



**BUDAPESTI CORVINUS EGYETEM**  
TÁJÉPÍTÉSZETI KAR  
TÁJÉPÍTÉSZETI ÉS TÁJÖKOLÓGIAI DOKTORI ISKOLA

**ESZTER KARLÓCAINÉ BAKAY**

**OPENSOURCE DESIGN OF HOUSING ESTATES BETWEEN  
1945-1990 THROUGH THE EXAMPLE OF BUDAPEST**

Ph.D. THESES

THESIS ADVISOR  
JÁMBOR IMRE, CSc, DLA

BUDAPEST, JANUARY 2012.



**School name:** Corvinus University of Budapest  
**faculty:** Doctorate School of Landscape Design and Landscape Ecology

Discipline: Agricultural and Technical Sciences

**Dean of school:** Csemez Attila, DSc  
Full professor  
Corvinus University of Budapest  
Faculty of Landscape Design  
Department of Regional Planning

**Thesis advisor:** Jámbor Imre, CSc, DLA  
Full professor  
Corvinus University of Budapest  
Faculty of Landscape Design  
Department of Garden- and Open Space Design

**The candidate has fulfilled all the requirements of the doctoral school, and has modified her doctoral thesis according to all the suggestions of the departmental open discussion of the dissertation. Hence, the doctoral thesis can be put to an official, open and final discussion and defence.**

.....  
Dean of the doctoral school

.....  
Thesis advisor

# CONTENTS

---

<b>INTRODUCTION</b>	<b>5</b>
<b>THESIS STATEMENTS</b>	<b>9</b>
<b>AUTHOR'S PUBLICATIONS CONNECTED TO THE TOPIC OF THE THESIS</b>	<b>18</b>
<i>ARTICLES</i>	<i>18</i>
<i>CONFERENCE PUBLICATIONS AND ELECTRONIC PUBLICATIONS</i>	<i>18</i>
<i>CONFERENCE PAPERS</i>	<i>19</i>
<b>REALIZED OPENSOURCE DESIGN WORKS ON PUBLIC PLACES</b>	<b>20</b>
<b>PRICES, AWARDS</b>	<b>22</b>

## INTRODUCTION

---

The topic of the dissertation is the openspace design of housing estates in the second half of the 20<sup>th</sup> century, between 1945 and 1990. The openspace design of this era is absolutely undiscovered from professional aspect, and this dissertation deals with a segment of this huge subject.

The goal is to get familiar with this special openspace design task which was so typical in that era, to track its changes and to evaluate the openspace design works of different periods from the point of contemporary art trends. The recognition the present values of housing estates' openspaces built in the era in focus, is extremely important especially nowadays prior their renovations, to avoid destruction of existing values. By learning the openspace design of housing estates typical in the era, the final goal of the dissertation is to provide a useable help for the decision makers, for NGOs and designers in the revitalization process.

The built-up systems and openspaces of housing estates built in the researched period of 45 years are not uniform. Characteristic changes, specific trends can be observed, which give base for creating further periods within the analyzed era. The specialty of housing estates' openspace design, that the size and proportions of openspaces are determined to certain level by the built- up system, and the space walls are basically influenced by the quality of building facades. The location of

commercial units and primary educational institutions within the housing estate is also determining the openspace structure. Therefore the most important changes in architecture and built-up system of housing estates are also tracked parallel with the changes of openspace system.

During the analyzed era openspace-use functions, relation of car- and pedestrian traffic, methods for providing enclosure, composition principles, methods of plant application, the usage of plans, building materials and street furniture have changed. In addition to this, some specialties appeared in certain periods. Between 1945 and 1990 a series of legal regulation and planning guidelines were introduced dealing with placement and sizing of housing estates' openspaces and required proportions to be provided for different openspace-use. The changes of these regulations and guidelines have also influenced size, placement and structure of openspaces in housing estates.

The review of openspace design of the researched era can be subdivided into periods of decades. After general statements regarding housing estate developments of each decade we come to the review of built-up system, architecture and typical placement of commercial units and primary educational facilities. Following the architectural and urbanistic reviews comes the presentation of openspace solutions supported by photos and original plans according to the following criteria: vehicle- and pedestrian traffic, outdoor functions, methods to provide enclosure, composition principles, ways of plant application, changes in the use of plans and building materials, appearance of different street furniture, and the review of specialties of openspace design in each specific decade. At the end of the review on housing estates developments of each decade openspace systems

of three contemporary housing estates are analyzed mainly from landscape architectural point of view based on landscape development plans and construction drawings.

