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Analyzing ways of transition in the pattern of urban growth

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Abstract
Today each city due to natural limitations, facilities and planning policies has different growth pattern which according to its spread, has different consequences and results. Although there is a wide range of urban growth patterns, but the important thing is not diversity and number of models but is the absence of rules and methods of transition from one to another pattern (form). So this article review and analysis ways which we can achieve this transition in the pattern of urban growth. Evidence shows that in order to transition from the pattern of automobile-dependent city (modern) to post-industrial and post-modern models, there are different approaches, including urban containment, urban consolidation policies, new urbanism, smart growth, emphasis on infill development and transit-oriented development and it is considered that the most important thing in all of them, is the relationship between land use and urban transport. In fact, the key of many compact city debates is transit-based transportation systems and urban mixed landuse that reduces use of machine and limits travel time for commuters. Also transition has multi-level perspective: first are niches (technological innovation in transport and landuse, second are regimes (regulation and governance that provides appropriate frameworks, guidelines and rules for transition) and finally are landscapes (the broader conditions, environment and pressures for transition).

Key words: *transition, urban growth, sprawl, compact city*

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1.Introduction

Growth pattern (form) of the city is one of important subjects in urban planning and one of the fundamental criteria for urban sustainable development, because it deals with land as one of the limited available resources. In the broadest possible definition, urban form includes physical structure, urban body size and population distribution within boundaries (Schwarz, 2010:30). Because of economic, social and environmental effects, urban form could push the city towards sustainability or unsustainability (Jabareen, 2006:39). Although the form of a particular city, is result of diverse influences, including location and topography, economic development and population and activities planned in the past (Batty and Longley, 1994); but the discussions always distinguish between two opposite forms: "Urban Sprawl" in North America and "compact city" as European ideal (Dieleman and Wegener, 2004; Frenkel and Ashkenazi, 2008).

It is more useful to say urban sprawl is not a pure form but it defines as a series of intensive development to fully disperse. The idea has been approved by Harvey and Clarke (Harvey & Clark, 1965).

In fact, what should be considered is the ongoing shift in the different systems of technical innovation and social change regimes (forms of government and laws and regulations) and the landscape that is reminiscent of so-called transition. (Roorda et al, 2012:4). In our country cities exit from the traditional and basic shapes as a result of past events, and have become more or less modern cities. Because modern patterns are formed on the basis of a car model; today they are scattered and it is necessary to move toward compact forms. However, if the cities, want to go from modern to post-industrial and post-modern patterns, the rules and procedures for this transition must be identified. Therefore, this paper attempts to understand the transition concept and theory and explain ways through which we can achieve this transition in the pattern of urban growth. In other words, the fundamental question in this research is as follows:

- According to the theory of transition, what does urban transition mean and how it occurs?
- Through what ways transition from sprawl to compact city form could be accomplished?

Research Methodology

This study is theoretical research based on anatomical analytical methods. Gathering data has been made from documentary method. Due to the nature and objectives of this research and the objectives, it is impossible to determine scope, location and specific geographic area. The concept and theory of transition identify according to the available documents and studies in the world and different countries, and then transition theory and possible ways to make the transition in the pattern of urban growth derived.

Concepts, perspectives and theoretical foundations

Transition

In Webster's dictionary (Webster) transition term meant "to pass from one state, stage, subject or location to another" or "move, expansion or transformation of one form or type to another stage" (Elzen et al, 2004:2). Transitions are fundamental changes that change processes or subsystems of complex society over a long period (more than a generation is 25 years or more) (Rotmans et al, 2000). In another definition, the transition is "a long and continuous process of fundamental change or a subsystem of a society where each reinforce aggregate changes in technology systems, economy, institutions, ecology, culture, behavior and belief" (Vergragt, 2006:13).

