Conzen in the early 1960s in his studies of Alnwick and Newcastle upon Tyne (Conzen, 1960-1962). Conzen's research formed the foundation for a morphological theory of urban growth and change. The inner and middle fringe belts were associated with city walls as fixation lines which acted as barriers to the physical growth of the

city (Gu, 2010).

The second stage of fringe belt research was between the mid-1960s and the late 1990s. Whitehand (1967-1987) established the relationship between fringe belts and building cycles, land values and innovations in transport and suggested the bid-rent model (1972) by these dynamics (Figure 2).

The creation of fringe belts was linked to slumps in housebuilding when land values were low; whereas the creation of high-density housing tended to predominate during booms in housebuilding when land values were high. In this period, research on fringe belts mainly undertaken by geographers and largely concerned with the description and explanation of urban form rather than its relevance to planning (Openshaw, 1974; Slater, 1978; Carter and Wheatley, 1979; Whitehand, 1972; Conzen, 1978; Carter, 1983; Barke, 1976-1990).

In the third stage of research, from the late 1990s to the present day, greater attention has been given to exploring the connection between the idea of fringe belts and the practice of planning and urban landscape management. For instance, the discussion of the fringe belt idea as an integrated planning approach (Whitehand & Morton 2003-2006), the place of fringe belts in urban design management (Kropf 2001; Whitehand 2005) and their significance for urban ecology and sustainable development (Hopkins, 2004) is being systematically examined by urban morphologists, especially in the UK (Gu, 2010).

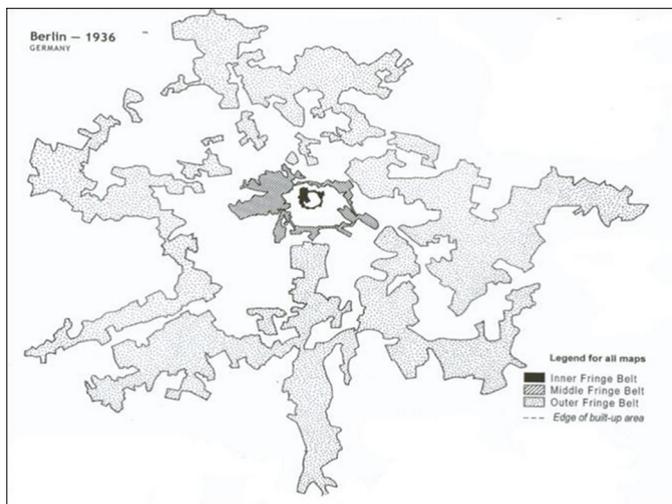


Figure 1. Berlin FB analysis, 1936 (Conzen, 2009).

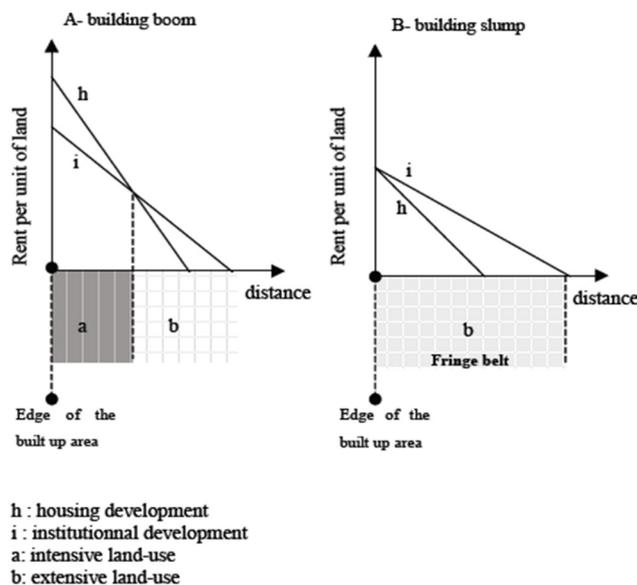


Figure 2. Bid-rent model (Whitehand, 1972).

3. Fringe belt formation, modification and alienation

Fringe areas emerge spontaneously. Like their formation, their continuity is also about the operations of physical, socio-economic and cultural powers. This interaction shows that the fringe belt concept has a potential in the process of urban planning. Additionally, using fringe belt concept as a tool of planning is predicting to be helpful in integrated planning (Whitehand & Morton, 2004), urban design and land development management (Kropf, 2001; Whitehand, 2005).

