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AN OVERVIEW OF THE CONCEPTS OF TRANSITION, TRANSFORMATION AND CHANGES IN THE URBAN ENVIRONMENT AND THEIR RELATIONSHIP WITH EACH OTHER*

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ABSTRACT

Urban environmental changes, providing increasingly favorable living conditions in cities, are a permanent, continuous and long-term process with broad and long-lasting effects on the development of cities. In order to create a new content and meaning, cities are subject to constant transformations, changes, and ultimately transitions to another structure, either intentional or unintentional. However, what is not clear in the concepts of transition, transformation and change is their conceptualization and position and the relationship between them, as well as types, dimensions and goals of each of them; so that the concepts are used interchangeably in many studies. Therefore, revising and introducing the role of each component of urban transition, transformation, and changes, as well as their impact on each other can be considered as the main purpose of the study. Accordingly, this paper examines the views and perspectives of the experts in this field, using the descriptive method and content analysis, and inferring applied results based on a review of related literature. Furthermore, in order to achieve the findings, the meta-synthesis method has been used as a kind of meta-analyses method. As a result, the positions of each of the concepts of urban transformation, transition and changes and the differences between them, as well as different kinds of urban changes and their relationships with each other have been found in this study. In the end, it can be expressed that transition creates various urban changes in various physical, economic, social, political and environmental dimensions, which leads to broad visible and invisible urban changes in considered dimensions. Thus, urban changes could be a dynamic and integral part of urban transition and transformation.

KEYWORDS: Transition, transformation, urban environmental changes, city

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1.INTRODUCTION

Environmental changes, as a dynamic process and the main component in the urban experience, seek solutions to solve the problems in different spatial and human dimensions. Although transformation and changes can be effective in solving urban and human problems, they can have adverse consequences if not occurring in accordance with the individuals' perceptual and spatial conditions. In order to adapt the changes to the individuals' perceptual and spatial conditions, and, as a result, improve human relations and the relationships between human and place, it is necessary to find out about different types of changes in the city and different transformational processes. Cities are subject to constant changes, transformations, and ultimately transitions to another structure in order to improve the conditions and provide a favourable situation for humans and to create a new content and meaning. However, what is not clear in the concepts of change, transformation and transition is their conceptualization, terminology and position and the relationship between them, as well as types, dimensions and goals of each of them in urban life. The initial review of the related literature shows that not only is there no clear definition and terminology of these concepts and no clear position for them in the topics related to the city, but also, in most of the studies, these concepts are used interchangeably. Finding the relationships between the above mentioned concepts, the present study has attempted to provide a more obvious process in performing different changes, in order to influence humans more effectively. By examining such aspects of environmental changes, it might be possible to find a clearer answer to the following questions: What do the concepts of urban transformation and transition mean? What are urban changes and which types are they? And finally, what is the difference between transition, transformation and changes in the urban environment? In order to answer the raised questions, the above mentioned concepts are discussed

2.Theoretical Foundations

2.1. The Concept of Transition

Transition has different meanings some of which contradict each other, and it can be used to change a complex system with the correlation and evolution of various processes, such as transition from a traditional transport system based on the carriage to a modern transport system based on cars. In this case, it refers to an evolutionary process (Yang, 2010). The term transition refers to the change from the adaptation cycle phase to the other phase (Rotmans et al., 2001; Martens and Rotmans, 2005). Transition through an adaptation cycle may result in a complete change in the state and creating a basically new system, which in this case represents a transformation (Park et al., 2012). Transformation occurs when environmental, economic, social and political conditions cause the existing system to be untenable (Walker et al., 2004).

Transition is defined as long-term nonlinear processes, which take about 25 to 50 years (Mendizabal et al., 2018). Transition can be considered as passing from one state, stage, subject or location to the other, or a move, progress or evolution from one form, stage or style to the other, and these forms have internal characteristics that give them coherence and stability (Yang, 2010; Park et al., 2012). Moreover, transition indicates a quick change, temporary rotation, discontinuous change to a new path and system or "jumping" from one state to the other (Elzen and Green, 2004).

Transition is a broad concept in which the stimuli of change are very important, and it is very difficult to give an exact definition to it. The most important internal factors in creating change as stimuli and causes of urban transition include: power, political leadership, learning from natural disasters, responsibility, increasing public and private intermediaries, social participation and innovation (Mendizabal et al., 2018). The stimuli mentioned are effective to overcome barriers and control the internal and external transition factors (Mendizabal et al., 2018). Transition can be carried out by the pressure of external factors, including foreign economic and political conditions, energy crisis, foreign biological conditions and climate changes (Redman et al., 2004; Yang, 2010). Regarding the broad and vague concept of transition, special attention should be paid to the transition steps as a pattern that

transition follows (Rotmans et al., 2000; Van der Brugge and Rotmans, 2007), as well as transition management as a proposed process aiming at influencing acceleration of the transition process (Park et al., 2012). In addition, the concept of transition is used to examine the current and future tensions between issues like environment, welfare, well-being, etc. (Martens and Rotmans, 2005). From the integrated systems standpoint, Rotmans and Vries (1997) define the concept of transition as a change in the system from a dynamic balance condition to another state. The process of change in the form of a nonlinear transition, in which slow changes accompany with rapid changes, when all changes reinforce each other, the system with more change comes in a new balance. The old one and the new one overlap, conflict and ultimately tend to converge. The fundamental mechanism is transformation and integration, because sub-systems evolve together and lead to irreversible patterns of change and are integrated to a new system (Rotmans and Vries, 1997). Transition is considered as complex, dynamic, uncertain and nonlinear systems that have experienced interaction with other systems. They include transformational processes in which existing structures, institutions, cultures, and practices decompose and new structures are created. The term transition, particularly, emphasizes dynamic aspects from an initial situation to a different situation with particular qualities that are lacking in the initial situation conditions, and during which something new should be created (Elzen and Green. , 2004; Teisman and Edelenbos, 2004; Yang, 2010). As a gradual process, transition can change from slow dynamics to rapid development and instability, and ultimately to a relative stability and balance, during the minimum time of 25 years, and the speed of transition, the size of change and the period of change can be suggested as effective dimensions in the transition process (Rotmans, Kemp and Asselt, 2001). According to what was discussed, transition has a complex and broad meaning related to the adaptation cycle, and can has different types that, in order to make a clearer definition of the concept, all transition steps, transition management and its different types should be addressed. However, what is clear is that transition is not a quick change, but it includes transformational processes that are dynamic, nonlinear, and long-term and it can lead to the formation of a new state and structure, or continue its process in the same structure with a different speed in an evolutionary manner, and ultimately lead to development in different areas.

2.1.1.Transition Phases

Transition includes 4 phases, which represents the general pattern that is followed by transition (Rotmans, Kemp and Asselt, 2001; Van der Brugge and Rotmans, 2007). These phases include: a) Pre-development, a situation where the system's dynamics does not change clearly, but the experiment occurs at the individual level, b) Take-off, taking off from where the structural change process start to reinforce the movement due to the emergence of innovation and infinity, c) Acceleration, a situation where structural transformation takes place as a result of accumulation and implementation of social, cultural, economic, environmental and organizational changes, and d) Stabilization, a situation where the system reaches a new dynamic state of balance (Rotmans, Kemp and Asselt, 2001; Van Der Brugge and Rotmans, 2007; Park et al., 2012; Mendizabal et al., 2018). It should be noted that the nature and speed of change in each of the transition phases are different (Yang, 2010).