Due to relative few sources in professional literature, the conclusions of the dissertation are based first of all on analysis of plans of the period. Landscape architects, active in the researched period, with whom interviews were made helped in interpretation of plans and in placing them into specific context typical of their formation.

During the selection of analyzed plans it was an important consideration that each selected plan should represent the period in which it was designed and demonstrate its most typical features mostly from space enclosure, composition and plant-usage point of view. In selection of housing estates to be analyzed another important criteria was to choose the ones which have references in the professional literature of the period and according to the current professional literature are considered as valuable, progressive and characteristic works. A special effort was made to find size housing estates with typical built-up system of the period. In each chapter reviewing decades, there are references of openspace design solutions of many other housing estates of the period besides the ones presented in details.

In addition to the above mentioned, a determining factor was in the selection of plans to be analyzed, which housing estates have relative complete documentation available and to be researched. (As it is well-known, after the cessation of big state-owned planning firms in 1990 a big portion of plans were lost or destroyed.)

The ecological- aspect analysis of settlement value on housing estate openspaces was realized by selecting model areas. Measurements based on uniform criteria were made on construction drawings regarding the size and proportions of green surface, of pervious pavements, within green surface the proportion of multi-level vegetation, of fragmented green areas, and of canopy coverage. The present biological value of housing estates' open-spaces was indicated by vegetation index measurements. To rate the vegetation index values of housing estates three downtown parks of Budapest were introduced as control territories, whose vegetation index values were compared to those of analyzed housing estates.



## THESIS STATEMENTS

---

*I. The period of observation can be categorized according to styles of openspace architecture in the following way:*

- *Modern era after the World War II. (1947-1950)*
- *Era of Social Realism (1951 -1955)*
- *Late modernist era (1956 - 1980)*
  - *First part of late modernism (1956-1969)*
  - *Second part of late modernism (1970-1979)*
- *Decline of late modernism (1981 -1989)*

The periods above have been determined by a comparative analysis of the open space design elements of housing estates, taking various elements into consideration: such as functionality, structural elements, design principles, plants used in composition. In addition to these, a special attention was given to materials and plants used and garden furniture.

The open spaces of housing estates are special compositions that are influenced by not only the main design styles and trends of the era, but they are greatly influenced by the architectural styles of the buildings. According to this, the following characteristics can be observed: The socialist era was mainly directed and determined by state planning which lasted for a three- year and several five-year periods. Considering the state-

built housing, it meant not only the volume of the housing estates, but it implied proper decisions about the applied new construction technologies that were strongly related to the open spaces and functionalities of the housing estates. Hence, in coherence with the architectural resources and literature of the period- I considered the economic periods and decisions of the actual five-year long state plans.

*2. The basic principle of the modern, functionalist design of the 20<sup>th</sup> century is that the form is determined by the functionalism, can be observed in the plans and open space design. The artworks were subject to mass production and this phenomenon could be observed in open design, as well. Nevertheless, these characteristics can be observed in art compositions of any era, but elements of functional garden design can mostly be found in the second half of the 20<sup>th</sup> century.*

The functionalism in open space design means to subdivide the open space into certain monocultural inclusions where each part bears a specific purpose. Although the enclosures were separated, spatial connections were established between them by roads and pathways in a hierarchical ways providing the optimal connections. These ideas were supported by special open space design applications such as spatial dividers to provide adequate shade and wind protection. According to current urban ecological research, these functionalist principles are essential in order to provide adequate protection from negative environmental effects. In terms of materials used, this era can be characterised by simple and cheap, but functionally

acceptable solutions. As the industrial solutions developed, the mass production of ready made elements and serial plans were mostly used, implying that the open space solutions were not unique, but they rather were subject to multiple applications.

In terms of plant application, the fundamental principle of the functionalist design and planning was to maximise the production capacity of plants of a given area or land based on geobotanical or fitogeographic science. Considering the form of plant applications, we can say that it was rather simple, or followed some natural layouts. In terms of economical point of view, they were rather cheap solutions in terms of establishment, cultivation and maintenance.

Some elements of the functional design have been used in the earlier times and periods of the openspace design, but the concentrated appearance of functional design elements can be related mostly to the era of late modernism of the 20<sup>th</sup> century.

***2.1. The connective elements between green surfaces and enclosures or streets with significant green proportions - around the housing estates that were built in the socialist realism era - can be basically characterised by functionalism.***

The social realism, the main architectural design style of the 1950's - although it was seemingly opposing the modern artistic ideas- considering the main principles in the construction of the enclosures of the housing estates in terms of the separation of neighbouring units and grouping

objects into functional entities, has used the basic ideas of modern urban architecture<sup>1</sup>. Regarding landscape architecture, the functionalist approach basically meant the formation of enclosures between buildings that resulted in the realisation of inner gardens that provided a special functionality and also served as a boundary for open space.