The transitions approach makes use of a multi-level perspective (MLP) (Figure 1).These multi-levels being the landscape, the regime and the niche which interact in processes of "co-evolution and mutual adaptation" (Shove & Walker, 2007). The landscape refers to the "the broader 'conditions', 'environment' and 'pressures' for transition (Hodson& Marvin,

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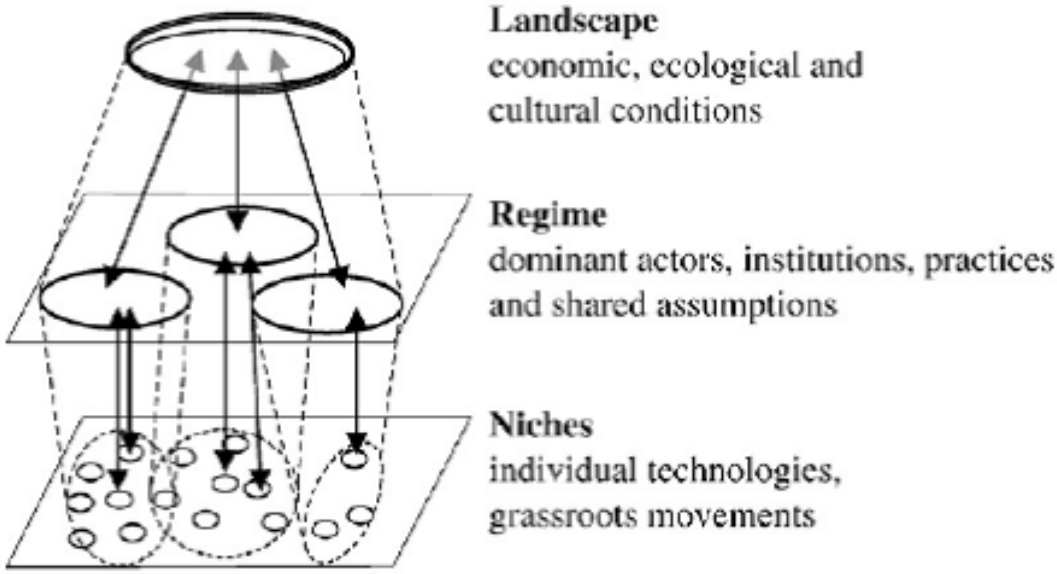


Figure 1. The prospect of multi-level transition (Nykvist & Whitmarsh, 2008,1995)

2010,479). The regime consists of the dominant "culture, structure and practices" (Nykvist & Whitmarsh, 2008:1374) governing a socio-technical system.

City Transition

The last decades a new field of research emerged that attempted to understand and explain the dynamics of fundamental, long term societal change: transition studies. From a transition perspective the ambitions of European cities to make structural changes toward sustainability represent fundamental changes in institutional frameworks, mindsets and practices (Roorda et al, 2012,6). If the city consider as a level of socio-technical functions, its transition include changes in socio-technical systems. This transition includes a set of elements such as technology, regulation, user behavior, markets, cultural concepts, infrastructure, networks, facilities and supply networks. In this context, review of some international experiences can be effective which is addressed below:

Netherlands

In 1960s, important wave of suburbanization in the Netherlands caused that "second report physical planning in the Netherlands' propose population transfer from west of country to its north and south". Other proposed options, was suburban guidance towards "concentrated deconcentration". This policy was used in Randastad Netherlands (Randstad Holland) in the late 1970s and early 1980s. Since then, the foundation of physical planning in Netherlands is compact city development. From the perspective of Floudy and Van der Walk, concentrated deconcentration policy was successful and Half a million persons moved to designed growth centers and urban sprawl stopped through prohibition of villages growth in Green Hart (Dieleman et al, 1999:609). During the 1980s, the policy of compact city development changed. The main reason for this shift was the decline of Old Town centers. Under this new policy the government tried to guide urban (re) development to the places within existing cities (brown fields) and (in later periods) to undeveloped areas (Greenfield), which were directly adjacent to the cities of Amsterdam, Rotterdam, Hague and Utrecht (Utrecht). In the 1980s, major investment has been in urban regeneration. During the 10-year period, built a total of 227,200 housing, on these locations and that were relatively compact. At the same time, restrictive planning actions protect Green Heart of urban growth (Dieleman et al, 1999:609).

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America

With the development of the interstate highway system in the 1950s, sprawl and low-density residential development in America began and getting away from the city center quickly- a pattern that continued in the last 50 years and caused increased costs in peripheral development, reduced environmental resources and consumed a lot of land and natural and energy resources. The 1990s was the decade of revision of the land reform. The latest concept of urban development control used in America is "smart growth" that emerged in this decade and its main elements are mixed landuse in compact neighborhoods, protection of open space, orientation towards transit and revitalization of city centers (American Planning Assocation, 1999) and a total of 39 states were identified as its supporters (Lorenz & Shaw, 2000).

