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An overview of fringe belt literature through studies from different perspectives

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Abstract

The fringe belt phenomenon, which was conceptually put forth by Herbert Luis in 1936, developed by M.R.G. Conzen starting from 1960, and placed on a historico-geographical basis in the context of urban rent theories by J.W.R. Whitehand, has been studied by researchers with different perspectives in cities developed with distinct socio-economic and cultural dynamics in various parts of the world. This paper aims to reveal how the fringe belt concept, which emerged within the Conzenian tradition of urban morphology turn into a phenomenon, has been handled from the time it first appeared to the present, to examine the contribution of different perspectives to the fringe belt literature and to present suggestions for the development of the concept. Selected from peer-viewed journals and academic conferences, 53 different fringe belt studies were examined according to their publication periods, within the framework of spatial, economic, social, and planning perspectives previously discussed by Ünlü (2013) as well as the ecological perspective. In this context, the selected studies are examined based on the case areas, methodology, and main findings on fringe belt formation and change. Property perspective is discussed as a hybrid approach in fringe belt studies. Finally, further research proposals are emphasized in order to realize the fringe belt phenomenon as durable and sustainable urban spaces.

Keywords: cross-cultural studies, different perspectives, fringe belt, literature

1. Introduction

When residential areas, commercial areas, and non-residential forests and agricultural areas are split from a city, the remaining open, recreational, industrial, institutional, or only villa-type housing areas with a continuous belt-like form within the city as well as with less dense forms, and generally larger and cheaper plots than the city center are defined as fringe belts (Larkham, 1998; Conzen, 2009). The streets and plots can remain unchanged for longer periods compared to buildings in the fringe belt areas which formed regarding a fixation line and consolidated in the city (Whitehand, 2001, p. 106). Fringe belts in a city are categorized as inner fringe belt (IFB), middle fringe belt (MFB), and outer fringe belt (OFB) (Conzen, 2009). These morphological regions formed in city peripheries become embedded within a growing city over time, and they usually change in various ways by different urban dynamics. These transformations can result in the complete integration of fringe belt areas by transforming into the urban fabric by losing the fringe belt character, literally defined as fringe belt alienation or the consolidation of the fringe belt character (Barke, 1982; Conzen, 2009).

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The perspectives of researchers from different cities, different backgrounds, and cultures who have conducted their studies on different periods contributed to the formation of the theoretical framework on fringe belts. The concept of fringe belt, first appeared in Herbert Louis's Berlin study in 1936 (Conzen, 1960, p. 58), and gained conceptual clarity and terminology through M.R.G. Conzen's detailed morphological examinations in the study of Alnwick (Figure 1). Conzen (2009) emphasizes that the most significant contribution of M.R.G. Conzen is the inclusion of fringe belt patterns within a city, including the activity between urban form evolution, especially commercial, industrial, residential, and institutional developments and the evolutionary structures to a detailed morphological theory that considers all formative and transformative spatial processes in a city, as can be seen from the detailed cartographic documents produced by him as well (Conzen, 2009, p. 31).

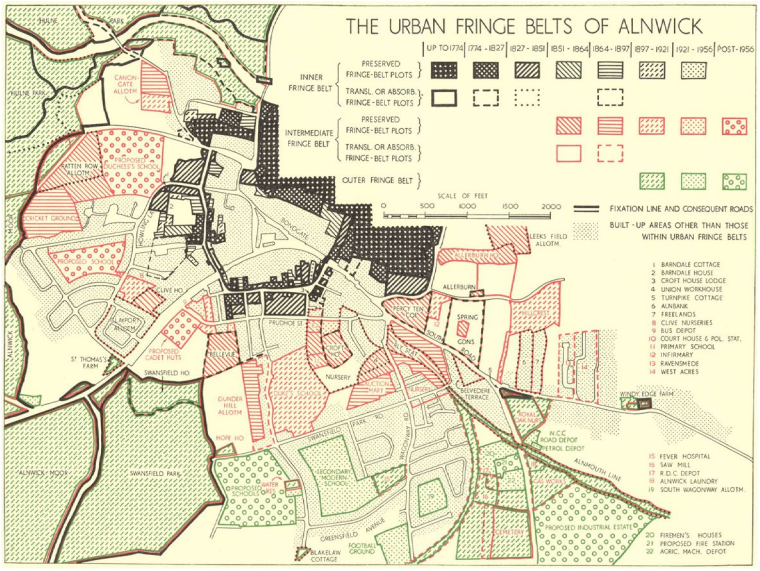

Figure 1 Fringe belt areas of Alnwick in different periods (Conzen, 1960)

This study provides an examination of the research in the fringe belt literature by analyzing a group of selected studies published in peer-reviewed journals and international or national symposiums. The aim is to unveil both the concept development so far and the areas that have not been addressed yet by exploring each case by geographic-cultural regions, the methodologies applied to identify fringe belt areas, the major findings on the phases of fringe belt formation, fixation lines, the number and sizes of fringe belts, continuity in fringe belt areas and fringe belt transformation. In this regard, 53 pieces of research are examined. These studies are categorized and analyzed according to the spatial, economic, social, and planning perspectives grouped by Ünlü (2013) in his fringe belt research and also the ecological perspective is included in this classification. The evaluation section presents the findings derived from the basic text analyses and graphical representations for each research. In the final part, suggestions for future research are made to conclude the study.