Urban periphery and urban fringe

belt are two concepts which can be confused with each other because fringe belts are the areas which used to locate at the periphery, then embedded within the city as a result of the city growth. Fringe belts can be defined as the former urban peripheries which are embedded within the city. Open spaces, industrial areas, institutional areas, low density housing areas and recreational areas are the examples of fringe belts. For open spaces, public parks, market gardens, cemeteries and vacant plots; for industrial areas, transportation utilities, warehouses, factories and quarries; for institutional areas, religious centers, monasteries, barracks, campuses, hospitals and waste water treatment plants; for low density housing areas, villas, rural settlements; for recreational areas, sport areas, riding schools and golf courses can be given as examples of fringe belt areas.

There are three fringe belt types which have been classified according to their emergence times, distances from the city center and relations with the fixation lines: inner, middle and outer fringe belts. The oldest fringe formation is the inner fringe belt which has been formed around the historical core and the city wall as a fixation line. If fringe belts continue to be used by their formation purpose, they become permanent. If a fringe belt does not locate at the periphery but the inside of the built environment, transformation pressure increases as a result of the city growth. Most of the transitions occur in the current character of the fringe area. Although their characters modify, sprawl or narrow, they continue to be separate from their surroundings (Whitehand, 1967).

In fringe belt modification, area does not lose its fringe character; however, its land use changes (e.g. farm houses turn to institutional usages). While the city grows, the location of the fringe belt plots in the city also changes. Relative change increases if the plot is older because the inner fringe belt plots which used to locate at the periphery of the city become at the periphery of CBD. As a result of the CBD pressure, some of the inner fringe belt plots start to alienate (e.g. new residential developments, densification and urban re-

newal projects).

Fringe belts can be restructured and modified as a result of radical and large scale transitions in the city. New residential developments and CBD pressure are few of the reasons for this modification (Conzen, 2009). The acquisition of fringe belt sites by land uses of different character (e.g. multi-storey office blocks and apartment buildings) and planning of park/open areas as new development sites are few of the reasons of fringe belt alienation. Unfortunately, a systematic strategy and integrated policy framework for the management of change are missing which may prevent the continuity of fringe belt areas (Gu, 2010).

4. Urban fringe belts of Istanbul

In this study, both general and inner fringe belt formations of Istanbul and Barcelona have been evaluated and compared. Thematic maps have been generated to show the general fringe areas of Istanbul (Figure 3-8). Land uses which have been specified as fringe areas are natural parks, botanical gardens, agricultural lands, farmlands, riverbeds, protected areas, public parks, ports, institutional uses (e.g. campus, hospital, airports) and industrial areas. Fringe areas have been decreased or removed regularly during this process. One of the reasons is that squatter areas which include in fringe belts have been turned into legal settlements. Moreover, this situation consolidates the idea that fringe areas orient the city growth (Vilagrassa, 1990).

Old industrial areas' filling with business centers and shopping malls is another example of fringe belt alienation in Istanbul (e.g. Esentepe Arı Büsküvi factory, Bomonti historical beer factory, Eczacıbaşı business centers and Kanyon shopping center). Haydarpaşa station is very important in terms of historical pattern of the city and unfortunately has a similar transformation process. Furthermore, squatter areas located on agricultural lands which have turned into legal settlements and many market gardens have been zoned for housing. Along with Taksim project and Gezi Park protests, these can be given as the examples of fringe belt alienation in Istanbul.