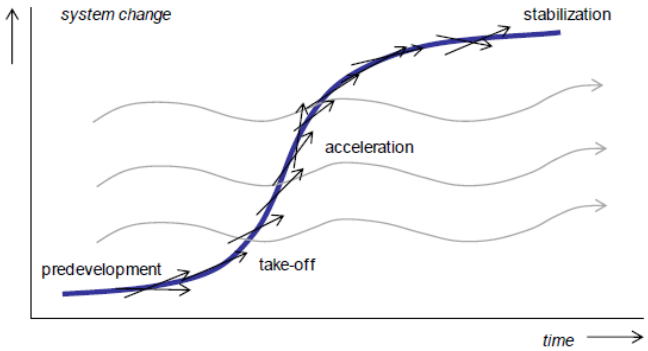


Figure 1. Different transition phases at various levels of the system, (Yang, 2010)

During transition, coping capacity is needed for addressing the degree of complexity, uncertainty, big data management and deep analyses, and a wide range of beneficiaries should be involved in different processes of change. Therefore, different managements in various fields are of great importance (Mendizabal et al., 2018), and transition management could be considered as a long-term thinking and a framework to form short-term policies.

2.1.2.Transition Management

Transition Management has been presented as a practical management framework for accelerating and guiding social innovation processes, and has synchronized with the development of the concept of transition in the past decade (Park et al., 2012). Transition management includes a set of principles with the purpose of influencing, facilitating, stimulating and organizing processes that help transition (Van der Brugge and Rotmans, 2007).

A key concept within the framework of transition management is a cycle consisting of four activities (Loorbach, 2007). The first type of activity is structuring the problem and establishing the transition arena, which can develop a common understanding of the problem along with a set of guiding principles in order to predict the transition. The second activity focuses on identifying images and pathways that represent perspectives and possible options for transition, and provides the possibility of developing the transition agenda. The agenda includes transition goals and provides guidance for pioneers during the search and learning process. The third activity builds on transition images, pathways, programs and agenda, by implementing transition experiments. These experiments mobilize and equip various actors to contribute to the transition pathways and overall transition goals. The fourth activity focuses on monitoring and evaluating the transition process to consider possible progresses, especially in terms of the function of the transition arena, implementation of transition programs and agenda, insights and impacts of transition experiments and the speed of progress and challenges facing transition (Loorbach, 2007).

From a different point of view, transition management includes different steps: 1. Analysis of a system 2. Prediction 3. Exploration in the pathways 4. Experiment 5- Evaluation 6- Transition (Mendizabal et al., 2018). The goal of transition management is directing the transformation in the perspective and prospects of social-naturalistic issues and social-technical practices, along with "structural characteristics of society" from a balance to another balance (Rotmans, Kemp and Asselt, 2001). Transition management has been used as a proposed process with the aim of influencing and accelerating the transition process. Transition management has an effective role in determining the results of the transformation process (Park et al., 2012).

2.1.3.Types of Transition and Adaptation cycles

In one category, transition includes two evolutionary and purposeful modes that in the purposeful transition the goals are clear from the beginning (Kemp and Rotmans, 2004). Transition can be considered as evolutionary processes. In this mode, transition is considered as a complex and dynamic process, consisting of various subjects in which there are different actors and beneficiaries with different backgrounds who play different roles and try to meet different goals (Teisman and Edelenbos, 2004). In evolutionary transition mode, transition does not occur in phases but occurs due to the processes without coordination and chaos, which is somewhat developed through system management and is generated randomly (Yang, 2010). In evolutionary transition, the result has not been significantly planned (Kemp and Rotmans, 2004).

In another category, transition includes incremental or progressive adaptation and transformational adaptation. This type of category in adaptation mainly focuses on social-naturalistic systems (Mendizabal et al., 2018). The two mentioned types of transition may occur due to the knowledge or skills obtained from evaluation, monitoring and learning, and there is no predicted result of the development and implementation of transition actions on different scales (Park et al., 2012). The fundamental difference between incremental and transformational transition results from the extent of

the changes that is either conservation of the system with the existing process or creating a system with a fundamentally new process. These two types of transition lead to the formation of incremental adaptation cycles and transformational adaptation cycles according to the types of activity in transition management. The two adaptation cycles are both concentric, and linked, which can lead to conservation with the current trend or create something totally different (Park et al., 2012).

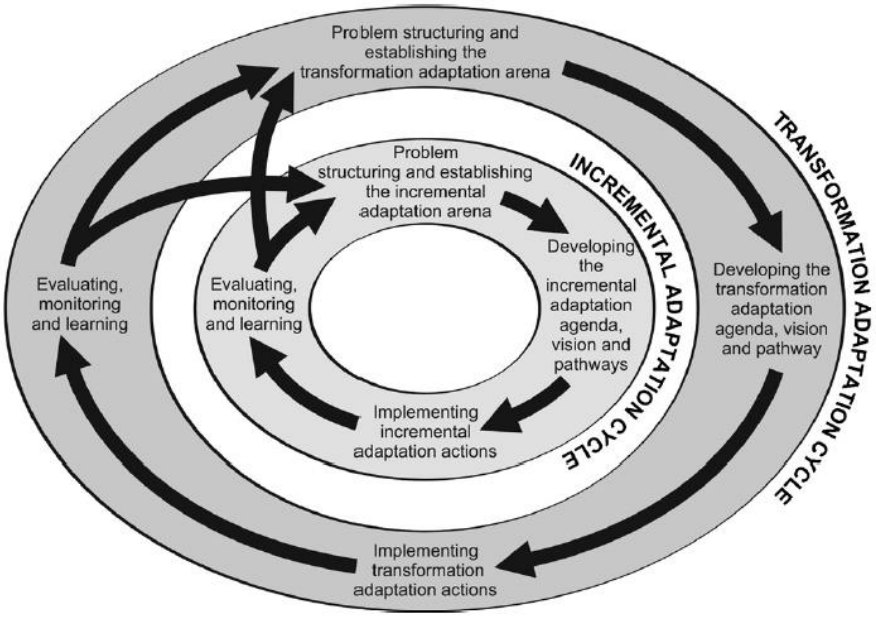


Figure 2. Schematic representation of the Adaptation Action Cycles, (Park et al., 2012)

The Holling cycle (1986) is another adaptation cycle that is formed by using samples of various ecosystems and a naturalistic approach, and with the development of several forms of an innovative model that includes four phases of exploitation, conservation, creative destruction, and reconstruction. (Gunderson and Holling, 2002; Holling, 2001; 1986). The mentioned adaptation cycle is categorized in the four phases as below:

Table 1. Phases of adaptation changes cycle

Phases	Description
r	Exploitation / Development
K	Conservation / Collection
Ω	Release / Creative destruction
α	Reorganization / Reconstruction

Source: (Gunderson and Holling, 2002; Holling, 2001; 1986)

The following figure is a complex representation of 4 ecosystem functions (r. K. Ω و α) along with the flow of events among them. The arrows show the speed of changes in the cycle. Short arrows, which are close to each other, indicate a slowly changing situation, and long arrows indicate a rapidly changing situation. Rapid processes greatly influence slow processes. Rapid processes cause challenges and slow processes provide continuity. The cycle reflects changes in two factors: 1. Y-axis, the potential in accumulated resources, 2. X-axis, the degree of connectedness between control variables. Low relationships are related to scattered elements that lack a strong connectedness, which are dominated by external connectedness and influenced by the changeability from outside the system. High connectedness are related to aggregate elements, which are dominated by internal connectedness among elements, the relationships that control or modify the effect of the changeability from the

outside. Exiting the cycle is shown on the left side of the figure in a special style, the stage in which the potential is lost and the probability of sudden change into a system with low productivity and organization increases (Gunderson and Holling, 2002).