2. Fringe Belt Studies

Conzen's (2009) study, which compiles a set of studies on fringe belts, reveals the development of fringe belt literature by presenting Conzen's study areas, the formation and population of the study locations, the identified number of fringe belts, the publication dates of the studies, and the researchers involved. Ünlü's (2013) study examines fringe belt studies from four perspectives namely, spatial, economic, social, and planning, and highlights noteworthy studies from the 1960s to the 2010s. The evolution of the fringe belt concept is summarized into three periods (Table 1): The first period is from 1936 to the early 1960s when the concept was developed, defined, and visualized by European geographers; the second period is from the mid-1960s to the late 1990s when the concept was discussed by geographers in conjunction with economic concepts and

utilized in defining and explaining urban form; and the third period is from the late 1990s to the present when processes related to fringe belts were examined, the concept was studied in a multidisciplinary way, and it was associated with urban planning, landscape management, and ecology (Kubat, 2019).

Table 1 Focus areas of fringe belt studies according to periods (Kubat, 2019)

Periods	*First Period:* 1936 – mid 1960's	*Second Period:* mid 1960's – end of the 1990's	*Third Period:* end of the 1990's – today
Researchers	European geographers	Geographers	Multi-disciplined researchers
Focus Areas	Fringe belt concept described	Associated with the economic perspective and concerned with the description and explanation of urban form rather than its relation to planning	Explores the relation between the fringe belt concept and planning practices and urban landscape management

2.1. Spatial perspective in fringe belt studies

The aim of the studies handled with this perspective is to reveal the urban development by identifying the fringe belt areas of the cities. Besides providing cartographic records from the case areas, most of the literature focus on the physical transformation of fringe belts through a spatial perspective considering morphological periods (Ünlü, 2013). Conzen's (1960) study in Alnwick, which determines fringe belt areas based on land use and plot sizes using various maps from 1774 to 1956, stands out among these studies. His study illustrating the development of inner, middle, and outer fringe belts in Alnwick also introduces other morphological terms such as the burgage cycle and morphological frame. Also, Whitehand's (1967) Newcastle study presents the development of fringe belts from the period up to 1868 to the 1930s (Figure 2) and discusses a special fringe belt area that emerged during the Edwardian period.

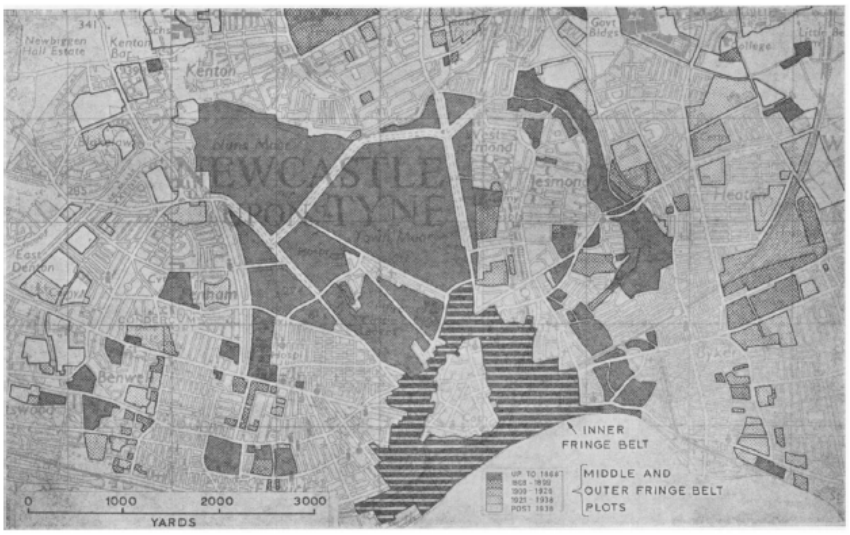

Figure 2 Fringe belt study of Newcastle upon Tyne (Whitehand, 1967, p.225)

Al-Ashab's (1974) PhD thesis, which is studied under the supervision of M.R.G. Conzen reveals the formation of fringe belts in Baghdad from 1925 to 1974 and includes squatter settlements within the fringe belt areas. This study stands out due to its focus on different geography and its unique perspective on fringe belt areas, revealing that fringe belt characteristics of Middle Eastern cities are similar to European cities and share many common features. During this period, Barke's (1974; 1976) studies in Falkirk, Scotland, suggest that fringe belt transformation is influenced by pre-existing land-use patterns. Ünlü's (2013) study in Mersin highlights the distinctive characteristics of fringe belt development in coastal cities in Turkey, while Meneguetti and Pereira Costa's (2015) study in Maringa, Brazil, demonstrates that the formation of three fringe belts — inner, middle, and outer— is possible even in new planned city. Hazar and Kubat's (2015) studies