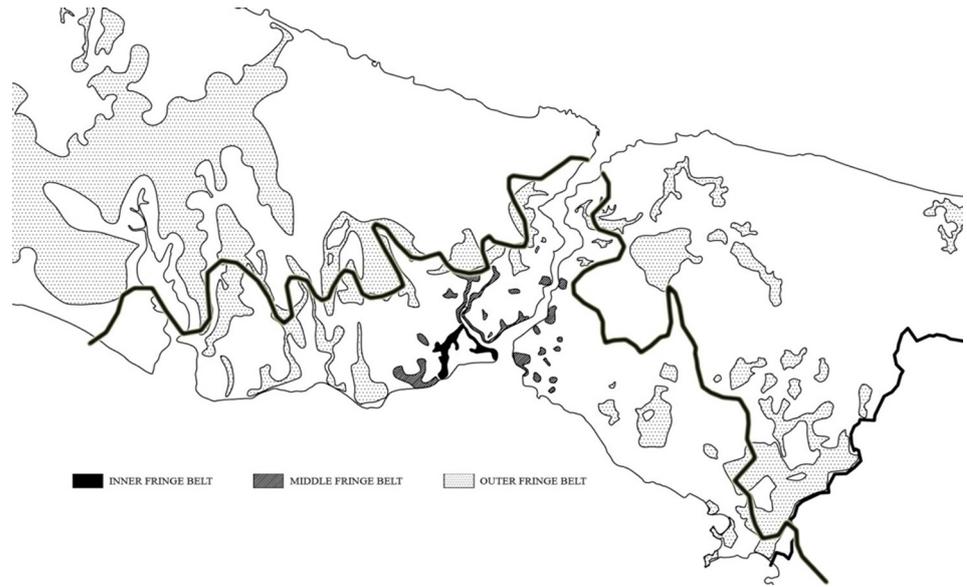


Figure 3. Istanbul FB analysis.

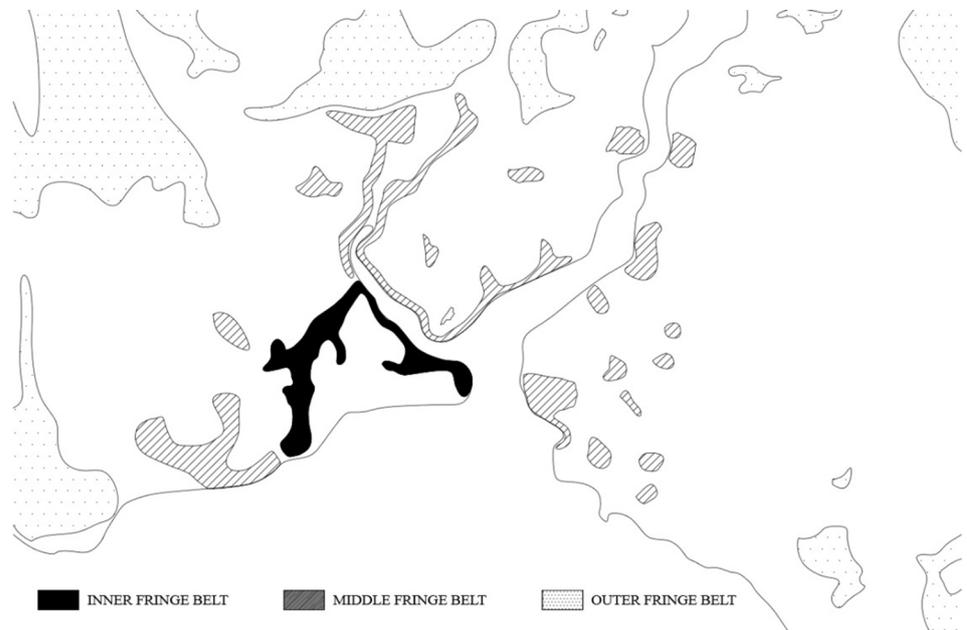


Figure 4. Istanbul FB analysis.

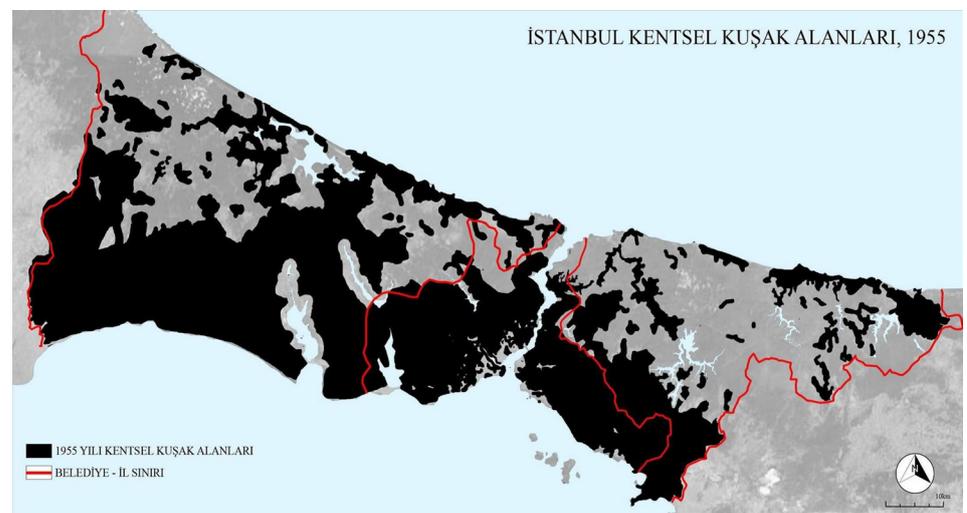


Figure 5. Istanbul FB analysis, 1955.

