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Theory and Practice of Spatial Planning

CAUSES AND CONSEQUENCES OF THE CYCLE
OF CHANGES IN URBAN MORPHOLOGY:
URBAN THEORY AND PRACTICE

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Velimir Stojanović: VZROKI IN POSLEDICE CIKLUSA SPREMEMB V URBANI MORFOLOGIJI: Urbana teorija in praksa *CAUSES AND CONSEQUENCES OF THE CYCLE OF CHANGES IN URBAN MORPHOLOGY: Urban Theory and Practice*

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IZVLEČEK

Ciklusi sprememb v urbani morfologiji imajo zgodovinsko razsežnost, ki je povezana s tistimi tokovi preteklih sprememb, ki s svojo močjo in učinki vplivajo na spremembe preteklih in sedanjih morfoloških pogojev, z mislimi na prihodnost. Tokovi preteklih trendov praviloma niso tesno povezani z urbano morfologijo, razen v redkih primerih. Dinamični učinki v prostoru pričajo o odtujitvi tokov in o vrsti njihovih notranjih dogodkov, ki se po navadi odvijajo ne glede na vzroke in posledice – so učinki zamisli, interesov in ciljev, ki delujejo na podlagi stanja urbane morfologije, tako njenih delov kot celote. Članek predstavlja cikel vzrokov, razlogov, vplivov in posledic sprememb. Prostorske raziskave so obravnavale urbano morfologijo, strukturo in prisotnost reda/prostorskih pogojev v teoriji in praksi. Ciklusi sprememb, kot se kvantitativno in kvalitativno izražajo v prostoru in času, zato ne vsebujejo le algoritma dogodkov, saj se matematični, abstraktni izraz/abstraktna oblika ter objektivna in vizualna predstavitev te abstraktne oblike lahko izražajo in predstavljajo na veliko načinov.

KLJUČNE BESEDE

morfologija, cikel, sprememba, vzrok, posledica, pravilo

ABSTRACT

The cycles of change in urban morphology have a historical dimension related to those flows of historical events which with its power and influence effect the change of both past and current morphological conditions, with the set of thoughts in the future. These flows of historical trends as a rule do not have a close relationship with the urban morphology, except in rare cases. The dynamic effects in space tells us about the alienation of flows and the nature of their internal events that usually do not care too much about the consequences and cause – effects points of their ideas, interests and goals, acting on the state of urban morphology, as in parts and in its entirety. This paper presents the cycle between causes, reasons, influences and consequences of changes. Spatial research was made through urban morphology, structure and the presence of order/ spatial conditions in the theory and its practise. The cycles of change, with their quantitative and qualitative expression in time and space, therefore do not have only the algorithm of events, as mathematical, abstract expression/shape and objective and visual presentation of this abstract shape can be expressed and displayed in many ways.

KEY-WORDS

morphology, cycle, change, cause, consequence, rule

1. INTRODUCTION

When change happens to urban structure, its occurrence is related to certain precise time – space frame. The change is caused by the action of those influences that can be observed, measured, recognized and which then turn into wider influences, acting on the surrounding structures and structural systems. The change has its beginning, its development period and its end. All changes with their beginning, development and end have their own causes, reasons and effects. It is the most logical and the most visible form of change. Behind that obvious form, there are much less visible and seemingly illogical flows of change of what exists and what is defined as an existing condition. The divisions of impacts are determined by their nature and type. Without that basic definition it is impossible to understand where change comes from, what consequences it brings and whether it is justified or not? The main characteristic of the urban structure is dynamism. The dynamism is conditionally taken as the static state and immutability. Change is, therefore, a phenomenon that eliminates this appearance and where the dynamics is necessarily confirmed as the basic nature of the structure, function, and the form of urban order. The impacts, causes, reasons and consequences which conditionally convert the static state into dynamism are present in every moment. There are no changes without causes, reasons, influences and consequences, regardless of whether they are known and understandable to us or not. How the causes, reasons and consequences of the changes, as well as the very change that happened, will be understood, is not just a question of causes, reasons and consequences of the changes, but also our ability to understand and realize them. As part of this relationship, known and unknown, comprehensible and incomprehensible, there are all other relationships that reflect the variability of urban reality, first through time and space dimension and then the other.