on fringe belt development in Istanbul and Barcelona, respectively, compare the inner fringe belt areas of the two metropolises based on planning and conservation policies. Fringe belt studies in Istanbul progressed by Kubat's (2019) study examining fringe belt development along the central business district axis in Istanbul (Figure 3). Additionally, keeping the focus on Istanbul, Kubat et al. (2022) contribute to the literature with their research on the existence of fringe belt areas in the Historic Peninsula following the route of the Constantine Walls, the development of fringe belt areas in Yedikule, the fringe belt areas of Üsküdar, the development of fringe belt areas in the Taksim-Pera region (Soygüzeloğlu & Kubat, 2022), and the transformation of industrial fringe belt areas in Istanbul (Küçük Çalışkan & Kubat, 2022a).

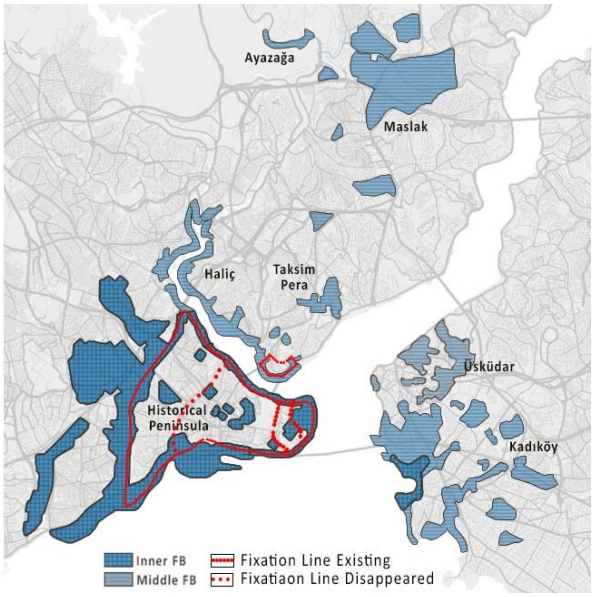

Figure 3 Istanbul fringe belt study, revised after 2019 (Kubat, 2019)

The study of Ünlü and Baş (2016), focusing on the formation of fringe belts in sub-centers in Mersin reveals an individual fringe belt development model, namely the umbrella fringe belt (Figure 4). Karaulan and Kubat's (2018) study on Milan examines the impact of fringe belt formation on other land uses, while Zhang's (2019) study on Birmingham examines Edwardian fringe belts in relation to green areas, revealing findings on ground surface types, street patterns, accessibility, and property ownership. Šćitaroci and Marić's (2019) article, which examines the green areas of 26 different European fortress cities within the framework of the fringe belt concept, emphasizes the relationship between these areas and international conservation policies. Hazar and Özkan's (2020) study on the fringe belts of Izmir focuses on military areas from an ecological perspective.

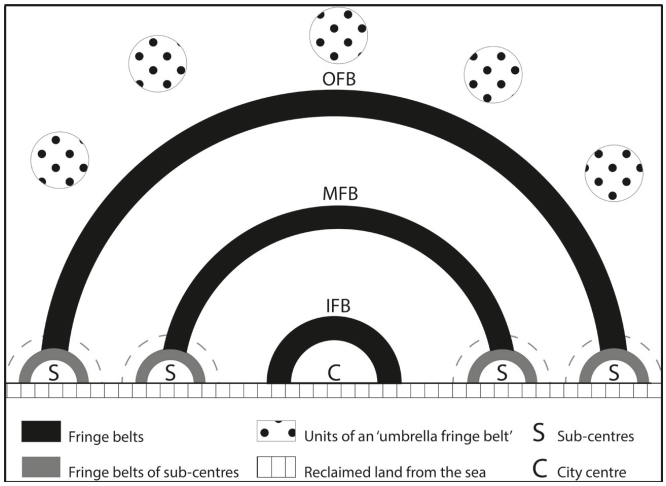

Figure 4 Umbrella fringe belt model explained in fringe belt study of Mersin (Ünlü & Baş, 2016, p. 119)

In addition to these studies, some notable conference papers have the spatial perspective as well, as follows; Simão and Costa's (2014) study on fringe belt transformations in Belo Horizonte, Chen and Lin's (2014) study on macro-level changes in Tainan, Geddes's (2014) study on the middle fringe belt in Limassol, in which the fringe belts are recognised within two regions based on plot sizes, Lammers et al.'s (2015) study on the city of Eindhove in which a unique fringe belt model to the city also identified, Gu et al.'s (2015) comparative study on Nanjing and Pingyao, and Logunova's (2017) study revealing the presence of four fringe belt areas in Krasnoyarsk.