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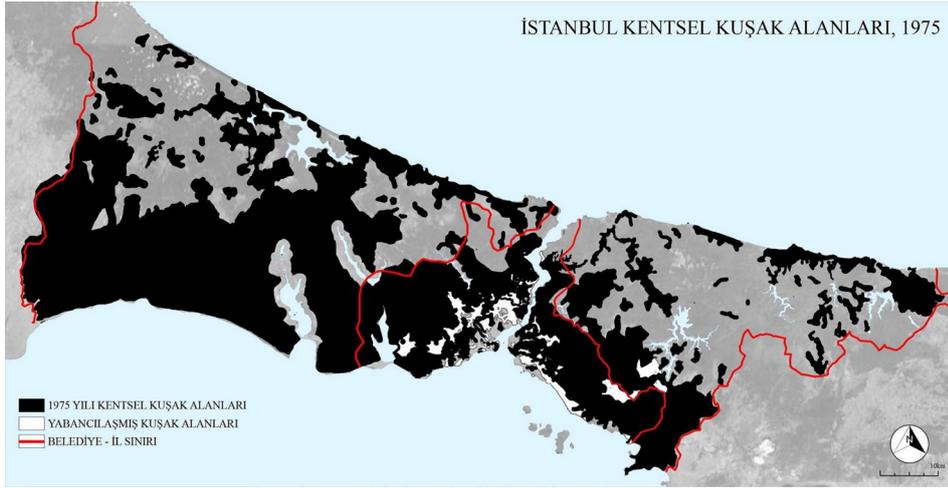


Figure 6. Istanbul FB analysis, 1975.

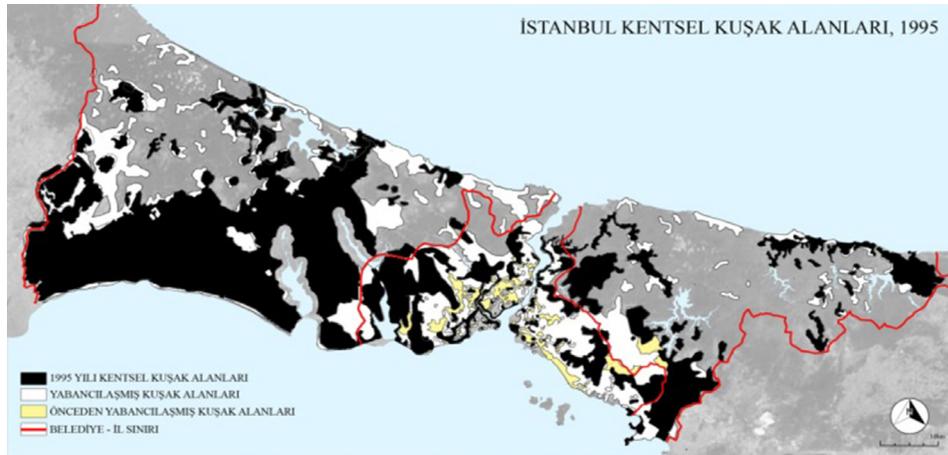


Figure 7. Istanbul FB analysis, 1995.

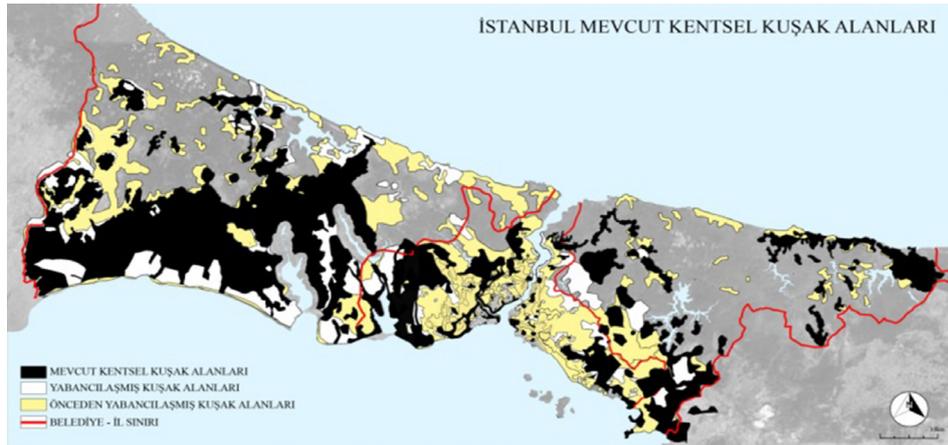


Figure 8. Istanbul current FB analysis, 2012.