2. CAUSES OF CHANGES IN URBAN MORPHOLOGY

2.1 The nature and type of the change causes

The aim of the display of nature and type of change causes would be a scenic overview of the time-spatial flow change (transformation) without interruption and punctuated fragments. Any break in the development of urban structure is illusory. Urban structure develops continuously irrespective of how we treat its objective development. Urban legislation may, in different levels, attempt to control or prescribe the development but when, for whatever is the reason it does not do that, urban structure shall develop. Thus, the morphology of the city will be continuous variable category, whether we like it or not. It may be said that the lack of the law creates a law. All that is done in a city, sooner or later, or better said immediately, sets new laws of behaviour, conditions, development, trends, directions, growth dynamics, etc. These newly formed parameters may not be immediately visible, strong and influential, but will eventually come to the fore and thus lead to finding the answers to their presence. Nature and forms and mostly the structure of these laws remain largely hidden and unknown, and it is the biggest problem of architectural and urban analysis. That problem is moved from analytic to everything that has anything to do with urban analysis. Detecti-

on, presentation and definition of those laws are facing us with complicated formulas of relationships in quantitative value levels, which seemingly have no end. We can only give certain frames of observation and grouping of these relationships, which has been done up to now, but we cannot give the final form for the calculation of all the events in such a complicated set. Today's analysis capabilities supported by the most modern information technologies and techniques allow for deep penetration into an intricate world of real dynamic image development (transformation) of the city, but still not for a reliable formula of its behaviour.

The change in urban structure is natural, expected and inevitable process. It is defined in many ways depending on the fact what is sought for and found in the process of the change. Kropf (2001, p. 31) says: „The common point shared by these different kinds of change is the notion of a formative or transformative process. Allied to that notion is the explanatory strategy that we see now or at a given time is derived from what came before. To understand the end, or intermediate, result of a process – a building or town – one must examine and understand the process of formation.“ In many phases of the development of contemporary urban structure, the definitions and descriptions of the process were followed by chosen methodological approaches that were mostly connected to scientific and critical apparatuses of historical data, theoretical settings and logical methods of analysis, to the following of changes in a real structure, and by using contemporary methods of virtual modulation. The use of different methodological approaches has an important impact on the result itself and the outcome of the research. It is difficult to determine without deeper analysis of the economic, political and social spheres, as well as everything else that may occur as a factor of influence, which of these impacts is dominant. Speaking about the paradoxes of postmodern, Elin says (2002, p. 164): “The main feature of postmodern urbanism is contextualism (historical, physical, social and mass – cultural) which is exactly the opposite of termination of modern urbanism with the past and the spirit of the city. When adjusting to context was achieved in urban design, it was usually successful. In most cases, contextualism is not fully achieved due to political and economic constraints, remains from the past, failures of urban designers (who were just giving false statements about contextualism as they ran for their personal interests) and other reasons. In short, these objectives usually prove unattainable because of ironic errors of urban planners to recognize the broader context in which they build. When contextualism is not reached, the initiative of the urban project is usually not estimated (it is unsuccessful) except in certain cases where people themselves believe that the space is historically, physically or socially contextual (even if it is not) or do not care about it because space has success for other reasons, such as standard of living, which offers prestige and/or its location.”

