URBAN GROWTH OF A MEDITERRANEAN CITY FROM THE FRINGE-BELT PERSPECTIVE

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ABSTRACT

Urban fringe belts are crucial entities for ecological sustainability as they are frequently the urban heritages, ecological corridors and buffer zones that protect natural areas. Fringe belts are also potential public spaces that usually contain open green areas, institutional areas and industrial heritage sites. The study aims to identify the fringe belt formation and modification process during the urban growth of İzmir, which is a western Mediterranean port and the third metropolitan city of Turkey. Comparative map analysis is the main research methodology of the study by focusing on the historical maps, aerial photos and master plans. In addition, consolidated fringe belts of İzmir are digitized by ArcGIS tool in order to assist in proposals for a common green belt policy within the urban planning and design strategies and the commons literature, which may improve the quality of life and ecological sustainability of the city by protecting the fringe characteristics. Thus, the study suggests that urban fringe belt planning within the green belt policies, green infrastructure and commons management strategies should be necessity to eliminate the capital-promoted alienation and enclosure processes.

Key words: Urban growth, urban morphology, fringe belt, commons, İzmir

1. INTRODUCTION

Urban fringe belts are the former urban peripheries that are embedded within the city during the historical development process. In contrast to densely built up areas, fringe belts are the potential green belts and public spaces. However, as a result of the rapid population increase at metropolitan cities, fringe belt sites are often regarded as potential new development areas. Eventually, the unique characteristics of the fringe areas and the historical identity of the city may be damaged in the process called the 'fringe belt alienation' (Hazar & Kubat, 2015).

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The first comprehensive definition of the fringe belt is that it is *"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"* (Conzen, 1969). Fringe belts can be defined as urban entities, which orient the city growth and have the potential to be planned as green belts and public spaces (Barke, 1990).

Open green areas, urban farming, industrial uses (including industrial heritage sites), institutional uses, sport areas, low density residential areas (e.g. villas, squatter housing) and recreational areas can be included among the fringe belt land uses. Open green areas include urban parks, urban forests, orchards, recreational areas, waterfront infill areas and common spaces, which are significant for the urban memory. Institutional uses include military areas, religious buildings, utilities, public buildings, campuses and water treatment facilities. Industrial heritage includes old industrial zones, warehouses and empty/vacant land (Barke, 1982).

The property ownership structure in fringe belt development is also significant. Squatter housing development on the common public land and agricultural land is especially visible (Vilagrasa, 1990; Carter & Wheatey, 1978). However, there are contradictory views about whether the squatter houses are the fringe belts or not (Vilagrasa, 1990; Ünlü, 2013). Therefore, in this study, the squatter houses are categorized as belonging to a 'pre-alienation phase'.

The development of research about fringe belts can be categorized into four themes: spatial, economic, social and planning. From the late 1990s to the present day, several studies explain the potential interrelationship between fringe belts and integrated planning and design policies (Whitehand & Morton, 2004); urban landscape management (Kropf, 2001; Whitehand, 2005); urban ecology and sustainable development (Hopkins, 2004).

Urban fringe belts are divided into three categories according to their time of emergence, their distance from the city center and their relationship with the fixation lines: the inner fringe belt (IFB), the middle fringe belt (MFB) and the outer fringe belt (OFB). The inner fringe belt is the oldest fringe formation around the historical core, which has the city walls as a fixation line (Conzen, 2009).

Middle fringe belts emerge closer to the city centers if the city growth is relatively slow; however, they usually emerge far from the center and in relation with the fixation lines. They have less continuous and more scatter plots than the inner fringe belts. They usually have less road networks and larger plots with open and green areas (M.P. Conzen, 2009).

One of the best examples is the urban green belt of Birmingham city (UK), which provides the survival of the scattered but well-defined Edwardian middle fringe

belt. Middle fringe belts have less development pressure than the inner fringe belts; however, they eventually modify. For example, some of the middle fringe belts of had been alienated to new development areas with a particular negative affect on urban ecology (Whitehand & Morton, 2003).