The second step of the study in Istanbul is inner fringe belt analysis around the historical peninsula. Land uses which have been specified as inner fringe areas are vacant areas, green areas, cemeteries, agricultural land and industrial areas. Moreover, religious and landmark areas and old

squatter housing areas exist around the city wall. To identify the fringe areas around historical core plots bigger than 2000 m² and 5000 m² have been chosen and compared with land use data (Figure 9).

Study area around the city wall has been observed at Edirnekapı - Yedikü-

le axis. Edirnekapi cemetery is a fringe area which locates at the opposite of Mihrimah Sultan mosque and Sulukule old squatter housing (new renewal) area as an example of fringe belt alienation. There is busy traffic around the city wall in Edirnekapi (Figure 10).

Mostly cemeteries and park areas, also agricultural land, infrastructures, small scale industry, storage areas and gas stations have been determined at the axis. Industrial areas and warehouses are incompatible to the historical pattern and aesthetic (Figure 11).

Some buildings are incompatible with the historical silhouette around the city wall of Istanbul (Figure 12). Moreover, some parts of the wall are identified to be under the risk of demolition and need restoration and reconstruction.

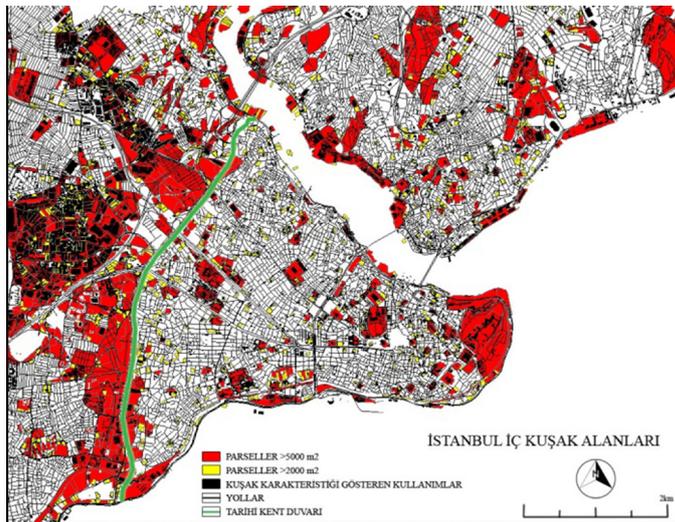


Figure 9. Istanbul IFB analysis, 2009.

Parks and institutional areas (e.g. Topkapı social facility) exist at a part of the city wall. At Yedikule district, where city walls meet to the sea, a train station, an overpass construction and an old industry chimney at the opposite of International Peace Park exist. Also, infrastructure facilities and warehouses are observed at the district. There is not an active public usage (Figure 13).

5. Urban fringe belts of Barcelona

Two thematic maps have been generated to show the general fringe areas of Barcelona. Land uses which have been specified as fringe areas are marina, train station, sub regions, technical service facilities, industrial areas, public parks, institutional usages and road system (Figure 14).

Fringe areas of Barcelona have been decreased and removed during the ur-



Figure 10. Istanbul city walls surrounding, 2012.



Figure 11. Industry and warehouses, 2012.



Figure 12. Incompatible buildings, 2012.

banization process. Expansion of the settlements and relocating of fringe belts (e.g. moving industry beyond the mountains to Valles plain) are few of the reasons for this situation. Moreover, there have been fringe belt modifications (Figure 15).

Land uses which have been specified as inner fringe areas are green areas, public parks, cemeteries, institutional usages and marina (Figure 16). Many old industrial buildings have transformed into institutional areas (e.g. museum, university, library, public



Figure 13. Yedikule, 2012.



Figure 14. Barcelona FB analysis, 1966-80.



Figure 15. Barcelona current FB analysis, 2012.