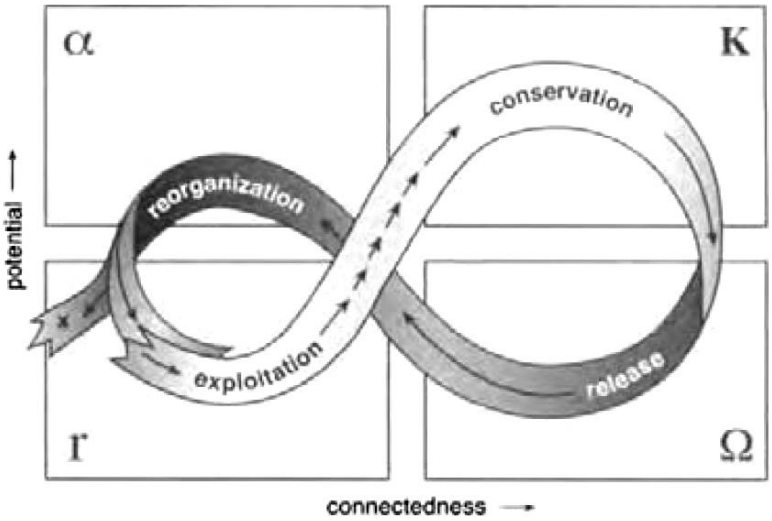


Figure 3. The cycle of adaptive changes, (Gunderson and Holling, 2002)

2.2. The Concept of Transformation

Transformation indicates changes over time and is the result of understanding the need to create favorable conditions for living, in order to grow and develop (Thorns, 2002). Transformation is life. It is the movement and motion within living creatures and the world. The movement is dependent on the place and it is defined in a relation of time and place. Changes during time and place lead to adaptation and eventually dominance that transformation and other changes occur again over time (Mishra & Pandit, 2013). The concept of transformation has evolved over time and has been defined with various meanings that causes fail to form a clear definition of transformation (Colantonio & Dixon, 2009). Over the years and in various fields of study, this term has overlapped with several concepts, including transition, change, etc. (Park et al., 2012; Rotmans et al., 2001; Gunderson and Holling, 2002; Yang, 2010). What is clear is that transformation involves a process of different changes in various dimensions, which does not have a clear link with the concepts like transition and changes; this has led to the complexity of the concept of transformation over time.

Although there is a particular similarity in the concepts of transformation and transition in terms of "change", three key differences between the concepts of "transformation" and "transition" can be expressed as follows (Yang, 2010): 1- "Transformation" is a continuous process, while "transition" refers to the change from a system to the other, dynamically in systems, which is not about the re-orientation of an existing path, but about a new path; 2. "Transformation" is processed and "transition" is considered more as a turning point and fundamental change or a jump from one mode to the other; and 3- From the management perspective, "transformation" is a planned and continuous process, which is mainly directed by stimuli and internal forces (for example, poverty, economic growth, government). "Transition" is a nonlinear change process, which is mainly carried out by external agents and stimuli (for example, fundamental changes in a political or economic system, energy crisis, and climate change).

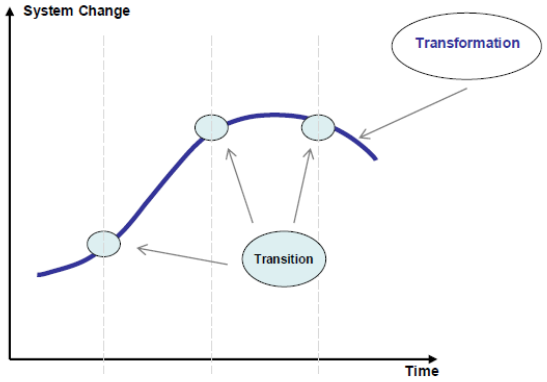


Figure 4. Transition and Transformation, (Yang, 2010)

2.2.1.The Concept of Transformation in the City

The concept of urban transformation began in the early nineteenth century, when the social, cultural and economic needs of the city changed the city by the physical factors (Egercioglu, 2016). Urban transformation can produce modifying processes in the process of urban decay (Linchfield, 1992), and to understand it much better, special attention should be paid to particular aspects of transformation and change, including time, scale, and place. (Zube & Sell, 1986). Urban transformation is a method of solving urban problems that focuses on eliminating weaknesses and considering urban growth through a comprehensive and coordinated approach (Donnison, 1993).

Roberts (2000) defines transformation and urban change as a comprehensive and integrated perspective, trying to guarantee continuous improvement in economic, physical, social and environmental conditions. He also discusses changes in employment and economy, social issues, physical decay and need to use new land and properties and environmental quality and sustainable development as the main aspects of transformation. Understanding and modifying the process of urban decay, improving living conditions in terms of general health, developing physical and social infrastructure, and identifying and solving the problems continuously, can be highlighted in the concept of transformation. Apart from the above-mentioned, planning and coordinating existing places instead of creating new spaces, as well as restoring the lost continuity in urban context can be expressed as other aspects of transformation (Egercioglu, 2016).

Different urban transformations can lead to urban metamorphosis. Slow and continuous metamorphosis, along with the transformation of the city, occurs over time (Habibi, 2015). Metamorphosis is a positive concept and implies the movement to a superior situation, while it might not be true in reality (Lotfi, 2007). Urban metamorphosis creates different cities, which can be divided into two groups of pre-modern cities and modern cities (Ashuri, 2013: 230). In pre-modern cities, culture and civilization are developed based on religion and language and lead to the formation of human nature (Ashuri, 2013: 230). But modern cities are developed based on humanity and human experiences (Ashuri, 2013: 231). According to what mentioned, the human experiences of the city are the civilization narrative of the city, the civilization formed in space and place, the civilization that is transformed and metamorphosed with fast or slow and continuous transformation and metamorphosis of urban space and places, the civilization that suggests the permanence of the city and its concept. (Habibi, 2015: 35). According to what mentioned and regarding the fact that metamorphosis occurs in specific periods of time. The present study has only addressed its conceptual perspective.

Finally, urban transformation occurs as a part of the dynamic nature of the city (Thorns, 2002) and can be planned through appropriate policies in a positive direction, and values and changes in values are defined based on such policies (Alkiser et al., 2009).

2.2.2.Dimensions and Objectives of Urban Transformation

Transformation and change occur in the city in different physical, economic, social and political dimensions (Von Wirth et al., 2016). In other words, transformation occurs everywhere, including various global structures from economic, political, cultural and social issues, to practices that are related to people's everyday life, and its goal is to improve social, economic and spatial quality of the cities, improve people's lives and improve the relationship between people and their surrounding environment (Thorns, 2002). The objective of transformation may be to increase the capacity to achieve optimal values and transformation may have both negative and beneficial results (Park et al., 2012).