However, the Edwardian middle fringe belt of Birmingham, which emerged in 1910-1920 (after the WW1) still exist due to the green belt policy since the 1960s. The green belt and highway have become the fixation lines that limited the city growth (Ducom, 2003).

The study aims to describe the fringe belt phenomenon and investigate on the fringe belt development process of İzmir, a Mediterranean port city, by historical-geographical survey methods such as comparative map analysis. The study also suggests that fringe belts are crucial urban entities, which may limit and/or orient the urban growth and should be involved in the green infrastructure projects (e.g. Urban Green Up, Peripheral Ecological Parks) of İzmir Metropolitan Municipality. In addition, fringe belts include possible areas to constitute a more comprehensive green belt planning in the future planning and design policies.

1.1. Development of Fringe Belt Research

The development of fringe belt research can be categorized into four themes: spatial, economic, social and planning (Whitehand & Morton, 2004; Ünlü, 2013). The first theme is the emergence of the fringe belt phenomenon from a spatial perspective between 1936 and the mid-1960s, which was first recognized by Louis (1936) in a study of Berlin and later explored by M.R.G. Conzen (1960) in his studies of Alnwick and Newcastle upon Tyne as the foundation of a morphological urban growth theory. Conzen (1960) identified the fixation lines as key morphological elements in his study of Alnwick and Whitehand (1967) elaborated the concept by associating the inner and middle fringe belts with fixation lines, which are the barriers to the physical growth of a city.

The second theme involved the interrelation of fringe belts and the bid-rent theory (Alonso, 1960) as well as the building of a cycles model and innovations in transport (Whitehand, 1972) from the mid-1960s until the late 1990s. The dynamics of building slumps and fringe belt emergence, growth, adaptation, modification and alienation processes are examined mainly by urban geographers.

The third theme of fringe belt dynamics is strongly linked to the changing locations of social groups and changes in the socio-physical structure of the city (Ünlü, 2013). Fringe belt alienation in squatter houses, changing locations of the former residents, gentrification and the development of new housing areas are the examples of the social stage.

The fourth theme of research, from the late 1990s to the present day, is focused on the potential interrelationship between fringe belts and integrated planning and design policies (Whitehand & Morton, 2004); urban landscape management (Kropf, 2001; Whitehand, 2005); urban ecology and sustainable development (Hopkins, 2003). Eventually, the fringe belt phenomenon is taken as a potential tool within integrated urban planning, urban design and land management strategies (Gu, 2010; Ünlü, 2013; Hazar & Kubat, 2015). It has mainly been used to understand urban landscape transformation in cities with a long history to provide a basis for more coordinated decision making in urban planning (Whitehand & Morton, 2004).

The green belt policies can be promising for protecting the fringe belt characteristics and urban ecology, which continue existing in spite of the urban redevelopment pressure. However, the survival of the fringe belts in the future is in question due to market demands and pressures and lack of consciousness among decision-makers. Urban fringe belts are usually relevant to several governmental organizations, NGOs and related professional actors, which results in a harder decision-making process due to the different opinions and the frequent ignorance of the decision makers of urban morphology and planning. Thus, taking the fringe belt phenomenon into account as an historical-geographical structure of the city during the urban planning and design processes is necessary to prevent fringe belt alienation (Whitehand & Morton, 2004).

The fringe belt concept has recently been elaborated through its interrelations with urban design, planning and sustainable management strategies and its cultural dimension (Kropf, 2001; Hopkins, 2004; Whitehand & Morton, 2004; Whitehand, 2005; Gu, 2010; Hazar & Kubat, 2015).

The fringe belt research in Turkey is only recently developing and is of a limited quantity: (1) comparison of the fringe belts of Istanbul and Barcelona (Hazar, 2012; Hazar & Kubat, 2015); (2) IFB analysis of Mersin (Ünlü, 2013); (3) IFB analysis of Istanbul (Hazar & Kubat, 2016; Kubat & Hazar, 2018); (4) analysis of the fringe belt concept in multi-nuclear metropolitan cities (Ünlü & Baş, 2016); and (5) effects of fringe belts on the spatial growth of cities (Kaya & Akdemir, 2019).

