

# Morphological processes and the making of residential forms: morphogenetic types in Turkish cities

Tolga Ünlü and Yener Baş

Department of City and Regional Planning, Mersin University, Yenişehir,  
Mersin 33343, Turkey. E-mail: tolgaunlu@gmail.com

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**Abstract.** *Changes to the characteristics of the urban landscape as a result of morphological processes are investigated. The effects of change to individual plots are considered. Particular attention is given to the residential district of Çamlıbel in the city of Mersin, Turkey. Conzen's conception of the burgage cycle provides a basis for recognition of a development cycle. This comprises initial, interim and ultimate phases that gave rise respectively to generation, degeneration and regeneration. Individuals, government, planning practice and legislation contributed to this cycle. Attention is drawn to the value of the concept of morphogenetic type in understanding plot pattern development and building repletion and replacement processes.*

*Keywords: morphogenetic types, morphological process, typology, Mersin.*

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A good deal of research has shown that the evolution of the built environment is in some respects cyclical. For example, this is evident in the formation and modification of fringe belts at a city-wide scale, with the emergence of new residential forms occurring during booms in house building (Whitehand, 2001a). Research on the typological process suggests that new building types supersede existing ones within a sequential development (Gu *et al.*, 2008), with the adaptation of existing forms being the basis for the production of new types (Maffei and Whitehand, 2001; Whitehand *et al.*, 2014). When adaptation can no longer occur in a satisfactory manner, the pressure of functional requirements is liable to result in the destruction of obsolete forms and their replacement by new ones (Conzen, 1966, pp. 57–8).

Within the processes of change in the urban landscape, a type is a set of conventions and norms developed in the course of the building experience (Caniggia and Maffei, 2001). The built-up area becomes the accumulated record

of a series of periods in which the urban pattern of land use, streets, plots and buildings are manifestations of the cultural context (Conzen, 1969, p. 6).

Building on these previous studies this paper explores the morphological processes in the residential areas of Turkish cities, with particular emphasis on the processes of change in plots and buildings that together result in the emergence of 'morphogenetic types' within the built environment. A detailed study is made of Çamlıbel, a residential district of the city of Mersin. Since much of its basis is in the work of Conzen and Caniggia, a summary of this earlier work is a necessary starting point.

## **Changes to urban form and morphological processes**

M. R. G. Conzen developed urban morphological research in the mid-twentieth century

mainly through his studies of English cities (Conzen, 1962, 1966, 1969; Whitehand, 1981; Whitehand, 2001b; Whitehand and Larkham, 1992). His approach has been referred to variously as the morphogenetic/Conzenian tradition (Whitehand, 2001b), the Conzenian/British school (Moudon, 1997) and the historico-geographical approach (Kropf, 2009; Oliveira, 2016). At much the same time, a process typological approach was developed in Italy by Saverio Muratori and Gianfranco Caniggia, to which the labels Muratorian tradition (Moudon, 1997), Italian/Caniggian School (Cataldi, 2003) and process-typological approach (Kropf, 2009; Oliveira, 2016) have been applied.

In the morphogenetic tradition the plot is the fundamental unit of analysis and use is made of detailed cartographic sources in conjunction with field surveys and historical documentation (Whitehand, 1981, p. 12). The process typological approach is developed particularly at the scale of individual buildings, while the morphogenetic tradition is focused more on how the forms that make up urban areas come together (Maffei and Whitehand, 2001).

In the Conzenian approach, adaptations to existing forms include modifications to a building through the addition of rooms, changes to the roof, or by changing the character of the street in its relation to the built-up area (Whitehand *et al.*, 2014, p. 513). A transformation of forms occurs when the changing needs of society cannot be satisfied through adaptation, and the result is the destruction of obsolete forms and their replacement by new ones. The accumulation, adaptation and transformation of forms in a redevelopment cycle is particularly observed through the relationship between the plots and block-plans of buildings (Whitehand, 2001b, p. 105). There is a sequence of 'institutive, repletive, climax and recessive phases, measurable in terms of building coverage and followed by urban fallow' (Conzen, 1969, pp. 123–4). Morphological processes create morphological periods that are visible in the distinctive material forms of the urban built environment that relate to the needs of society at a particular time (Conzen, 1969, p. 7).

In the Caniggian school, building type refers to buildings with common characteristics produced through an accumulation of past and present consciousness. Differentiations are more visible in old buildings and less in more recent buildings throughout the 'phases' of the typological process (Caniggia and Maffei, 2001, pp. 50–6). New building types are products of a process of learning from adaptations of previous types (Whitehand, 2001b), which leads to an 'architectural organism' (Cataldi, 2003, pp. 22–3) and forms 'contextualized architecture' (Cataldi *et al.*, 2002, p. 3). The structure and character of a city at any given time stems from the continuous change to the built environment through the persistence and replacement of forms (Kropf, 1998, p. 129).

Both the Conzenian and Caniggian schools conceive urban form to be a cultural palimpsest that evolved from its formative years through subsequent transformations (Moudon, 1997). The analysis of the evolution of urban form recognizes the emergence of morphological periods in relation to the production of building types (Whitehand *et al.*, 2014, p. 513). The plan elements most resistant to change during a morphological process are the streets and the street-blocks (Conzen, 1975). Earlier divisions tend to influence new formations (Scheer and Ferdelman, 2001). Larger plots and street-blocks tend to be divided into smaller ones to provide better circulation patterns, more frontages and finer-grained fabrics (Siksna, 1997).

Studies of morphological change in Turkish cities are few in number. In his seminal work, *Türk Kenti (Turkish City)* Aru (1994) investigated the urban fabrics of diverse cities in different regions of the country, giving particular attention to the traditional Ottoman cores of Turkish cities that were formed during the fourteenth and fifteenth centuries. During the late-Ottoman period, from the late-nineteenth century to 1920, traditional terraced houses, and the first examples of apartment blocks, and suburban houses, were introduced. In the early-Republican period, between 1923 and 1945, mass housing projects at a neighbourhood scale were launched. In this period, apartment blocks were also erected. They

were considered from the very beginning to be a symbol of the Western way of life (Bilgin, 1999; Sey, 1998a).