Roberts (2000) suggested the process of urban changes and transformation based on five objectives: 1. Determining the direct and strong relationship between spatial characteristics and social problems of space; 2. Providing spatial needs to form the urban context; 3. Achieving the strategies for economic development, improvement of the quality of life and urban welfare; 4. Promoting urban policies based on collaborative and collective planning process; and 5. Developing strategies that provide the most suitable use of urban land, and prevent unnecessary urban dispersion.

According to what was mentioned, it can be said that transformation is a permanent, continuous, long-term process and has long and broad effects on the evolution of cities, which can result in positive and negative change. For example, transformation can be used to create a multi-storey structure in the center of large cities, reflecting new nodes in the global economic system (Thorns, 2002), or as the result of an influential urban transformation, empty spaces can be transformed to places that attract people and activities (Thorns, 2002). So it seems that identifying the objectives, dimensions and types of transformation and changes in cities is essential and necessary because now we are under the influence of urban conditions in the dominated world more than ever in the history. Therefore, based on what was discussed, the objectives, dimensions and types of transformation processes and consequent changes can be stated as follows:

Table 2. Transformation objectives according to the view of theorists

Transformation Objectives	
Eliminating the weaknesses and focusing on the growth of the city	(Donnison, 1993)
Continuous improvement of economic, physical, social and environmental conditions	(Roberts, 2000)
Creating favorable conditions for living - improving social, economic and spatial quality of cities - improving the relationship between people with surroundings environment	(Thorns, 2002)
Defining the values and changing the existing values	(Alkiser et al., 2009)
Shaping the community and establishing a structure in different dimensions of transformation	(Edwards- Schachter & Wallace, 2017; Fougere, Segercrantz, & Seeck, 2017; Schubert, 2018)

According to the studies (Table 3), transformation has different physical, economic, social, political and environmental dimensions, each of which can affect each other and be discussed in relation to many different fields and areas such as technology, behavior, culture, organization, belief, etc.

Table 3. Dimensions of transformation according to the theorists' viewpoint

Dimensions of Transformation	
Economic-Physical-Social-Environmental	(Roberts, 2000)
Economic-Political-Cultural-Social-Environmental	(Thorns, 2002)
Social-cultural-economical-physical	(Egercioglu, 2016)
Physical-Economic-Social-Political	(Von Wirth et al., 2016)

Changes related to different urban transformations can be expressed as follows:

Table 4. Types of influential transformations and changes according to the theorists' viewpoint

Changes caused by transformations	
Residence patterns	(Giddens, 1987)
Changes in the environment made through renovation and reconstruction - the emergence of certain types of services - changes in reusing the land- investment in new forms in the area of building	(Warde, 1991)
Changes in the structure of the city, urban and personal life, the relationship between individuals and communities and with the nature-changes in different economic, social, political, cultural and environmental processes - changes in public health -changes in housing - developing new forms of transport- changes in the form of city - changes in ideas, innovation and knowledge	(Thorns, 2002)
Urban dispersion - changes in spatial distances, transportation and energy consumption - traffic	(Travisi et al. 2010)
Reform and expansion of economics - motility and displacement	(Castles et al. 2013)
Changes in climate, poverty, lack of equality, social justice and community deformation	Edwards- Schachter &) (Wallace, 2017
Social changes - Smart growth	(Wittmayer et al. 2019)

2.3. Urban Environmental Changes

According to Ittelson (1978), the main component in the experience of urban areas is the experience of change. According to Ittelson (1978), cities change because people do things to change them, and we not only experience the city, but also change it, and the reality of changing the city changes our experience, too. Change is neither continuous and gradual, nor constantly chaotic, but it is episodic (Gunderson and Holling, 2002). Change periods include static periods and growing fragility, modification or collapse periods and reorganization periods for rehabilitation and reconstruction (Gunderson and Holling, 2002).

Urban changes can be interpreted as the practice of providing a solution for economic, physical, social and political problems in a comprehensive state for a changed urban environment (Von Wirth et al., 2016). A relatively new interpretation of environmental changes is based on accepting that people are seeking benefits in their surroundings, and in order to achieve them they make changes to their environment (Dandy et al., 2019). These benefits can be considered as an ecosystem of providing resources (food, water, etc.) that conserve and organize the environment, and provide culturally necessary, valuable or important elements of life capability in order to protect and improve life (Schröter et al., 2014).

2.3.1. Types of Urban Change Processes and their Consequences

According to Sell and Zube (1986), changes emerge physically in the development and reconstruction of cities, collectively in social, cultural and economic alternations in the cities, and individually with the alternations in residents of the cities, and these modes of changes are connected to a dynamic system, in which the main response to change is more and more change (Sell & Zube, 1986).

Lynch (1972, 190), "A change in the environment may include a growth or a decay, a simple redistribution, a change in intensity or in form. It may be a disturbance followed by a restoration, an adaptation to new conditions, a intentional change or an unintentional one". Sell and Zube (1986) suggested man-made changes and changes caused by the natural forces as types of urban changes. They identified three main dimensions of man-made urban changes: changes in neighborhoods (urban renovation, gentrification); Mobility, transition and displacement (For example, patterns of motion); and urban growth (Sell & Zube, 1986). Natural environmental changes may weaken social life, social relationships, self and cultural identity, and individual's mental health, which lies in certain places (Fried, 2000; Manzo & Perkins, 2006). Man-made changes, such as changes in land use, can lead to the destruction of agricultural products, wildlife habitats, and the loss of the quality of regions with

beautiful landscapes (LAI and Kreuter, 2012), or changes in increasing size, density and heterogeneity in buildings may affect social relationships and lead to more diversity and changes in the relationships of individuals (Thorns, 2002). In addition, these changes are the starting point for changes in the systems of disturbance (such as periodic fire), biochemical cycles, and other environmental processes (Dale, Archer, Chang, & Ojima, 2005). Environmental changes can occur in the form of abrupt and gradual disturbances (Bronen et al., 2009). Some of these disturbances are on a global scale and may have hybrid effects like climate change (Dandy et al., 2019).