2.2. Economic perspective in fringe belt studies

Studies dealt with from an economic perspective generally focus on determining the dynamics of fringe belt formation. Whitehand's (1972a, 1972b, 1988) economic perspective in the fringe belt studies opened up a new field of research. He explored the mutual relationship among fringe belt formation, modification, bid-rent theory, construction cycles, and innovation (Ünlü, 2013). Whitehand (1972a) studied on urban land-use patterns in British cities by examining construction cycles and explained the housing and institutional land-use location preferences based on land rental values and distances from the city center using graphs (Figure 5) with the example of Glasgow (Whitehand, 1972b).

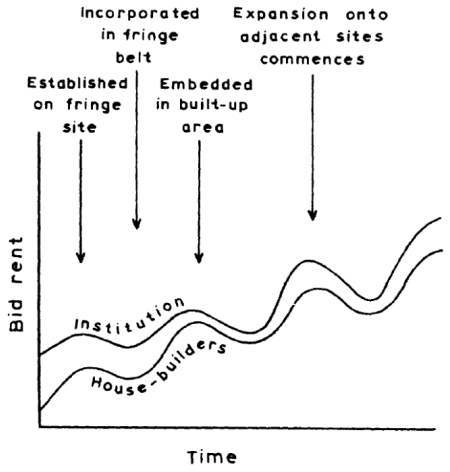

Figure 5 The hypothetical bid rent of institutions and homebuilders over time as revealed in the Glasgow study (Whitehand, 1972b, p. 220)

Openshaw (1974) and Barke (1982; 1990) conducted studies on fringe belt processes and economic development-based models. Barke's (1982) study in Derby and Newcastle illustrated graphs on contrasting supply conditions of residential and institutional land use at a distance from the city center (Figure 6). Whitehand (1988) stated that fringe belt formation occurs during economic downturns, concentrating on large, cheap lands and fringe areas. Vilagrasa's (1990) study in Lleida emphasized the formation of slum areas due to unmet housing demand and highlighted that the newly formed fringe belts through planning in the 1980s in competition with land-use types such as housing preferred locations that were difficult to access and had low land value. Whitehand's (1994) research focused on the University of Birmingham campus, revealing the impact of land value indices and transportation modes on fringe belt formations and highlighting the morphological characteristics of fringe belt plots from different periods.

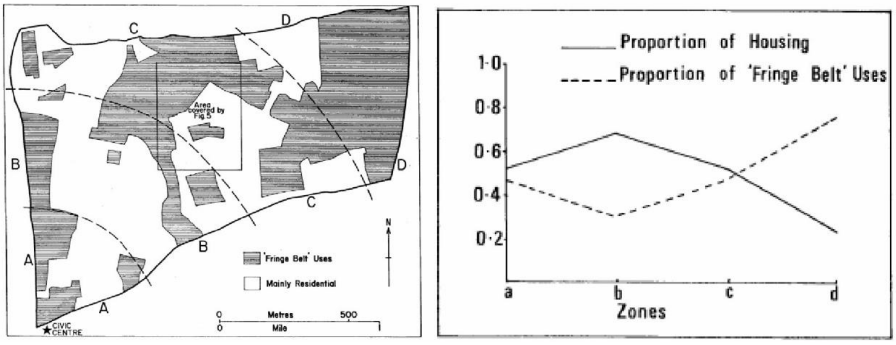

Figure 6 Derby and Newcastle fringe belt study and residential area-fringe belt development graph (Barke, 1982)

2.3. Social perspective in fringe belt studies

Studies from social perspective aims to examine the effect of social, cultural and political factors on the formation and transformation of fringe belts. Therefore, the studies held from a social perspective have been categorized and analyzed in terms of socio-spatial, socio-political, and socio-cultural aspects. As a typical example of socio-spatial studies, there is Carter and Wheatley's (1979) research on the transition of the upper class to inner fringe belt areas by examining the boundaries of the inner fringe belt and the transition of the upper class to the middle fringe belt in the later period. Besides, Del Monaco's (2015) studies on African metropolises and rapidly developing cities in the Far East as unstable examples, and cities with a deep historical background such as Rome and Beijing as stable examples, emphasizing the impact of different cultural dynamics on fringe belt formations.

Studies conducted from a socio-political perspective include Deputla's (2014) research on the fringe belt developments of Torun in Poland, interpreting them within the framework of war periods and the effects of the socialist era, and Camiz and Bruccoleri's (2015) studies on the fringe belt formations of Kyrenia in Northern Cyprus, which highlight the impact of border policies and political processes. Whitehand and Gu (2017) emphasize the presence of city walls as a fixation line in European cities, which has a more prolonged lifespan in Chinese cities due to socio-political reasons, and their articles focusing on Nanjing's fringe belt development from the 10th century to the 2000s reveal the effects of city walls on fringe belt formations.

In the socio-cultural context, Conzen's (2009) paper stands out as it provides a comparison of exemplary studies in fringe belt literature and discusses the absence of a distinct fringe belt formation in the Chicago metropolis in light of the influence of different cultural dynamics. Additionally, the study by Whitehand et al. (2011) on Pingyao highlights the role of tourism-focused policies in fringe belt development, and Marques de Sousa Safe and Pereira Costa's (2016) research in Rabat, Morocco, and cities in Morocco, which suggests that understanding the urban layers and examining fringe belt formations can help to define historical hierarchies in a historic center, are also among the notable examples in this context.