The first appearance of multi-family apartment blocks in İstanbul was in the last decades of the nineteenth century and in the early-twentieth century, during the modernization of the urban fabric of Ottoman cities (Öncel, 2010, p. 126). This housing form started to become the dominant building type in Turkish cities from the middle of the twentieth century (Balamir, 1975; Günay, 2005; Sey, 1998b) in response to the increasing urban population associated with rural-to-urban migration. Another effect of increased migration to urban areas was the proliferation of squatter settlements (Balamir, 1975; Şenyapılı, 1986; Tekeli, 2012). Between 1950 and 1980, mass housing projects occurred on a large scale reflecting the rise of co-operative organizations and state incentives (Altaban, 1996; Bilgin, 1999). In recent decades, housing estates in 'campus-tissue' forms, featuring 'a larger tract of land with multiple buildings' (Scheer, 2010, pp. 51–2) began to be constructed, mostly in newly developing areas, as an alternative to earlier types (Ünlü, 2011).

### **The complex nature of the urban landscape: morphogenetic types**

Morphological analyses of changes to urban form are widely acknowledged to be predicated on three main principles (Moudon, 1997). First, urban form is formed and transformed through a complex interaction of plots, buildings, streets and related open spaces. Secondly, the entire hierarchy of urban form can be examined, beginning with the individual plot, including even the materials of a building (Kropf, 2014), and ending with the entire city. Thirdly, urban form is subject to continuous adaptation, transformation and replacement. During such changes, new building types are conceived as part of the formation and transformation of the urban landscape influenced by cultural and socio-political contexts.

The method applied in this study is based on these three principles, taking the plot as the basis of morphological processes. Successive changes to plots affect how the character of a neighbourhood or an entire town is changed in the course of its historical development. In this light, this study seeks to answer a number of questions. First, how were new urban forms produced within the complex interaction of plots and buildings in Turkish cities? Secondly, is it possible to recognize a redevelopment cycle in Turkish cities that takes into account all stages of the transformation of the built environment? Thirdly, if it is possible to offer a general explanation of the formation and transformation of the built environment in Turkish cities, which are the characteristics that underwent change, and what key morphological processes and phases are evident? Finally, what are the cumulative effects of the redevelopment of individual plots on the aggregate urban built environment?

To answer these questions, a study is made of Çamlıbel, Mersin. This city has been the subject of a number of recent studies, especially concerned with its fringe-belt formation and the modification processes it has undergone (Ünlü, 2013; Ünlü and Baş, 2016). In these studies, Çamlıbel is examined in relation to its envelopment within the western section of Mersin's inner fringe belt (Ünlü and Baş, 2016, Fig. 3). It is the first suburban development within walking distance of the centre of Mersin, movement at that time being very largely on foot. As in British cities at much the same time (Whitehand and Carr, 2003, p. 1) it marked a change from an essentially closed streetscape to a more open one. This residential area was established to house the new bourgeoisie that was emerging as a result of growing international commercial activities in the late-nineteenth and early-twentieth centuries. Consequently, it is referred to as the 'bourgeoisie neighbourhood' in French archives (Ünlü and Selvi Ünlü, 2012, p. 82). It comprises an intricate interrelationship of plots and buildings, together with their open spaces, and provides an ideal opportunity for the investigation of complex morphological processes.

The investigation involves the delineation of the ground plan, and an examination of changes to plots and building types. A plot-based study requires detailed cartographic and documentary information, but the availability of this is limited for most Turkish cities. Systematic historical building records and ground plans showing streets, building block-plans and plot patterns are few – a problem that has been noted in urban morphological research in Chinese cities (Gu *et al.*, 2008, p. 99). Diverse sources of information, including building permits, cadastral surveys, aerial photographs and field surveys were utilized. Among these, town plans and cadastral plans were the primary sources of information. They were especially important in providing building footprints and plot boundaries, allowing the compilation of ground plans for different dates. Building permit data were used to identify the morphological processes in five time periods: up to 1956; 1957–1977; 1978–1986; 1987–1995; and since 1995. There remained the problem of obtaining access to architectural drawings of building types for earlier periods, unless the buildings were listed for conservation. The problem of delineating the block-plans of buildings was overcome for recent periods by utilizing aerial photographs.

The earliest data source for plot patterns and street patterns was a cadastral plan for 1945. This shows the boundaries of each plot, but provides limited information on the block-plans of buildings. A ground plan of 1945 was eventually produced by locating each building in its plot largely by the utilization of aerial photographs. A second ground plan was compiled from a plan of 1975, which showed street-blocks, building block-plans, and building heights, and was supplemented by information from a further aerial photograph. A third ground plan was based on information from a digital plan of 2015.

The information collected for 1945, 1975 and 2015 revealed building intensification in the form of increases in building coverage. Changes in plot patterns were particularly evident between 1945 and 1975 (Figure 1). Attention will be focused now on the underlying changes in plots and buildings. The

applicability of the development cycle put forward by Conzen (1969, pp. 92–4) for British cities is particularly considered.

#### *Changes to plot pattern*

M. R. G. Conzen (1969, p. 92) initially explored the development cycle of urban plots in relation to burgages – the term applied to the strip plots held by burgesses in British medieval towns. These plots contained three main elements: a building, a garden and a courtyard. They underwent instinctive, repletive, climax and recessive phases of development, namely long-term increases in building coverage, and ultimately partial or total clearance of buildings and a period of ‘urban fallow’. This was a precursor to redevelopment.

Conzen’s studies of British cities draw attention to the development cycle within the boundaries of individual plots. Although the plot is the main unit of morphological transformation throughout the development cycle, other morphological processes include plot amalgamation and division (Conzen, 1969, pp. 69–70). In Çamlıbel five different plot types are recognized relating to plot metamorphosis in the course of the development cycle (Figure 2). In the first of these, Type 1 (T1), the parent plot is retained in its original form. Type 2 (T2) emerges after the division of the parent plot and the production of derivative plots within the boundary of the parent plot. These derivatives may be the subject of further division to produce sub-types of T2. Type 3 (T3) results from morphological change occurring beyond the boundaries of the original, or parent, plots. A further case of change is the production of Type 4 (T4) through the amalgamation of parent plots. In the final case, Type 5 (T5) is a result of the division of the amalgamated plots that were produced as Type 4.