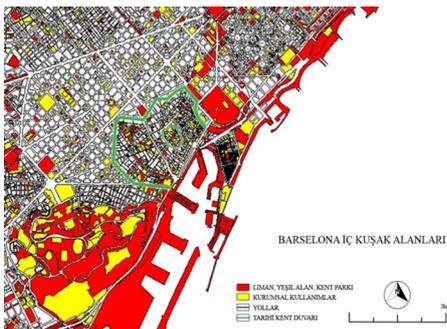


Figure 16. Barcelona IFB analysis, 2012.



Figure 17. Library, 2012.

park). During the process, many old industrial buildings and/or their chimneys have been conserved as landmarks to remind the history of the city (Figure 17).

Urban fringe belt concept has not been included in the planning policy of Barcelona yet. However, urban ecology, human scale and public space concepts have been studying parallelly during the planning and design processes.

Table 1. Visual concepts and values.

Concepts	Values
Green Area	+
Public Area	+
Historical Area	+
Industrial Area	-

Table 2. Inner fringe belt comparison.

Concepts	İstanbul		Barcelona	
	Score	Factorial	Score	Factorial
Green area x (+)				
Sense of quality	3	3	5	5
Areas to be protected	5	5	5	5
<i>Sum</i>	8		10	
Public area x (+)				
Sense of quality	2	2	5	5
Accessibility	3	3	5	5
Sense of security	2	2	4	4
<i>Sum</i>	7		14	
Historical area x (+)				
Urban heritage	5	5	5	5
Public perception	2	2	5	5
City silhouette	3	3	5	5
<i>Sum</i>	10		15	
Industrial area x (-)				
Visual pollution	3	-3	0	0
Empty/inactive areas	3	-3	0	0
<i>Sum</i>	-6		0	
<i>Total</i>	19		39	

Barcelona urban development model and strategies have been followed by many worldwide cities and the city has won a golden medal from RIBA (Royal Institute of British Architects) in 1999.

In this study, inner fringe belt areas of the both cities have been compared according to the specified concepts and generated scoring system. Following studies are planned to analyze and determine the whole fringe belt areas (inner, middle and outer) in the cities.

6. Inner fringe belt (IFB) comparison

A scoring system has been created to evaluate and compare the fringe belt formations by several concepts in Istanbul and Barcelona. Four main topics have been chosen to evaluate the historic-morphological values and urban qualities of these areas: green area, public area, historical area and industrial area. These concepts have been

evaluated by observation in situ, aerial maps and photos and measured by a scoring system. These determined concepts have been based on fringe belt characteristics (Table 1).

Values have been given to the chosen concepts to identify the historical cores' quality, functionality and historicity. These values are positive for green, public and historical areas and negative for the industrial areas. Concepts have been given points within the range of 0-5. Outcomes have been evaluated by EXCEL program and compared with an optimum value of 40 points in which all positive values given 5 points and negative values given 0 points (Table 2).

Green areas in the inner fringe belts of Istanbul score 8 and Barcelona score 10. Barcelona has many designed and aesthetic green areas; however, Istanbul has not. Both cities have equal importance in terms of the historical and green areas to be protected.

Public areas in the inner fringe belts of Istanbul score 7 and Barcelona score 14. In Istanbul, surrounding of the city wall is not active like Barcelona; as a result, public areas are inadequate in terms of aesthetic, accessibility and sense of security.

Historical areas in the inner fringe belts of Istanbul score 10 and Barcelona score 15. Historical centers, city walls and their surroundings are equally important for both cities in terms of urban heritage. However, public perception and public awareness differ from each other. In Istanbul, public awareness about history is inadequate as opposed to Barcelona which appreciates and respects its history in public space projects. Many of the projects in Istanbul result a change in the historical silhouette of the city critically since Condominium Law (1965). City silhouette has been protected in Barcelona and several landmarks have been continued to be the highest buildings (e.g. Sagrada Familia, Cathedral).

Industrial area is the only negative concept in this scoring system because its location inside the city has negative effects on the protection and consideration of the historical pattern. Industrial areas in the inner fringe belts of Istanbul score -6 and Barcelona score

0. Barcelona, which was an old industrial city used to have many industrial buildings in and around the city center. Changes in the city plan after Sanitary Revolution (1936) have resulted in the relocation of the old industrial usages out of the city and functions of the old industrial buildings and/or plots have changed to become institutional or green areas. Industrial areas and warehouses around the city wall of Istanbul are suggested to be moved out for new usages (e.g. institutional/cultural alternative usages, public parks and vista points).