2.4. Ecological perspective in fringe belt studies

The aim of the studies handled with an ecological perspective is to examine the ecological value of the fringe belt areas and to emphasize their ecological importance. Ecological perspective began to emerge in the 2010s, and they consider environmental inputs and outcomes in general. Ünlü (2022) emphasizes that global issues such as climate change have increased ecological perspective in fringe belt studies. Hopkins's (2012) study on Birmingham, which reveals the ratios of tree in the city center, fringe belts, old suburban areas, and outer suburban areas, highlights the high tree ratios in fringe belt areas and emphasizes Birmingham's Edwardian fringe belts in terms of fringe settlements, other fringe belt formations, wildlife corridors, and average species in the city center (Figure 7).

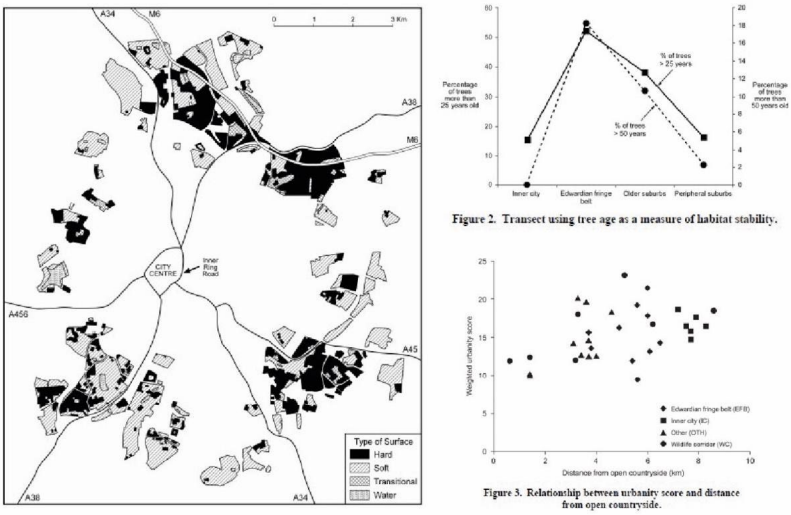

Figure 7 Fringe belt study focusing on Birmingham's ecological features (Hopkins, 2012)

Hazar and Kubat's (2016) study summarizing the inner fringe belt formation and change in Istanbul highlights the ecological value of agricultural uses and green belt-like areas such as Yedikule urban garden and touches the conversion of urban gardens into slum areas. Whitehand's (2019) article focusing on green spaces within fringe belt areas in Visby, Gotland in Sweden, Krakow in Poland, Birmingham in England, and the London metropolis suggests that these areas have remained undisturbed due to the absence of specific land uses and property ownership, and also they are buried within the city, and associated with cultural heritage sites, highlighting the importance of evaluating them from an ecological perspective by city administrators.

2.5. Planning perspective in fringe belt studies

In the studies handled with the planning perspective, the investigation of the relationship between fringe belts and urban planning is the main objective. The planning perspective in fringe belt studies, which has been approached since the 2000s (Ünlü, 2013), can be observed early in the works of Whitehand and Morton (2003, 2004, 2006), Ducom (2005), Gu (2010), and Conzen et al. (2012), as well as in some studies presented in conferences. Whitehand and Morton's (2003) elaborated fringe belt study in Birmingham includes interviews with planning authorities of the city besides using maps and plans, and it revealed that fringe belts are overlooked in urban planning, however the concept of green belt is more prominent in praxis. In the next study, the sources such as Birmingham City Council's land development documents and urban development control files are utilized. Within the scope of the study, in which the pressure of transformation to housing on the Edwardian fringe belt plots was examined in detail, how many of the total number of parcels were about to be transformed (alienated) actually and on the plan was also analyzed (Whitehand & Morton, 2004). Whitehand and Morton (2006) also addressed environmentalists' lobbying and inter-actor processes in fringe belt transformations in Birmingham.

Ducom's (2005) study in Nantes and Rennes argued that planners can assist in decision-making and implementation processes. Gu's (2010) study in Auckland discussed how alienations in fringe belt areas along the coasts restrict public use of the coastline. Conzen et al. (2012) examined the city of Pingyao in China and the city of Como in Italy in regard to tourism decisions in urban planning, and Lammers et al. (2017) integrated the fringe belt concept with strategic planning processes in their study on Eindhoven. Ünlü and Baş's (2019) research emphasized the importance of incorporating effective planning decisions in the formation and transformations of fringe belts in Turkish cities based on morphological periods. The study of Küçük Çalışkan and Kubat (2022b), in which the transformations in fringe belt plots in Istanbul within the context of property relations are revealed, presents a perspective that focuses on agents beyond planning and development processes.