Diverse division and amalgamation processes and plot pattern metamorphoses are shown for blocks 33 and 34 in Figure 3. The plot pattern in 1945, delineated from cadastral plans, is the initial phase of establishment of



Figure 1. Plots and buildings in Çamlıbel in 1945, 1975 and 2015.





**Table 1. Percentage of buildings constructed, dominant building types and dominant processes during five periods**

	–1956	1957–1977	1978–1986	1987–1995	1996–
<b>Percentage of buildings constructed</b>	10.9	33.5	31.3	12.2	3.9
<b>Dominant building type</b>	single-family house	single-family house and apartment block	apartment block	apartment block	apartment block
<b>Dominant process</b>	repletion	repletion and replacement	replacement	replacement	replacement

*Changes to the urban fabric*

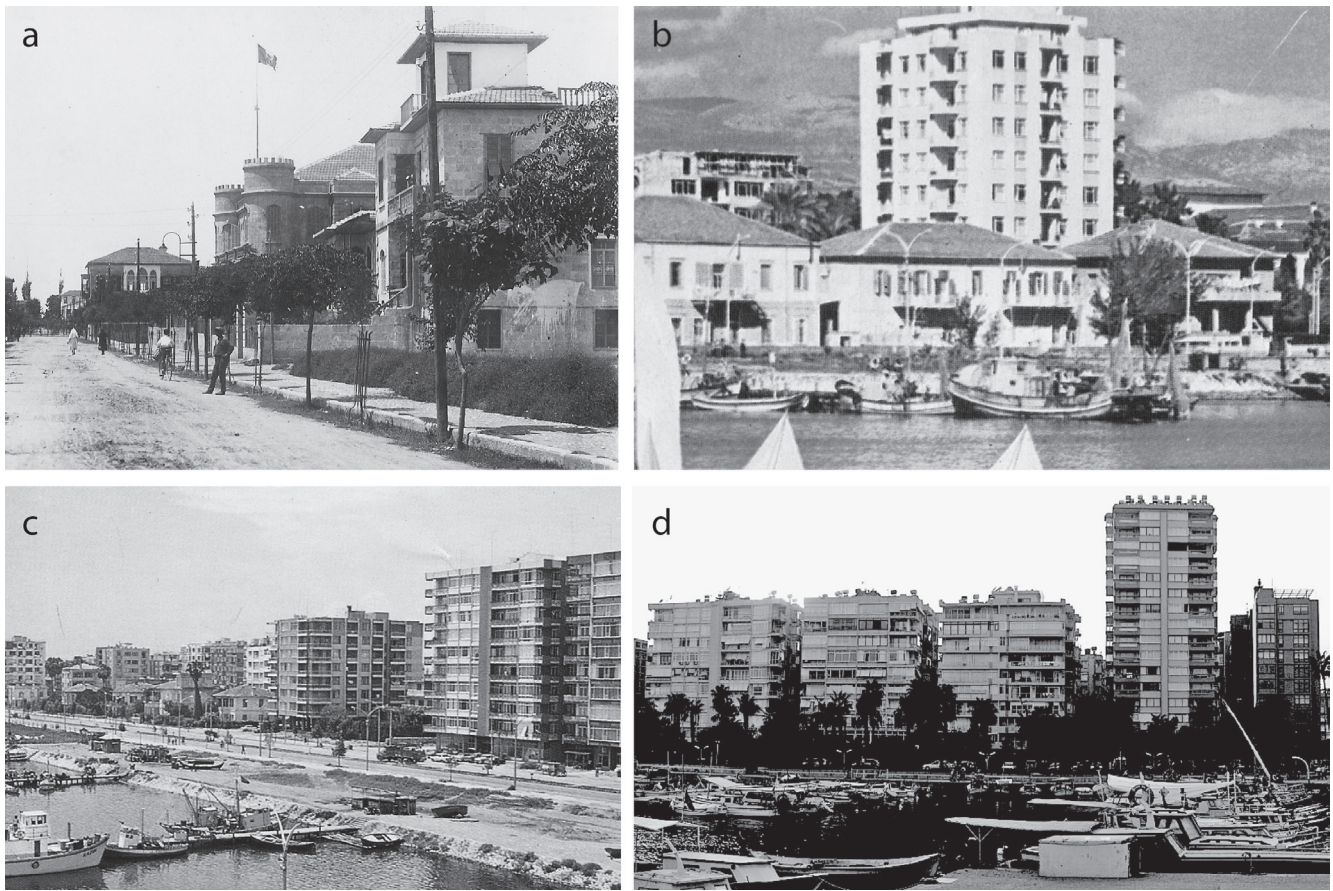
Changes to the three-dimensional composition of the built environment are associated with new building types and new arrangements within plots. As in the case of the emergence of semi-detached houses in the UK, single-family houses in large gardens became the dominant form within the first developments outside the historical core of Mersin (Selvi Ünlü and Ünlü, 2009), and they were the main building type for new settlements for the first 20 years after the declaration of the Turkish Republic in 1923. These were the new and ‘modern’ environments of the middle and upper classes, who sought to distinguish themselves from the traditional urban centres, and featured single-family houses built in a simple architectural style with little ornamentation (Bilgin, 1998, p. 261).

Building permit data reveal that 75.7 per cent of all buildings in Çamlıbel were constructed before 1986. Thereafter building activity declined (Table 1). Of the buildings before 1956, 56 per cent were single-family houses. Apartment blocks appeared as a new building type during 1957–1977 entailing large-scale replacement of single-family houses. This was stimulated by attempts to address the housing shortage that came with the rapid population increase after the 1950s that was a feature of all Turkish cities (Tekeli, 2012). It also reflected a desire to increase the rents (Sey, 1998a, p. 34). Building replacement was also widespread in the following periods.

*The development cycle*

The concurrent morphological processes in the plot patterns and building fabric in Çamlıbel allow discussion of the development cycle within second-order plan divisions. These are morphogenetic plan units with a relatively high degree of internal homogeneity in their constitutive phase. They developed mostly as residential integuments to the historical city centre during the early Republican period, between 1923 and 1945.