The basic approach to every change of physical structure of the city that is seen by many exclusively as a change of the form is in spatial - planned decision-making. This is best seen in the environments that are in the process of an intense economical development, but basically relates to the developed economical-urban environments as well. From this directive matrix, all other results related to the system, organization, function and at the end the morphology and form of the city arise. The morphology and the form

is a noticeable image of what is previously entered into them. Analyzing the development of urban structures in Brazil, Neto and Moreira (2002, p. 4-5) show the following organization of the procedure: „As stated in every master plan, a joint urban operation law must contain the following minimum elements: delimitation in the intervention area; purpose of the urban operation; basic programs for area occupation and interventions; study on the impact in the neighborhood; economic and social programs directed towards population directly affected; counterparts to owners, permanent users and private investors; the way to control the operation, which must include civil society representatives.“

From this, we can conclude that the changes may, in the most essentially possible way, be divided on:

- Unavoidable changes (which are a consequence of impacts, causes and reasons of the objective nature and the forces that cannot or may very little be affected by man, because they are outside the sphere of his power influence...)
- Changes that can be controlled by plans and other means and procedures, and which make up the largest part of the area of variable, no matter how we assess and evaluate them,
- Changes that do not need to happen, but that happen because particular interest factors present them in that way, typically as changes belonging to one of the above mentioned groups. That is a group of changes that are usually called the apparent or even false and that camouflage and conceal the real changes and their existence.

The complexity of the structure, levels, not only physical but also functional that lead to the form, require a deep approach of the analysis that is not related only for the architectonic urban sphere as a technical-technological category. Doevendans et al. (2014, p. 38) state the following about this: „These tendencies determined morphology and typology of the modern city. This will be shown from a theoretical and practical perspective. The presentation will focus on: I) how above mentioned assumptions led towards a design method of modularization, which had radical consequences for morphology and typology of the city. Modularization was applied on different scales, such as functional zoning at the scale of the city, formation of neighborhood units on district level and so called stamps at the level of allotments. The concept of the dwelling unit figured as a key word; II) examples of morphological modularization at the level of allotments taking the strip as point of departure, theoretically in the creation of stamps as morphological and social building blocks for the modern city, aiming at the creation of society.“

2.2 The consequences of the causes of changes

Each change, whether justified or not, has something in its cause, reason and consequence which we might call the influence power centre or central starting point for change. After that, in accordance with the nature of the change, follows the development phase of change and the end of change flow and its impact. Full change flow from its starting point or source to its end represents is duration. It is relative and not always clearly

defined and specific phenomenon, because the period of change duration relates first to the time in regard to the physical structure, function, and in the end form, while other indicators and meanings are either lost or not taken into account. The centres of power or influence (sources) of changes can neither emerge nor vanish without leaving their consequences, no matter what they are, somewhere in themselves, in their own time and space, to affect the creation of new centres of change. This means that it is not unlikely that any change that affects the creation of others, was itself created under the influence of some other change (changes).

It is understandable that we are interested in the character of such evolutionary cycle, apparently continuous, as well as in how it looks like and whether it includes (meets) all visible architectural and urban space in time or not? The first thing we can imagine is something like a linear stream of changes in space in time where one occurrence replaces another (figure 1). However, since neither the space nor the time or movement in them are exclusively linear and represent a multidimensional time – spatial continuity, the changes themselves are not linear but time – spatial. They do not happen by simple formula of the end of one and the start of the other change, but they are already multiple connected not only in the beginning and in the end, but in every possible time – space time. So every time – spatial moment of urban space (time) represents a potential change (its beginning, the end or, most often, the flow of influence) and whether it is really so we have to determine in the analytical procedure. Sources (centres) of influence, their flows and their end are not defined by a logical and easily calculable order which is always understandable and close to us. They are defined with no doubt, by complex laws of causes and consequences which must be presented in a way that suits us in order to be comprehensible. This imagery should not be a problem if we know the principles and the laws by which the changes take place and their basis in mathematics – systemic relations, in the form of the adoption of system constraints and urban legislation, the location information of urban statistics, in the form of visual and aesthetic experience of urban transformation, etc. Impacts and their complex interconnections are the most similar, technically speaking, to developments in the areas of dynamics (fluid dynamics), but they necessarily contain in themselves a number of sectors that characterize the profile of urban morphology.