Canada

In Canada, following America, urban smart growth is considered versus urban sprawl. Ontario, experienced the first step of the smart growth initiative in 2003 (Central Ontario Smart Growth Panel, 2003) and nowadays in spite of the criticism that comes to smart growth, has become popular as a means to improve urban development (Tregoning; Agyeman & Shenot, 2002).

Argentina- Buenos Aires

Buenos Aires is a claw-shaped city that its development program has special circumstances, so that the development of the city is considered as linear form along the Plate and Riyoyarana River and its comprehensive plan of 2000, considered the creation of new urban areas on axis tangential to build areas in that region (Abdolahzadeh fard, 2004, 47).

Sweden – Stockholm

Urban planning in Stockholm, Sweden, proposed the theory of urban development in urban corridors. Accordingly, satellite towns are along with principal axes that lead to the city center. This design follows the layout of the radial form. In this discipline, the emphasis is still on the center and all satellite regions, Are centralist despite of the deployment of some activities (Zekavat,1994:29-28). These experiences show that growth patterns cannot be revised suddenly or in a short time, and considering the complexity of urban systems, should be viewed from the perspective of transition theory and slowly and Continuous change. So the shift from sprawl to compaction is inevitable that must happen in different ways and through a transition in growth patterns. So here, different ways of transition in the pattern of urban growth are studied.

Transition from sprawl to compact city pattern

Analysis of urban form reveals the issues and challenges of urban development. In terms of policy, it is necessary to determine areas with high requirements to political interference and identify diversity of urban development. Williams points out that more compact cities can be achieved through densification existing cities and encourage people to live in cities and more compact buildings (Williams et al, 1996:83). Due to the above, in order to reduce the negative effects of urban sprawl pattern,

	Charactristic	Pupose	Tightness
Green belt	New developments are not allowed within the belt area	The permanent protection of open space or natural resources	Tightest (change in boundaries (is uncommomn
Urban growth boundary	New developments are discouraged beyond the boundary with some exceptions	Protection agricultural and open space, and cubing urban sprawl	Moderately tight (boundaries are (reviewed periodically
Urban services boundary	New developments are allowed beyond the boundary without provision of services	Minimizing the costs of public services with a service boundary	Least tight (more flexible (changes in boundaries

Table1. comparisons of different policies of urban containment and their purposes,Source: Wo, 2007:12

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planners have insisted on the following:

Urban Containment

The following table compares the different policies of urban containment and their purposes.

Urban consolidation policies

Urban consolidation policies in general, including the following four:

1.Construction in pieces of unused land within the city (infill development)

2.New Breakdown of residential parcels suitable for countries that have a history of large parcels of housing.

3.Reduce the size of minimum level that allowed for Residential segregation piece in landuse plans.

4.Allowing to construction of medium density housing in areas that previously according to comprehensive plans had been predicted for low-density housing (Azizi, 2007, 54).

New urbanism

The basic pattern of New Urbanism is defined based on traditional neighborhood development (TND) but nowadays is also taken into consideration to transit-based development (TOD) and also discussed liveable neighborhood pattern, that mix together two basic patterns. In pattern of TND, the main unit is neighborhood approach that is designed in such a way that more houses have three-minute walk to neighborhood parks and five minutes' walk to central common space or square. In this view, the design of each phase is place of various types of residential and income groups. The pattern of transit-oriented development is a dense and intertwined neighborhood that mix shops, housing and offices in a compact area with walking distances for commuters and Located near the transit station (Danesh and Mozhdehi,2008). This type of public transport have very high density of population (at least 14 housing units per acre) as well as commercial landuses around the center of transport so more attention has been paid to Vehicle traffic and pedestrians. The liveable neighborhoods pattern incorporates features of TND and TOD. This concept is defined as amended of small unit's model. Australian liveable neighborhoods have pedestrian routes which for decentralizing is located along main passage ways, such as TOD. But in fact, neighborhoods are located along Regional pathways. As TND and inconsistent with TOD, pedestrian routes are in the circle with a quarter mile radius. As TND, the advantage of this model is high rate of neighborhood areas covered by sidewalks (guide et al., 1392:32-35).