Urbanization and the consequent environmental changes not only affect the physical environment, but also form the "imaginations and insights that individuals have about their environment, as well as their traditions, their values, and their goals" (Antrop, 2000: 258). Such changes may interfere with the connection between people and the environment, leading to psychological consequences such as feeling of loss, sorrow, anxiety, separation and homesickness (Fried, 2000; Milligan, 2003). Therefore, significant and specific changes in urban environments can cause challenges in effective links between people and places (Von Wirth et al. 2016). There are many unwanted challenges that are raised in different economic, social, ecological and health dimensions (Bettencourt & West, 2010). According to what was mentioned, different urban change processes (Fig. 5) are as follows based on the theorists' point of view:

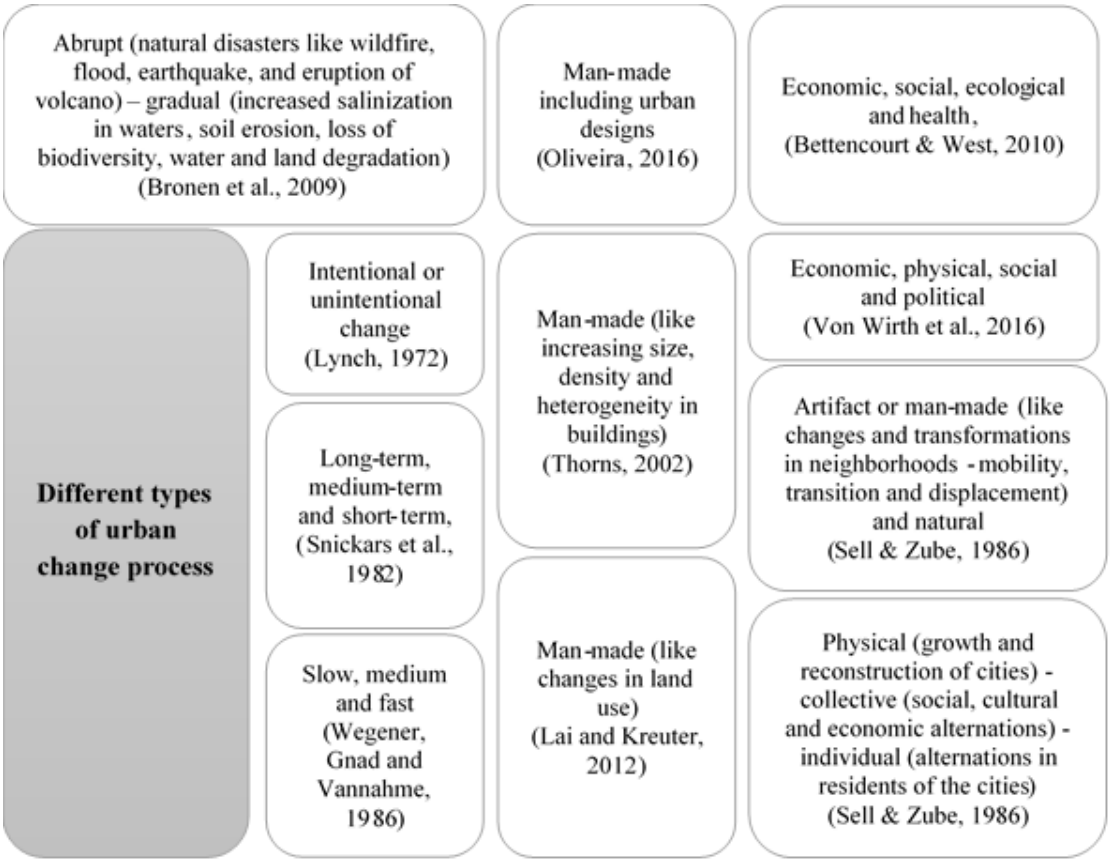


Figure 5. Types of urban environment change process

2.3.2.The Role of Scale and Time in Urban Environment Changes

Urban environment change is dynamic in nature and various dimensions affect it. Changes in space include local changes to regional changes and then global ones, and take place over months to millenniums, and from one meter to tens of thousands kilometers in distance (Gunderson and Holling, 2002). Environmental changes, in different scales, can include a room to a region, and in different contexts, neighborhoods and urban and rural areas to desert lands (Zube & Sell, 1986). So there is a

dynamic on the scale of changes, so that a change can first occur in the smallest scale of the city (neighborhood), and then expand on the scale of the city, country and the world, or on the contrary, it may appear on a global scale and then occur on the local scale. Changes in the neighborhood are mainly related to changes in certain places, usually in the city or older parts of the urban areas. Such changes focus on changing the severe conditions by the government or the private sector involvement (Sell & Zube, 1986).

Variables such as scale and time in urban changes are effective factors on individual and group perception. Each change has a time dimension too, which can be estimated on a daily or weekly basis for changes with small scale and simple context, and on an annual basis for changes with wide scale and complex context (Zube & Sell, 1986). Bentley (1999) believes that as a result of time force, the physical context of cities changes with cultural and social developments. Based on this view, historical conditions have some requirements and follow inflexible laws, and the form of the city is, in fact, a logical response to these requirements (Morris, 2006). Timing of change should conform to the minds of people residing in the given area of changes (Oliveira, 2016). The time and scale of change should also conform to each other in order for a proper perception of people and type of relationship between people and urban environment (Zube & Sell, 1986). Time is an important factor that the city's developers should take into account in implementing their plans. The actual changes are always done later than the time they are supposed to be when they are started (Oliveira, 2016). So time is effective in the process of changes. Wegener et al. (1986) suggest that urban change processes are created based on a set of descriptive dimensions and based on a stimulus-response plan. The first dimension determines the process or the stimulus. The second dimension determines which area is under the influence of change. Four other dimensions determine the type of response effected on the stock by the stimulus: the response time shows the time which is normally spent from stimulation to the first sign of response. The duration of response indicates the time that it usually takes from the first sign of response to the end of it, that is the time it takes to respond, which does its work in relation to that particular area. This time may be also called the life cycle of that area. The response level is related to the response time. The last dimension, the reversibility of the response, indicates the degree of change in the direction of the process. The table below shows the dimensions mentioned above that summarizes the processes of urban changes selected, and is organized at three levels of response time, response duration and different response level (Wegener, Gnad and Vannahme, 1986)

Table 5. Urban Change Processes

Level	Change Process	Stock Affected	Response Time (years)	Response Duration (years)	Response Level	Reversibility
1 Slow	industrial construction	industrial buildings	3-5	50-100	low	very low
	residential construction	residential buildings	2-3	60-80	low	low
	transport construction	transport system	5-10	>100	low	nearly irreversible
2 Medium Speed	economic change	employment/ unemployment	2-5	10-20	medium	reversible
	demographic change	population/ households	0-70	0-70	low/high	partly reversible
	technological change	transport equipment	3-5	10-15	medium	very low
3 Fast	labour mobility	workplace occupancy	<1	5-10	high	reversible
	residential mobility	housing occupancy	<1	5-10	high	reversible
	daily mobility	traffic	<1	2-5	high	reversible

Source: (Wegener, Gnad and Vannahme, 1986)

In another category based on time, Snickars et al. (1982), suggest long-term, medium-term and short-term processes as urban change processes. During the time, changes can be irreversible or slowly reversible (Gunderson and Holling, 2002). Considering what was stated, the time and scale of the changes have a significant relationship with each other in how to implement and perceive changes in urban environment. The scale can be considered in two different modes: the first mode refers to the scale or size of the change which, influenced by time, can be changed daily, weekly, annually, etc., and the second mode refers to the scale or the width of place or different areas or fields of the changes (for example, the areas of technology, behavior, health, etc.) that, in order for the proper and desirable perception of people, the period of time of implementing a change, with a certain size and scale, should coordinate with a scale or the width of the place and areas of change. The relationship between the time and scale of change can be interpreted as the speed of changes. For example, daily changes can be for a small scale and simple context, and annual changes with extensive changes and in different dimensions can be for a large scale complex context. Ultimately, human habitats change and evolve over different time and scales, with increasing efforts by numerous generations. Change in the urban area is a permanent subject that emerges in different types and dimensions. But better understanding of the changes in terms of types, processes, implications, etc., requires awareness of the processes of human perception and response to the environmental changes.