2. URBAN GROWTH OF İZMİR FROM THE FRINGE BELT PERSPECTIVE

2.1. Historical Development of İzmir

İzmir is a Mediterranean port city on the western coast of Turkey and the third largest metropolitan city in the country with its population of approximately 5 million (TURKSTAT, 2019). Throughout history, İzmir has always been an important center of sea trade and civilization and has hosted many civilizations such as the

Sumerian, Egyptian, Assyrian, Babylonian, Hittite, Cretan and Greek. İzmir has become one of Anatolia's most outstanding trade, art, culture and commercial centers and a symbol of modernization and hospitality, including different cultures such as Levants, Rums and Balkans (Aksoy, 2001).

According to the 1914 population census in the Ottoman records, there was a total population of 1,568,451 in İzmir, which used to be the metropole of the Aegean. However, there was a serious population loss during the Independence War between 1919-1923 and most of the city was burnt. Afterwards, a regular increase in the population has taken place with a peak in the 1990s due to the late industrialization and concomitant rural-urban migration.

As a result of the late industrialization of Turkey, growth of the cities in the industrial age have been relatively slower than the cities in Europe and United States and rapid growth cycles have only been experienced since the 20th century (Ünlü & Baş, 2016). In addition, the strict borders between the rural and urban areas have disappeared by the intermeshing economic activities of globalization, which poses both potentials and threats on the rural-urban fringe, which is a multifunctional and dynamic zone (Gallent et.al., 2006).

The rural-urban fringe or the urban periphery that differs from the dense urban mass offers an area for alternative usages, similar to the urban fringe belts. It offers the possibilities of alternative recreative and agricultural land uses for urban citizens. However, rapid urbanization pressure has increased due to several legislations and the planning policies at the urban fringe belts have rendered sustainable development and commons management (Hazar, 2018). Eventually, urban sprawl management, rural-urban migration and decreasing life quality have become the major problems that need to be solved in Turkey (Tekeli, 2004).

The historical development of İzmir can be separated into four main periods: Ancient İzmir (3000-300 B.C.), Hellenistic, Roman and Byzantine Period (300 B.C.-1081 A.C.), Seljuk and Ottoman Period (1081-1923), and Republican Period (1923-Today). Before the proclamation of the Republic of Turkey, a huge fire broke out in İzmir, which resulted the destruction of almost half of the city. Eventually, the public improvements and planning regulations took the lead in the Republican Period and the primary aim has become the reconstruction of the damaged areas and the transformation of the city into an important national economic center (Table 1).

Table 1. Historical development of İzmir (edited from Aksoy, 2001).

Historical Period	Development Process / Outcome	Fringe Belt Elements
3000-300 B.C. / Ancient İzmir	Smyrna, mythos, Amazons / Historical city, site-town	Monumental stone fountains, king tombs, temples
300 B.C.- 1081 A.C. / Hellenistic, Roman and Byzantine Period	Alexander the Great, coastal town, settlements on Kadifekale / Mediterranean port city, trade and culture center	Cemetery, temple, Agora, castle, stadium, theatre, Pagos walls (Kadifekale), bishopric
1081-1923 / Seljuk and Ottoman Period	Multi-economical and functional city, agriculture and trade economy / Pre-industrial Mediterranean port city	Cemetery, fountain, clock tower, mosque, Sarıkışla military barrack (Fig. 1)
1923-Today / Republican Period	Industrialization, Independence War, great fire, development acts, planning regulations / Migration, metropolitan city	Squatter housing, new MFB formation after the fire: Kültürpark

Figure 1. Sarıkışla Military Barrack, 1865 (APIKAM, 2018)

2.2. Planning Practices of İzmir

İzmir experienced six citywide planning practices during the Republican Period which correspond to the major events in the political and socio-economic history of Turkey. The planning history of İzmir can be categorized into seven historical periods (Table 2).