It may not be possible to protect the whole fringe characteristic of an industrial area if it is too large and/or under the pressure of CBD. Then, it is crucial for redevelopment projects to consider the industrial heritage, ecologic corridor and urban fringe belt concepts for mixed use environments and give precedence to public and green spaces. It is suggested to increase green space per person with the help of fringe belt concept.

In total, Istanbul scores 19 and Barcelona scores 39. As a result of this comparison, it is understood that fringe belt concept can be useful especially during the development process of Istanbul for the continuity of the historical identity of the city. Primary concepts which have more scoring difference between Istanbul and Barcelona are public area and industrial area. These two concepts should be given precedence in the future projects for the inner fringe belts of Istanbul (Figure 18).

5. Conclusion and evaluation

As a result of the fringe belt analysis of Istanbul and Barcelona, it is obvious that areas which have fringe belt char-

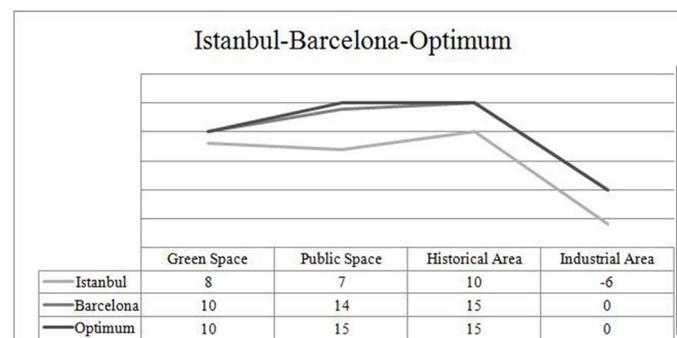


Figure 18. Comparison chart.

acteristics have been declined during the historical process. This situation, named fringe belt alienation, causes the disappearance of these areas as a result of rapid urbanization and increasing rent.

Istanbul historical peninsula has one of the worldwide special city walls which remain standing. Re-design of the historical and abandoned area with alive, aesthetic, attractive public usages which increase public awareness, support tourism and protect fringe belt characteristics is suggested like Barcelona.

Urban, social and technical infrastructure usages which are defined in 3194 numbered Construction Law are the fringe belt usages. In the regulations, green areas, hospitals, cultural and social institutions, religious institutions, administration and technical infrastructure systems except for the roads and parking areas are estimated in terms of m^2/pp per person. According to the calculations, areas which show fringe belt characteristics in Turkey are 25,9 m^2/pp for 0-15.000 people, 27,9 m^2/pp for 15.000-45.000 people, 31,9 m^2/pp for 45.000-100.000 people and 35,9 m^2/pp for more than 100.000 people.

If we look at the green area proportions for all over the world, England and America have 40 m^2/pp , Stockholm (Sweden) has 77 m^2/pp and Frankfurt has 154 m^2/pp (Emür & Onsekiz, 2007). This proportion in Turkey is 10 m^2/pp . According to the examples, even the green areas are much more than the whole fringe areas in Turkey. It is commensurably obvious that this situation has negative effects on the life quality in Turkey.

Considering observations and analysis, there is a heavy traffic following the line of city wall in Istanbul and pedestrian access is limited and interrupted. It is recommended to protect the city walls' historical and urban identity as well as surrounding fringe areas. City walls need restoration and reconstruction. Besides, surrounding green areas need to be designed; pedestrian access need to be increased, agricultural lands need to be protected and vacant parts of the area should be designed and transformed into aesthetic

and high quality urban areas.

There are several buildings which ruin the silhouette around the city wall. Primarily, protecting the historical silhouette by storey restriction is a necessity.

Public areas around the city wall are inadequate. Besides, the area gives an unsecured feeling especially at the evening/night. To prevent the vacant and unsafe image of the area, active uses, cafes, museums, art centers, connected pedestrian streets and lighting design are suggested. It is determined that lighting of the city walls is inadequate. Several usages are suggested to be modified for a more compatible use for the historical pattern. Industrial areas and warehouses should be relocated and replaced by cultural centers, museums and several institutional uses and/or public parks and vista points. Old industrial area in Yedikule is suggested to be transformed into a public park as an aesthetic landmark with the connection of new overpass and train station. The proposals for the inner fringe belt area around the city wall in Istanbul are crucial to improve the vividness of the area and to protect its history, bring identity and increase the public awareness for the area's history to help tourism. Future projects should protect the fringe characteristics and design the city according to the real needs of it rather than the increasing rent. Augmenting the active green m^2/pp and public space, rearrangement of the regulations, acceptance fringe belts as urban entities and increasing in the number by fringe belt creation/design processes are recommended.