3.Methodology

In order to examine conceptually and find out the objectives and different types of transition, transformation and changes in the urban environment, a documentary method was used in the Theoretical Foundation Section to collect the required information and basics. The qualitative content analysis has been used to find out the relationship and interactions between these concepts. Content analysis is an analytical method for achieving valid and repeatable results from the data extracted from the text (Riffe et al., 2006). In addition, meta-synthesis method has been used to analyze the qualitative findings related to urban transition, transformation and change and their relationship. Meta-synthesis is a kind of meta-study method and a coherent approach for analyzing data. Meta-synthesis is synthesizing the interpretations of the main data of selected studies that, providing a systematic attitude through synthesizing different qualitative studies, discovers new and fundamental metaphors, and through this method, promotes current knowledge and provides a comprehensive view of issues (Sohrabi et al., 2011). As a result, based on the review of related literature and related documents in the field of urban transformation, transition and changes, this study has examined and analyzed the views and opinions of the experts and discussed the relationship between these concepts and clarity of such concepts. Therefore, in order to achieve the main objective of the research using the meta-synthesis method, the English scientific articles, published in valid journals, have been searched with different keywords related to urban transition, transformation, and changes, and the relationship between these concepts.

4.Discussion and Findings

Generally, with the studies undertaken, and meta-synthesis of the existing theories, there is no clear definition of the terms "transformation" and "transition". What is clear in the concept of transition is that in any circumstances and any types it occurs (evolutionary, purposeful, gradual and transformed), it occurs with a kind of change in form or state that can lead to a new structure or revolution and movement in the existing structure with development in different dimensions and going through the phases of birth, growth, maturity and death. In both cases, i.e. creating a new structure or revolution of a structure, transition occurs for the purpose of creating a balance (Fig. 6).

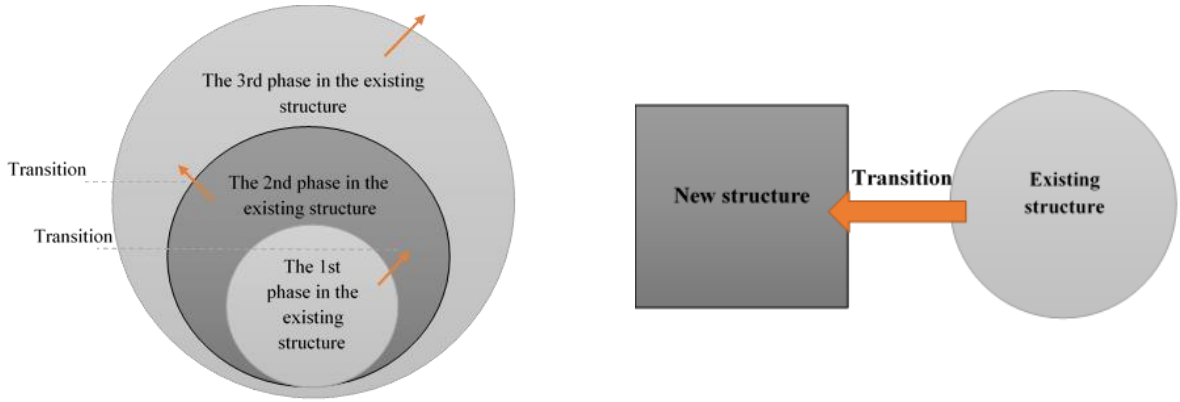


Figure 6. Transition by creating a new structure or with revolution and movement in the existing structure

Regarding the adaptation cycles, to achieve a transformed adaptation cycle, revolution and gradual adaptability can occur several times and then the system can be transformed, and eventually transition can occur. According to what was stated, a third type can be considered for transition, which consists of a revolution and then transforming the revolutionized structure and eventually transferring to a new structure (Fig. 7).

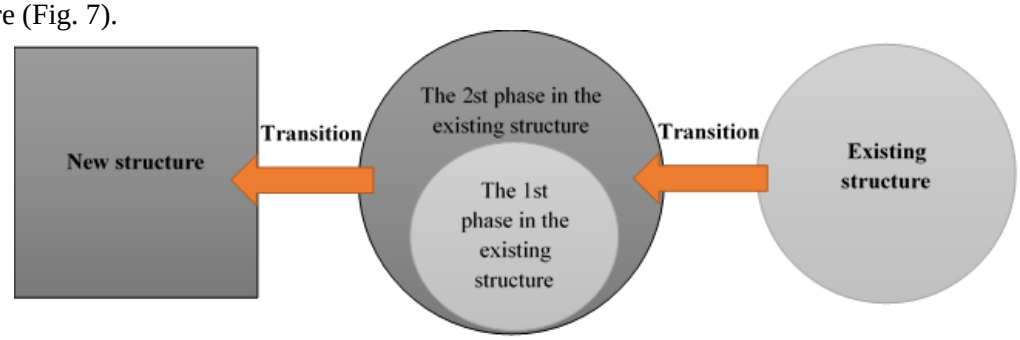


Figure 7. Transition with revolution and then creating a new structure

Transition as a complex, dynamic and indefinite system, is associated with transformation processes in which existing structures, institutions, behaviors, cultures, and practices are decomposed and then it leads to evolution and revolution in the existing structure or creating new structures. Transformation processes can be discrete and continuous and lead to changes in various physical, social, economic, political dimensions, and change occurs in the form, performance or position.

Table 6. Transition and transformation features

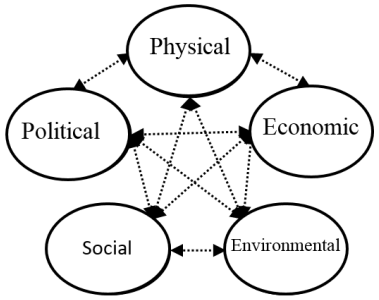
Transition Features	Transformation Features
Consisting of Transformation processes	Consisting of changes in different dimensions
Non-linear process	Having a process
Irreversible	Irreversible or reversible
Purposeful or evolutionary	intentional or unintentional
Duration of the transition of 50-25 years	Continuous process

Regarding what was discussed and their meta-synthesis, internal and external stimuli of the change can influence the formation of transition. There is no transition factor in cities, and the officials of different sections, as well as environmental factors and conditions, are very important and effective for transition into other conditions.