Çamlıbel underwent a rise in the popularity of apartment blocks in derivative plots at the beginning of the 1960s. During the following decades they became the dominant building type through building replacement at the plot heads of parent plots (Figure 4). Within the boundaries of a parent plot, the period leading up to the 1960s was the institutive phase with small amounts of building coverage. The second period leading up to the 1980s was a repletive phase, when apartment blocks on derivative plots were introduced. Single-family houses at plot heads were replaced by apartments in the third period. However, a second replacement process in this period emerged during the 1990s, when a new apartment block was constructed on the parent plot, and was retained in its original form until the most recent phase of development. The former case resulted in the building of two apartment blocks, while the latter involved one apartment block with more storeys but less building coverage. The main motivation in producing a new apartment block type with



**Figure 4. (a) Single family houses from the first period; (b) apartment block from the second period; (c) apartment blocks from the third period; (d) higher apartment blocks from the third period.**

less building coverage was to provide more space for such service areas as car parking (Figure 5).

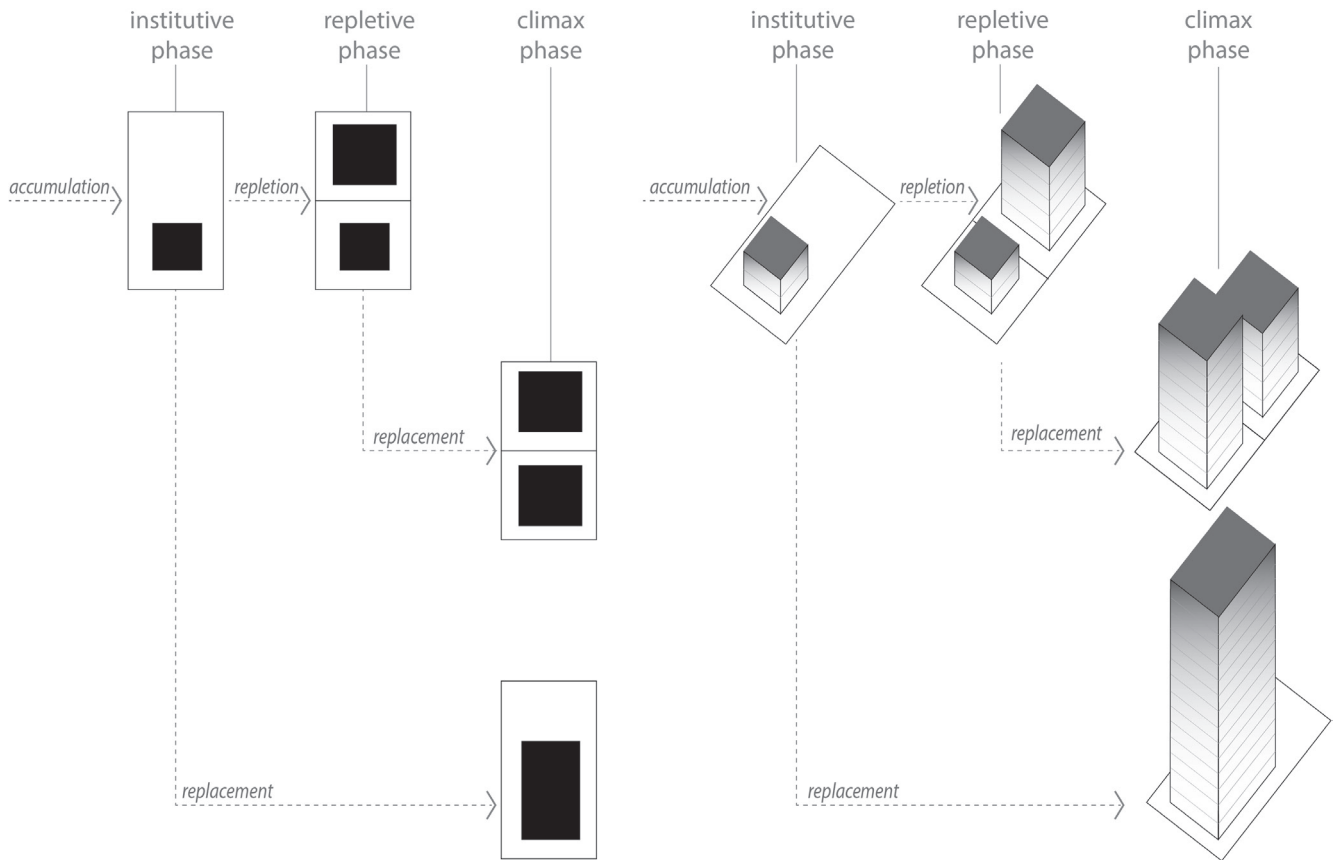
Although there was a limited decrease in the average size of plot areas, average building coverage rose from 0.33 in 1945 to 0.57 and 0.77 in 1975 and 2015 respectively, while average building heights increased from 2 storeys in 1945 to 2.45 in 1975 and 4.50 in 2015. As building coverage and heights increased with the appearance of apartment-type residential units, total floor area ratio increased sevenfold from 0.50 to 3.56 (Figure 6). The third period can be termed the climax phase.

While it is not possible to specify an exact number of households in 1945, as Çamlıbel was established in a similar way to a garden suburb, consisting of detached houses, it would seem that only 230 families were

living in the entire district in 1945, increasing to 1714 by 2015. This almost sevenfold increase in the number of inhabitants resulted in a shortage of services, which is most evident in the insufficiency of car parking and infrastructure.