In the study, fringe belts of Istanbul and Barcelona which have different historical, geographic and cultural processes have specified and compared according to the inner fringe belt areas by a scoring system. As a result of this comparison, fringe belt concept has been determined purposive especially for the development process of Istanbul and for the continuity of the city's historical identity. These areas should have an enforcement which impresses the decision mechanism. Urban design and landscaping projects that will be produced in the planning process which acknowledges fringe belt areas

as urban entities are predicted to bring positive feedbacks in the future.

Urban landscape reflects the history, economical process and evolution of the city. Public spaces can be developed with new usages and fringe areas can be protected in the urbanization process which creates an urban quality, an inheritance to be left in the future. These areas which have a potential to create efficient and inviting places, unfortunately have been projected separately (Gu, 2010) from the urban fabric without an interest of the historical landscape.

Optimum utilization of fringe areas in the city whole is vital. In contrast to densely built up areas, fringe belts are the spaces to wind up the city which can be evaluated with several alternative usages and/or be protected. As a result, fringe areas should be defined as urban entities which orient the city growth in the natural growing process.

Aim of the study is; understanding the urban fringe belt concept to include it in the planning literature. In the recent urban regeneration processes, urban fringe belts can be planned as green belts, public spaces and public parks. Old fringe plots filled by conurbation can be re-considered to gain their old characteristics or to transform into another fringe belt usage. Nowadays, Europe and America are designing more green spaces by phenomenons like urban gardening and urban farming. Thus, without losing their fringe origins, healthier, sustainable and green cities can be created.

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Kentsel planlama ve tasarım süreçlerinde kentsel kuşak alanları: İstanbul ve Barselona kentleri karşılaştırmalı değerlendirmesi

Tarih boyunca kent gelişimine çeşitli disiplinlerce birçok farklı açıdan yaklaşmıştır. Bu yaklaşımlardan biri de morfolojik yaklaşımdır. Kentsel kuşak alanı kavramı son yarım yüzyıldır kent morfoloqları ve coğrafyacilar tarafından araştırılan, ancak planlama ve tasarım ölçeklerinde fazla tanımlanmamış bir kavramdır. Uygulanan farklı planlama politikalarının kuşak alanlarını hangi açılardan etkilediği, bu alanların kent içerisindeki konumları, fonksiyonları ve kente kazandırdıkları değerin anlaşılması açısından önemlidir. Çalışmada çeşitli kavramlar belirlenmiş ve bir puanlama sistemi oluşturularak sayısallaştırılmıştır ve İstanbul ve Barselona kentleri üzerinde uygulanan bu yöntem ile kentlerin gelişim süreçleri, kuşak alanları üzerindeki olası etkileri ve kuşak alanı oluşumları karşılaştırılmıştır. Kuşak

alanları, yapılaşma döngüleri arasında kent çeperinde oluşan ve kentin genişlemesiyle kent içinde gömülü kalan kentsel birimlerdir. Sıklıkla önemli kent mirası ve ekolojik koridor özellikleri gösteren kuşak alanları, turizm potansiyeline sahip olmakla birlikte, kent sakinlerinin geleneksellik ve süreklilik hissi açısından da önemlidir. Ayrıca bu alanlar, kentin doğaya ve kırsal bölgelere olan olumsuz etkisini azaltan tampon bölgelerdir. Ancak, hızlı nüfus artışı ve artan rant sonucunda, özellikle kent merkezinde bulunan iç kuşak alanlarına yeni gelişim alanları olarak bakılmaya başlanmıştır. Kuşak alanı yabancılaşması olarak adlandırılan bu durum, bir problem olarak tanımlanmalıdır. Kentsel kuşak alanı kavramının planlama ve kentsel dönüşüm süreçlerinde dikkate alınması, sağlıklı kent gelişimi için önemlidir. Kuşak alanlarının kimliklerini korumalarının, geleceğe miras bırakılabilecek bir kentsel kalite olacağı düşünülmektedir.