According to what was mentioned and meta-synthesizing the related theories, the main objective of urban transformation can be considered as promoting and developing a coherent and desirable structure in different dimensions and in different urban areas, through planning and defining values or

redefining values in each dimension, in order to form and upgrade the proper and desirable conditions of life, as well as promotion and improvement of human relationship with the urban environment. Therefore, the transformation objectives can be considered in two modes: the first mode seeks to create a new structure and the second mode seeks to promote and improve the existing structure. As it is clear, the goals of transformation are similar to those of transition, and lead to various changes. The changes made, can be categorized in four urban, individual, organizational and managerial, and ultimately knowledge and information structures, each of which with different dimensions (physical, economic, etc.). According to what was discussed, the objectives and types of transformation, dimensions of transformation, how the dimensions affect each other, the consequences, and changes caused by the goals can be categorized as follows:

Table 7. Objectives and types of transformation, dimensions and effects of transformation and different changes caused by transformation

<table>
<tr><th>Objectives of Transformation</th><th>Types of Transformation</th><th>Dimensions of Transformation</th><th>How dimensions influence each other</th></tr>
<tr><td>- Creating a new structure
- promoting and improving the existing structure</td><td>- Planned (intentional)
- Unplanned (unintentional)</td><td>Physically
Economic
Social
Political
Environmental</td><td> 
</td></tr>
<tr><th colspan="4">Created Changes</th></tr>
<tr><td rowspan="5">Urban structure</td><td>Physical structure of the city</td><td colspan="2">Changes in the built environment, such as changes in new forms of housing, land use, facade, etc. – Changes in spatial distances - urban dispersion, etc.</td></tr>
<tr><td>Natural structure of the city</td><td colspan="2">Climate change, changes in natural landscapes, etc.</td></tr>
<tr><td>Social structure of the city</td><td colspan="2">Changes in relationships of individuals with each other, the nature and different urban places, the formation of new residential patterns, mobility and displacement, changes in social justice, reducing or increasing poverty, etc.</td></tr>
<tr><td>Economic structure of the city</td><td colspan="2">Changes in investment in new forms of building and housing stock, changes in energy consumption, etc.</td></tr>
<tr><td>Political structure of the city</td><td colspan="2">Changes in various political processes and communication with other countries, etc.</td></tr>
<tr><td>Individual structure</td><td colspan="3">Changes in personal life, changes in people’s relationships, changes in behavioral and belief system, etc.</td></tr>
<tr><td>Organizational and Managerial Structure</td><td colspan="3">The emergence of new services, changes in laws related to public health, buildings and housing, transportation and energy consumption, changes in different managerial processes, etc.</td></tr>
<tr><td>Knowledge and information structure</td><td colspan="3">Changes in the idea, science and technology, etc.</td></tr>
</table>

It is clear that transformation can be the result of a planned (intentional) or an unplanned (unintentional) action that seeks to make changes and beneficial or non-beneficial consequences. Therefore, finding different scenarios of the process of transformation can largely contribute to increasing awareness and understanding of the urban environment and, as a result, developing and promoting the relationship between humans and the environment. The processes of transformation and change are essential for the existence of the city, and form part of the urban development. The status of going from an initial position to another position, as a result of the transformation process, creates a particular transit in various physical, architectural, urban development, social, economic, cultural dimensions. Ultimately, transformation is a relatively new, broad and complex concept beyond all the concepts and approaches of urban development, and lacks an explanatory theory that can cover concepts such as changes in urban environment.

Types of changes brought in Figure 5 (types of urban environmental changes) in Theoretical Foundations Section can affect each other. For example, a change in increasing the density and the heterogeneity of buildings can affect social relationships and relationships between people and different urban places. In addition, man-made and natural changes can also affect each other. As an example, a change in the volume of construction in the city and outside the city (for example, in gardens) can cause the loss of natural landscapes and animals' habitats, global warming, or an outbreak of a pandemic can change many managerial and organizational structures and regulations. In other words, change in a system can lead to promotion or disruption of another system. Therefore, in order for change to happen in a system, special attention should be paid to the conditions and fields of changes and factors affecting the changes to prevent undesirable unplanned changes. Finally, it is clear that most of the identified changes are often physical. Therefore, according to what was discussed, a variety of urban environmental changes and their relationships can be shown as follows:

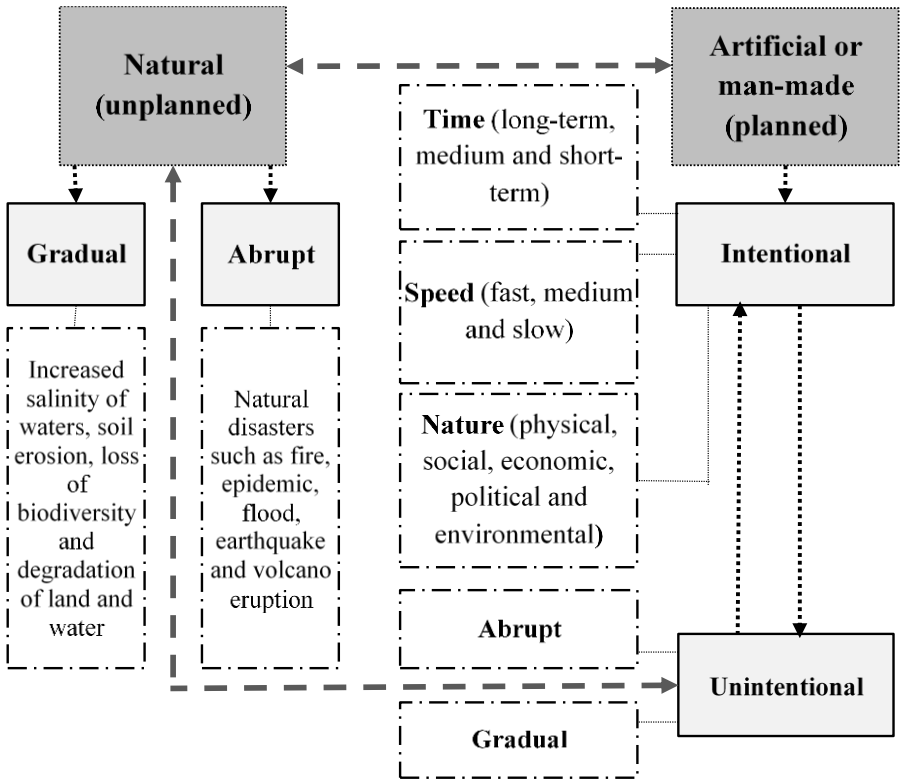


Figure 8. Different types of urban environmental changes and their relationships with each other

Using the meta-synthesis method, interpretations of main data in urban changes and discussions about them, their characteristics and objectives by different theorists were expressed for urban changes, and finally the main objective was discussed as finding a solution to eliminate the problems in order to conserve the environment, and create order and good living conditions, which leads to promotion or decay or deformation of the structure of a system. Urban environmental changes can generally be considered in two modes: the first mode is overt changes that occur obviously and are more tangible and more perceptible, and the second mode is the covert changes that emerge slowly and over time and maybe in some cases occur all at once.

Different transitions and transformations lead to different changes in the city. Therefore, it can be said that changes in different dimensions can be as the elements of a transformation. Although solving urban problems is what changes are likely to do, they can lead to other consequences and ultimately different problems if factors such as changing environment, time, and scale, as well as features and characteristics of people living in the environment are not taken into account. The timing of the changes should match the minds of people living in the area of changes. Moreover, in order to go through the process of perception by humans, and establish a proper relationship with the urban environment, the time and scale of change should be matched. Otherwise, the consequences of changes can lead to deformation, destruction or reconstruction, weakening the social relations of individuals, loss of the quality of the landscapes, etc. Finally, according to what was stated, as well as the factors and elements mentioned, it could be said that internal and external stimuli and human actors cause different overt and covert urban changes. The factors and their relationships can be shown as follows:

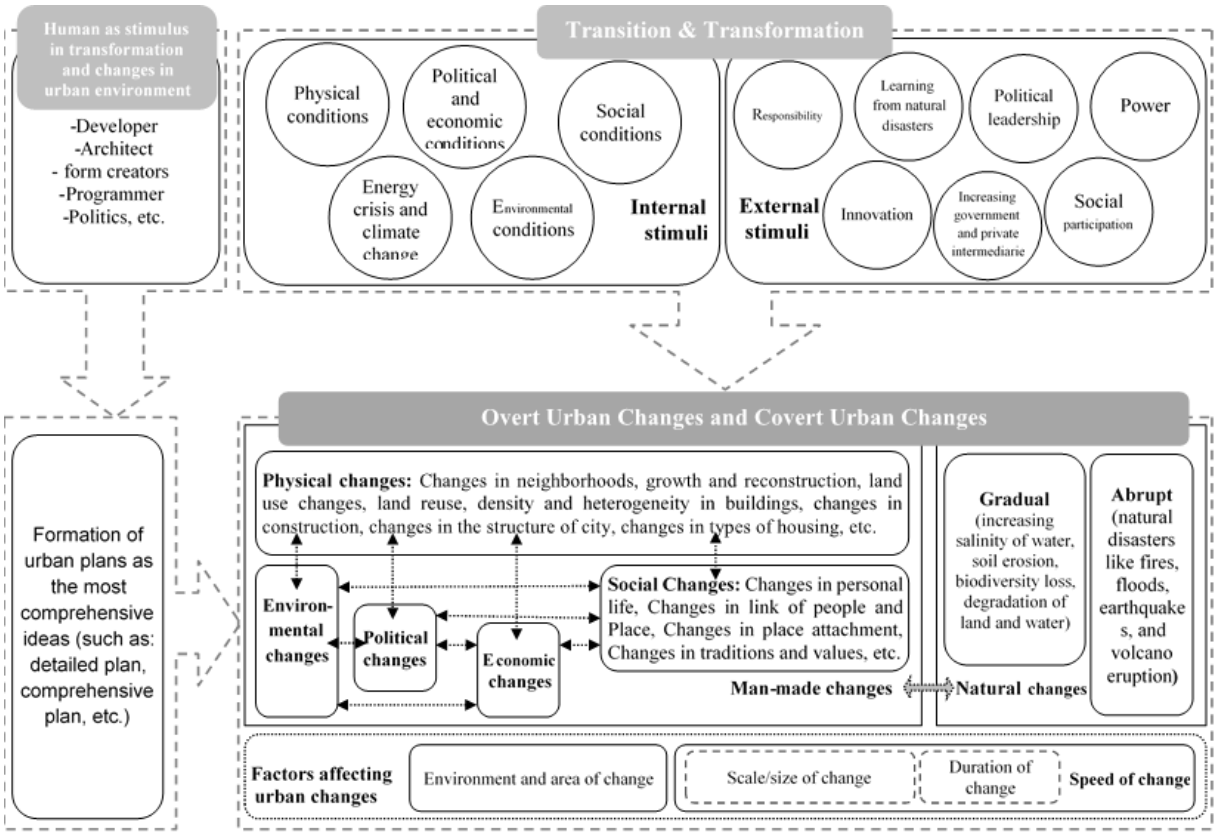


Figure 9. Factors affecting urban transition, transformation and changes and their relationships

5.Conclusion

Urban environment change and transformation in order to create favorable conditions of life is a permanent, continuous, long-term process with long and extensive effects on the evolution of cities. Transformation, as an important and necessary process for the city, consists of changes in various economic, political, cultural, social, physical, and environmental dimensions that occurs as a conscious and intentional or unintentional process, which is mainly directed by the internal stimuli and forces and can be irreversible or reversible. Transformation, as an integral part of the process of evolution of cities, leads to the movement and motion. Movement is also dependent on place and is defined in a relation to the time.

By reviewing the theoretical foundations, it was found that the concept of transformation over time and in different fields of studies overlaps with several concepts, including transition and change; however, there is no clear definition of the terms. Considering the studies and the characteristics expressed regarding these two concepts, more specific definitions of them can be found. The concept of transition can be a process consisting of the complex and dynamic transformation processes that are nonlinear, purposeful, or evolutionary over a specified period of time (25-50 years), with the main characteristic of being irreversible. Accordingly, it can be argued that transition is a kind of transformation and, mainly affected by the external stimuli and factors, influences all different economic, political, cultural, social, physical, and environmental dimensions of a system. This process occurs in a specific time and leads to a shock in transformation processes and a jump from one mode to another. The shock either promotes the existing process and structure with a higher speed, or creates a new structure, or it forms a combination of the two modes. The new structure, itself, is the context and platform of subsequent changes and transformations. Therefore, transition, as a complex, dynamic and indefinite system, can be considered as a change in a structure from an existing balance conditions to another balance in which there are different types of changes (slow to very fast).

Moreover, according to the previous studies, factors and stimuli like power, political leadership, learning from natural disasters, responsibility, increasing government and private intermediaries, social participation and innovation can be considered as internal factors and stimuli, and the external political, economic, physical and social conditions, energy crisis, external environmental conditions and climate change, can be considered as external stimuli, affecting the forming and creating transition and transformation. These internal and external factors can act as a helper in parallel with each other and affect the onset of transition, or act as a hinder in conflict with each other. This conflict continues until the existing system is untenable, and eventually transition happens.

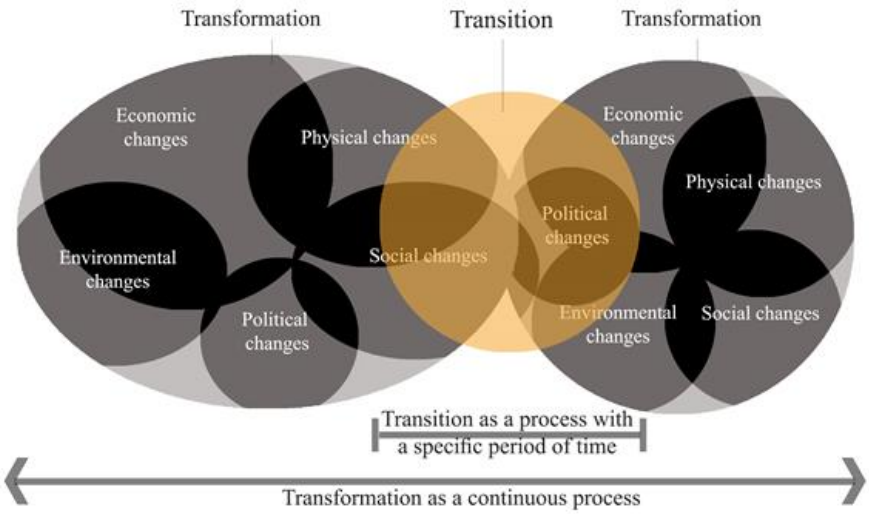


Figure 10. Relationship of Transmission and Transformation

On the other hand, as it can be seen in the picture above, there is a reciprocal relation between the concepts of change and transformation that not only indicates the impact of physical, social, economic transformations on the city changes, but also shows that changes in different dimensions can be considered as the constituent elements of a transformation. Thus, to give a general redefinition of the concept of change, it can be said that changes in the urban environment are dynamic and periodic processes, and are the main constituent in the city experience that consist of four phases of exploitation, conservation, creative destruction and reconstruction, and the ultimate objective of urban changes is solving urban problems in different human and place dimensions, although that may not always be met.

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