Sustainable planning and development of city centers

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Abstract

This article is focused on mapping the main typical problems of city centers, under the dynamic circumstances of this era, and introduces a sustainable planning and development (SPD) approach to city centers. The article is focused mainly on a comprehensive and integrative point of view, rather than on one aspect of sustainability. In this framework the skeletal components of the city center are introduced and the strategic model is identified as the most suitable model of the planning models included in planning theories. In this framework the strategic model is introduced as relating to city centers and different fields of activity are also introduced. In each field the main aspects of sustainability are stressed and possible directions for the future are outlined.

1 Introduction

The city center is one of the most important elements of the urban fabric and it usually includes the oldest residential area [1]. It can have many important roles at the regional and even the national level: historical, memorial, commercial, social, public, cultural etc. Structural failures of the city center may influence the total functioning of the city in many aspects, and may have a negative impact on many other systems. Various processes and dynamic events in this era such as: globalization, massive consumption, population growth, immigration and others, expose city centers worldwide to different kinds of threats, which can be destructive to the whole urban and regional systems. For this reason a sustainable approach to city centers is needed. It is possible to see this effort as part of the effort of the international community that addresses issues such as urban sustainability [2] and sustainable urbanism [3].

Adjunct staff
2 City centers – structural failures and problems

2.1 Selected structural failures and problems of city centers

City centers today face many different failures. Although each case has its own characteristics, it is possible to identify a few typical problems such as: air pollution, transportation difficulties, visual damages, etc. But in addition to these “normal problems”, other problems may be noted, which usually occur successively (based also on the Israeli experience):

**Commercial sprawl from city centers to peripheral zones** – City centers lose their commercial hegemony, when big new malls are erected outside the city centers and large-scale commercial sprawl begins to take place. These big malls offer impressive diversity of products and act as strong magnets. These centers, which are usually located near highways and accessible places, may be open many hours during the week.

**Failure of the commercial system and penetration of low-image commerce** - The commercial sprawl outside the city center reduces commercial diversity and destroys the intensiveness of the city centers. Certain places are neglected and other businesses are unable to exist. In addition there is a beginning of penetration of low-image commercial activities. City centers are losing their livability.

**Environmental neglect** - The collapse of commercial functions and the penetration of low-image commercial functions, causes environmental neglect, and many places look physically neglected.

**Failure of the system of cultural activity** - The collapse of commercial functions in addition to the neglected environment also affects the infrastructure of the cultural activity and many cultural activities lose their ability to exist. Public functions begin to move from the city center to other places.

**Negative image and penetration of negative activities** – The collapse of the commercial and cultural infrastructure, in addition to the neglected environments, create a negative image, which attracts negative activities.

**Failure of the human system** - The negative image of city centers causes an emigration of strong population from the city center. As a result, residential prices fall and weak populations are attracted.

**Loss of the city center identity** - The overall outcome of all the mentioned events is that many city centers lose their central identity and their principal role. As a result, the “skeleton” of the whole city loses its essential element and many of the damages are almost irreversible.

2.2 The roots of the structural failures and problems of city centers

There can be many reasons for the outcomes described above, but it seems that the leading reasons are: a) lack of clear, integrative and long-range policy; b) pressures of political and economical interest groups; c) relative weakness of pro-environment actors; d) traffic and movement problems; e) lack of parking; f) emergence of undeveloped areas outside the city centers (usually near highways), due to agricultural crises.
3 SPD approach to city centers

All the above-mentioned stress the importance of having an integrative and large-scope approach to city centers. This, in order to ensure the performance of city centers in the long-range and to allow future generations to cope with dynamic environments. This approach may be called- the Sustainable Planning and Development Approach. There is no one definition of sustainability. Based on the U.N definition the most adequate definition for our needs is: planning and development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The framework for sustainable planning and development of city centers is based on a large-scope point of view rather than focusing on a small number of aspects. This framework can help identify the main strategic elements that must be taken into consideration when dealing with this subject. The framework includes:

* Sustainable strategic components of the city center system
* A general model for SPD of city centers
* Sustainable fields of activity in city centers

The content of each element is described in the following sections.

3.1 Sustainable strategic components of the city center system

When dealing with sustainable city centers it is important, first of all to indicate the crucial components of the city center. These components are:

1) **The natural and ecological sub-system** - N – This sub-system includes all the elements of nature – vegetation, animals, climate, topography and others. In relation to city centers, in many cases these elements are neglected and cease to exist.

2) **The human sub-system** - H - This sub-system includes all the social, humanistic, and behavioral aspects, which are relevant to the city center: Ethnic structure, socio-economic structure, population growth and other human aspects.

3) **The development sub-system** – D – This sub-system includes all the humanly created artificial entities. This is the overall result of the development process.