3. Evaluation of the Research

The examined studies from the literature of fringe belt concept are evaluated based on the regional distribution of case areas, the major methodological structures that are used to identify fringe belts of the case areas, stages of fringe belt formation, fixed lines of demarcation, quantitative characteristics, and change processes.

3.1. Regional distribution and case areas

Looking at the geographical distribution of the case cities within the scope of 53 different studies that have been selected and examined from the fringe belt studies conducted to date (Figure 5), the majority of the studies focused on Western European cities (17 cities), followed by studies on East Asian (7) and West Asian (14) cities. There is also an increasing number of studies from Southern European cities (5). Among the examined studies, there are also examples from Central European (2), Northern European (2), South American (2), North American (1), Northern Asian (1), Southern African (1), and Northern African (1) cities. It can be observed that the majority of the literature is concentrated in Western European and West Asian cities with a focus on spatial perspective.

3.2. Methods and sources for fringe belt identification

As in all urban morphology studies, which are handled with a historico-geographical point of view, all drawn and written documents are used, from the oldest settlement maps of the city to be studied, to other maps and plans that will teach the periodical change. The land uses are extracted and mapped based on the periods considered for all studies. In some studies, quantitative analyses are conducted by considering plot sizes in addition to land uses. Change rates according to land use types and changes in plots are measured and visualised with graphs.

In studies from the spatial perspective, fringe belt analysis, comparative analysis, and historical maps of different periods are used. Perimeter analysis, graphic analysis of housing construction, institutional construction, and other construction data, and land value indices were used in studies from the economic perspective. In the research from the social perspective, besides the analyses of fringe belt evolution, various comparative analyses, the use of historical maps from different periods, historical documents, and the use of social data have been observed. While analyses of green areas in fringe belt areas, utilization of ecological data, and comparative analyzes are observed in ecological perspective studies, it is noteworthy that plans, plan notes, and interviews with planning actors are used in the fringe belt studies made from the planning perspective.

3.3. Phases of fringe belt formation and fixation lines

The formation processes of fringe belts are observed in the fixation, expansion, and consolidation phases. The majority of the studies address the fixation and consolidation phases. In some studies, the expansion phase is revealed through land use types that require larger plots, such as industrial areas, schools, and hospitals.

What emerges from the literature review in general is that the inner fringe belts form along a fixed line, with an integrated and continuous structure. Also, the physical integrity of the middle fringe belts is weaker compared to the inner fringe belts. These fringe belts are built on larger lands, closely intertwined with green areas and agricultural lands, and with a sparser road network. As for outer fringe belts, it can be stated that many of them were formed in the 20th century and consist of very large and fragmented plots.

Most of the cases shows that rivers, mountains, and the sea act as natural fixation lines. The matter that fringe belts generally begin to form along a fixation line was put forward in the early studies on fringe belt concept. The studies in the literature also indicate that fringe belts may develop due to economic conditions, in addition to the influence of the fixation lines.

3.4. Number and sizes of fringe belts

The studies indicate that generally three separate fringe belts are identified in cities. In cities with a small scale and a historical urban fabric, especially in European cities that have experienced the Middle Ages and modernization process, an inner fringe belt, a middle fringe belt, and an outer fringe belt can be observed. A single fringe belt has been found in East Asian cities that experienced the industrial revolution at a later period, but these fringe belt areas are remarkable in terms of their size. According to the samples examined, in cities with a younger history, there may be only one or two fringe belts. Developing West Asian cities, on the other hand, include a large number of overlapping fringe belt formations within different sub-centers of the city. Umbrella-type fringe belt model, which is seen as campus-type fringe belt units in Ünlü and Baş's (2016) study, is also among the remarkable findings.

3.5. Continuity and change in fringe belts

The examined fringe belt studies from different periods shows that some fringe belt areas are under pressure for change for residential and commercial uses. In particular, it can be said that controlled processes such as the economic investments of the city, urbanization strategies, and planning decisions, as well as unplanned factors such as migration, population growth, and war, have an impact on the change in fringe belt areas. The changes and transformations in fringe belt areas are categorized as consolidation, alienation, reduction, migration, or continuity of the fringe belt, which is consistent with the literature.

It is determined that fringe belt areas undergoing alienation generally turn into residential and commercial areas, losing the fringe belt characteristics completely. In the examined studies, the continuity of fringe belt areas is observed more in middle fringe belts and outer fringe belts due to reasons such as their formation in a later period of urban development, the presence of permanent fixation lines, larger plot sizes, and not being able to migrate because of the difficulty of finding places with similar spatial characteristics. It has been emphasized that inner fringe belt areas are quite dynamic and open to change due to their proximity to the city center and found in smaller plots.

4. Property Perspective as a Hybrid Approach

Understanding the future of an urban system requires a realistic assessment of the processes behind the changes and the direction in which the social system as a whole is being driven (Harvey, 2009). Although there are approaches to the evaluations in this framework among the researches in the fringe belt literature, it has been understood that there has not been a study that examines the property factor in the formation, development, or transformation of the urban form and that deals with it from the perspective of property relations. Following the studies of Hazar and Kubat (2015) and Kubat (2019), Küçük Çalışkan and Kubat (2022b) emphasized the alienation process in the fringe belt plots based on the transition from public property to private property. In the study inner, middle, and outer fringe belt areas of Istanbul are revealed (Figure 8), and selected cases are examined by the agency network in the transformation phase of the plot.