#### *Morphogenetic types*

The interrelationship of five plot types (T1, T2, T3, T4 and T5) and three building types (a, b and c) resulted in the emergence of 15 morphogenetic types (1a, 1b, 1c ... 5a, 5b, and 5c). As shown in Figure 7, 'a' is the original building, generally a single-family house that was built in the institutive phase and retained its form during later phases. Such a property on the parent plot in its original form



**Figure 5. Phases of transformation.**

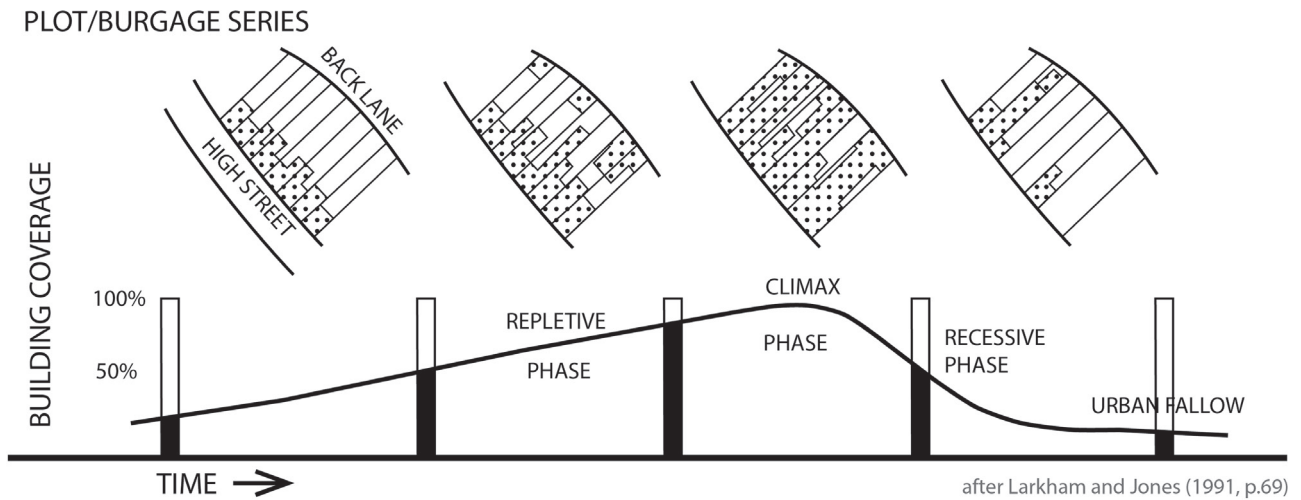
is referred to as morphogenetic Type 1a. As the parent plot is divided into derivative plots, morphogenetic Type 2a emerges when the original building is retained at the plot head. When adjacent derivative plots are amalgamated and the original building is retained, Type 3a occurs. Type 4a consists of the retention of the original building within amalgamated adjacent parent plots, while Type 5a is the resultant form of a single-family house within a new plot that is derived from the division of amalgamated parent plots.

New building 'b' is usually an apartment block that replaces the original building within a plot during the repletion phase. Such replacements may occur in the parent plot (Type 1b); in a derivative plot, acquired through the division of a parent plot (Type 2b); within the plot, produced through an amalgamation of adjacent derivative plots (Type 3b); in amalgamated adjacent parent plots (Type 4b); or in

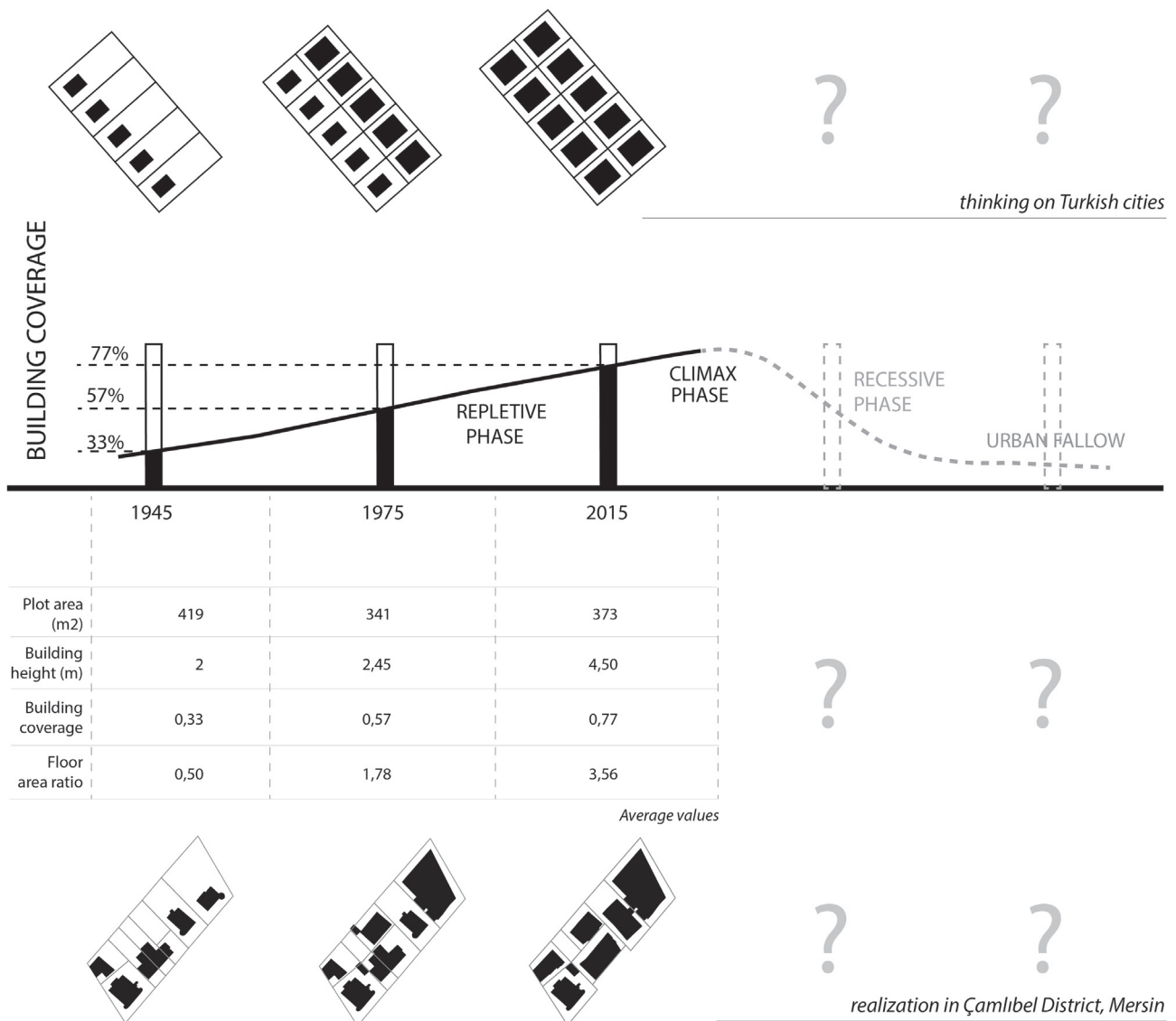
derivative plots, obtained through the division of amalgamated parent plots (Type 5b).