![Diagram of City center components and their relationships](image)

Figure 1: City center components and their relationships

The ideal situation is that in which all these subsystems with their mutual relations act in harmony to achieve the vision of the sustainable city center.
3.2 The general model for SPD of city centers

The field of planning theories consists of different kinds of planning models, [4], [4], [6]. Examining the main models, it seems that the strategic model is the most suitable to achieve sustainable planning and development of city centers. This model is mainly adequate for long-range thinking in unstable and turbulent environments, which require flexibility in order to react to dynamic situations.

3.2.2 The strategic model – organizational and process aspects

According to the strategic model the planning and development process must include several necessary stages. These stages contain interrelated feedbacks and loops and the whole process is dynamic by nature. The main stages are:

Identification of city center strategic actors for consensus building - The first action, according to this model is identifying the main strategic actors and involving them from the beginning. This is especially important in the case of city centers, where there are many different interest groups and political actors. The effort is focused on creating a process of legitimization aimed at reducing “friction”, mainly by participation of the public and other actors, as early as possible.

Analysis of the strategic environments of the city center – The internal and external environments of the city center are scanned and analyzed. This analysis usually includes quantitative and qualitative methods of long-range forecasting. It also includes rational tools (such as extrapolation analysis) and intuitive and creative tools (such as futuristic scenarios).

Creation of a long-range and integrative sustainable vision for the city center - This stage is one of the most critical stages and should be an outcome of a continued dialogue on future alternatives between the strategic actors identified in early stages. This vision is usually based on rational and intuitive thinking and it can be helpful if it also has a visual concept. The visual language has many communicative advantages [7].

Development of a sustainable strategy and guidelines for the city center – This stage is an elaboration of the sustainable vision by creating a sustainable strategy and strategic guidelines. The strategy and the guidelines must relate to many aspects of life in the long-range perspective. It is also desirable to add visual images of the genius loci of the city center.

Creation of flexibility for the city center – This stage is mainly oriented at increasing the ability to cope with uncertainty and ensuring future options for the next generations. It includes various tools, which can enable the system to respond to dynamic changes.

Creation of a process of crises management - The purpose is to try and predict future city center crises and develop basic strategic guidelines concerning recommended actions facilitating the sustainable vision.

Creation of coordination and control mechanisms for implementation - This stage is focused on the implementation of the sustainable vision of the city center. It includes development of indicators for monitoring the performance of the planning and development process.
3.3 Sustainable fields of activity in city centers

The following are the sustainable fields of activity, which have to ensure the sustainability of city centers.

3.3.1 Sustainable social community and culture
This aspect relates mainly to the human subsystem. It deals with the shaping of the city-center community, which has the social and cultural ability to exist safely in the next generation, as a livable and sustainable community. This community must act as a responsive community in accordance with long-range vision with environmental awareness. Pluralistic atmosphere, critical approach, public participation, empowerment by the leadership, and open discussions are some of the main elements that can ensure the ability to retain the community's sustainability. In this field the social fabric of the community has a very significant role.

3.3.2 Sustainable natural environment of the city center
In such an intensively built environment as the city center, it is especially important to encourage conservation and development of natural elements. By doing this it is possible to bring the “light of nature” to the city center and to soften the intensive and massive man-made development. In addition, it can create a pleasant, aesthetic and healthy environment, which may contribute to commitment and respect. One of the most important elements of the nature-oriented city center is the “green skeleton” - the overall green scheme within the city center. It can contain different components such as: spatial open spaces, linear avenues, focal elements, etc. It is important that this system should have a diversity of elements on different levels, in order to supply different demands for different types of populations at different times. It is also important that this system act as a connective element among public activities, especially with other systems such as: pedestrian and bike systems, leisure functions, public buildings, etc. The use of natural materials in the city center as part of the whole nature-oriented development is also an important issue in this field of activity.

3.3.3 Pleasant and aesthetic environment of the city center
This field of activity deals with the creation of a pleasant and aesthetic city center environment (in relation to visual problems, noises, smells and other hazards). This aspect is crucial to the “sense of place” and to the attractiveness of the city center. In addition, it also has indirect effects such as commitment to the environment and mutual responsibility. The main activities in this case are urban design and planning, infrastructure design such as electricity, telephone, signs, etc. as well as preventive activities.

3.3.4 Creation of a clean environment of the city center
This field of activity includes aspects such as air pollution, water pollution, sewage treatment etc. Sustainable planning and development of city centers must include efforts to create, as clean an environment as possible. This goal can be achieved by many means such as: reduction of air pollution by limiting
private cars and using environment-friendly public transportation, industrial policies protecting the city center from pollution, land-use planning preventing the location of problematic industries inside the city center. Possible indirect influences of this activity are awareness of the importance of a clean environment and the creation of an environmental culture.