During the economic stagnation period between 1939-1948, there was a building slump, nevertheless the new squatter houses emerged. There were not many new construction efforts except several institutional constructions and attempts to enlarge the port and complete the airport, all of which have become part of the new fringe belt formations. In the postwar era, İzmir became one of the top migration receiving and rapidly urbanizing cities in Turkey. In the 1950s, the city has become a metropolitan center, while the squatter houses enlarged parallel to its industrialization (Aksoy, 2001).

Table 2. Planning practices of İzmir (edited from Kaya, 2002).

Master Plan	**Approval / Outcome**	**Fringe Belt Elements**
1925-1933, Danger and Prost Plan	1925 / Partial implementation, master plan	MFB formation: *Kültürpark*, park and international fair, FB modification (barracks and prison into urban park), FB alienation (housing)
1949, Le Corbusier Plan	Not approved / Remained as a legal document-guide	FB modification and alienation (squatter houses), FB formation (Hospital, Central Bus Station, enlargement of the port and airport)
1952-1957, Aru, Ozdes and Canpolat Plan	1955 / Partial implementation, master plan, action area plans	FB formation (industrial developments and warehouses, health, education, sports facilities), FB alienation (squatter houses at the periphery), FB modification (demolition of *Sarıkışla barrack*)
1960, Albert Bodmer Plan	Not approved / Remained as a legal document-guide	FB translation (moving small-scale industry and heavy industry), FB formation (railway connection between industry and the port)
1972-1978, Metropolitan Planning Office Plan	1973 / Partial implementation, large scale projects	FB formation and translation (new industrial region: *Aliaga*)
1980-1990, IMM Plan	1989 / Master plan, revisions	FB formation (university campuses at the periphery, new airport, national park), FB alienation (squatter houses)
2012- Today, IMM Plan	Revisions, workshops, strategical reports, EU projects, EU networks	Potential FB formation and modification by GI strategies, Horizon2020 urban green up project: urban fringe parks workshop

Due to the proximity of the port and several industrial areas, several fringe belt land uses such as warehouses and factories were located at the IFB. Later, these

industrial developments and surrounding housing areas sprawled towards the periphery, which triggered the city growth beyond the municipality borders (Kaya, 2002).

In 2012, the 1/25,000 scale İzmir Metropolitan Plan, which is currently being implemented was prepared within the new Municipality boundaries with numerous partial and revision plans. Some of the continuing planning efforts of the İzmir Metropolitan Municipality (IMM) aims to develop strategical plans within the regional scale in relation with the basin-based planning and strategic planning by combination of the IMM, Universities and the İzmir Development Agency. The plan revisions of the 1/100,000 scale master plan by the Ministry of Environment and Urbanization, 1/25,000-1/5,000 and 1/1,000 scale master plans by IMM and district municipalities are still ongoing.

Since the last two decades, the urbanization processes in Turkish cities have become much more dependent on the construction projects in favor of the re-production of capital and land rent by the neoliberal urbanization strategies such as 'competitive city' and 'brand city' (Penpecioğlu, 2013). Moreover, Turkish planning regulations have easily been affected by politics, legislations, bills, development amnesties, financiers and the lack of interinstitutional coordination, all of which may negatively affect the fringe belts, which are hardly visible for the decision-makers. However, the legal suits by the professional chambers, NGOs and citizens struggle to slowdown the implementation of the partial revision plans and related alienation and enclosure processes especially on the commons, open green areas and public spaces, included in the urban fringe belts.

3. URBAN FRINGE BELT DEVELOPMENT OF İZMİR

3.1. Fringe Belts of İzmir

İzmir has a multi-nuclear settlement pattern with sub-centers (e.g. Alsancak, Karsiyaka, Bornova) and seaside and rural peripheral districts. It can be said that there is a relatively fragmented MFB formation along the railway and highway, which can also be defined as an 'umbrella fringe belt' similar to the model of Mersin (Ünlü & Baş, 2016). İzmir does not have a specific fixation line like a city wall; therefore, the IFB formation is less contiguous. There is a linear type of fringe belt development along the waterfront infill areas similar to Mersin, which also connects the IFB and the fringe belts of the sub-centers with the help of the IZBAN railway and highway. The waterfront infill areas have become the integral part of fringe belts associated with Sahil Boulevard, Kordon infill recreation area and Kültürpark.