Building 'c' is also a new building form, and is again usually an apartment block, although in this case there is no replacement process. The building may be erected within the urban fallow or take the form of repletion of derivative plots. Type 1c denotes the emergence of a new building within the urban fallow. Type 2c is a new building constructed on derivative plots, while Type 3c is a new building within amalgamated derivative plots. Constructing new buildings within amalgamated parent plots results in the production of Type 4c, while Type 5c consists of new buildings produced within derivative plots that occur through division of amalgamated parent plots.

Plot 3 in Block 33 is an example of Type 1a, since the plot and single-family house, which has been listed for conservation, have



**DEVELOPMENT CYCLE IN TURKISH CITIES**



**Figure 6. The development cycle.**

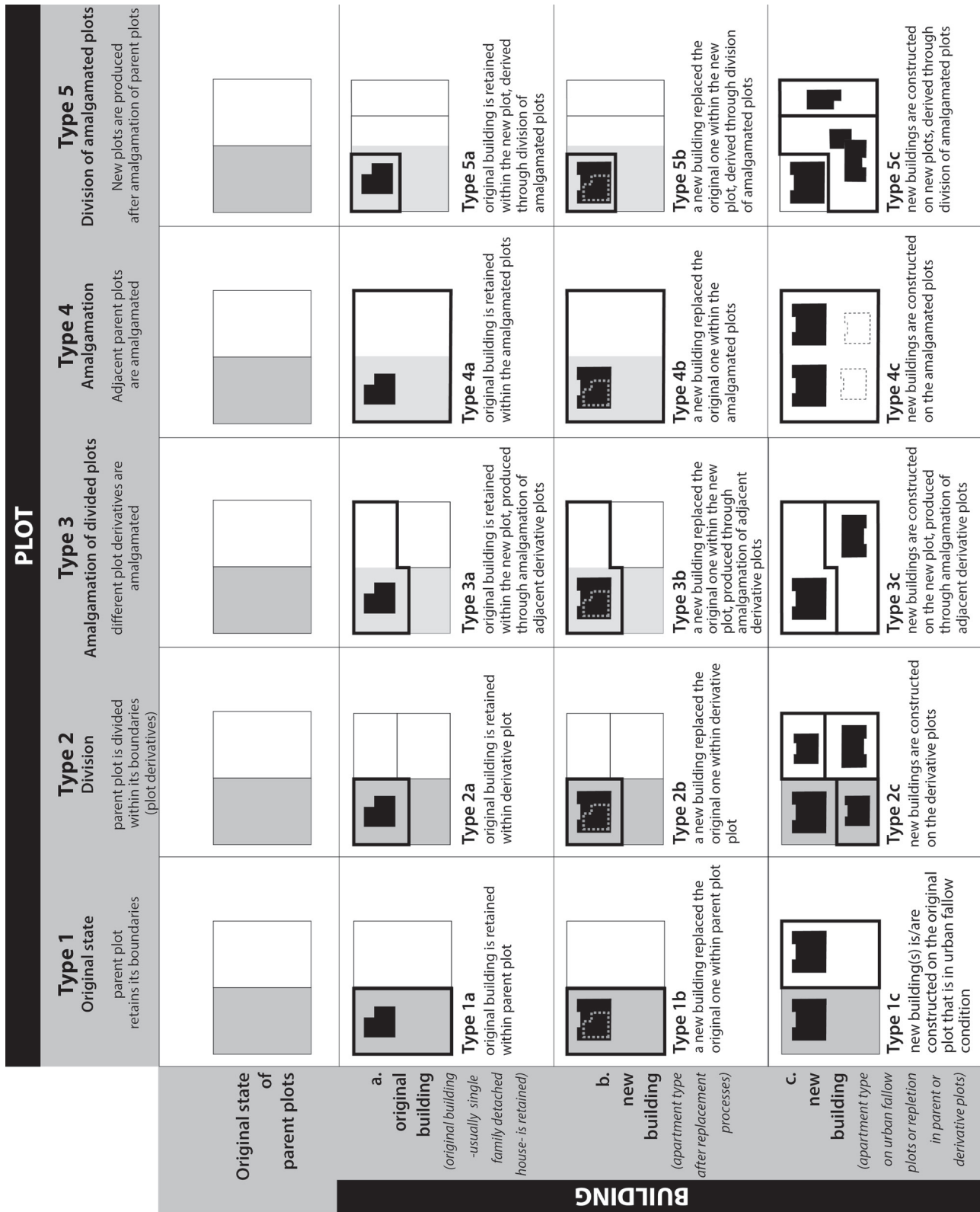
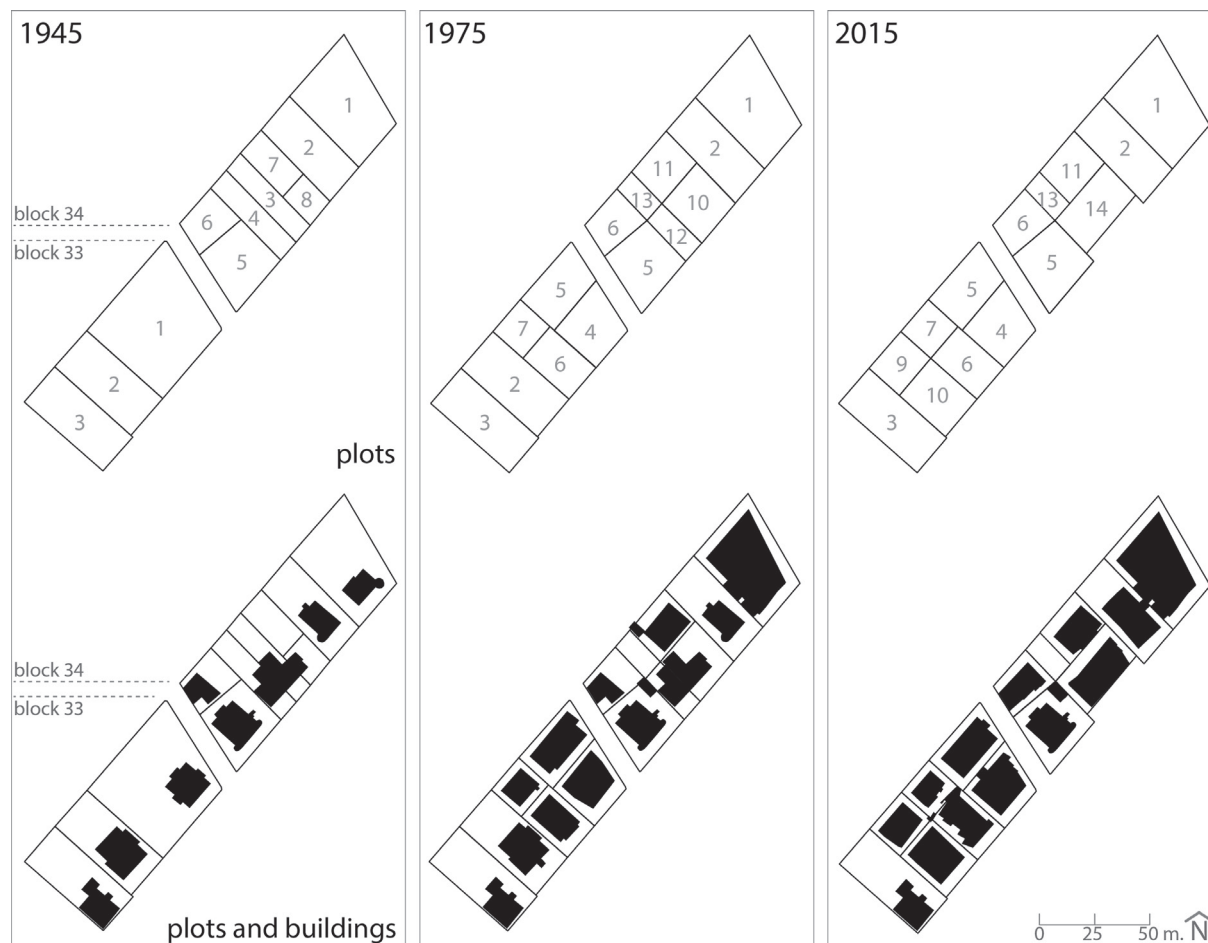