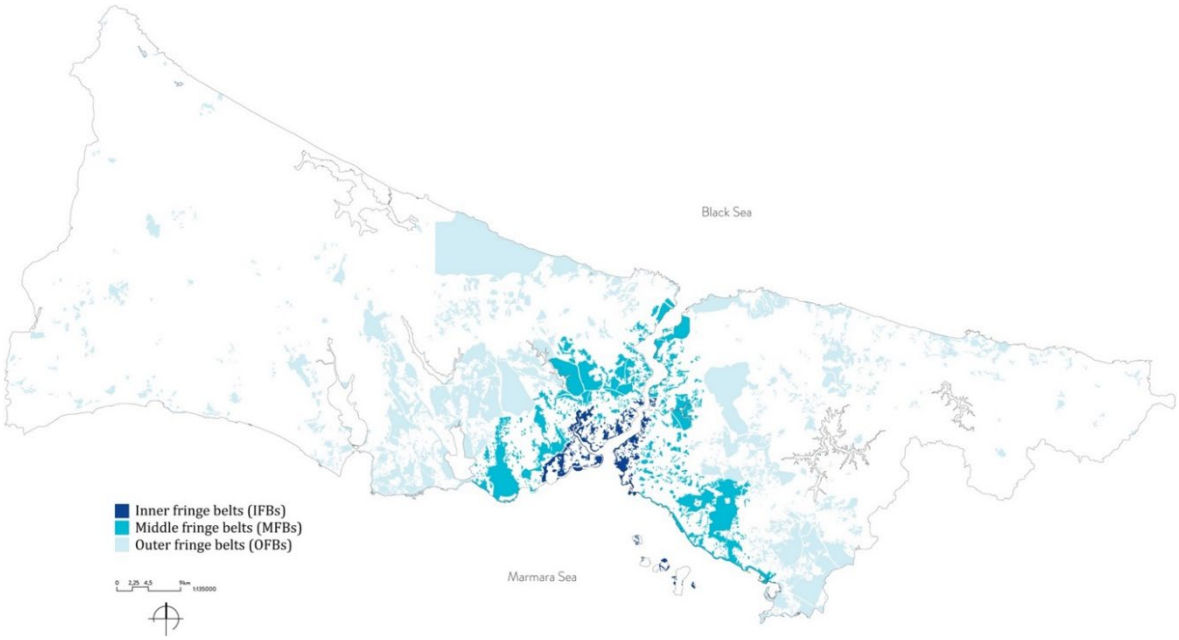

Figure 8 Fringe belt areas of Istanbul (Küçük Çalışkan & Kubat, 2022b)

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Küçük Çalışkan's (2023) thesis study, in which the development and transformation of the fringe belt concept in Istanbul are examined at different scales, the investigation of property relations in the fringe belt areas put forth. Case areas selected from different fringe belt areas of Istanbul were subjected to a typological analysis and a detailed investigation of four cases with similar characteristics was emphasized. In what direction and how the transformations in the fringe belt parcels will take place can be determined by the state's view of the property and the powers of the actors over the property, their relations with each other, and the basic tools they use to create the urban form. Therefore, in the study, a detailed analysis of the relations between the parcel and the agents was held as can be seen from the work shown in Figure 9 (Küçük Çalışkan, 2023).