The division of open spaces and the adequate shading was realised by using appropriate assortment of plants that could provide sufficient shade. Logically constructed, straightforward walkways served for pedestrian traffic in the most frequented directions- excluding trespassing traffic. The realisation of a coherent, connected green surface areas was a common characteristic of the garden design of the era, so it was an important factor for landscape designers to provide a connection and continuity between enclosures and outer green areas.

## ***2.2. The design of open spaces of housing estates in late modernist era was fundamentally determined by functionalism.***

The design of open spaces for housing estates based on functionalist principles was completely fulfilled between 1956 and 1989. The fundamental design principle of functionalism, namely the functionality and purpose determines the form and material used, the industrial and mass production resulted in the lack of decorative elements and simple geometric motifs used in design of the open spaces of housing estates in the 60's and 70's.

The functionalist approach of the 50's still was in practice in the next two decades (60's and 70's) but it was supported with results of geobotanical research. The negative effects of the motorized traffic - the increased noise level and pollution was to be minimized by garden design. In addition to this, the main design principle was to find the cheapest solution possible in terms of construction and maintenance- which had a negative effect in the quality of open space. (In the housing estates of the 80's one can find occasional symbols of post modernism within the extremely functional modernist elements. Only a few elements of unique, individual features - mostly among the architectural elements or open spaces between housing estates- can be found that can create special characteristics for a housing estate that can serve as personal connection for the inhabitants of the place).

***3. The pavement system of the 50's and 60's for housing estates was superior to the pavement systems of the later periods in terms of water retention.***

In case of the housing estates of the 50's and 60' it was very common to use water permeable pavements as it can be concluded analyzing plans of the era. These water permeable pavements are not biologically active surfaces, but they can retain water and can positively influence water balance ability of the environment - making a positive effect on climatic conditions. In the '970s and '980s the amount of water permeable pavements was reduced mainly due to economic factors, and even the previously built water permeable pavements were mostly terminated.

***4. In the second half of '950s and in the first half of '960s the clustered structure of housing estates made possible to form larger, connected green surfaces.***

Our housing estates of focus were built in different decades of the era in different architectural style. In terms of green surfaces, I have determined other parameters beyond the compulsory categories that could influence the quality of green surfaces, such as fragments and fractions of green surfaces.

The housing estates that were built in the first part of the '950s had framed built-up structure or the buildings were arranged in stripes, while the housing estates of the '970s were mainly built in fiber-like or linear structure - which was less advantageous for green surface realization.

Analyzing the fragmented green surfaces, it can be stated that housing estates of the late 1950's or 1960's, where the houses were placed in clustered form can boast with the best (lowest) fragmentation index indicating the biggest coherent green surfaces in their openspaces. (The proportion of coherent green surfaces less than 200 m<sup>2</sup> size was only 16,0 % in case of József Attila housing estate and only 15,7% in case of Lakatos Street housing estate. In this respect the worst situation can be found in Pók Street housing estate which was built at the beginning of the '80s, where 29, 0% of coherent green surfaces are less than 200 m<sup>2</sup>.)

***5. During the 1970's, in the dividing green stripes between blocks of houses or at the edges of housing estates, huge masses of wooden vegetation and artificial mounds appeared for the first time, in order to divide the openspace and to separate the housing estate from the traditional urban fabric with proper scale plant application and earthwork.***

The plant- application practice was typically realized in the previous decades is family-garden scale by using solitary trees or small groves. The change of scale typical in housing estate architecture of the 1970's has implied a similar change of scale in the division of openspaces as well. Considering plant applications, the large size, relative homogeneous, forest-like plant mass in accordance the architectural scale and rhythm appeared between some blocks and at the edges of housing estates. The method of space division and separation by artificial mounds appeared in this decade as well, often combined with mass plantation. Besides their space dividing role they proved to be efficient first of all in sound- isolation along main roads with heavy traffic at the borders of housing estates.

***6. Analyzing the openspace development plans of the period it can be stated that some further indicators are important regarding the ecological quality of green surfaces, such as the proportions of multi-leveled vegetation and canopy coverage in openspaces of different housing estates, though they are subject to significant dispersion, are independent from different building periods, and seem to be unique characteristics for each plan.***

The proportion of multi-leveled vegetation on analyzed housing estates varies from 3% to 15%, the proportion of canopy coverage is between 15, 1 % and 30, 8 %. The changes seem to be independent from different eras or built-up methods, but depend on local circumstances and unique design characteristics.