3.3.5 Energy saving and performance efficiency in the city center
This field of activity is focused mainly on saving energy and natural resources in the city center. This can be achieved by climatic design - using natural energies, natural resources and other means for cooling and heating more efficiently. This may also be achieved by greater use of internet and public transportation instead of private cars, giving priority to pedestrian and bicycle movement inside the city center. Recycling is also a fundamental principle, which may lead to better utilization of materials and natural resources. In addition, planning a user-friendly city center, in a way that saves energy in daily activities such as walking, working, shopping etc is another way of increasing efficiency. The direct effect of this field of activity is less consumption of natural resources and as a result- a cleaner environment. In addition, it can also promote awareness of energy saving, encourage respect towards natural resources, create a culture of harmony and integration with nature. It can also create local identity and responsibility.

3.3.6 Identity and Uniqueness of the city center
Stressing the identity and uniqueness of the city center can create a community that identifies with the place and its values. As a result strong commitment, respect and responsiveness to the environment can be achieved. These are in addition to other benefits such as: clear order and well-determined hierarchy of the whole city, overall cognitive orientation in space, attractive image, etc. Examples for various actions that can strengthen the identity of the city center are: creation of a special urban design, stressing the borders of the city center by urban and landscape design, design of special local elements and other actions. In addition, it is important to note that identity and uniqueness of the city center relates also to the human subsystem. The goal here is to stress the special human and social fabric as a unique aspect of the place. Many efforts of this kind can create the overall identity and uniqueness of the city center – the genius loci.

3.3.7 Historical heritage of the city center
The historical infrastructure of the city center is one of the most important aspects that are strongly connected to the essence of the city center and its identity. It includes not only man-made elements like historical buildings but also natural and human elements (historical vegetation, population with deep historical roots in the place). The historical heritage is a type of conservation of historical information for the next generations. It can provide a historical temporal dimension, which can create a sense of continuity through history and stress that the present events are part of a long evolution. This can lead to an authentic spirit of place, a local identity, respect, commitment, and a collective
memory. In addition, the historical infrastructure can have many other benefits – for tourism and even economical benefits.

The human aspect of conservation may occur where there is still an original population with historical roots in the city center for many generations. In this case it can be possible to keep this historical human fabric as an authentic part of the city center. Natural conservation can take place when there are natural historical elements that are connected to the history of the city center. The physical conservation includes historical buildings and other historical man-made elements. In this case it is important to identify the “historical skeleton” of the city center, to “write the urban biography” (the story of the city with architectural elements) and to integrate this skeleton with other public systems (public buildings, for example).

3.3.8 Sustainable economical and commercial activities

The economical infrastructure of the city center has a direct influence on the material existence of the community. Moreover, it can also generate a livable and attractive city center, and influence other systems. For these reasons, it is necessary to see the economical activity as an integral part of the sustainability of the city center. In spite of this, economical development can be destructive to city centers if not carefully operated.

In order to reach sustainability, the economical system must be developed from a comprehensive point of view. Activities, that must take place within the city center, should be identified and receive incentives, while others must be located outside. At the same time, it is important to eliminate the sprawl of the preferred activities, and if needed, to restrict sporadic development in external areas. According to the gravity model and other theories, it is possible to identify a few main elements, which are essential for the prosperity of city centers. The most important are: 1.a critical mass of commercial activities; 2. commercial diversity; 3. accessibility; 4. uniqueness and pleasantness.

In addition it is important to retain the balance between outdoor and indoor activities (usually at shopping malls), in order to have livable streets and open places. The open commercial activities can include: galleries, books shops, art centers, coffee shops, restaurants etc. - activities which can create a unique and pleasant atmosphere and support cultural life. It is also possible to integrate local products or traditional works in order to intensify the local identity of the place.

3.3.9 Sustainable transportation system in the city center

The transportation system has one of the most crucial roles in the creation of sustainable city centers. It mainly contains two sub-elements: 1. the motorist system 2. the pedestrian and bike system. In order to achieve a more sustainable city center it is important to use more internet services and to give priority to pedestrians and bike systems (safe and protected roads and districts, friendly bike parking, etc). The pedestrian system should connect between important public points and integrate green elements and unique places. When dealing with motorist transportation it is important to give priority to public transportation and also to create connections between public transportation and
pedestrian and public activities system. In addition it is preferable to discourage private cars from penetrating city centers by various means. In specific cases peripheral roads outside the city center, which conduct passing private traffic, can reduce internal traffic in the city center.

3.3.10 Sustainable public buildings system in the city center
The public buildings system, which is part of the collective essence of the community, can have an important role in achieving sustainable planning and development. Public buildings can provide a sense of collective identity and local unity, helping to create public sustainable-awareness and public commitment.