Smart Growth

Another model to achieve a compact form, is smart growth strategy that its root is in sustainable development (Kashani Joo and Mofidi Shemirani,2009:11) and includes characteristics such as high density, mixed land uses and Reliance on walking (Chen & Lau, 2007:28). Smart growth strategies led to the creation of new, attractive safe and healthy neighborhoods and provokes economic growth in the addition of environmental protection (Saidi Rezavani & Kazemi,2011: 116).

Infill Development

According to Wilson et al (2003), infill development is determined "by undeveloped pixels which Converting to land use and there are at least 40% of developed pixels is around it ". Also it can be defined as a small part of the land that is surrounded by urban landuses. According to ELL Man, infill development policies are policies which attempt to encourage infill development and construction of buildings in the vacant lots in the area, and usually occur in places where there are facilities such as sewer, water and road.

Infill development includes use and construction in vacant or virgin lands of urban and suburban areas for housing, commercial, public facilities in the context of developed regions. Among the elements of infill development can be referred to Re-use of available buildings, infrastructure and spaces, Regeneration to poor neighborhoods through the creation of social and communication spaces, construction between existing tissues, rehabilitation of

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historic buildings, protection of signs or public squares (Meshkini et al., 2010:182).

Transit-Supportive Development

Transit-oriented development means creating a community where residents can pass between work places, housings, schools, shopping centers, restaurants, parks and other recreational and commercial facilities by walking, cycling and public transport as well as if looks to maximize the density, pedestrian-friendly urban environment and civic spaces (Meshkini et al., 2010, 182). However, in today's world, public transport-based development is known as one of the best types of development, but it is not an end to the present problems of cities, but the it can be a beginning for improve the current situation.

Conclusion

Urbanization is determined by fundamental changes in physical focus of population, in nature and scale of economic production, in landuse and in social structure and their interaction patterns. Changes in all of these aspects affect person's life and the need for resources governance. When the industries and services become more important, they need more infrastructure, production technology and exchange information and provide other options. Dense settlements lead land and wealth toward housing and related infrastructure. The earth developed more and as a result of its spatial layout, influence on availability, physical contact between the communities, interacting with the surrounding natural environment (including agricultural land around the city), and fixed costs of infrastructure networks. Throughout this transition, families and communities affected deeply: more women work outside of home, children face with different opportunities and risks, mixing cultures, diversity of ideas and differences in wealth becomes more apparent. Urban transition translates to various urban settlements systems in different countries. Every city and town in the country shows dissimilar output of extent and nature of poverty, wealth patterns and growth rates of employment, spatial distribution of residential and commercial areas and in quality of environmental and cultural. What is certain is that transition from current urban systems that has led them into unsustainability and imbalance, is necessary. In this regard, the orientation pattern of growth must be considered as one of the main frameworks. For this purpose, according to the results and consequences of urban sprawl, transition from sprawl toward compact is certain. But it should be noted that transition ways and strategies of compact are diverse and include urban growth strategies, national and local transportation politics and etc. compact Strategies include urban structure or a comprehensive plan that gives priority to compactness, large blocks, open space or triangle green space near the urban neighborhoods and emphasis on infill development and more efficient use of derelict inefficient land within city core and higher mixes and integration of functions.

It should be noted that in all the various ways which this study reviewed and in an effort to achieve sustainable cities, the most important issue that is mentioned, is relationship between land use and transportation within the city. Change in attitudes about land use planning and urban transport is new paradigm and a fundamental change is taking place in landuse and transport planning. In this context, traditional land use planning that was based on the principle of "separate landuse" and in transportation based on "movement" is in the transition toward a new paradigm that in landuse follow the principle of "mixed landuse" and in transit follow the principle of "accessibility" and in fact the key of many debates on compact, is transit-oriented transportation system that avoids of car use and limits travel time for commuters. The point that should be noted is that based on multi-level perspective of transition, transition in these systems need for technological innovations that has good progress in current world and has been made a lot of innovation on the one hand. But on

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second level requires regimes, regulations and governance that should be provide appropriate frameworks, guidelines and rules for transition and finally are landscapes (the broader conditions, environment and pressures for transition).

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