***7. The biological activity values of some housing estates are almost as high as the biological activity values of some downtown parks of Budapest. It can be stated, that the green surfaces of housing estates, thanks to their high biological value, are extremely important elements of Budapest green system.***

According to their normalized average vegetation index values (NDVI) the biological activity of the analyzed housing estates is almost the same as the biological value of some downtown parks. For example according to measurements taken on 01. 08. 2005. the vegetation index values of eight housing estates chosen as model areas were between 0,65 and 0,112, while the vegetation index values measured in three downtown parks were



between 0,07 and 0,13. (The best vegetation index values were measured at the József Attila housing estate in the 9<sup>th</sup> district and Lakatos Street housing estates in the 18<sup>th</sup> district.).

If we take into consideration, that in case of housing estates by the available techniques only average vegetation index value can be measured, which includes the biologically inactive surfaces of buildings, pavements and parking lots as well, it can be supposed, that „pure” green surfaces of housing estates could be proud of having with much higher vegetation index values. The reason of this is partially the appropriate- and in some cases high proportion- of green surfaces in housing estates, thanks to the former normative regulations, partially the existing well-developed wooden vegetation. Due to their biological activity the green surfaces of housing estates are significant elements of Budapest green system nowadays.

## AUTHOR'S PUBLICATIONS CONNECTED TO THE TOPIC OF THE THESIS

---

### *ARTICLES*

Bakay, Eszter: **„Retroparkok” Kertépítészeti alkotások a 60-as, 70-es évek funkcionalista korszakából.** (Retroparks, Landscape architectural works of the functionalist period of the 1960's and 70's)'4D' *Tájépítészeti és kertművészeti Folyóirat*, 18/201 34-53.

Karlóciné Bakay Eszter: **Növényalkalmazás történeti kertekben.** (Plant application in historical gardens) In: *Tájépítészet*. 2004. 1-2 szám 68. old.

Bakay, Eszter: **A lakótelepeink szabadtérépítészete az ötvenes évek első felében,** (Openspace design of our housing estates in the first half of 1950's) 4D *Tájépítészeti és kertművészeti Folyóirat*, különszám, 2012. in press

### *CONFERENCE PUBLICATIONS AND ELECTRONIC PUBLICATIONS*

Bakay, Eszter: **Budapest kertépítészete a 70-es években.** (Landscape Architecture of Budapest in the '970s) In: Sallay Ágnes (szerk.): *Ormos Imre Tudományos Ülésszak. LOV 2009. Tájépítészeti Tanulmányok*, Budapesti Corvinus Egyetem, Tájépítészeti Kar, Bp. 2010, 97 – 109.

Bakay, Eszter: **Trends of Landscape Architecture in Hungary in the '70s.** In: Fabos, Julius Gy – Ryan, Robert L. – Lindhurt, Mark – Kumble, Peter – Kollányi, László – Ahern, Jack – Jombach, Sándor (eds.): *Proceedings of Fábos Conference on Landscape and Greenway Planning*, Budapest 2010. 655- 662.

Bakay, Eszter: **Játszóterek története 1950-től napjainkig.** (History of playgrounds from 1950 to present) In *“Élhető települési táj” tudományos közlemények és értekezések. 4D könyvek: Jámbor Imre (szerk.): Budapesti Corvinus Egyetem, Tájépítészeti Kar, Bp. 2011, accepted / in press*

Bakay, Eszter – Hutter, Dóra – Szilágyi, Kinga: **The Evolution of Open Spaces and Green Surfaces on High-Density Developments Since 1950.** In: *Acta Universitatis Sapientiae Agriculture and Environment*, 3/2011 288-298.

Bakay, Eszter: **The evolution of green surfaces in housing estates** (The role of housing estates' green surfaces in forming the city climate of Budapest) AEER ISSN 1785 0037 AEER, IF: 0,567 Volume 10/1

### **CONFERENCE PAPERS**

Bakay, Eszter: **Late modernist landscape in the Eastern – block countries of the 1960's and 1970's.** ECLAS Conference Sheffield 2011. Ethics/Aesthetics. 2011.szeptember 7-10.

Bakay, Eszter: **A magyar kertépítészet változása az 50-es évektől napjainkig különböző szabadtérépítészeti feladatok tükrében** (Changes of Hungarian landscape architecture in the light of different openspace design tasks) TÁMOP Workshop, Budapesti Corvinus Egyetem - Tájépítészeti Kar, 2011. április 19.