This saturation of the impact of changes and their flows may be studied in the following sectors:

- Sector of general science of space and professional approach,
- Sector of the city morphology,
- Sector of area planning process,
- Sector of geostatistics,
- Sector of urban (political),
- Sector of urban sociology,
- Sector of urban philosophy,
- Sector of urban psychology,
- Sector of urban history, revitalization, protection and restoration,

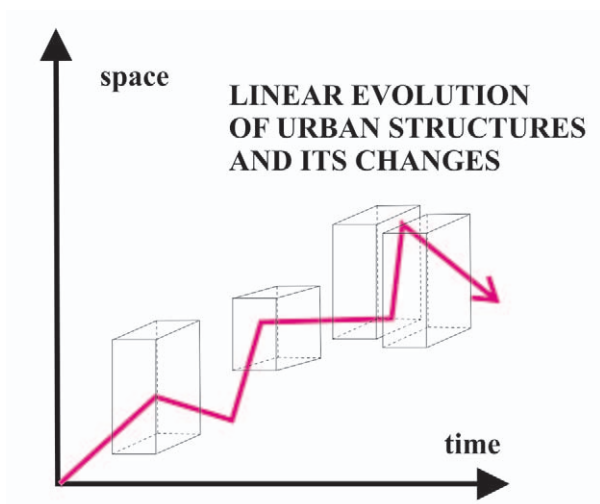


Figure 1: Linear evolution of urban structures and its changes (source: author).

- Sector of urban ecology,
- Sector of planning and design,
- Sector of technology and technological materialization (production) area, and
- Sector of general urban informatics and model simulations.

Layering, interactivity and permeation of the influences led to the conclusion that the form is the origination and the final result and not the abstract goal, cause and the reason for its own emergence. The introduction of multiple parameters that are by their nature different was explained by Lynch (1960, p. 9): "Since the emphasis here will be on the physical environment as the independent variable, this study will look for physical qualities which relate to the attributes of identity and structure in the mental image. This leads to the definition of what might be called imageability: that quality in a physical object which gives it a high probability of evoking a strong image in any given observer. It is that shape, color, or arrangement which facilitates the making of vividly identified powerfully structured, highly useful mental images of the environment. It might also be called legibility, or perhaps visibility in a heightened sense, where objects are not only able to be seen, but are presented sharply and intensely to the senses."

In such variable relationships there is no empty space and places where nothing happens and which are entirely exempt from the impact of changes (figure 2). Yet there is a fundamental division and it was reduced to:

- Urban areas of major events,
- Urban areas of peripheral events.

Peripheral zones, which are distant from direct ones and depend on indirect impacts of changes, but in which the changes leave traces, can be called zones of smaller or larger unintended uses, according to the nature of impacts and consequences.

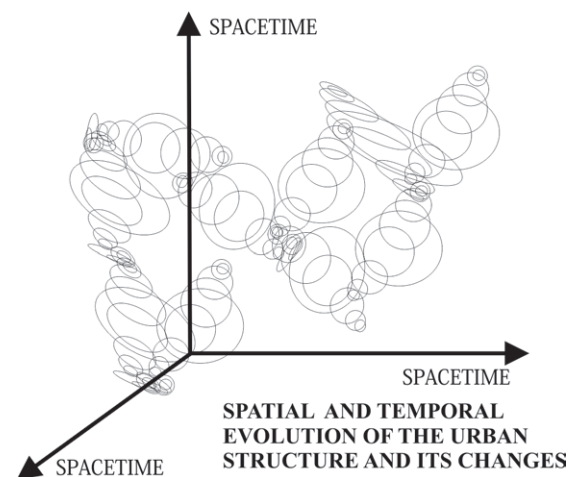


Figure 2: Spatial and temporal evolution of the urban structure and its changes (source: author)

Starting from the simplified displays of changes, we come to the question of what the centre of influence is, how it turns into a sphere/field of influence and how such centres and spheres of influence continue to establish their interrelationships and what their inner nature can be?