Several old industrial areas around Halkapınar central train and metro station have been turned into institutional and educational uses (e.g. Historical Gas Factory Culture Center, FactoryLab Workstation). The Historical Electricity Factory has been protected from being alienated by a shopping mall and residence project with the help of the courts, law suits and protests and recently has been bought by the Municipality for a culture center project. Similarly, another contentious residence and shopping mall project on a large triangular vacant plot called the 'Basmane Hollow' at the south adjoint of Kültürpark has been cancelled after the legal cases and civil protests. Recently, attaching the Basmane Hollow to the Kültürpark and enlarging the urban park is being discussed among the Kültürpark Platform that brings together the NGOs, professional chambers, citizens and local governors. In this context, it has the potential to become an area of fringe belt expansion in the future.

The city-wide fringe belt development of İzmir includes several land uses such as port, industrial areas, military areas, cemetery, recreational areas and stadium in IFB; train station, urban parks, recreational areas, stadium, hippodrome, cemeteries, military areas and squatter housing in MFB; and cemeteries, recreational areas, industrial areas, military areas, university campuses, sewage, organized industrial zone, free trade zone, fair, airport, low density secondary houses and squatter housing (pre-alienation phase) and waterfront infill areas in OFB. The port hinterland especially contains warehouses and industrial areas along the railway. However, the pressure for commercial and residential activities at the city center has restricted the IFB expansion.

3.2. Fringe Belt Planning and Design as a GI Strategy

Although the green belt policies are not adopted as frequently as in Europe, IMM has taken several promising steps such as the 'Green Infrastructure (GI) Strategy of İzmir' (2017) and the 'Urban Fringe Parks Exploration Workshop' (2019). Positioning the urban fringe belt concept as part of a common green belt policy within the GI strategies is crucial in order to sustain the fringe belt characteristics, biodiversity and ecological sustainability. Fringe belts are often important urban heritage features, urban ecological corridors and places for less constrained movement by urban populations (Gu, 2010), which also provides the qualifications of the GI strategies.

The GI idea has emerged in Florida (1994) and in the Europe agenda (2004) through claims that the ecological systems are crucial parts of the infrastructure. GI is an approach that provides for the improvement and management of the rural and urban biodiversity within a broader ecosystem approach; improves air quality, water and ecosystem products and the services capability of nature;

strategically plans the connections between the high quality natural, semi-natural and urban systems; and helps to maximize environmental, economic and social benefits (IMM, 2017; EPA, 2019).

There is an urgent need for GI systems in İzmir in order to connect the city center and the peripheral districts by transportation and public systems; to constitute adequate blue/green infrastructure systems; to coordinate with the relevant implementation projects (e.g. heat island elimination, smart farming, ecological corridors, flood elimination); to constitute a nature/climate sensitive database and mapping; to constitute international and interinstitutional relations; and to perform the sustainable energy action plan, sustainable local development and smart city strategies (IMM, 2017).

There have been specified five main zones and several ecological corridors in İzmir including streams and canals that have been specified for the potential green belts: (1) İzmir Gulf and central shore, (2) urban pattern, (3) first green belt, (4) peripheral districts, (5) second green belt (IMM, 2017). The Meles stream and delta (Bayrakli) is an especially crucial ecological and historical region.

These areas within the GI strategies include industrial heritage, waterfront areas (e.g. lake, wetland, delta, stream, dam), seashore, transportation networks, green areas (e.g. urban forests, parks, market gardens, agricultural lands, children playgrounds, hobby gardens, recreation areas, cemeteries and sport areas), military zones, squatter areas and relevant urban renewal areas, all of which are also included in the fringe belt land uses (IMM, 2017).