Figure 7. The development of morphogenetic types.



**Figure 8. Examples of sequences of plot development.**

been retained in their original form. Plots 4 and 10 in the current plot pattern are examples of Type 2b, in which a single-family house was replaced by an apartment block at the plot head. The other plots are examples of Type 2c, in which apartment blocks have been constructed in new derivative plots as part of a repletive process. In Block 34, Plot 5, the single-family house is a listed building of Type 1a, while Plots 1, 2 and 6 are examples of Type 1b, in which a single-family house has been replaced by an apartment block within the parent plot. A single-family house was replaced by an apartment block on Plot 14, which was an amalgamation of adjacent derivative plots, with a resulting Type 3b form; while Plot 11 is an example of Type 3c, with an apartment block built on amalgamated adjacent derivative plots. Plot 13 is Type 3,

but it is in an urban fallow condition since its dimensions do not permit the construction of a building compliant with building regulations (Figure 8).

Type 1a, signifying the primary accumulation of newly introduced single-family houses on parent plots, was the dominant type within the buildings and plots produced pre-1956; and Type 2c, which signifies repletion processes in derivative plots, was the dominant type in the 1957–1977 period. Building replacement within the parent plot, referred to as Type 1b, predominated in the 1978–1986, 1987–1995 and post-1996 periods.

Within existing morphogenetic types, Types 1b and 2c are predominant. These results were to be expected given that Type 2c relates to the advent of apartment blocks in derivative plots as secondary accumulations in the repletive

phase, and Type 1b relates to the replacement of a single-family house with an apartment block in the climax phase. In general there is a gradual intensification of plots through the division of parent plots, and the replacement of single-family houses with apartment blocks, resulting in an increase in building coverage and building heights throughout the institutive, repletive and climax phases (Figures 5 and 6).

### **Gradual transformation of the urban landscape**

Changes to urban form in Çamlıbel occurred through an interplay of amalgamation and division processes within the plot pattern, and through building repletion and replacement processes in the urban fabric, resulting in the emergence of morphogenetic types. As is the case in Scheer and Ferdelman's (2001) study of Cincinnati, early street-blocks limit the frame within which morphological processes occurred. Within the street-blocks, plots are the basis of morphological processes. Three-quarters of morphological processes took place within the boundaries of a parent plot.

In this study, Conzen's burgage cycle is the basis of the discussion of the development cycle in Çamlıbel. Conzen is referring to the traditional strip plot, inherited from the historical urban fabric in British cities. However, the conceptual framework of the burgage cycle offers an opportunity to discuss the development cycle of plots that are rectangular in form in the newly developed residential districts of Turkish cities that sprang up in the early-Republican period, of which Çamlıbel is one. As in the burgage cycle, the plots in Çamlıbel experienced a gradual increase of building coverage over the approximately 100 years since the beginning of the twentieth century.

Morphological processes lead to a gradual repletion and replacement of building types within plots in three consecutive phases – initial, interim and ultimate (Ünlü, 2011), and the overall effect of the changes occurring on individual plots is a generation, degeneration

and regeneration of the context. The 'generation of the context' in the initial phase refers to the primary accumulation of forms within parent plots, in which the dominant morphogenetic type is Type 1a. It resulted in single-family houses in large gardens and a consolidation of the residential environment in terms of block and street patterns. This comprises the institutive phase in the development cycle. The repletion of parent plots through division and the construction of apartment buildings in derivative plots comprises the morphogenetic Type 2c, which leads to the 'degeneration of the context' during the interim phase. Single-family houses at the plot head turn into Type 2a as the plot is divided into two parts. The co-presence of an apartment block and a single-family house results in a 'disturbing relationship' (Caniggia and Maffei, 2001, pp. 62–3), since the two are on different scales. The replacement of a single-family house at the plot head, within a parent plot by an apartment block, leads to the emergence of morphogenetic Types 2b and 1b, respectively. It culminates in a 'regeneration of the context' during the ultimate phase (Table 2 and Figure 5).