Bakay, Eszter – Hutter, Dóra – Szilágyi Kinga: **The Evolution of Open Spaces and Green Surfaces on High-Density Developments Since 1950.** I. Erdélyi Tájépítész és Kertész Konferencia. Sapientia Erdélyi Magyar Tudományegyetem, Marosvásárhely, 2011. április 8-9.

Bakay, Eszter: **Trends of Landscape Architecture in Hungary in the '70s.** Fábos Conference on Landscape and Greenway Planning, Budapest, July 8-11. 2010.

Bakay, Eszter: **Budapest kertépítésze a 70-es években.** (Landscape Architecture of Budapest in the '970s) Lippay János – Ormos Imre – Vas Károly Tudományos Ülésszak, Budapesti Corvinus Egyetem, Bp. 2009. október 28-30.

## **REALIZED OPENSOURCE DESIGN WORKS ON PUBLIC PLACES**

---

Karlóciné Bakay Eszter (2010): Mosonmagyaróvár, *Erzsébet tér szökőkút elhelyezés, és szökőkút környezetének kiviteli terve* ( Mosonmagyaróvár, Erzsébet Square, design of fountain and its immediate surrounding, construction leveles plan) (vízgépészet/waterworks: Karlócai, Péter)

Dr. Almási Balázs – Dr. Balogh Péter István – Gergely Antal – Bakay Eszter – Varga Dániel (2009): *Nagykovácsi, gr. Tisza István tér környezetépítészeti kiviteli terve.* (Revitalization of Tisza István Square, Nagykovácsi)

Karlóciné Bakay Eszter (2008): *Budaörs, Cserebogár utcai játszótér HRSZ 9607 és környéke* (Budaörs, Cserebogár Street playground and its environment, HRSZ 9607)

Karlóciné Bakay Eszter (2006): *Siklós, HRSZ 1213/2 és 1213/3 köztér környezetrendezési terve szökőkút elhelyezéssel.* (Siklós, revitalization of public square HRSZ 1213/2 and 121363 with fountain (vízgépészet/waterworks: Karlócai, Péter).

Karlóciné Bakay Eszter (2005): *Bp. XI. Budafoki út, IPWest székház belső udvar rendezési terve és vízesés terve, kiviteli terv.* (Bp. XI. IP West headquarter inner courtyard landscape development plan with waterfall, construction level plan) (vízgépészet/waterworks: Karlócai, Péter)

Karlóciné Bakay Eszter – Neogrady Judit (2005): *Budaörs, Köztér felújítási terve vízarchitektúra elhelyezésével.*(Budaörs, public Square, revitalization with water structure)

Karlóciné Bakay Eszter (2004): *Bp. XIV. Örs vezér tér rendezési terv és szökőkút rekonstrukció I., II., III. ütem.* ( Bp. XIV. Örs vezér Square, landscape development plan with reconstruction of existing fountain phase I. II. III. (vízgépészet/ waterworks): Karlócai Péter)

Karlóciné Bakay, Eszter (2004): *Sátoraljaújhely, Hősök terve térrekonstrukció és szökőkút elhelyezés, engedélyezési terv és kiviteli terv.* (Sátoraljaújhely, Heroes Square, revitalization plan with fountain, permission level and construction level plans) (vízgépészet/waterworks: Karlócai, Péter)

Karlóciné Bakay Eszter (2000): *Bp. VIII. Rezső tér környezetrendezési terv szoborelhelyezéssel.* (Budapest, VIII. Rezső Square, revitalization with placement of a new statue)

Karlóciné Bakay Eszter (2003-2004): *Bp. IX. Soroksári út, Dunapest Rezidenciák tetőkertjei, engedélyezési terv és kiviteli terv.* ( Bp. IX. Soroksári Street, Dunapest Residencies roof-gardens, permission and construction level plans) (építész: Csomay, Zsófia)

## **PRICES, AWARDS**

---

Dr. Almási Balázs – Dr. Balogh Péter István – Gergely Antal – Karlóciné Bakay Eszter (2011): *Nagykovácsi főterének megújítása – MUT- ICOMOS köztérmegújítási díj. I. Helyezés* (Revitalization of Nagykovácsi, Main Square, MUT- ICOMOS Public Space Revitalization Price, first place)



TÁMOP-4.2.1.B-09/1/KMR-2010-0005

10.1 Kutatóműhely



Nemzeti Fejlesztési Ügynökség

[www.ujszachenyiterv.gov.hu](http://www.ujszachenyiterv.gov.hu)

06 40 638 638



A projekt az Európai Unió támogatásával, az Európai Szociális Alap társfinanszírozásával valósul meg.

This PHD thesis was made possible by the support of **TÁMOP 4.2.1.B-09/1/KMR-2010-0005 Program**.