Green belt policies within the urban fringe belt planning has the potential to constitute contiguous green zones, which are crucial for resilience to climate change and catastrophic events and for improving the biodiversity and ecological sustainability. Eventually, many fringe belt areas (especially OFBs) contain the ecological commons with extensive open and green areas. Thus, the fringe belt planning can be a potential urban sprawl management strategy of İzmir. However, it is crucial to underline that there is not a formal green belt or fringe belt planning in İzmir yet.

In this study, as a planning and policy proposal we suggest a green belt axis in relation with the fringe belts and the ecological corridors in İzmir (Figure 2). In addition, we made a more detailed fringe belt analysis in the old city center, Konak (Figure 3) and linked it to the proposed green belts of IMM by possible routes including museums, neighborhood parks and historical mosques (Figure 4).

Another aspect of the urban fringe belt planning can be the 'commons management'. Commons are categorized as tangible or intangible spaces of public use and collective ownership that belongs to the society providing free

access (Santos Junior, 2014) and consist of two types: ecological commons (e.g. air, water bodies) and civic commons (e.g. streets, public spaces) or public goods (Ostrom, 1990).

Especially the older IFB and/or MFB areas can particularly include urban common spaces important for the urban memory as the fringe belts are the urban entities that are shaped by various historical and cultural processes, all of which forms the characteristics of the urban memory. Eventually, situating the urban fringe belt planning within the GI strategies may help to prevent the destructive processes of enclosure movements on the commons and the alienation of the urban fringe belts, which are roughly comparable.