The public building system can also strengthen the identity of the total public infrastructure and determine the “public skeleton” of the city center (and also the whole city) by means of public landmarks. The contribution of the public buildings to the collective identity can be intensified if the public buildings are historical buildings. For these reasons it is preferable that the public buildings have a special architectural design and an attractive image, which can also enhance tourism activity.

3.3.11 Sustainable housing in the city center
Housing is the most basic element of community life and thus it has a great influence on the community and on the livability of the city center. The main goal is to create a sense of community within the city center and to form a lively atmosphere. Thus, it is important to integrate the residential activities with other activities, in a way that ensures quality of life. The residential function should offer a diversity of housing solutions in order to create a heterogeneous community and population diversity. The housing should create a sense of common identity, while being flexible enough to allow personal expression and identity for each family or residence - unity but not homogeneity.

3.3.12 Sustainable tourism and leisure system – eco-tourism
Tourism and leisure activities can “inject” vitality in the life of the city center and also allow economical prosperity. These activities should expose tourists to the local culture and also be integrated with the historical heritage and the local natural resources. Events, stressing the local identity such as festivals, exhibitions, seminars, trips, etc., can contribute to the development of eco-tourism – a tourism, which is well integrated with the ecosystem and with local resources.

Accordingly tourist activities must be carefully balanced with other activities in the city center and should be planned and built on an adequate scale. The sensitivity and the carrying capacity of the tourism sites and the areas surrounding them must be carefully analyzed.

3.3.13 Sustainable infrastructure
This aspect includes all the elements, connected to the city’s metabolism: electricity, cable systems, water supply, sewage, etc. The sustainable approach in this case is oriented at preventing, as much as possible, visual and
environmental damages, and creating an efficient infrastructure, in order to save on materials and costs. Wireless city centers are now becoming more viable with the development of electro-optic technologies. In any case, unifying physical infrastructures and creating underground systems can decrease environmental damages.

3.3.14 Sustainable planning and regulations for land-use
This activity deals with the spatial organization of all the activities, mentioned above (social, economical, environmental and others), according to the sustainable vision of the city center. The land, especially in the city center has high level of irreversibility. Therefore it is important to use this resource as efficiently as possible and to create options and flexibility for future generations. Where possible, recycling lands is recommended, instead of using new open areas for development [8].

In addition to efficiency and flexibility of land use in the city center it is important, in general, to create mixed activities in the city center. This in order: to create a diversity of activities, to achieve a continuous city center life, and to ensure interactions and complex relations within the city center. All these can increase the ability to achieve sustainability.

3.3.15 Sustainable urban design and landscape design
This field of activity deals with the 3d design of the city-center vision, in order to ensure the sustainable physical environment of the city center for future generations. It influences the spirit of the place (genius loci), its identity, historical image, and pleasantness and aesthetic values. All these can influence the attractiveness of the city center, create solidarity, and empower the identification of the people with the place.

Sustainable urban design should create an architectural language, which ensures dialogue and continuity with the place and its tradition, integrate local and natural materials, prevent and reduce visual damage from infrastructures, signs, and others and integrate them as part of the urban environment.

3.3.16 Sustainable town center management
This field of activity relates mainly to the implementation of the planning and design process. It includes maintenance, budgeting, and other activities, but also cultural and social management - creating a lively city center with lots of activities throughout the year.

For this reason it can be beneficial to erect a managerial forum consisting of decision-makers, residents, representatives of the private sector, merchants, planners, and representatives of other interest groups. The purpose of the forum will be to steer and navigate the main activities of the city center and to encourage unique events, which are identified with the place and its history, such as: exhibitions, festivals, conferences, bazaars, markets for local products, tourist activities, etc. All these can develop and strengthen the unique identity of the place, which is very important for a sustainable culture.
4 Summary and future directions

The city center is one of the most important elements of the urban environment. This system is a living system, which is exposed to dynamic processes, in its internal or external environments. Failure and disability of the city center to fulfill its roles can influence many other areas and aspects of the city. Part of the damages can be irreversible, and future generations will bear the cost. For this reason it is important to have a sustainable approach which is as holistic as possible and to relate not only to traditional environmental aspects.

In this article, the city center system was divided into three main subsystems: N-the natural ecological subsystem, H-the human subsystem, D - the development subsystem. These three subsystems are interrelated and this must be taken into consideration. In addition, in sustainable planning and development it is important to identify the suitable model of planning, which can direct the whole process. Examination of the existing models in the field of planning theory indicates that the strategic model is the most suitable. This model relates to long-range vision in turbulent and dynamic environments. It also relates to organizational aspects and to the importance of a legitimizing process, especially by participating the public and other strategic actors. Besides the strategic model, a list of fields of activity for sustainable planning and development of city centers is introduced.

In the future it is important to continue analyzing the mutual relations between the three subsystems of the city center, to continue the adaptation of the strategic model to sustainable planning and development of city centers and to continue developing the knowledge in the various fields of activity.

References