When a centre of influence appears, it begins to build around itself a sphere of influence which includes the existing field, and has a time component. Such a sphere of influence, together with its driving centre permeates (bumps into) other similar spheres in terms of its development activity and influence within its domain, giving a dynamic, flowing, interactive whole, seemingly unpredictable in its further behaviour. The dynamic interplay of influence is not the same in any moment, it is not only the form which is constantly changing and transforming, but its cause-effect essence. Emerging, expanding and exerting their influence, centres and spheres of influences weaken, and in those peripheral areas that we call peripheral areas of the event, they create new conditions that consequences can make the new centre of influence with its sphere! That is why the movement of the urban sphere, although measured, planned and orderly directed, is full of controversial movements and unpredictable events.

Relating to this kind of relation of the physical and psychological influence on the structure of a city Markus and Colding (2014, p. 9) deepen the whole range of inter-relations and say: "In spatial terms this again points to the fundamental role of our generic model of spatial connections and discrete spaces, where the more segregated spaces can work as pockets of memory for survival in crises and from which the system can be retrieved if the right connections are present. In extension, the specific configuration typical for a particular ecological or social system, or a combination of the two, can be reflected and manifested in the concrete configuration of the urban spatial system, which thereby can be said to carry memory and even knowledge about this particular system. In contrast, if such spatial support of the system is not allowed it will be more difficult to remember." With creating

different spatial configurations, urban design can be a memory of particular situation the system is designed for. "In a resilience framework we can come to a general conclusion, saying that a high degree of spatial redundancy, as defined above, promotes self-organization but decreases the degree of memory written into the system, while a low degree of redundancy works in the opposite way" (Markus and Colding, 2014). The vision of the city as a complex single change in the chosen time and space this way gains a necessary dimension of a contemporary multifunctional and multiformal change with an ecological dimension. Multifunctional and multiformal change is a new field of the work of the architects and urbanists and at the same time the field of the creation of new tools, methods and procedures of architectonic and urban analysis. Some of them already exists and they are based precisely on the previously stated results. Thus Sidjanin (2006, p.66), explaining the way of movement of the functional model of an object-oriented system of data banks, that can be applied in architecture and urbanism, says: "A structure of the space hierarchy of an urban environment and its comprehension, based on the Lynch's theory of urban forms and his concept of cognitive mapping is developed for Design Tool." The space hierarchy key starting point of this development process consists of two types of elements, physical structures and psychological elements with forming the cognitive mapping of urban environment.

3. CAUSES OF CHANGES IN URBAN MORPHOLOGY AND URBAN FORM

Urban form is not, within such vision of urban structure behaviour, something that could exist by itself and for itself, on an abstract level beyond all cause-effect relationship in the way of start – development – end – consequences of the urban structure changes. There are opinions, both in theory and in practice, which would like to show architectural and urban form just like an abstract and independent phenomenon, but these gain less seriousness in architectural and urban analysis. Referring to the case of Deol Declaration from 1963, Radović (2005) confirms that the environment of our time does not adjust to the dynamic changes of the twentieth century.. The author further notices two contemporary tendencies - a natural one, where people accept the town more as product of development than the creation, and the second, where many people believe that today we have more opportunities to build a living dynamic system, and concludes that, in order to understand and then build a city as dynamic (flexible, adaptable, changeable and even ephemeral), serious social changes and new forms of life are necessary.

Architectural and consequently the urban form occur as part of the process of internal change, which then, as its name suggests, is displayed as the product, the product of that process. If anything is autonomous and independent in architectural and urban forms in relation to the process of change, those are some flows of its further survival or life in time and space that can be separated from the existence of other change parameters, but it is not just the feature of the only urban form. The urban and architectural form follows the cause of its creation. Form can be presented as something that has no close ties to the cause but the connection can always be found. In the history of architecture and urbanism there are many examples of sudden and rapid impacts and changes that were well accepted over time