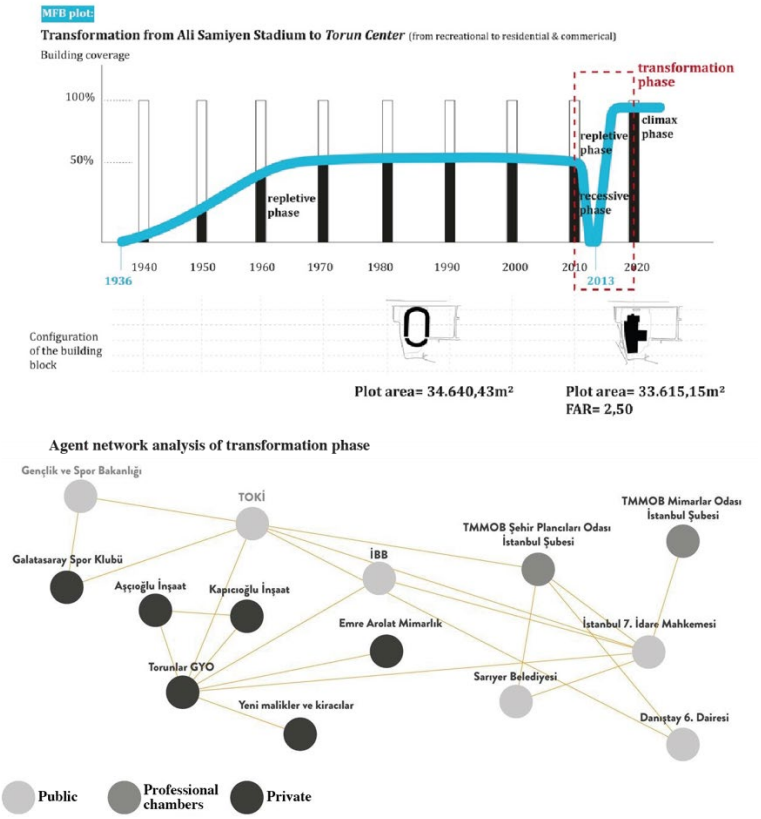

Figure 9 Exploration based on plot development cycle and agent network analysis for the transformation phase of an alienated fringe belt plot of Istanbul, namely the transformation case of Ali Sami Yen Stadium to Torun Center (Küçük Çalışkan, 2023)

The property perspective basically includes the spatial perspective within, and it provides a broad examination and multi-faceted evaluation, including planning, politics, as well as economic, ecological, and social perspectives.

5. Conclusion

This study, while summarizing the contributions of the research in the literature to the fringe belt concept, highlights the need to diversify research areas that are predominantly concentrated in European and Asian cities; beyond the spatial perspective, the need to increase studies focusing on social, economic and ecological perspectives as well as planning by making use of interdisciplinary studies and approaches; and finally, the importance of conducting more comparative research to reveal unique qualities in the examination of not only urban form but also other development dynamics of the city.

In the studies conducted from a spatial perspective, findings such as the number of fringe belts, land use and form of the fringe belts, city-specific fringe development models, fringe belt formation phases and transformations, and fixation lines have been reached. From an economic perspective, the relationships between housing supply and the formation of the fringe belt areas have been discussed. The studies handled with a social perspective include the characteristics of the fringe belts, the formation phases and transformation processes of the fringe belts, the social dynamics specific to each case, and the characteristics of the fringe belt interaction. The findings on the fixation lines, the formation phases and transformations of the fringe belts, and the accessibility, use, and protection of the fringe belts are among the major outputs of fringe belt research from the ecological perspective. Studies carried out with planning perspective present findings on the formation phases and transformation of the fringe belts, the absence of the fringe belt concept in the planning literature, and the possible position of the fringe belt concept in the policy making and planning process. The summary of each perspective is given in Table 2.

Table 2 Aim, methods and sources, and evidence in fringe belt studies from spatial, economic, social, ecological, planning based and property based perspectives

Perspectives	Aim	Methods and sources	Evidence
Spatial	To reveal the urban development by identifying the fringe belts	Fringe belt analysis, comparative analysis, using historical maps from different periods	The number of fringe belts of cities, features of fringe belts such as land use and form, urban-specific fringe belt development models, fringe belt formation phases and transformations, fixation lines
Economic	To determine the dynamics of fringe belt formation	Using data such as fringe belt analysis, graphical analysis of residential construction, corporate construction and other construction data, land value indices	Relationships between housing supply and the formation of fringe belt areas
Social	To examine the effect of social, cultural and political factors on the formation and transformation of fringe belts	Fringe belt analysis, comparative analysis, use of historical maps from different periods, historical documents, use of social data	Fringe belt characteristics of cities, formation phases and transformations of fringe belt areas, social dynamics specific to each case, and characteristics of fringe belt interaction.
Ecological	To examine the ecological value of the fringe belt areas and to emphasize their ecological importance	Analysis of green areas in fringe belts, use of ecological data, comparative analyzes	Outputs on the ecological dimension of the fringe belts, fixation lines, formation phases and transformations of the fringe belts, accessibility, use and protection of the fringe belt areas
Planning	Examining the relationship of fringe belts and urban planning	Fringe belt analysis, comparative analysis, using different historical maps, plans, plan notes, interviews with planning agents	Formation phases and transformation processes of the fringe belts, the absence of the fringe belt concept in the planning literature, the possible position of the fringe belt concept in the policy making and planning process
Property	To reveal effective property relations in the formation and transformation processes of fringe belt areas	Fringe belt analysis from different scales, historical maps, plans, plan notes, news texts, court case files, plot-based analyzes typological analyzes	The formation and transformation characteristics of fringe belts, the characteristics of change in various aspects of property in fringe belt transformations, the political and critical role of fringe belt areas in urban planning and policy making processes

Specific to the fringe belt concept, it is possible to see the processes that are effective in the development of the urban form in a more comprehensive and relational way by examining property relations. Therefore, covering all the other approaches, the property perspective in fringe belt studies provides critical findings on other possible dynamics in shaping the relationship between the main elements of the urban block as the basis of urban form and the agents who have roles within the whole process.

Particularly, studies that reveal the potential of fringe belt areas for planning cities that are fair, sustainable, and resilient to crises and disasters should be taken into account. Other areas that need to be developed include data-driven processes, mapping methods, and interpretation processes in the detailed identification process of fringe belt areas.

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Resume

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