The form of the urban tissue is an outcome of interactions between purposeful planning practices, everyday spontaneous practices, and the resilience of the inherited built environment itself and the building culture of which it is a product (Gauthier, 2005). During the gradual transformation of the urban landscape in Çamlıbel, morphological processes were the outcomes of the decisions and actions of individuals and government, planning practices and legislation. One landlord, named Nakkaş, after receiving permission from the Ottoman government to develop his agricultural land, initiated the foundation of Çamlıbel in the first 2 decades of the twentieth century. The land was divided into street blocks, and plots were bought by notable tradesmen of the period who built their own single-family houses within large gardens. The initial development was not directed by a development plan. In the following phase, increasing pressure on land in the mid-twentieth century led to the production of multi-storey apartment blocks.

**Table 2. Gradual transformation of the urban landscape**

	Initial phase	Interim phase	Ultimate phase
<b>Context</b>	generation	degeneration	regeneration
<b>Building type (dominant)</b>	single-family house	single-family house and apartment block	apartment block
<b>Plot</b>	parent plot	derivative plots	derivative plots
<b>Morphological process</b>	repletion (primary accumulation)	repletion (secondary accumulation)	replacement
<b>Development cycle</b>	institutive	repletive	climax
<b>Morphogenetic types</b>	type 1a	type 2c	type 1b

The Law of Flat Ownership enacted in 1965 gave rise to the replacement of single-family houses with high-rise multi-family apartment blocks. According to Balamir (1975), the law enabled small-scale contractors and landowners to combine their resources to undertake construction, and to fund it through the sale of independent flats while building was in progress. The Law of Flat Ownership, as an outcome of increasing transactions in the housing market, led eventually to a sharp increase in housing supply in the form of apartment blocks containing independently owned flats. In this regard, flat ownership became a major factor in the switch to ‘the apartment block’ as the dominant building type in Turkish cities, as was the case in Çamlıbel in the 1960s. After their emergence, apartment blocks were subjected to modifications, including the addition of further floors, the amalgamation or division of flats and changes to façade details. New apartment blocks were influenced by a ‘neighbour effect’ (Whitehand, 2001a) that gave rise to similar changes within plots in close proximity to one another.

The replacement of single-family houses by apartment blocks was also facilitated by planning decisions. In the first development plan, which came into effect in 1938, a type of garden city was proposed for Çamlıbel that mirrored its character in the initial phase. A holistic approach was put forward by the planner, Hermann Jansen, for the development of Çamlıbel and other new residential areas on a neighbourhood scale, and the development

plans that followed took the plot as the basic morphological unit of development. The basic aim was to achieve an equitable quantitative distribution of construction rights, and to erect freestanding buildings on individual plots (Ünlü, 2011). The interim phase included the implementation of decisions based on a second development plan that allowed increases in building heights and coverage, heralding the advent of apartment blocks. The planning decisions that followed also favoured apartment blocks as the main building type. During this process, small-scale alliances developed on the basis of individual plots for the production of apartment blocks, with landowners seeking to build as many units as possible and small-scale contractors requesting more construction rights to maximize profits. This was facilitated by local governments through new planning decisions that allowed more development rights.

## Conclusion

In this study of Çamlıbel, a second order plan division, the changing characteristics of the urban landscape have been analysed in relation to morphological processes. How changes to individual plots affect the urban landscape on a broader scale have been explored. Second order plan divisions such as Çamlıbel can be deemed of especial importance in that they are residential accretions to the important historical core and inner fringe belt. More

morphological processes tend to be evident in these areas than in residential accretions in later periods. Morphological investigations of these districts in Turkish cities can contribute to the conceptual framework for a discussion of the complexity of the redevelopment processes that occurred following the establishment of the Republic of Turkey. The detailed study of the transformation of the urban landscape in Çamlıbel between 1945 and 2015 enabled the development of a framework for discussion on the development cycle and morphological periods. It also allowed the gradual transformation of the urban landscape to be conceptualized. The concept of the 'morphogenetic type', produced through the interaction of morphological processes in the plot pattern and in relation to building types, helps to clarify the nature of development. Although this study is limited to Çamlıbel, the findings have relevance to other Turkish cities, especially their second order plan divisions.

Although Conzen's research was based on the traditional burğage, it provided the basis for explanations over long periods. In Çamlıbel it allowed the development cycle to be formulated on the basis of individual plots in relation to initial, interim and ultimate phases. These resulted in generation, degeneration and regeneration on a broader scale. Since the street blocks were consolidated in the initial phase, the plot is the essential morphological unit of development. Plot pattern metamorphosis occurred through amalgamation and division processes, while apartment blocks replaced single-family houses to become, in less than half a century, the dominant building type.

The decisions and actions of individuals and local and central governments, as well as planning practice and legislation, are all evident in the development mechanism. In the initial phase, the landowner emerged as the developer of Çamlıbel as a garden-city type of residential environment. However, in the following phases, small-scale alliances between landowners, contractors and local government on the basis of individual plots triggered a rapid development process. This led to the popularization of apartment blocks and the

intensification of development. During this process, new laws and planning decisions that relied on quantitative measures provided more development rights, and accelerated apartment-block production.

Further research would seem to follow logically from this investigation. First, morphogenetic types may provide a framework for the development of cross-cultural comparisons of contemporary cities, and a questioning of whether similar processes are evident in other Turkish cities. Secondly, the role of planning decisions in the development of Turkish cities merits in-depth examination. Thirdly, the effect of changes in planning legislation and related laws on redevelopment processes should be scrutinized, given that Turkish cities are today facing a new wave of redevelopment, spurred by the recently enacted Urban Regeneration Law, No. 6306. This could well result in further conflicts between inherited patterns and new types of development.

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