even though they were initially questionable and problematic. It is difficult to accept the sudden change of urban structure when there is no reason for it. It happens and we react to such changes. However, regardless of our reaction, structures of this kind tend to remain and then the question of their subsequent fitting into the current situation arises. Subsequent acceptance of the problematic structure is asking original and new way of urban action and behaviour. The method is, however, known from earlier - suddenly changing the character of the planned structure in whole or in part, without taking into account the historical content and the value of inherited environment, under the pretext of economic and other needs of environment development. Such changes are not followed by proper analysis of the previous, current and future content, and newly constructed structures usually fail even to justify their existence for a longer period of time. It is not rarely that they are never fully formed, or, if formed, take on elements of the structure and forms which are completely different from the imagined and planned. The synthesis of such changes and consequences, particularly in European urban history, is not easy. Considering the impacts in Europe, Benevolo (2004, p. 10) argues that the problems of physical forms, which originate from various combinations of geographic and historical factors, are associated with documents encompassing diverse fields, difficult to store in a single head and too complex to be formalized as an instrument; these, however, may easily be reduced to a few conceptual categories.

Following the formation and transformation of urban form, imagery that is constantly changing in front of our eyes, causing in us and around us different reactions, we actually read deeper structure, system and organization of the phenomenon of change, its beginning, development and end with all its reasons, causes of justifications and the consequences, accepting the form as a kind of record and the manuscript. Below this record there are parameters that form the natural logarithm of events by which urban structure constantly lives. We generally do not know, do not recognize or at best insufficiently respect the natural logarithm while creating our artificial ones, linking them with natural, considering that if only the natural laws of events are to decide what will occur in some places and how it will look like, urban lives will become a frightening automation without the participation of the human factor. Zite's (2006, p. 27) observation about the construction of a city, which should be both a matter of technique and of art, may be added to this point: "Only in our mathematical century the problem of expansion and renovation of the city became a purely technical issue." Fortunately, with the time people understood and accepted that the art is an inseparable segment of the same natural algorithm.

Since the quality of the space is consciously and unconsciously recognized, its achievement would be the final goal (or one of them) given through the use and the presence of details created on the basis of experiences. A successfully shaped space, and elimination of mistakes that are constantly repeated would be the final results that arises from this work, a successful place that creates a sense of peace and pleasure as a planned and project mixture of well-chosen elements and assemblies. The Guide for urban design (2008, p. 30) refers to the correspondance of the proposals to a concrete location and its context, and the type of project. "Whether it is only about the filling of the space, expansion of the previous region of the city

or the project of urban renewal and regeneration... the key of everything is appropriateness, a timely assessment of the factors that will probably affect the feasibility of the project will represent the foundation for the design solutions and checking."

4. CONCLUSION

The basic elements of the morphology of a city and their typology, through the change of ability and relative stability, through the ability to plan and implement, but also through the abolition of border between spontaneous and planned, create dynamic picture of urban structure that is never still. The morphology of a city, in addition to its physical appearance, is also a complex expression of social totality. The change in urban structure is not only a simple physical event in time and space; it already contains reasons and goals of spatial planning, spatial levels and time phases, various classifications and systematizations in the process of planning the urban community. Creating and designing complex compositions of buildings in the environment requires identification, collection and use of a number of different types of information and meanings, from material and physical elements, through economic and legal criteria, social contents, psychology and culture of urban life, to art and aesthetics. The point of this approach to urban, spatial structure is to enlighten the complicated relations of elements and systems through learning about the principles of organization that operate through them. We are looking for the causes and consequences of transformation, its genesis, regulation, self-regulation and thus entering the world of many processes in which the natural codes and methods of human intervention collide. The final product would be the ability not only to detect but also to use information and use a series of segments which would be, as a continuous variable and important cells of information, used for better planning of space, time and place as basic ontological determinants of a city. For this purpose, contemporary forms of IT infrastructure which operates with spatial and temporal attributes, numerical data and time sections would be used. Computer applications, today present in many areas of life, would be unavoidable in future construction of architectural and urban space and creation of new conceptual contents.

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