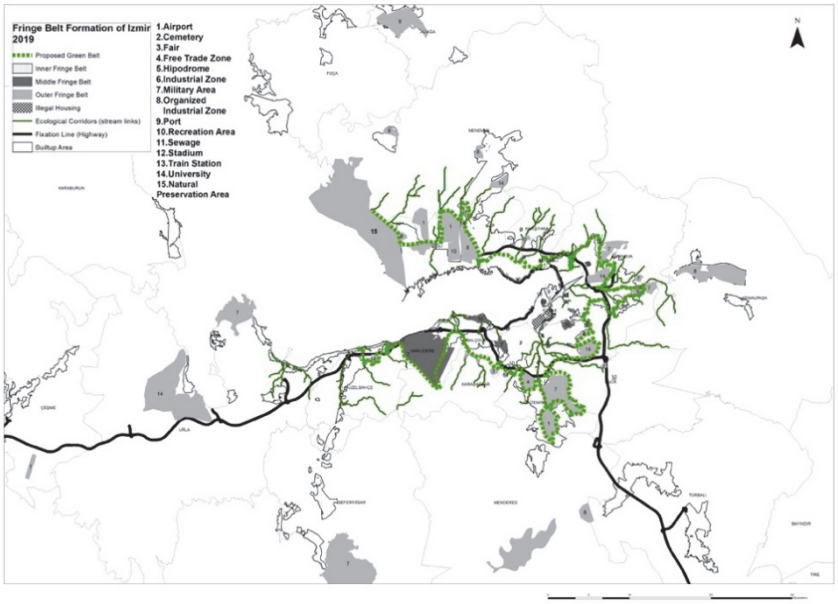

Figure 2. Fringe belts and proposed green belt axis of İzmir

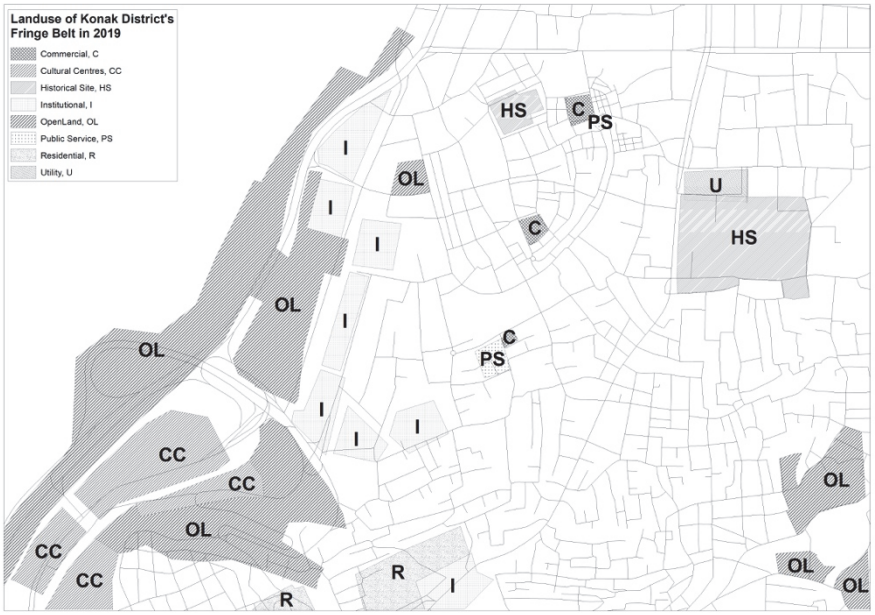

Figure 3. Fringe belts in Konak, İzmir

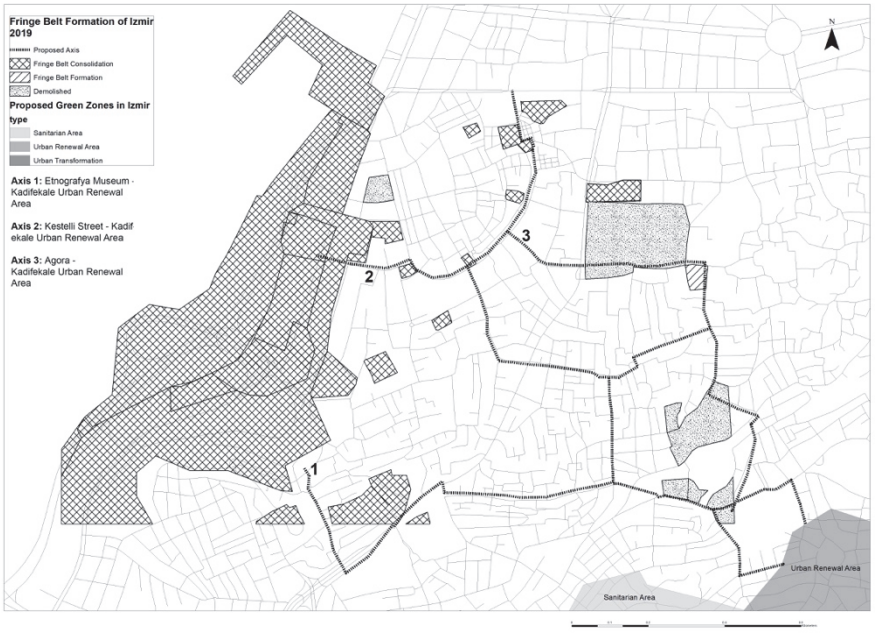

Figure 4. Fringe belts and possible interrelated axis with proposed green belts in Konak

4. CONCLUSION

In this study, we suggest that urban fringe belt planning within the green belt policies, green infrastructure and commons management strategies should be necessity. Eventually, urban fringe belts can be a part of a combined and contiguous green belt, especially at the OFB and the rural-urban fringe. Fringe belts in İzmir are primarily determined in order to prevent alienation by neoliberal policies and capital-promoted urban regeneration projects.

The sustainability of the fringe belt areas by refunctioning them as recreational and institutional uses at the industrial heritages (e.g. public parks, culture centers), warehouses, commons (e.g. urban farming) and green infrastructure strategies (e.g. green belts, ecological corridors) in favor of the public interest is strongly recommended.

Urban fringe belt planning is of great potential in the planning and design policies to sustain the common good and urban ecology and to eliminate the capital-promoted alienation and enclosure processes. Thus, it can be a crucial tool within the GI strategies. In future studies, a more detailed analysis of the urban fringe belt development of İzmir is projected in relation with the planning and design policies.

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